

**CHARTER TOWNSHIP OF ORION
PLANNING COMMISSION REGULAR MEETING AGENDA
WEDNESDAY, DECEMBER 7, 2022 - 7:00 PM
ORION TOWNSHIP MUNICIPAL COMPLEX BOARD ROOM
2323 JOSLYN ROAD
LAKE ORION, MI 48360**

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In the spirit of compliance with the Americans with Disabilities Act, individuals with a disability should feel free to contact Penny S. Shults, Clerk, at (248) 391-0304, ext. 4001, at least seventy-two hours in advance of the meeting to request accommodations.

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1. OPEN MEETING

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3. MINUTES

- A. 11-16-22, Planning Commission Regular Meeting Minutes
- B. 11-16-22, Public Hearing Minutes PC-22-39, Hudson Square PUD Concept Plan

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9. PUBLIC COMMENTS

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CHARTER TOWNSHIP OF ORION PLANNING COMMISSION
******* MINUTES *******
REGULAR MEETING, WEDNESDAY, NOVEMBER 16, 2022

The Charter Township of Orion Planning Commission held a regular meeting on Wednesday, November 16, 2022, at 7:00 p.m. at the Orion Township Municipality Complex Board Room, 2323 Joslyn Road, Lake Orion, Michigan 48360.

PLANNING COMMISSION MEMBERS PRESENT:

Scott Reynolds, Chairman	Don Walker, PC Rep to ZBA
Derek Brackon, Commissioner	Joe St. Henry, Secretary
Kim Urbanowski, BOT Rep to PC	Jessica Gingell, Commissioner

PLANNING COMMISSION MEMBERS ABSENT:

Don Gross, Vice Chairman

1. OPEN MEETING

Chairman Reynolds opened the meeting at 7:00 p.m.

2. ROLL CALL

As noted above.

CONSULTANT'S PRESENT:

Jill Bahm, (Township Planner) of Giffels Webster
Eric Pietsch, (Township Planner) of Giffels Webster
Mark Landis (Township Engineer) of Orchard, Hiltz, and McCliment, Inc.
Lynn Harrison, Planning & Zoning Specialist

OTHERS PRESENT:

Amy Harris	Scott Harris	Matt Malenick
Ray Harris	Greg Moran	Amy Keyzer
Sherley Moran	Emily Glassford	David Steuer
John Slocombe	Elizabeth Glassford	Lorita Woznick
Diane Glassford	Sydnee Keucken	Mary Mansfield
Ari Geczi	Jen Geczi	Terry Clissold
Fred Glassford	Elizabeth Fenwick	Sharon McQueen
Susan Johnston	Marcie Ramsey	John Whittey
Alicia Lawson	Matt Lawson	Melissa Canelis
Giselle Graham	James Graham	Tracy Deuman
Kelly Mihelich	Ryan Soldan	Al Hassnan

3. MINUTES

- A. 10-19-22, Planning Commission Regular Meeting Minutes
- B. 10-19-22, Planning Commission Public Hearing Minutes PC-22-35, Township Initiated Text Amendment – Performance Guarantees

Moved by Trustee Urbanowski, seconded by Commissioner Walker to **approve both sets of minutes as presented. Motion carried**

4. AGENDA REVIEW AND APPROVAL

Moved by Trustee Urbanowski, seconded by Commissioner Jessica Gingell, to **approve the agenda as presented. Motion carried**

5. BRIEF PUBLIC COMMENT – NON-AGENDA ITEMS ONLY

None.

6. CONSENT AGENDA

None.

Chairman Reynolds recessed the regular meeting at 7:05 p.m. and opened the public hearing for PC-22-39, Hudson Square Planned Unit Development (PUD) Concept Plan, located at 3030 S. Lapeer Rd. (Sidwell #09-26-101-021) at 7:06 p.m.

Chairman Reynolds closed the public hearing for PC-22-39 at 8:25 p.m. and reconvened the regular Planning Commission meeting.

7. NEW BUSINESS

A. PC-2019-06, Silverbell Pointe PUD Site Plan Extension, located on 4 vacant parcels S. of Silverbell Rd. on the east side of Joslyn Rd. (Sidwell #09-33-201-001, 09-33-128-001, 09-28-379-001, & 09-28-451-001).

Chairman Reynolds asked the applicant to state their name and address for the record.

Mr. David Steuer 30108 Orchard Lake Rd., Suite 150, Farmington Hills, MI.

Mr. Steuer said that they thought that they had the property all approved and ready to turn it over to start the actual physical development toward the end of June. MDOT and CN Railroad wanted to come out for a final inspection and walk it and in doing so had some new requirements. They have been working nonstop with RCOC, MDOT, CN Railroad, our traffic consultant, OHM, Professional Engineering Associates, and their engineers to get everybody together in agreement about how to proceed. It is all about what is off-site, and it has nothing to do with the legal description.

Moved by Chairman Reynolds, seconded by Trustee Urbanowski, that the Planning Commission approved the site plan extension request for PC-2019-06, Silverbell Pointe PUD Site Plan for 1 year. This approval is based on the following findings of facts: that the applicant is still working through approvals with neighboring jurisdictions and approvals are still in process and there has been due diligence on the project and intent of it moving forward.

Roll call vote was as follows: St. Henry, yes; Walker, yes; Urbanowski, yes; Brackon, yes; Gingell, yes; Reynolds, yes. **Motion carried 6-0. (Gross absent)**

B. PC-22-16, Lava Mountain Special Land Use, and Site Plan Postponement Extension, located at 1472 S. Lapeer Rd. 09-14-100-074.

Chairman Reynolds said he did not believe that the applicant is present tonight he had another conflict. He was familiar with this this was essentially a postponement of further deliberation on this topic for them to work through. They have made some comments and suggestions on how to make the drive-through configuration of Lava Mountain Coffee work better. He thought that they were still working through that. He knew that there had been a conversation with OHM so there is some movement, and he would support further postponing this PC case.

Moved by Commissioner Walker, seconded by Commissioner Gingell, that the Planning Commission approves the postponement extension request for PC-2022-16, Lava Mountain Special Land Use, and Site Plan postponement extension request for one year. This approval is based on the information received from the petitioner.

Roll call vote was as follows: Urbanowski, yes; Gingell, yes; Walker, yes; Brackon, yes; St. Henry, yes; Reynolds, yes. **Motion carried 6-0. (Gross absent)**

C. PC-22-39, Hudson Square Planned Unit Development (PUD) Concept Plan, located at 3030 S. Lapeer Rd. (Sidwell #09-26-101-021).

Chairman Reynolds asked for the consultants to read through their reviews.

Planner Pietsch read through his review date stamped received November 11, 2022.

Engineer Landis read through his review date stamped received November 9, 2022.

Chairman Reynolds said that the Fire Marshal did review the conceptual plans and had some concerns about some of the turnarounds.

Chairman Reynolds stated that there was a site walk completed by the Site Walk Committee from Vice-Chairman Gross. They have completed a site walk a few times on this parcel in the past. There was also a preliminary review from WRC.

Planner Gingell asked when they will have that traffic study to review. Engineer Landis replied that they should have their review completed within about a week to a week and a half.

Commissioner Walker said he wasn't sure if anyone on this dais or on the other dais is a more frequent patron of their restaurant than him. He wanted to disclose that right up front. He has no interest in their restaurant other than he really wanted them to make it happen. Anything negative he says up here has nothing to do with their restaurant or with Biggby Coffee. He did have some questions. His biggest concern is the traffic. He understands that they cannot control MDOT any more than they can. Every developer that comes before them says this, it is only going to be 26, 37, 48, more cars, whatever the number is. Southbound M24 in the morning and any time of the day now, north, and southbound M24 are hideous the traffic is terrible. That stop sign at Waldon and M24 is not sufficient. Something must be done, and he is not saying they can do it. To him, if there was a light there or a light coming out at the ingress or egress point of their development on M24 it would make him extremely happy. He thought that everybody would forget about a whole lot of other things if they could pull that off. He knew they couldn't do it, and the Township couldn't do it. That is his biggest concern. The next concern he had was water runoff, and he is not an engineer, but he is worried about the water runoff, especially with the stream configuration change. They indicated that all the water runs to the southeast quadrant of their development and then goes into a culvert that runs under M24. He asked if that was true. Mr. Wayne replied that when the Classic Car Club plans were approved it was approved that that stream would get rerouted basically into that 6-ft. culvert and that is where all the water flows naturally. There was already a permit from EGLE to relocate the stream, and they plan to copy the exact path of relocation and update the permit just to reflect the new design. The stream relocation has already been through the eyes of EGLE, and they deemed that this path is feasible.

Commissioner Walker said he was somewhat concerned about the lighting. They indicated that there are enough trees and things in the way that there is not going to be any input to the neighbors to the west. Mr. Wayne said the west portion of the site is where their residential is located and so those have modest lighting similar lighting to what a single-family home would have in terms of exterior façade lighting. The parking lot to the east would have more traditional parking lot lighting. His point was that the whole tree line on Waldon is going to remain part of

the nature preservation effort. From Waldon Rd.'s point of view, they will have the tree line completely blocking any lights in that parking lot. He added that the beauty of this site is there are some trees on property lines and in areas that are being preserved that stand 50-60 feet tall. Those trees will serve as a great natural buffer both for light and for the buildings themselves. Commissioner Walker asked if those trees are going to remain. Mr. Wayne replied yes, they haven't done a tree survey yet to tell you exactly which ones but there is a big line of trees on Waldon Rd., the intent is to preserve those trees, and then those other trees that are at the entry point and over by the wetland.

Commissioner Walker said the only other person who is a bigger tree hugger than he is, that he knows of is Mary Ann Ryan who was one of the people that spoke during public comment. She gave them their full endorsement.

Trustee Urbanowski said that Engineer Landis had said that the stream relocation will need wetland and or EGLE permits. Mr. Wayne said it was previously permitted for the conditional rezoning for the previously approved site plan. That same stream location design, basically the direction that it is moving is exactly what they copied on. The previous site plan was approved with that stream location, so they are going to take the same one and place it on this site plan.

Trustee Urbanowski asked if there were any changes because that came before the change in the Engineering Standards. Engineer Landis said that the stream relocation would not necessarily be impacted by the new standards. The new standards would be more towards promoting infiltration outside of the detention area. He didn't recall the previous site plan relocating that stream, he thought the stream was being enhanced in place, but he would have to look and see if he can find that.

Trustee Urbanowski stated that they have been here many times and she appreciated their tenacity and listening because there were three people that came up to speak tonight that had been here before for The Woodlands and they were not quite happy with that development. It sounds like they all are ok with the development now. Probably no small part to Sweet Amy's but she also thought it was the other parts too, the car club is something that people wanted before, it has been approved already and it is something she thought people were looking forward to. Then other people say the need for these apartments, which is something that they have discussed. Mary Ann's endorsements were huge, she was waiting to see what she was going to say.

Trustee Urbanowski questioned the turnaround and the Fire Department turnaround, a cult-de-sack or something. Mr. Wayne said there is a proposed turnaround area. He understood the concern of the turnaround configuration is that if cars were parked outside of that garage, it would block the firetruck from being able to pull all the way in. They do have a little space to the west so he spoke with their engineers about this previously and one concept was to extend those driveways further to the west so that it would provide a space where the car could still be parked in front of the garage without blocking part of the driveway that the firetruck would use. He didn't know if that was feasible yet because they are working through that, but the intent would be to basically configure that driveway in a way where it achieves the goal of the turnaround.

Chairman Reynolds said they are at the initial step of this process, concept, and eligibility plan. He did think that the proposal as they see it here tonight from previous proposals on the parcel or adjacent parcels is much improved from density impact and it does meet a lot of the criteria in their Master Plan from that missing housing component. He thought that was a great benefit. He stated that they heard a large outcry of support for Sweet Amy's and essentially the coffee shop. He thought that there were some positives there. He did think there are a number of

technical items that still need to be addressed. One of the things was the turnaround and talking about extending that. His concern was about some of the buffer and transitional zones between this property and the adjacent ones. Regarding the west, if they were to extend that then that essentially eliminates any natural buffer that is going to remain or any tree buffer that would be proposed, that was a concern of his. It also seemed like he is in support of the coffee shop, he thought it was great, he knew previously when they approved the conditional rezone with the asterisk of no drive-through that was in relation to traffic. His biggest concern right now would be that they ask for a 100-ft. setback to residential and it is significantly reduced here in this plan. The building is 52 feet from the driveway it looks around 30 feet. He felt that if there is indeed a hardship here because of some of the limitations of the natural features, he was in support of working with that but to just flat out just say it is 50-ft. without other measures being proposed and he thought that brings him back to the landscape discussion. It did get brought up this evening about proximity and they have had other projects here straight zoned that it is a special land use that is something they always talk about is sound, sound transfer, and traffic flow. He thought those were topics to consider in this plan. He would like to see that drive-through, he liked the orientation of the site, but can they shift some things down, can they start to make that buffer greater, if they are going to indeed decrease it? They are not speaking about what remains of the natural features of trees, they are talking about preservation. What does grading do to this? They know that they can love that tree but if they are bringing that grade up two feet that tree is never going to survive. That was a big topic for him to discuss and he would like some input on the proximity of the drive-through in relationship to the site.

Chairman Reynolds added that he knew they are talking round and round about the likelihood and the response and what the traffic study might bring them. One of their measures here about looking at a (PUD) is the detrimental impact on surrounding areas and felt that was an important piece for them to at least have a formal review on or response before they further deliberate no matter how positive they feel about this evening. It seemed like if that is something that they require of everyone else that should be some facts they have in front of them before they just say, yep, I agree, or hope that there isn't. Maybe there is something that they need to ask for in addition. Going back to the conditional rezoning of the past they said that asterisk because of the proximity to Waldon Rd. that it probably isn't going to get much better, but they also want to mitigate that risk moving forward with whatever proposed uses might be there. He was in support, but they are up there to do their due diligence.

Chairman Reynolds said he knew that there were some comments on reduced setbacks of some of the drives. The T-turnaround was another thing he wrote down. He would like to move forward no matter what condition, they must make sure the density fits. He thought that also the conditions also need to include that asterisk of making sure they are being smart with drainage and runoff on this parcel.

Chairman Reynolds said he would like some discussion on the drive-through area and the thoughts on preceding/not preceding without having their formal review of the traffic study that was submitted.

Trustee Urbanowski stated that the traffic continues to be the major issue that got brought up a lot. She thought that with all the positivity that has come from the changes she did agree that they must have the opportunity to fully review the traffic study. Also figuring out the turn-around for the firetrucks is important.

Chairman Reynolds said to be perfectly clear there are usually components and items that get to be worked through with future steps of this. He thought that where conditions come into the comment, they agree bigger picture, the final grading, and things that will come. If it is a huge make or break or it is not possible that maybe break their initial thoughts.

Secretary St. Henry said he thought that this concept development is much more appealing than what they have seen in the past. He did like the mixed-use nature of it. He thought that the four different components of this development provide benefits. The traffic is his biggest concern, it is good to see that they are not routing cars in and off Waldon. He lives off M24 and he knows what M24 is like, and they are seeing a lot of proposed developments up and down M24. It is bad, it is going to get bad plus with the other developments. Recognizing that this is a responsible well thought-out concept plan. In terms of the turnaround with the fire department, later in the process, it is his understanding that those things typically are figured out one way or another. He thought that the developer and everyone recognizes that fire access and so forth is critical to any development and felt they would figure that out. This is a much more appealing development concept than what they have seen in the past for this area.

Commissioner Walker asked if they still had the windmill. Mr. Wayne replied that the last time he was there the windmill was still there about a month ago. He jotted that down when that comment got made because if they could preserve and keep that water flowing.

Engineer Landis said regarding the stream relocation, the previous Classic Car Club site plan did show the stream relocation as included on this plan before them tonight.

Mr. Wayne said they mentioned a residential setback, does that have to do with the fact that the north property is zoned residential? Chairman Reynolds replied that the required setback to residential for a drive-through in a special land use is 100 feet. That is kind of the key criterion there. There is a 35-foot residential setback to the residential units, which is a deviation. He thought that seemed like they were scrunching that up close and without understanding other mitigation measures it is a concern. Mr. Wayne asked if that deviation from their own residential. Chairman Reynolds replied to the north adjacent property owners. Mr. Wayne asked if that parcel was zoned institution or commercial zoning, what would that setback be in that case. Chairman Reynolds believed that the setback was 50-ft. Mr. Wayne said the underline zoning is (R-2) the current use is the church, technically it is residential zoning practically speaking it is functioning as a commercial business or an institutional business he thought a 50-ft. requirement should be considered.

Mr. Wayne said they would certainly like to maximize it, the challenge they have is they are pushing from each end to try to fit all the pieces in with the necessary setbacks, and meeting all the ordinances that is a challenge every developer faces. These minor tweaks that they can make, he thought, could improve the overall orientation, and allow them to come closer to the setbacks. One specifically that he asked for feedback on is the extra 5 feet on the residential being 30 feet as opposed to 35 feet. That area behind those residences is intended to remain as natural and undisturbed as possible. Their intent was to provide a 30-ft. setback there, and their hope is that that is sufficient. Trustee Urbanowski asked if there was a deck or patio back there. Mr. Wayne said for the first-floor units the 200-ft. outdoor patios would be between the buildings.

Chairman Reynolds said it is not that he is not open to decreasing the setback it is what other measures are in place to mitigate that. They are lacking some landscaping here to just say they have just spoken to propose buffers between evergreens staggering between uses on the parcel. They are kind of saying it is going to be maintained or proposed but thought that was something that would help them come to those conclusions. At least to say that it is going to be a solid buffer or whatever it might have been.

Chairman Reynolds said just proceeding this evening without the formal review of the traffic study, in favor or not. It would have to be their next meeting, or it seems like it could be ready

by their next packet. He asked Engineer Landis if that was possible. Engineer Landis replied yes. Mr. Wayne said it will be ready and reviewed and he doesn't want to convey that he is diminishing the importance of it. It is going to say that the existing conditions warrant a traffic signal. It is going to analyze the warrant signals for that and describe how each of those is met. It is then going to look at background conditions that add to population growth for the next two years. Then it is going to look at the future conditions with their development built and will compare the signalization and the unsignalized. What it shows is that even with their project built and the addition of signalization the then traffic conditions will then be better than they are today without the site built. He would love to guarantee a light, but they don't know that yet. He thought in the Planning Commissions' eyes to consider how to manage that situation given that it is not this entity that controls that. Chairman Reynolds stated that he understood. He thought what was important to them was the traffic reviews and their process. It isn't so much about that that might change it is just the opportunity for their professional review of that. He understood and knew how to read a traffic study but at the same time, they have a process and a duty on these projects and this process. He stated that he wouldn't mark this plan substantially complete without that together. He didn't want to delay the process but at the same time, it is a pivotal piece to a (PUD).

Trustee Urbanowski agreed with Chairman Reynolds. She stated that the need to look at traffic. She agrees that they should not make any decision on it until they have all of the pieces of the puzzle. She asked what the hours of operation were for the car club and the restaurant. She asked what the capacity was for the restaurant, and how many patrons were they expecting. What is the average for a Biggby drive-through? Ms. Amy Harris replied that the restaurant seats about 100 people on the main floor, the patio seats about 30, and the mezzanine will potentially seat around 30. The hours of operation during the week for the restaurant would potentially be open 4 p.m. to 10 p.m. on Fridays 4 p.m. to 11 p.m. and Saturdays and Sundays they would be open for brunch. So probably 9 a.m. to 11 p.m. on Saturdays, and Sundays would probably be 9 a.m. to 3 p.m. or 4 p.m. Biggby, would be open from 6 a.m. till 8 p.m. most days of the week, maybe on Saturdays and Sundays a little bit earlier. Biggby would probably have a max of 20 seats in there. She added because of the road that is being developed there will not be that backup of traffic that they see on Lapeer Rd.

Dr. John Canine 1247 Lake Shore Blvd. said the current car club they have had three inside parties in seven years at the current location. The hours of operation are fully secured with cameras, and they give the car owners keys to the building, and security codes and they can come and go 24/7. He heard one of the comments about loud cars, they leave that to Joe Zimmer down at Culver's he can handle the car shows and he does a nice job with it, but they will not be having car shows like that. Chairman Reynold replied so a private-based use. Trustee Urbanowski said she wanted to get a general idea of when the traffic was going to be coming and going.

Moved by Trustee Urbanowski, seconded by Commissioner Walker, that the Planning Commission **postpones** action on PC-22-39, Planned Unit Development Concept and Eligibility plan, located at 3030 S. Lapeer Rd. (Sidwell #09-26-101-021) for plans date stamped received October 20, 2022, for the following reasons: they still have an outstanding report on the traffic study that they need to look at and digest; and T-turnaround for the Fire Departments' approval.

Discussion on the motion:

Secretary St. Henry asked when the applicant comes back before them after they have a chance to look at the traffic study, they will have an opportunity to make some changes to their concept plan. Chairman Reynolds replied that they are not encouraging necessarily another submittal it would be the review of what was submitted. If there are

going to be additional conditions or items that they bring forth for them to consider in addition to the submitted plans that would be the current thought. There wouldn't be time to recur and get resubmitted with time. Secretary St. Henry said that their plan is to come back quickly. Chairman Reynolds replied correct, with this plan with their reviews complete. If there were to be additional items that maybe meet or are discussion points, they could present that and they could say as presented. Secretary St. Henry said that was what he was getting at if they want to address any of these outstanding concerns no matter what it is if they think they can tweak the plan accordingly.

Mr. Wayne said he agreed with Chairman Reynolds that they would like to be back in two weeks, he will check with Tammy and Lynn just to see if they can be on that meeting. They would like to be back as soon as possible absent of another submission. If they are unable to be at the next meeting, then perhaps they would just resubmit and be on in two meetings from now with an updated plan and traffic study. Their preference is to come back as soon as they can.

Chairman Reynolds said if there are some thoughts and at least some of those items that they can clarify some additional information or as submitted he thought that would be helpful and that potentially mitigates some of the conditions that might be brought forth.

Mrs. Amy Harris said regarding the hours of the restaurant they will be closed on Mondays and Tuesdays; it will only be Wednesdays – Fridays they will open starting at 4 p.m.

Planning & Zoning Specialist Harrison asked if the Planning Commission would like to see revised plans back or not or if it is just the traffic study. Chairman Reynolds replied that they are seeking the postponement for the ability for the traffic study to come forth. They weren't asking for submitted plans, they were just asking if there were clarifications during a future presentation to address some of their concerns, they are appropriate with that, but they weren't trying to get into a whole revised plan at this point.

Roll call vote was as follows: Brackon, yes; St. Henry, yes; Urbanowski, yes; Gingell, yes; Walker, yes; Reynolds, yes. **Motion carried 6-0. (Gross absent)**

D. 2023 Planning Commission Meeting Dates

Chairman Reynolds said as always, they meet on the first and third Wednesday of each month beginning on January 4th and ending on December 20th. They want any dates potentially considered for review; they could talk about amending those if not they can adopt as presented.

Moved by Commissioner Gingell, seconded by Trustee Urbanowski, that the Planning Commission approve the 2023 PC Meeting Dates Resolution as presented and **forward it to the Board of Trustees for adoption.**

Roll call vote was as follows: Gingell, yes; Brackon, yes; St. Henry, yes; Urbanowski, yes; Walker, yes; Reynolds, yes. **Motion carried 6-0. (Gross absent)**

8. UNFINISHED BUSINESS

None.

9. PUBLIC COMMENTS

None.

10. COMMUNICATIONS

None.

11. PLANNERS REPORTS

A. The Future of Transportation – Electric Vehicles Part 2

Planner Pietsch said the last report was also regarding transportation and so this is just a continuation of that, to talk about the importance of the evolution of electronic vehicles and how they are being implemented throughout the country and world. There were some points about getting incentives for those. One of the main points of the report is talking about implementing those into the Capital Improvement Project (CIP) which just helps to encourage the community that the commission and community leadership is interested in at least keeping on the radar of the community to implement electronic vehicles and electronic vehicle infrastructure and to explore by the of (CIP).

Planner Pietsch introduced Planner Jill Bahn with Giffels Webster.

Planner Bahn stated that she was a partner in charge of the Planner Group at Giffels Webster. Planner Arroyo is still working with their team, but he will not be attending any more night meetings. Their team is shifting and adjusting to meet that little bit of workload for them. Her background she has over 25 years of planning experience and she has been a planning consultant for 14 years. Working with a variety of communities of different shapes and sizes, from small towns to townships. She has been sort of in the background hearing a lot of what has been going on in Orion and it is very exciting. She loves bringing her dog out to the dog park here, so she does come out quite a bit for that. She thought that was a fantastic amenity for the whole area.

12. COMMITTEE REPORTS

None.

13. PUBLIC HEARINGS

None.

14. CHAIRMAN'S COMMENTS

Chairman Reynolds welcomed Planner Jill Bahn to the team.

15. COMMISSIONERS' COMMENTS

Commissioner Gingell welcomed Planner Bahn.

Commissioner Walker welcomed Planner Bahn. He added that the library silent auction holiday auction basket ends this Saturday. If you haven't been there to put a bid on 58 baskets all profits, go to support the library. Tomorrow is the Orion Art Center holiday market running from 6 p.m. to 9 p.m., and they are all welcome to stop by there for holiday gifts.

Secretary St. Henry said welcome to Planner Bahn.

Trustee Urbanowski thanked Planner Arroyo, for the two years she had been there he has been a pleasure to work with. She welcomed Planner Bahn.

16. ADJOURNMENT

Moved by Trustee Urbanowski, seconded by Commissioner Gingell, to adjourn the meeting at 9:25 p.m. **Motion carried.**

Respectfully submitted,

Debra Walton
PC/ZBA Recording Secretary
Charter Township of Orion

Planning Commission Approval Date

DRAFT

**CHARTER TOWNSHIP OF ORION PLANNING COMMISSION MINUTES
PC-22-39, HUDSON SQUARE PLANNED UNIT DEVELOPMENT (PUD) CONCEPT PLAN
JOINT PUBLIC HEARING – WEDNESDAY, NOVEMBER 16, 2022**

The Charter Township of Orion Planning Commission held a Public Hearing on Wednesday, November 16, 2022, at 7:05 p.m. at the Orion Township Municipal Complex Board Room 2323 Joslyn Road, Lake Orion, MI 48360.

PLANNING COMMISSION MEMBERS PRESENT:

Scott Reynolds, Chairman	Don Walker, PC Rep to ZBA
Derek Brackon, Commissioner	Joe St. Henry, Secretary
Kim Urbanowski, BOT Rep to PC	Jessica Gingell, Commissioner

PLANNING COMMISSION MEMBERS ABSENT:

Don Gross, Vice Chairman

CONSULTANTS PRESENT:

Jill Bahm, (Township Planner) of Giffels Webster
Eric Pietsch, (Township Planner) of Giffels Webster
Mark Landis (Township Engineer) of Orchard, Hiltz, and McCliment, Inc.
Lynn Harrison, Planning & Zoning Specialist

OTHERS PRESENT:

Amy Harris	Scott Harris	Matt Malenich
Ray Harris	Greg Moran	Amy Keyzer
Sherley Moran	Emily Glassford	David Steuer
John Slocombe	Elizabeth Glassford	Lorita Woznick
Diane Glassford	Sydnee Keucken	Mary Mansfield
Ari Geczi	Jen Geczi	Terry Clissold
Fred Glassford	Elizabeth Fenwick	Sharon McQueen
Susan Johnston	Marcie Ramsey	John Whitley
Alicia Lawson	Matt Lawson	Melissa Canelis
Giselle Graham	James Graham	Tracy Deuman
Kelly Mihelich	Ryan Soldan	Al Hassnan

PC-22-39, Hudson Square Planned Unit Development (PUD) Concept Plan, located at 3030 S. Lapeer Rd. (Sidwell #09-26-101-021).

Chairman Reynolds asked the petitioner to make a presentation.

Mr. Michael Wayne with Detroit Riverside Capital located at 3250 Auburn Rd., Auburn Hills, MI presented.

Mr. Wayne stated that they were there to share with them a proposal that cultivates the vision of the Orion Township Master Plan and practices responsible development on a currently underutilized parcel.

Mr. Wayne said that this project is not The Woodlands. This proposal has nothing to do with The Woodlands and it is a completely separate project. He added that the adjoining 20 acres that were previously part of The Woodlands proposal is not a part of this proposal, and they have no intention to combine this with the adjacent parcels.

Mr. Wayne stated that the history of this site is interesting because following The Woodlands proposal Dr. Canine was left with a choice of what to do with his land. He met with various members of the Township and through those meetings created some ideas, and the output of those ideas is what they have here tonight.

Mr. Wayne said the existing subject parcel is 7.07 acres. It is located on the northwest corner of Lapeer and Waldon, and the address is 3030 S. Lapeer Rd. The current zoning of the parcel is split between

General Business (GB), and (R-2) single-family. They are bordered to the south by (OP-1) to the east by (RM-1) and to the north, by (R-2) although the current land use is institutional a church being built there and then north of that is (RM-1), to the west is (R-2) residential.

Mr. Wayne said that as of today there is a project that is currently approved on this site. This project features 26,000 total square feet of office space as well as a 4,000 square foot free-standing restaurant. He added that the majority of the office space was being built on spec to complement the car club. But, in a post-pandemic environment, the demand for office space has completely fallen off a cliff. As an example, in Oakland County there are 54 million square feet of office space in total, currently, 24% of that office space is vacant. That leaves 12 million square feet of office space in Oakland County currently vacant. Not a good time to build spec office space.

Mr. Wayne stated that there was another challenge facing this site and that was the adjacent three acres that by building the subject parcel really limited the future development potential of the property to the west. When faced with the economic challenges of office space, as well as the underutilized land, Dr. Canine knew that he had to rethink his approach to this site. So, they collaborated with Dr. Canine and created Hudson Square. They feel that Hudson Square is a tremendous project that meets the relevant needs of the community today as compared to what is currently approved.

Mr. Wayne said that Hudson Square site plan has four main components. On the southeast is the restaurant which is also attached to the car club. The northeast is the drive-through Biggby Coffee and to the west is the for-lease residential. Now, of all of these uses, they need a total of 128 parking spaces of which they provide 130, so parking is not an issue.

Mr. Wayne stated that every (PUD) must bring along with it public benefits, and Hudson Square has numerous. Many of those were mentioned by the Giffels Webster review, which they will hear about later tonight. A couple of those benefits include the preservation of natural features. On the southwest portion of the site, they have a beautiful water feature and that was certainly key in their site design to preserve and not disturb that wetland area. Furthermore, Waldon Rd. features a beautiful tree line as they are driving toward Lapeer and it was really important to them to preserve that tree line, in doing so they did not create any access from the property to Waldon Rd.

Mr. Wayne said that Hudson Square also brings improvements in public safety through the additional construction of safety paths. Of course, this is beneficial just for their site alone, but when they look at the macro situation there is an existing safety path that runs about 3,000-ft. north to south just south of Summerfield Condo community all the way up to the Home Depot. That stretch of safety path doesn't currently connect with the existing three-mile path that is to the west along Waldon Rd. in between Lapeer Rd. and Baldwin. Hudson Square will provide for the connection of almost four miles worth of safety paths which currently are inaccessible to one another.

Mr. Wayne stated that open space and nature preservation were important to them so open space was another public benefit. They have been able to generate 40% of the site to remain as open space, and this is more than double what the ordinance requires.

Mr. Wayne noted that high-quality architectural design is another public benefit listed in the (PUD) application and it is certainly applicable to Hudson Square. Between the commercial and residential uses they have identified façade materials that are not only high quality and durable, but also very aesthetically pleasing and that is represented in some of the elevations and renderings that they will see tonight.

Mr. Wayne said that his favorite public benefit is the public art feature which is proposed at the southeast corner of the site. This is a 10-acre patio space that will be centered by public art piece. He will collaborate with some of the various art institutions, perhaps the DIA to come up with a sculpture design and then propose that for approval to the necessary township boards. They feel that this is a really great

way to accent a popular corner and display a cornerstone piece that can be representative of Orion Township.

Mr. Wayne stated that accessing (PUD) compliance with the Master Plan is critical. One of the ways to do that is to look at the Future Land Use designation. This site on the west portion is high-density residential in the Master Plan and on the east portion is General Business (GB). The Master Plan also calls for higher density residential near commercial thoroughfares, of course, that applies here. It looks like they are missing middle housing types that specifically name quadplexes as one of those and that is what they were presenting tonight.

Mr. Wayne said it calls for the clustering of residential units around natural features and open space, he explained how that was achieved by this site plan. Lastly, it mentions that commercial corridors should be placed along major thoroughfares, of course, they are the most major thoroughfare in the Township.

Mr. Wayne stated that the Giffels Webster review letter notes a number of these, and they stated that the project was generally consistent with the Master Plan and the Future Land Use, and they agreed.

Mr. Wayne said with this project there are four key components; the first is Sweet Amy's Eating House. This is a 4,000-square-foot upscale restaurant that has over 1,000 square feet of outdoor dining space. Then they have Biggby Coffee which is a 1,700-square-foot drive-through, quick-service restaurant. They have the Orion Classic Car Club, which is 3,000 square feet and again is connected to the restaurant. And lastly the 24 residential for lease units. They are going to break down each of these components. He asked Amy Harris the owner of Sweet Amy's and Biggby Coffee to come up and share a few words.

Mrs. Amy Harris 943 Watersmeet Dr., Oxford, MI presented.

Mrs. Harris said that she has lived in the area for ten years. All four of their adult children went to Lake Orion High School. They are affiliated with Lake Orion although they technically are in Oxford. She stated that she owned Sweet Amy's Eating House in Lake Orion for six years. She said she worked in restaurants for seven years throughout high school and college. She then went into advertising and worked 18 years at a larger advertising agency managing a multimillion-dollar automotive, casino, and healthcare accounts. After those 18 years, she got burnt out in corporate America and she always had the desire to open a healthy restaurant. Her family eats very healthy and clean, and her daughter has 10 plus anaphylactic food allergies. No restaurants in the area can truly accommodate her allergies. They did some research and found there was a need for a healthy primarily non-GMO restaurant in the area that does accommodate individuals with special dietary restrictions. They decided to open an Honest to Goodness Breakfast & Smoothies in May of 2016. That evolved into Sweet Amy's Eating House during COVID as people were not so apt to go out for breakfast. They had to pivot and change their primary focus to lunches and dinners, and still served the breakfast that they were known for. They were an award-winning restaurant for six years; they won various awards, everything from best breakfast to best lunch in the local advertiser and as well as the Oakland Press. They were consistently rated 4.5 and higher on all social media. With heavy hearts, they had to make a decision to close their doors on January 30, 2022, due to the everlasting effects of COVID. They were not able to maintain a kitchen crew, they tried for over 6 months to no avail. They had to make a hard decision and take a break and close at that location. However, the intent was always to open in a better location. They have been interested in partnering with Dr. John Canine for years. It just recently came to the realization that they were going to be part of this Hudson Square plan, within the last year. She added that two years ago she was diagnosed with celiac. Between herself and her daughter's allergies, they understand the challenges that the community and people with special dietary restrictions go through on a daily basis. There is literally nowhere in town where she can feel comfortable dining, or her daughter, that she won't have a severe allergic reaction and end up in the hospital. Restaurants say they can accommodate but the reality is most can't. Therefore, she always felt Sweet Amy's was her way of giving back and helping others in the community that goes through similar challenges.

Mrs. Harris added that they did previously own Sweet Amy's Eating House located at 1166 S. Lapeer Rd. in Orion Township. It was located in the Sherman Williams Plaza just north of OSB across from Planet Fitness. They developed quite a following as they were a scratch kitchen 90% non-GMO and accommodated special diets such as celiac, vegetarians, and vegans, and did their best to accommodate those with anaphylactic food allergies. In her kitchen, they would utilize only the highest ingredients such as nitrate-free breakfast meats, cage-free eggs, grass-fed beef, wild-caught salmon, and as much organic dairy and produce as they could. All of their sauces, pancake mixes, and salad dressings, were made from scratch, handmade. Just as an example they had three varieties of their pancake mix, organic buttermilk, gluten-free dairy free, and a vegan mix made without eggs and dairy. They take their allergies very seriously. On that note, they had a separate gluten-free griddle, gluten-free fryer, that only touched potatoes, gluten-free toaster, and a gluten-free prep area to avoid contamination with gluten and other major allergens. Many of their breakfast, lunch, and dinner options are naturally gluten-free since they are making items from scratch. Some of their local favorites were gluten-free dairy-free carrot cake pancakes, gluten-free eggs over ham hash, gluten-free vegan hash, grass-fed burger slider that had an option for gluten-free slider bun, and 100% gluten-free fried varieties.

Mrs. Harris noted that this new Sweet Amy's Restaurant would follow suit with the same scratch kitchen model that accommodates special diets, however, this restaurant will be primarily focused on dinners with a brunch offering on the weekends. In the renderings, it displays that they are proposing a 4,000-square-foot building with a 1,000-square-foot mezzanine above it for VIP social gathering space. It would have a minimum of 1,000 square foot patio surrounded by beautiful foliage that overlooks the pond. There would be lots of glass so even those dining from inside would be able to enjoy the beautiful scenery. The overall look will be upscale in nature, two unique aspects of their restaurants to the area would be the fact that they would have a private dining room fishbowl style, so it would be open surrounded by wine on the walls. They are going to have soft seating in the front all the way to the middle of the restaurant where there will be sofas, tables, and chairs so people can come and socialize over appetizers and hors d'oeuvres. In addition, they are going to have a window that showcases and displays one of those luxury classic cars that Dr. John Canine would have in his car club. Truly nothing like it from an ambiance perspective along with food offerings in their area. They would need to drive to southern Oakland County or Detroit to find something comparable. They are excited to bring the second rendition of Sweet Amy's to Lake Orion. There is a need for Sweet Amy's number two in Lake Orion, additionally, there is a need for another coffee venue in Lake Orion. They would like to bring a Biggby Coffee to the area. There are currently no Biggby Coffee locations in Lake Orion. The closest Biggby Cafes are in Metamora, which is 16.3 miles away, 27 minutes north, and in Auburn Hills 4.5 miles away, 9 minutes southwest. Additionally, there is no coffee venue with a drive-through once you pass Tim Hortons on Lapeer Rd. Tim Hortons is 2.6 miles away. The closest non-drive-through coffee shop is Lava Mountain which is 1.7 miles away. Their new big café will fill the void of a somewhat coffee dessert area for morning commuters. Especially for those moms with young children or those in a hurry looking for a quick convenient drive-through venue. For those who drive Lapeer Rd. every day you can't help but notice the backed-up traffic at Starbucks and Tim Hortons where the traffic wraps around the road. This would help alleviate that backup by providing another coffee venue. For those looking for a place for a business meeting, or to work remotely, there will be a café available for them. Biggby offers a wide array of unique coffee drinks and hot and cold beverages such as Biggby Blast energy drinks. Biggby also serves items such as bragel sandwiches and baked goods. Because of her personal issue with celiac, she is passionate about adding a gluten-free component to Biggby's model. They are currently working with a local baker that can potentially produce mass quantities to see if they can make this happen. Biggby is a Michigan-based company. The first Biggby Café originated in Lansing, MI in 1955, and its headquarters is based there to this day. The rendering is of an existing Biggby Café that resides in Allegan County, and theirs will look very similar to that. For all of these reasons and more, they feel the addition of this Biggby Café with a drive-through will be a positive addition to the community.

Mr. Wayne said that the third component is the Orion Classic Car Club. This was a concept that was approved by this Commission previously. What is most critical about it is that it is really a one-of-a-kind destination, it is about more than storing cars, this is really a community in that these gentlemen and

ladies share a love for cars over and use it to create that community and socialize. Nothing like this in the Township currently and certainly creates a unique asset.

Mr. Wayne stated that for the fourth component they are presenting Hudson Valley which is six individual buildings with four homes in each. These are two-story structures, and the maximum height measured to the midpoint of the roofline is about 27-ft. They know that height is critical and that was a key element to this design. Each building has two, two-bedroom units on the first floor, over 1,100 square feet of living space plus a 420 square foot garage area, and a 200 square foot outdoor patio. A short trip up the steps and they will arrive at the three-bedroom units located on the second floor. Those enjoy 1,600 square feet of living space plus a 420 square foot garage, and over a 400 square foot rooftop patio. The variation between the two and three bedrooms allows them to attract a wide range of demographics in terms of the renter base. They really envision two primary demographics with these homes. First, it would be young families, a married couple with a dog and a kid on the way might be in between housing options, maybe not quite ready to buy a home. This serves as a perfect way to keep those people in the community and give them a housing type that is conducive to their needs. The second would be the late baby boomer generation so perhaps empty nesters free of kids looking for a hassle-free, maintenance-free, living environment. This serves perfectly for those demographics. Keep in mind that these residential dwellings are very high-end. The rental rates on these drawings will be comparable to the monthly mortgage payments of many homes in the surrounding areas. This demonstrates that the demographic will blend nicely with the existing landscape. Another feature of the Hudson Valley design is that all garages are side entry. This means that from the front façade view as they walk down the street no garages are visible, which gives it a quiet neighborhood feel. One other item of note would be that half of the homes are handicap accessible.

Mr. Wayne said when they compared this product type to others in the area and they found a very similar example and that would be in the Summerfield Condo community. This property is just to the north of the proposed site, and these are two-story condos that were built in the early 2000s. The similarities are strong between the two structures both from a height perspective as well as a general overall architecture mass and scale. They blend nicely with the existing landscape in the area, they do not immediately abut the Summerfield Condo community so it is an example of a similar product type in the surrounding area but there is no visual connection between the properties.

Mr. Wayne stated that there is a tremendous need for residential housing options in the community and the existing ones are at their capacity. In order for the Township to continue to grow responsibly it must add housing options of this type to support this need. Since 2000 they have only seen 353 for-lease residential dwellings built in the Township. Despite the 15% population growth over that same period, so clearly a big need in the community today. Mr. Wayne said when apartments are built in Orion Township, they lease out immediately.

Mr. Wayne said regarding density and public resources. From a commercial density perspective, their proposal is 21,000 square feet less of total commercial space as compared to the already approved site plan. They reduced that density by 71% in this proposal. From a residential perspective, the Future Land Use on the parcel is high-density residential, which means 3-5 dwelling units per acre, they are proposing 6. This meets the intent of the Future Land Use of high-density residential. One extra unit per acre on a 4-acre site they are only asking for a total of 4 additional units compared to the underlining future land use permitted density. If they take that a step further and assume that there are two people per one of those dwelling units that is a total of 8 additional heartbeats for public resources like police, fire, and EMS demand. The (RM-1) density category of 6 units per acre is what they are proposing. This exact zoning designation exists to the east, north, and also partially to the south. He thought they were in good company as far as the (RM-1) category is concerned.

Mr. Wayne stated in terms of Stormwater Management one of the most critical aspects of every development is to effectively manage that stormwater, and ensure that it has no negative effects on surrounding properties. They will show this through an underground series of catch basins with

underground storage on site. He added that they are going to work with OHM to ensure that their design meets the ordinance. This is the same ordinance that of course is designed to prevent this exact issue from happening. So, trusting with collaboration with OHM they will develop a design that has been thoroughly reviewed and confirmed that it meets the standards of the ordinance.

Mr. Wayne said that OHM acknowledges in their review letter that the stormwater on this site flows to the southeast. The southeast corner of the Hudson's proposal is at the corner of Waldon and Lapeer Roads. There are no properties to the east for any of their stormwater to flow onto. On the contrary, all of the properties surrounding them are flowing toward their property. This really eliminates the potential of their site depositing any stormwater or disturbing any surrounding property as a result.

Mr. Wayne stated that as it relates to site circulation and traffic this was a key component of their site design. They did not provide access through Waldon Rd. This was deliberate for two reasons, the first was to preserve the tree line, and the second was to not deposit any new traffic volume onto Waldon Rd. roadway. They understood that there are some existing concerns over traffic at this intersection and they believe that Hudson Square could potentially be the impetus to solve this problem through collaborating with MDOT. They have submitted a traffic study to the Township. It is currently in review, and they also submitted the study to MDOT. They look forward to working with MDOT to develop whatever mitigation requirements MDOT deems necessary, they are willing to provide. They look forward to that process to ensure that they are mitigating traffic congestion to the fullest extent.

Mr. Wayne said that nature preservation was a really critical piece of their design. The large part of the natural water feature but also the buffering surrounding the site gets them to the 40% open space. Of that total ruffly 30% will be completely preserved in its natural habitat.

Mr. Wayne said lastly, they are bringing walking trails to the natural features so existing they are completely inaccessible. Through the construction of both the safety paths as well as their interior site circulation these natural features will be able to be enjoyed by residents, customers and businesses in the community alike.

Mr. Wayne stated that they are at a public hearing, so they wanted to share some feedback that they got from the virtual town square, Facebook. Their proposal was posted on the Orion Township Facebook group as well as a couple of various other groups within the community. The results were overwhelmingly positive. Almost 500 total likes between the posts, and over 250 total comments, and when they compared the positive comments to the negative comments, they saw about 96% positivity for the project. Clearly, hundreds of their community members have spoken and 96% of them were supportive of this project.

Chairman Reynolds asked if there were any public comments. He asked them to limit themselves to 3 minutes. He added that they were taking notes so if something was mentioned previously, they will have that in their notes when they further deliberate on the project.

Ms. Tracy Deuman 270 Waldon Rd. She is the west property adjacent to the proposed property. She really appreciated Mr. Wayne's how he addressed a lot of their concerns. The three main points that she heard were that there was no intent to combine the adjacent parcel behind her property, so she was very impressed by that and hoped that stood true. The next one is that there is no access off of Waldon Rd. Currently, there is an unofficial driveway on Waldon Rd. already and there is a mailbox there. She asked if that would be blocked. She appreciated the preservation of the tree line on Waldon Rd. Her personal concern for her property was she hoped they could keep the tree line and the berm that is on the west side of the property, so adjacent to her property. I would provide light pollution coverage, so it would block the light and privacy from the apartments. Also, there is a big fence there that was put up intentionally and she wanted to make sure that they keep that fence. She has a half-acre pond, and it could be a liability problem with her with an apartment next to her. She was worried about the traffic, and the water runoff.

Al Hassinger 1600 S. Baldwin Rd., Brandon Twp., is a property owner in Lake Orion Village. He wanted to say that getting to know Amy and Scott and really admiring their entrepreneurial spirit, wanting to pick up again where they had to leave off through no fault of their own and bring a fantastic business to Lake Orion. He thought it would be a tremendous addition and a great gateway into and out of the town.

Matt Malenich 4014 Sunfish Dr., Lapeer, was there to speak on behalf of Scott and Amy Harris. First, he would like to say that he wholeheartedly supports the business ventures that Scott and Amy are taking. His wife and he are regular patrons of the Lake Orion community and would love to see an upscale restaurant added to their dining community. As a patron of Scott and Amy's previous restaurant, he can speak from experience about the quality of food and service that was provided. Everything was created with the highest standards in terms of the foods that were used, the presentation of the food, the taste of the food, which for him is the most important, and the service in which it was provided. He truly believed that adding an upscale restaurant to their community run by Scott and Amy would be beneficial to all and would run successfully. He also believed that adding another coffee venue to the Lake Orion community would be beneficial as well. He knew that there are plenty of places to get coffee in Lake Orion, but to his knowledge, there are only two venues with drive-through services. He believed that adding another coffee place with a drive-through would benefit the members of their community and those who travel through their city every day simply due to convenience. He has known Scott his entire life and his wife for many years. In terms of Scott, he didn't think there was anyone who could talk about his character better than him, except for his parents or his wife. Scott is the most dedicated hard-working person that he knows. It doesn't matter if it is in his professional or his personal life, if there is something that needs to be done there is nothing that would stop Scott from doing it. He also saw the driving dedication that Scott and Amy put into their previous business venture. The amount of sacrifice and time they put into their restaurant shows they are willing to do whatever it takes to be successful in their ventures. There is no doubt in his mind that approving these two venues would be beneficial to the Lake Orion community.

Mr. John Slocombe 3066 Waldon Meadows Dr. said that a personal friend got killed on Lapeer Rd. last year and he lost a very dear friend from England, it is a very dangerous road. He has nothing against the project, he hopes it works. He hoped the city would do something about the traffic situation because more traffic would mean it is harder to get off Waldon. He goes out onto Waldon Rd. sometimes and some people are frozen in terror, they just sit there. There are 14-18 people trying to get out. He knew it had nothing to do with the development, but they already have a dangerous situation, he has lost a personal friend and he will never be the same after it. He hoped in partnership with these people that they put a traffic light in. He would like to know what the details were and that they can make it all work and make it less dangerous for people.

Ms. Elizabeth Glassford 389 Hunters Rill, Oxford, MI, said she has been in the food industry for 10 years and an operating partner for 6 years. What she has noticed is it is impossible to fully accommodate severe allergies. The model she has can suffice multiple allergies, and felt it would really create a positive buzz for the community because it is something that not everybody offers. She also does drive down Lapeer Rd. southbound toward 75. The few coffee places that do have drive-throughs are very busy in the morning and she felt that adding the Biggby would be great, a great spot, a great location, and definitely the customers to pull from. She moved out to Lake Orion a couple of years ago. When she was looking, she was looking for 2-3 bedrooms with 2 baths, with amenities such as a washer and dryer, and it was very difficult to find availability in the area. It actually took her over six months, and she had to pay double rent for 4 of those months just to ensure that she had a place locked in. She felt that adding those residential properties to the community would definitely be a positive for the community as well. As far as ownership, great customer service, and having owners that live in the community are very positive when it comes to retention, profitability, and just maintenance, maintaining the area as well.

Ms. Emily Glassford 24 Leslie Lane, Waterford, MI, said she has a lot of family in the Lake Orion/Oxford area, so she is frequently out here. She was a patron often at Sweet Amy's restaurant and since they have had a shutdown it has been hard. A lot of her family does have very severe food allergies. It is hard going to restaurants and feeling safe enough to have them eat there without wondering if they are going to

end up in the hospital because of an anaphylactic issue. She is extremely happy to hear that Amy and Scott Harris are trying to make another location, their family has really missed it.

Ms. Linda Martin-Seng 6625 Shelley Dr., Clarkston, MI, said both she and her husband both have food allergies, especially her husband, his are pretty severe. They have been patrons of Sweet Amy's for many years, and they really trust the owners to take the care that is necessary to make food that is safe for them to eat, and her husband won't be sick for a week after eating there. Their food is delicious and well-presented and the owners and the people that work there are all wonderful. They have really missed it since they have been gone. Also, as for Biggby Coffee, she is not a Starbucks fan she likes Biggby way better and there is always a line at the Starbucks on Lapeer Rd. You can't get in it backs up onto Lapeer Rd. She thought another coffee shop with a drive-through would be a real benefit to the area. They also bring lots of family members to their facility. They celebrated their Mother's Day there one year. They then go into Lake Orion and do shopping, so they bring business to the area as well. She did know a lot of other people, her friend from Rochester loves their restaurant. Her friend from Royal Oak drives up here and eats at their restaurant. She thought it would be a benefit to the community overall. She loves them as people and also their food.

Ms. Kelly Mihelich 275 Waldon Rd. said over the last few months their neighborhood has been here quite often because of the proposed Woodlands development. Once again, she wanted to reiterate that her neighborhood on Waldon Rd. does not come out and fight against development. She lives right next door to the Orion Kennel Club and the new Vet Clinic; they are wonderful neighbors. She has the driving range directly behind her, they are also wonderful neighbors. She knows that Sweet Amy's restaurant obviously everybody loves, its wonderful food, and there is a need for it in their Township. Biggby Coffee is wonderful. Her only concern is the apartments and where they are going to be located. She was concerned that even though they have a dense tree line on Waldon Rd. she was concerned that they are going to see a lot of rooftops and a lot of light pollution, flood lights, that type of thing. They did have to go to the Kennel Club and the Vet and ask them to please tone down their night security cameras because their house was lit up at night, and they had to put extra shades up, it was not good. They cooperated and it is wonderful. So far, she was impressed with what she has seen, she doesn't have any objections, her only concern is the traffic because it is already terrible for them to get out of Waldon Rd. She hoped that they could get a traffic light, the noise pollution, and she is worried about the ponds. The owner of that property used to have a running windmill that he used to keep his pond full. That has not been in operation since he passed away a number of years ago. His pond is way down, and Tracy's Pond at 270 Waldon is way down. She was concerned that the ponds were going to get dried up. Are they going to bring the windmill, which was beautiful, or are they going to put that back into operation to help the ponds and keep everything healthy? Other than that, she really can't see anything to object to at this point. She asked if anyone addressed getting a liquor license for the restaurant. She might have a concern about that, other than that she was impressed with what she saw.

Ms. Elizabeth Fenwick 1133 Devon St. stated she thought that his project would be a great asset to the community. She enjoyed hearing more about it, but she was excited about it already. Seeing it broken down was a lot more exciting. Ever since Sweet Amy's closed, she hasn't been able to find a restaurant that can meet her dietary needs. She works in Rochester and has sent a lot of the Rochester community here too and they are eagerly awaiting their reopening also for the same reason, you can really find a place like that. She felt for them as people and their businesses were a great asset to the community when they were in business and is eager to see them reopen.

Ms. Melisa Canelis, 986 Maloney Ave., Oxford, MI, said she was a resident and a business owner in northern Lake Orion (Oxford). She wanted to be here in support of Amy and Scott Harris today. They did buy a home this last year, having a boy and a girl there was nowhere they could live without a three-bedroom. Fortunately, they found a house they could buy but there were not a lot of options when it came to apartments with three bedrooms, so she really liked and appreciated that. Anybody that drives south on M24 does see a backup, and as an insurance agent, she is terrified that her insurers are going to get rear-ended or rear-end someone else on a daily basis, hopefully, that would cause a little less panic attack.

She liked the idea in general of having the drive-through with the convenience and everything else. She did like the idea of a stoplight because she used to live at Joslyn and Silverbell and anytime, they took that way down it was terrible. Outside of the consumers' side, she was there as personal support for Scott and Amy. Her husband was a chef at their restaurant for multiple years. Not only was he a chef at their restaurant but they also became close friends with them. On top of that anything that they did, they took more care than many other business owners she had ever seen. They were much more thorough than many other business owners, herself included and she is a crazy analytical person. They were genuine anytime from the pandemic to struggles with seating, or anything to do with the restaurant, loss of business, closing down, reopening, and shutting down officially, every step along the way they communicated with the staff, they were incredibly professional and organized. Genuinely as humans they are amazing people, and she would love to see them own another restaurant in the area and more.

Ms. Jen Gaczi 776 Fairledge, Lake Orion said the coffee shop would be amazing. She lives off of Heights Rd., so they get stuck by all the traffic-stopping for Starbucks and blocking all the traffic. That would be a phenomenal idea to have another option. As for Sweet Amy's, her family of seven has multiple food allergies and it has been missed greatly. She really appreciated it when they went into the restaurant, it wasn't just a restaurant it was like a family, they were very kind and considerate, they knew them. Whether you had not been in for a while or you were there all the time, they knew them. They recognized them tonight and she hasn't seen them in probably 9 months. She really would appreciate this being approved.

Ms. Susan Johnson 348 Four Seasons Dr., which is the condo development north of the church. It doesn't sound like it, but she was wondering if there were plans for outdoor car shows like Culvers with music and people showing off their vehicles. She didn't want to listen to 50's music which she would hear if there were something like that planned in the works once a week, or even once a month might be too much. The other concern she had was the traffic. For them to go north on 24 and to have to use the turnaround, people are afraid to go they sit there forever, or other people go when they shouldn't, it is dangerous already, and this is going to add a lot to it. She was also wondering about air quality there will be a lot of idling vehicles maybe only morning and night but in that line for the coffee shop where is all that exhaust, is it going to concentrate in her backyard, she is on the south side of her condo development. Having a coffee shop with high-calorie sweet drinks within walking distance is going to be dangerous for her.

Mr. John Whitley 6581 Eastlawn Ave., Clarkston, MI, is a former resident of Lake Orion. He has known Scott for 25 years and Amy for about 10 years. He is a small business owner as well in the area, they are very fortunate to have small business owners like Scott and Amy, very high-integrity people. His wife and he are both vegans, so they appreciate the ability to have vegan alternative and was a big fan of Biggby as well.

Ms. Mary Ann Ryan, 301 Waldon Rd., lives across the street from this development. The parcel of property that sits on the corner of M24 and Waldon Rd. was previously owned by Tim Jones. People might remember the flower shop that existed there, but she was a guest that was frequently invited to the rest of the property. Tim had done landscaping, but that doesn't adequately describe what he really did, he was an artist. Flower trees and bushes planted on this piece of heaven are beyond description. The number of annuals, biannuals, and perennials that bloomed throughout the year was stunning. He would sit on his patio which overlooked the pond and bask in the peace and tranquility of the place. She can't think of a better use for this property than a restaurant with a patio overlooking that pond. She was sure that the vegetation that he planted remained to some degree. She believed that the citizens of Orion Township deserve to experience the solemn beauty of the place. It would honor Tim if others could enjoy the environment he sought to create. She and the neighborhood have been expecting the antique car club to appear for a very long time now, they have no idea why it hasn't. As for the apartment density, she leaves that to the Zoning Board to sort out.

Mr. Ryan Soldan 4124 Calumet Dr., Oakland Twp., was there to support Scott Harris and his wife Amy. He has known Scott for over 15 years echoing some of the people that have spoken before him. Scott is a very passionate individual and anything he commits to is in it 110%. What he has seen and heard tonight about their plans and their development is very impressive. He is a big dog owner so his route is right there on Waldon and a Biggby would be awesome because he would go there and get his coffee and then take his dogs and life would be good.

Ms. Shirley Moran said that Scott Harris was her son, and Amy was her daughter-in-law. They live at 9257 Monica Dr., Davison, MI. They frequent their restaurant at least two times a month. They have to drive 40 minutes to get there but they appreciate the quality of the food. She is also a Naturopathic Doctor so the types of food that her family eats are very important to her. She appreciates going to a restaurant and she knows that the quality of the food is there, and it is what they say it is. It always tastes very good no matter what they eat. She thought that the addition of this restaurant would be a great addition to Lake Orion and for health reasons too.

Ms. Marcie Ramsey 335 Waldon Rd. said it was her understanding that the restaurant, the car club, and a coffee shop were already approved so it was just the four-family housing that was what this meeting was really about. She would really love to have the restaurant, the car club, and all of it approved as long as they can somehow get that traffic light in at Waldon and Lapeer because it is a traffic nightmare, pretty constant to get off Waldon onto Lapeer Rd. If there are accidents somewhere in the area, they take off and come back down Waldon Rd. and sometimes it is a mile backup. That is her only concern. She was concerned about the wildlife, but it sounded like that is kind of being addressed so she appreciated it.

Mr. Scott Harris 947 Watersmeet Dr., Oxford, MI stated that the thought that came to his mind was the conversation he had with his wife in late summer or early fall of 2015. He got a different rendition than a burnout on marketing, she was actually in a company where they lost two major accounts back-to-back and was caught up in a riff. They lost the Greek Town Casino account and the Blue Cross Michigan account. They had been talking about this restaurant concept for some time and her desire to do something special. They talked about creating this little brunch/breakfast spot where she would know everyone's name like Cheers, and it was a common conversation in their house. For those who know him, he was a former commercial banker turned insurance consultant, pretty conservative by nature. When she asked to turn this from something that they were just talking about to something that they actually might do the thing he told her was you don't start a restaurant or business because it would be cute or nice, you do it because there is a business need. Her due diligence literally went from the top of Oxford when the Palace was still standing to where the Palace was, and they did the same thing on Baldwin Rd. They got the menus from every single restaurant and evaluated them, dined in many of them, and determined that nobody was doing what she envisioned. Nobody was doing upscale in Lake Orion, so they started just two years into their marriage and blended family they said they are going to do this crazy restaurant thing. For those of you who have patronized her restaurant you know the rest of the story. It was a great business not because they made a lot of money because it was always a challenge for those who knew the location was at but because they put every ounce of everything into this restaurant in order to build something that helped the community. Fast forward to today, with the absence of her restaurant there is still no one doing what she and her team did, the way they did it. By this time division is even grander. For the same reasons that Honest to Goodness became a reality in May of 2016, they are hopeful that once again this will become a reality sometime around the summer of 2024. Just like there is a business case for Amy's Restaurant there is also a business case for all of the other components of this development. The car club, the Biggby, and the new luxury dwelling units, all have a need for a purpose that will provide value and benefit to his Lake Orion community. Hence, he enthusiastically supports this project and respectfully requests the Planning Commission to also share in his excitement by providing conceptual approval this evening.

Chairman Reynolds asked Secretary St. Henry to read the citizens that they received into the record.

Secretary St. Henry said they received a total of 10 letters, 6 were in favor of the development, and 4 were opposed. The residents that sent letters were Cheryl Querro, Michael Caldwell, Beverly Walton, Linda and Michael Seng, Amy Harris, Rilee Harris, Giselle Graham, Carlee Hass, and Jessica Williams. For those that supported the development, the overall general theme was how much they enjoy Sweet Amy's restaurant and recognizing the need for additional dining options in the community. Those that were against it had concerns about traffic and the size/footprint of the development. The applicant covered some of the statistical bullet points that came from Facebook. Amy Harris provided a letter that reiterated those in terms of general feedback that resulted from the Facebook postings: they had 494 overall like posts, 151 overall love posts, 8 overall wow faces, 1 sad face, 2 overall care faces emojis with hearts, 249 positive comments, 11 negative comments, 191 positive likes to the comments, 17 positive loves to the comments, 3 positive care to the comments, 8 negative likes to the comments, it was shared 27 times, and there were 6 individuals provide negative comments.

Chairman Reynolds turned it over to the Planning Commissioners for any comments or questions they would like to add during the public hearing portion of this evening. No comments.

Chairman Reynolds turned it over to the Board of Trustees.

Supervisor Barnett asked if there were any comments or questions from the Board of Trustees.

Trustee Flood said he thought people liked the restaurant. He counted 18 folks coming to that podium and 75% 12 out of 18 were good. Usually, they come to these, and they hear the opposite, displeasure, not pleasure. This is not their first rodeo on this parcel. Compared to what they had before he likes to see the open space and all that property along Waldon Rd. preserved, especially those pine trees. He liked the concept of not having an entrance on Waldon Rd. He understood the need for a traffic light, he had lived out here all his life and agreed it was not going to get any better. If they didn't have all the development to the north of them keep those people from northern Orion otherwise known as Oxford coming down through there, they would probably have a lot more space. The Planning Commission is going to have a lot of work to do; he has read all of the review letters from the Planner, OHM Engineering, and the Fire Marshal. He was very confident that the men and women that represent the Planning Commission would do their due diligence along with our consultants and go through this diligently. As has been previously stated in the past, someday somehow somewhere this property will be developed. The property owner has the right on private property to come forward to this body and go with (PUD), it is part of our ordinance, our zoning, and our Master Plan. Looking forward to the Planning Commission doing their due diligence and finding out what recommendation is to the Township Board.

Trustee Steele thanked everyone for coming. She always appreciates community involvement because that is what makes a good project a good project. She thanked the developer and felt they had been very diligent and patient. She asked regarding the community benefit and wanted to see if the water feature and the tree line features were just actually part of the green space and the water retention and not necessarily additional green space and water space. The safety path connection yes connects safety paths, but what is the actual contribution that they are making, in addition to what is already required for that development? She knew there was a gap on M24 because the land was never equaled out very well and so there is a big gap on M24 if that is what they were referring to. Height of the design, she knew that height was an issue on the other development and didn't know if they were in the guidelines of where it needed to be or if it higher than normal. She knew that single ownership was one of the criteria and it seemed to her there might be two or three, she wasn't sure how that was going to work. Regarding the drive-through use with the coffee, she asked if that was a Special Use, or if it is allowed because it is a (PUD). The price point of the apartments and to just verify that they are looking at the water drainage because she knew that had been an issue from day one. She asked if that back lot is back up for sale or is that a development that is going to come down at a different time.

Supervisor Barnett thanked everyone for coming. He said if he thought you ever wanted to have anything positive done, he is going to call Scott and Amy to run PR. He thought that this was a tough site, and they

knew the issues. When he reviewed the notes this afternoon from the last couple of times, they were in front of them and the notes he had was the main concerns were traffic, preservation of wetlands, and natural resources, the height, and the general fit of the building for the area, and the storm drainages came up over and over in that area. They have had lots of conversations to the credit of the Detroit Riverside Capitol, and they have been extremely diligent working with our consultants, OHM, and our team to try to do the best they could to take the feedback they received over the last few opportunities that they presented in front of them and put all that together. He thanked them because they don't always get that. A lot of times when people don't get their way, we get lawsuits and so thank you for not doing that. That doesn't always bode well for the Township, unfortunately. He agreed with what Trustee Flood said, he generally sits at these meetings because a lot of times this is the only time, they see some of them when something is going to be built in their backyard and they want to come to tell them how they feel about it. They want to see them but are happy to see them anytime. It is a challenge because as Trustee Flood said this is the busiest road in northern Oakland County, and it is not a park. He appreciated Mary Ann's comments because he didn't know the previous owner, but he got to know her 10 years ago when he was first running for this job. There is a lot of history on this site, he used to buy flowers there too. It was a very unique piece. People get very passionate about these things, they know it is not a park, and the Township doesn't own it, so unless they decide to do that it will never be a park. It is nice when they do have developers that do want to work with them and property owners as Dr. Canine to his credit have really come to them multiple times and asked what he thought the Township would want to see there. Not everyone is going to be happy with what goes on this corner, but he personally thinks this is a lot better than what they have seen in the past. He felt that they have addressed a lot of the issues that have been brought up by the people that live around there. The one thing that he told them all about is the traffic and the traffic lights. He and Jim Stevens from OHM met with MDOT the director of MDOT for their region a couple of months ago, on a few areas on Lapeer Rd. They are under their jurisdiction the Township owns no roads. Waldon is the Road Commission, but MDOT is the organization that they would work with on this project. He stated that they specifically asked about a light at this intersection, will they require it, and will they put the light in because there is a ton of traffic there. This is generally considered a small-scale development a drop in the ocean, and to require this developer to bear the cost of that traffic light which would be very costly is a challenge as well, probably making it a no go. They are working with MDOT and ultimately, they are going to be the ones what improvements will be required there. Their conversations with the developer have been really positive, and MDOT. Once MDOT reviews all of these things they will be able to make those determinations as to what improvements will be needed if any. There are lots of places that need traffic improvements. The challenge is they have no jurisdiction except they can sometimes be a squeaky enough wheel to force improvements. He thought it was great to see positive support. They worked a lot together on their first site, the food was amazing, parking was tough, and the location was you drove by it before you saw it, it was a tough spot for a restaurant. Obviously, they have a great following and great food. He did think it was the first time they had emojis read into the record. He explained that they will close their Board of Trustees public hearing and the three of them will leave. This is a multi-step process so he was sure he would be watching the rest of this meeting as well as his colleagues, but they were not leaving because they were not interested.

Chairman Reynolds said he wanted to address some of the comments from the petitioner. Supervisor Barnett talked a little bit about it, but can they just touch base on traffic mitigation, runoff, and drainage those were a couple of topics here, and then they have a few more.

Mr. Wayne said the traffic topic as the Supervisor outlined is an MDOT-controlled road. No one in this room has any authority on whether or not they could put a traffic light there. All they can be is the squeaky wheel. In this case, they might be the only wheel because absent of another development proposal that produces a traffic impact study and hands it to MDOT they are never going to look at this intersection. Really by proposing this and submitting this traffic study they are forcing them to identify the problem. What they decide to do about the problem is completely up to them. There are a lot of variables that they have to consider. There is a lot of traffic volume on Lapeer Rd. as they know. The idea of stopping it at a traffic light may not be their first reaction. Certainly, their job in this state is to ensure that they have drivable, functioning, hopefully, well-operating roads. They trust that they will do this for this project. As

far as their current process with them they have completed the TIS they have submitted to them, they have also submitted it to the Township. It didn't get fully reviewed before the meeting because they were late on the submission of that. What that traffic study basically says is that the existing conditions warrant a stop light at that intersection, today without their project warranting that stop light, it recommends the mitigation of that stop light. The determination on how or if that can happen is not theirs. They will certainly be the biggest cheerleader and be adequately working with MDOT to try to deliver that solution.

Mr. Wayne said regarding drainage the best way he can describe this is that the whole corner drains to that southeast corner of the site. If they drew a 45-degree line that hit that corner that basically is where all the flow of water is going. Notice none of the surrounding properties that have a concern about stormwater are in that flow, the water is flowing from the surrounding properties onto their site into the culvert that goes under M24. It would completely have to reverse stream and go in the opposite direction from the way that gravity is pulling it in order for the water to move in that direction. That is just a general concept, but on top of that of course they have to manage the stormwater from their site and make sure that despite any of their developments that it doesn't now all of a sudden go to a neighboring property and that is what their stormwater management system will do. That underground detention, they will go through the ordinance, and they are aware of what those requirements are. They briefly designed a system with their civil team. At this stage in the process, it is a little too early to get tremendously detailed about that. They understand it will be a thoroughly reviewed system and it will meet the ordinance. They have faith in satisfying that and eliminating stormwater concerns.

Mr. Wayne stated that there would be no connection to the adjoining 20-acre parcel and no intent to connect. There is a road on Waldon Rd. existing, it was an old service drive, and their plan calls for it to be turned into a pathway, so just a walking path, not a driveway, it will be eliminated there is no chance of a car coming by. He added as far as the fence he was not aware of where that was but will make himself aware of it and will make sure that they do what they can to mitigate that.

Mr. Wayne said as far as the apartment themselves and light pollution, one thing they have going for them just on their apartments themselves which of course is the furthest west is that because of the residential character they would have similar lighting to what a single-family home would have. It would likely have a couple of garage lights adjacent to the entry point of the garage, then a couple of lights along the front façade. They are not talking about huge parking lot lights lighting up a big sea of parking for the apartments. The commercial lights will be blocked from those houses by the apartments as they sit in between them but even still those lights will point in the direction of the light down to mitigate light pollution as much as possible, and that is also covered in the ordinance so they will achieve that.

Mr. Wayne stated as far as noise is concerned these are residential dwellings there are only 24 of them, he didn't think that they would create any kind of noise above and beyond what typical single-family homes would do, the garage door opens, and dog barking but that is about it.

Mr. Wayne said as far as ponds not remaining full as he had mentioned the water all does drain there. Not being a civil engineer himself he doesn't have a hypothesis as to why that is, but he understands the general flow is to that southeast corner.

Mr. Wayne stated regarding the outdoor car shows he can't speak for Dr. Canine he was sure he could answer that question but that is not an intent of the development, the goal is to be able to store the cars inside the structure and that is what the building is there for.

Chairman Reynolds asked about control and ownership. Mr. Wayne replied that the site is currently controlled solely by Dr. Canine. There are agreements that are formulated for each of their respective parties DRC, Scott, Amy, and Dr. Canine being one of them to purchase these individual parcels following the approval process, but for the sake of this application, the land is currently owned by one individual.

Chairman Reynolds closed the public hearing at 8:24²⁵ p.m.



Charter Township of Orion

2323 Joslyn Rd., Lake Orion MI 48360
www.oriontownship.org

Planning & Zoning Department

Phone: (248) 391-0304, ext. 5000

TO: The Charter Township of Orion Planning Commission

FROM: Tammy Girling, Planning & Zoning Director

DATE: December 1, 2022

RE: PC-22-46, GM Orion BET 2, Site Plan & Wetland Amendment

As requested, I am providing suggested motions for the abovementioned project. Please feel free to modify the language. The verbiage below could substantially change based upon the Planning Commissions' findings of facts for the project. Any additional findings of facts should be added to the motion below.

Wetland Permit (Ordinance No. 107)

Motion 1: I move that the Planning Commission **approves/denies** the wetland amendment for PC-22-46, GM Orion BET 2, located at 4555 Giddings Rd., parcel #09-34-200-006 & parcel #09-34-400-001 for plans date stamped received November 30, 2022. This **approval/denial** is based on the following finding of facts:

- a. The action or use **is not/is** likely to or **will not/will** pollute, impair, or destroy a Wetland (insert findings of facts).
- b. There **are no/are** feasible or prudent alternatives to the proposed action (insert findings of facts)
- c. The **approval is/is not** consistent with public interest, in light of the stated purposes of the ordinances (insert findings of facts).

If approved the approval is based on the following conditions:

Motion maker to insert any conditions.

Site Plan (Ord. No. 78, Section 30.01)

Motion 2: I move that the Planning Commission grants site plan amendment **approval** for PC-22-46, GM Orion BET 2, located at 4555 Giddings Rd., parcel #09-34-200-006 & parcel #09-34-400-001 for plans date stamped received November 17, 2022 based on the following findings of facts (**motion make to insert findings of facts**).

This **approval** is based on the following conditions:

- (Motion maker to list any unresolved issues related to the Township Planner's review letter).
- (Motion maker to list any unresolved issues related to the Township Engineer's review letter).
- (Motion maker to list any unresolved issues related to the Fire Marshall's review letter)
- (Motion maker to list any additional conditions).

Or

I move that the Planning Commission **denies** site plan amendment approval for PC-22-46, GM Orion BET 2, located at 4555 Giddings Rd., parcel #09-34-200-006 & parcel #09-34-400-001 for plans date stamped received November 17, 2022. This **denial** is based on the following reasons (insert findings of facts).

Or

I move that the Planning Commission **postpones** site plan amendment approval for PC-22-46, GM Orion BET 2, located at 4555 Giddings Rd., parcel #09-34-200-006 & parcel #09-34-400-001 for plans date stamped received November 17, 2022 for the following reasons (motion maker to indicate outstanding items to be addressed from the Planner's, Fire Marshall's, or Engineer's review letter(s)).

November 30, 2022

Orion Township Planning Commission
2525 Joslyn Road
Lake Orion, MI, 48360

RECEIVED

DEC 1 2022

Orion Township
Planning & Zoning



Site Plan Amendment – Admin. Review GM Orion BET2

Case Number:	PC-2022-46	Zoning:	IC – Industrial Complex
Address:	4555 Giddings Road	Approved Plan:	8/3/2022
Parcel ID:	09-34-200-006 & 09-34-400-011	Revised Plan:	11/17/2022
Applicant:	Wade Trim Associates, Inc.	Reviewer:	Eric Pietsch
Area:	455.91 acres		Rod Arroyo, AICP

SUMMARY OF ZONING ORDINANCE COMPLIANCE

The Orion Township Planning Commission approved the site plan for the GM BET2 facility on October 17, 2022. The following items are outlined in the Applicant List of Changes, dated November 16, 2022. Planner comments are shown in ***bold italics*** below.

1. Sheet G-004. Site Layout & Pavement Plan.

- 1) Rail Line and Ring Road – Portions of the rail are now slated to remain from the incoming rail lines under Silver Bell Road along the northeast side of the site. This has resulted in the internal Ring Road alignment being shifted to accommodate the rail to remain.

The realignment of the internal ring road maintains a setback from the north property line of approximately 32 feet and does not appear to impact the 50-foot greenbelt along Silverbell Road. The realigned roadway will tie back into the ring road network between the new body shop and temporary construction parking lot on the east side of the railroad tracks.

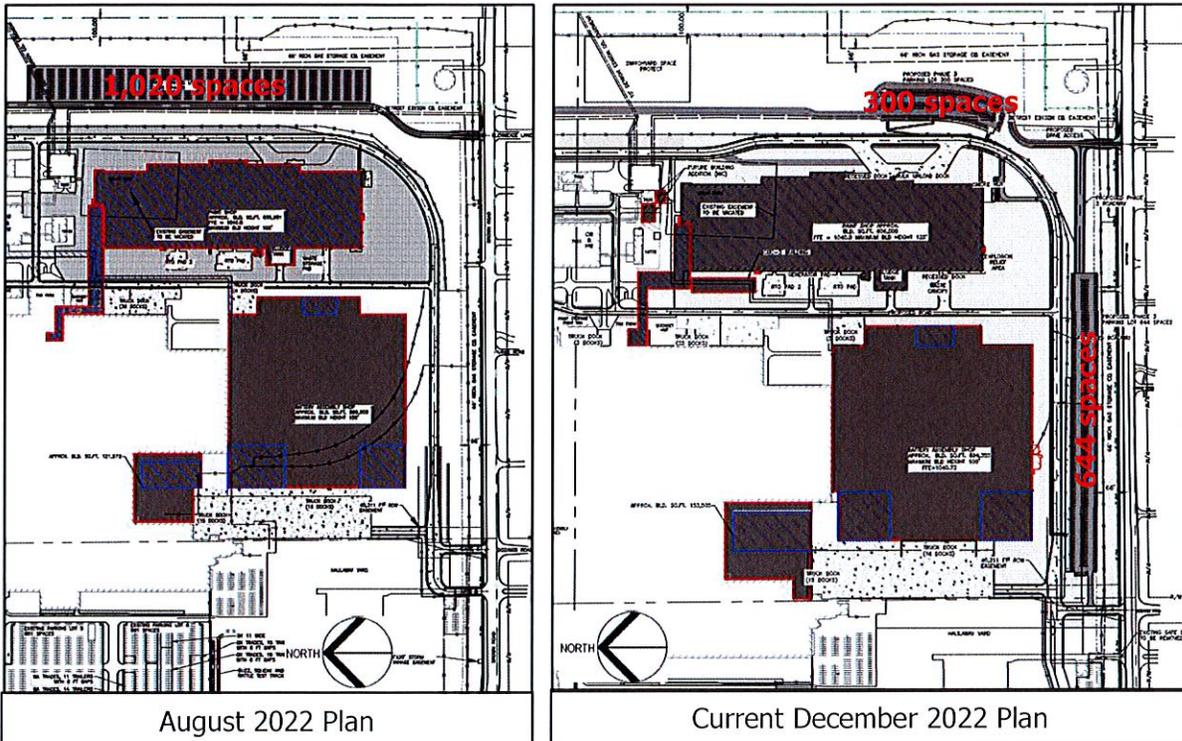
- 2) South and Southeast Parking Lot – The configuration of the proposed parking lots have been refined to support employee headcounts for location of work areas.

A 644-space surface parking lot is proposed between the battery assembly shop and the south property line along Brown Road. This parking lot maintains a setback of approximately 66 feet, due to an existing gas storage easement abutting Brown Road. The proposed surface parking lot at the southeast corner has been reduced from 1,020 spaces to 300 spaces. Together, the reduction of parking spaces provided is 76 spaces.

On August 3, 2022, the Planning Commission granted a waiver for a reduced number of parking spaces, a shortage of 3,380 spaces, (52% of the required parking provided). The reconfiguration of these parking spaces, as well as a reduction in parking spaces in the Giddings Road lots, amounts to a total reduction of 277 spaces, and just 48% of the total required parking provided. The meeting minutes reflect that the motion to approve the parking reduction waiver was based on the applicant providing evidence that indicated that the standard for reasonable use of the property is sufficient because of the level of current and future employment and the applicant

had demonstrated that the parking facility provided would accommodate the number of employees and visitors that are expected on the site.

The applicant had previously stated that 2,922 parking spaces would be sufficient satisfy the parking demand for the expanded facility. The 3,374 spaces that will remain after the reduction exceed that amount by 452 spaces. Since the waiver for 2,922 parking spaces was granted based on the current and future employment projections, the number of parking spaces provided will still exceed the amount granted as a waiver.



- 3) New Drive Entrances – Three added along Brown Road and one added on Giddings Road. Gate 7 will provide access to employee parking. Gate 6 will provide access to employee parking, as well as provide emergency access inside the secured fence perimeter and truck delivery “reject” exit. The existing Gate 5 will be demolished, and a Gate 5A along Giddings Road will be constructed for inbound truck deliveries and Gate 5B along Brown Road for outbound trucks.

These proposed changes are noted and have been found on the revised site plan.

- 4) Building Footprints – The following updates to building square feet have been made:
 - I. Battery Assembly from 899,900 to 894,355 square feet. ***(-5,545 sf)***
 - II. Paint Shop from 605,981 to 606,000 square feet. ***(+19 sf)***
 - III. Body Module Shop from 888,091 to 840,090 square feet. ***(-48,001 sf)***
 - IV. Small New Body Module Shops from 155,340 (total between 3 buildings) to 155,972 (total between 3 buildings) square feet. ***(+632 sf)***

V. Building at Northwest corner from 145,505 to 152,760 square feet. **(+7,255 sf)**

The overall change in facility square footage amounts to a reduction of approximately 45,640 square feet.

2. Sheet G-006 Wetlands.

1) Township wetlands W-P and W-Q will be impacted by the proposed parking lots and are requested to be removed.

We defer to the township engineer for review and comment.

3. Sheet AE2-100.

1) Height variance for RTO Stacks – A Zoning Board of Appeals variance request has been submitted to change the maximum height from 120 feet to 125 feet.

The proposed height of RTO Stacks to exceed the maximum height allowance, with variance request, is noted and observed on Sheet AE2-100. Additionally, we note that under Article 28, Section 2, ***any height requirement, variance, or waiver in excess of seventy (70) feet shall require mandatory approval of the Federal Aviation Agency.***

Article XIX Industrial Complex (IC)

Section 19.04 – Area and Bulk Requirements (Applies to Principal and Accessory Uses) *(amended 07.16.18, 07.05.22)*

Please see the Matrix Chart in Section 19.01 for variations to these requirements by use.

	IC
Front Yard Setback	100 ft.
Rear Yard Setback	100 ft.
Side Yard Setback	100 ft. on each side
Minimum Parcel Area	400 acres
Maximum Parcel Area	500 acres
Maximum Heights of All Structures	120 ft. subject to additional state and/or federal permits
Minimum Clear Space Around Structures	50 ft. subject to review and approval by the Fire Marshall

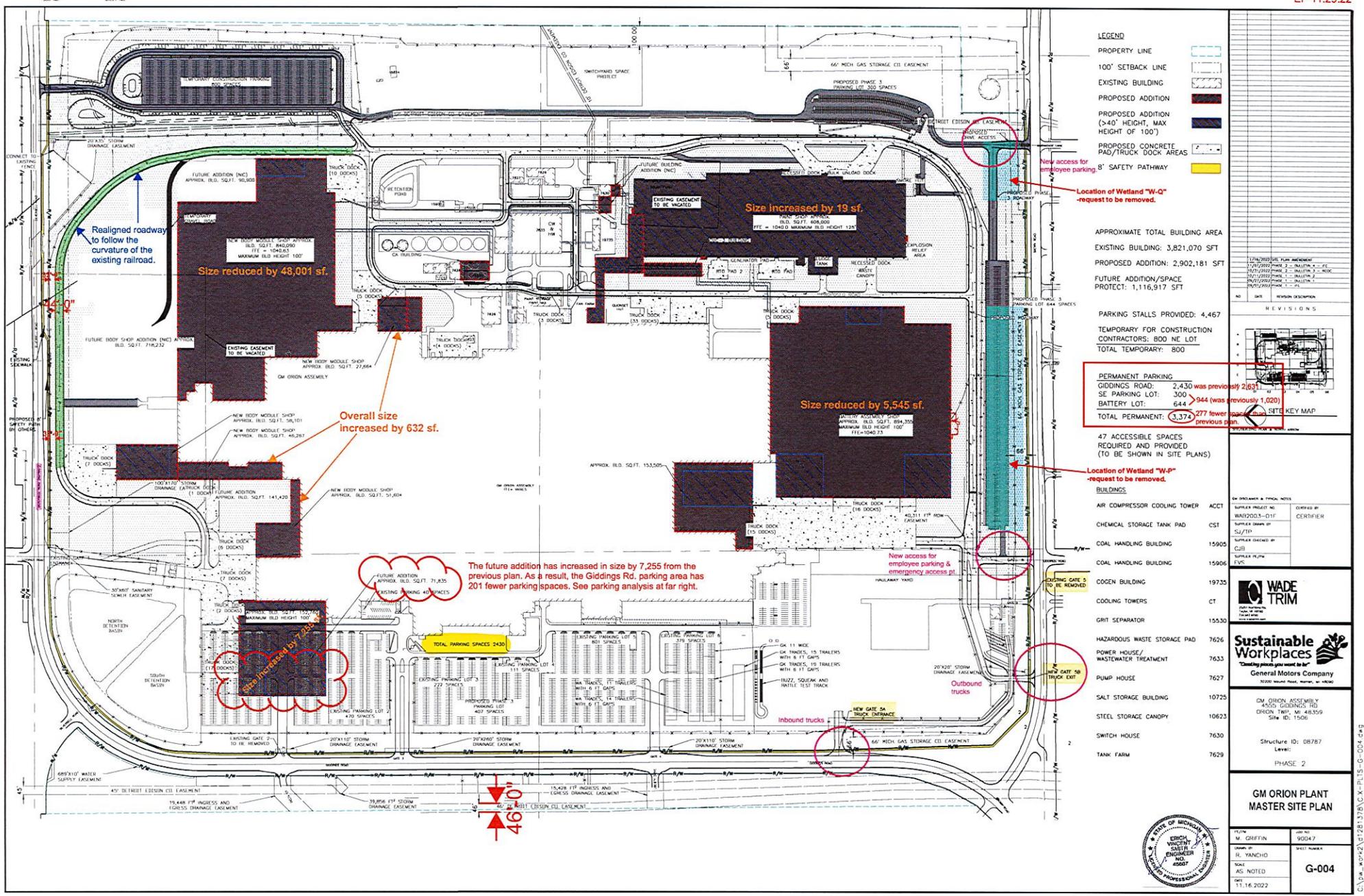
We are available to answer questions.

Respectfully,

Giffels Webster


 Rodney L. Arroyo, AICP
 Partner Emeritus


 Eric Pietsch
 Senior Planner



- LEGEND**
- PROPERTY LINE
 - 100' SETBACK LINE
 - EXISTING BUILDING
 - PROPOSED ADDITION
 - PROPOSED ADDITION (>40' HEIGHT, MAX HEIGHT OF 100')
 - PROPOSED CONCRETE PAD/TRUCK DOCK AREAS

APPROXIMATE TOTAL BUILDING AREA
 EXISTING BUILDING: 3,821,070 SFT
 PROPOSED ADDITION: 2,902,181 SFT
 FUTURE ADDITION/SPACE PROTECT: 1,116,917 SFT

PARKING STALLS PROVIDED: 4,467
 TEMPORARY FOR CONSTRUCTION CONTRACTORS: 800 NE LOT
 TOTAL TEMPORARY: 800

PERMANENT PARKING
 GIDDINGS ROAD: 2,430 (was previously 2,631)
 SE PARKING LOT: 300 (944 was previously 1,020)
 BATTERY LOT: 644 (277 fewer spaces)
 TOTAL PERMANENT: 3,374 (previous plan)

47 ACCESSIBLE SPACES REQUIRED AND PROVIDED (TO BE SHOWN IN SITE PLANS)

Location of Wetland "W-Q" - request to be removed.

Location of Wetland "W-P" - request to be removed.

BUILDINGS

AIR COMPRESSOR COOLING TOWER	ACCT
CHEMICAL STORAGE TANK PAD	CS1
COAL HANDLING BUILDING	15905
COAL HANDLING BUILDING	15906
COGEN BUILDING	19735
COOLING TOWERS	CT
GRIT SEPARATOR	15530
HAZARDOUS WASTE STORAGE PAD	7626
POWER HOUSE/WASTEWATER TREATMENT	7633
PUMP HOUSE	7627
SALT STORAGE BUILDING	10725
STEEL STORAGE CANDY	10623
SWITCH HOUSE	7630
TANK FARM	7629

REVISIONS

NO.	DATE	REVISION DESCRIPTION
1	11/16/2022	PLAN REVISION
2	11/16/2022	PLAN REVISION
3	11/16/2022	PLAN REVISION
4	11/16/2022	PLAN REVISION
5	11/16/2022	PLAN REVISION
6	11/16/2022	PLAN REVISION
7	11/16/2022	PLAN REVISION
8	11/16/2022	PLAN REVISION
9	11/16/2022	PLAN REVISION
10	11/16/2022	PLAN REVISION

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8	11/16/2022	PLAN REVISION
9	11/16/2022	PLAN REVISION
10	11/16/2022	PLAN REVISION



BY CONTRACTOR & TYPICAL NOTES

SUPPLIER PROJECT NO.	CHECKED BY
WAZ2001-01F	CERTIFIER
SUPPLIER DRAWN BY	
51/219	
SUPPLIER CHECKED BY	
CJJ	
SUPPLIER PLOTW	
EXC	



GM ORION PLANT MASTER SITE PLAN

PLN	APP NO
M. CRIFFIN	W5047
R. YANCHO	SHEET NUMBER
SCALE	
AS NOTED	G-004
DATE	
11.16.2022	





December 2, 2022

Scott Reynolds
Planning Commission Chairperson
CHARTER TOWNSHIP OF ORION
2323 Joslyn Road
Lake Orion, MI 48360

RECEIVED

DEC 2 2022

Orion Township
Planning & Zoning

RE: GM Orion Assembly BET Expansion – Amended Wetland – PC-2022-46
Amended Wetland Review

Received: November 28, 2022 by Orion Township

Dear Mr. Reynolds:

We have completed the review for the Amended GM Orion Assembly Wetland submittal. Wetlands on this site are shown on plans prepared by Wade Trim. The EGLE/USACE Joint Permit Application was utilized for the township wetland permit application and was included in the submittal. The wetland inspection, delineation report, and permit application were completed by GHD Services, Inc. The application was reviewed with respect to the Township's Wetlands Protection Ordinance, No. 107.

An Amended Wetland Application was submitted to the Township along with the Amended Site Plan. The Amended Site Plan requires impacts to the entirety of Wetland W-Q and the remaining portion of Wetland W-P that was originally proposed to be only partially impacted. Both Wetlands W-P and W-Q are Township regulated wetlands and are not regulated by EGLE.

EXISTING SITE CONDITIONS:

The proposed site is located east of Giddings Rd, south of Silver Bell Rd., and north of Brown Rd. within Section 34 of the Charter Township of Orion. After conducting a site visit on July 14, 2022, we were able to generally confirm the location of the wetlands as depicted on the plans and in the wetland report.

Please note that wetlands are described with a W ahead of the wetland identifying letter and the water bodies are described with a WB ahead of the water body identifying letter. For example, Wetland A is represented by W-A and Water Body A is represented by WB-A.

Following is a composite list of wetlands and water bodies from the delineation report:

W-A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y
WB-A, B, C, D, E, F, G, H, I, J

The following wetlands were added after the original delineation report:

W-AA, AB

PLEASE NOTE: Figure 1 – Delineated Wetland and Waterbody Features (GM Wetland Map) combines W-A, B, C, D, E, and F, with WB-A, B, C, D, E, and F respectively. For clarity, and most up-to-date information, this letter will refer to the GM Wetland Map included below for wetland identification purposes.

Regulated Under Ordinance 107, Section 3.A:

Wetlands regulated by this section include W-A, B, C, D, E, and F. Section 3.A identifies these wetlands as being regulated for the purpose that they are hydraulically contiguous with a river, lake, or stream. National Wetlands Inventory (NWI) and Michigan Resource Inventory System (MIRIS) maps appear to only recognize a small portion of Wetland A as wetland area. NWI Describes it as a Palustrine, Emergent, Persistent and Seasonally Flooded (PEMIC). Altogether, these wetlands total 5.6 acres. According to the USDA National Resource Conservation Service (NRCS) map, these wetlands are generally comprised of soils Oshtemo-Boyer Loamy Sands (13B and 13C), and Granby Loamy Sand (39). Per EGLE response to the wetland delineation report, these wetlands are also regulated by EGLE. The EGLE Regulated Wetland Map has been included below for reference.

Regulated Under Ordinance 107, Section 3.B:

Wetlands regulated by this section include only W-N. Section 3.B identifies this wetland as being regulated because the wetland is over two (2) acres in size. Neither NWI nor MIRIS recognize this area as an existing wetland. The NRCS maps identify this wetland's soils as Oshtemo-Boyer Loamy Sands (13B) and Riddles Sandy Loam (44C). W-N is 2.7 acres in size. This wetland was determined to not be regulated by EGLE.

Regulated Under Ordinance 107, Section 5.B.5:

Wetlands regulated by this section include W-G, H, I, J, K, M, O, P, Q, R, U, V, W, X, Y, and AA. Section 5.B.5 identifies these wetlands as being regulated for the purpose that the wetlands provide flood and storm control by hydrologic absorption and storage capacity. Of these wetlands, NWI maps only have record of W-Q, X, and W. W-X and W are represented as part of a much larger wetland adjacent Carpenter Lake. NWI maps identify these three (3) wetlands as Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, and Seasonally Flooded (PSS1C). MIRIS maps identify the same three (3) wetlands with the addition of W-Y. NRCS maps indicate soil types in these wetlands comprised primarily of Marlette Sandy Loam (10B), Capac Sandy Loam (11B), Brookston and Colwood Loams (12), Oshtemo-Boyer Loamy Sands (13B, 13C, and 13E), Houghton and Adrian Mucks (27), and riddles Sandy Loam (44C). These wetlands combine for a total area of 4.99 acres. Wetlands W-H, I, J, M, R, U, V, W, X, and Y are all regulated by EGLE per the EGLE Regulated Wetland Map.

Regulated Under Ordinance 107, Sections 5.B.3 & 5.B.5:

Wetlands regulated under this section include W-L, S, T, and AB. Section 5.B.3 identifies these wetlands as being regulated because they support plants or animals of an identified local importance. While neither the NWI nor MIRIS mapping systems have record of these wetlands, and the NRCS map identifies soil types to be Oshtemo-Boyer Loamy Sands (13B) which is consistent with other on-site wetlands, these wetlands were identified to be of higher quality. During the site visit, it was determined that W-L, S, and T contained species of Sphagnum moss which is typically found in bogs. These may be historical remnants of bogs that persist to this day. The bog ecosystem can be significant for a variety of species. Just south of W-S and T is W-AB, which is classified as a vernal pool. Vernal pools are seasonal depressional wetlands that provide a unique habitat for a variety of plants and animals that are able to survive in seasonally flooded areas. Altogether, these wetlands are 1.08 acres total in size. While these wetlands are not regulated by EGLE, these are considered higher-quality wetlands in the site.

Non-Regulated Wetlands

WB-F, G, H, I, and J (totaling 12.16 acres) are not considered regulated wetlands due to the fact that they are basins that were designed and constructed specifically for stormwater runoff management purposes. They are of standard quality and do not appear to be ecologically significant in nature.

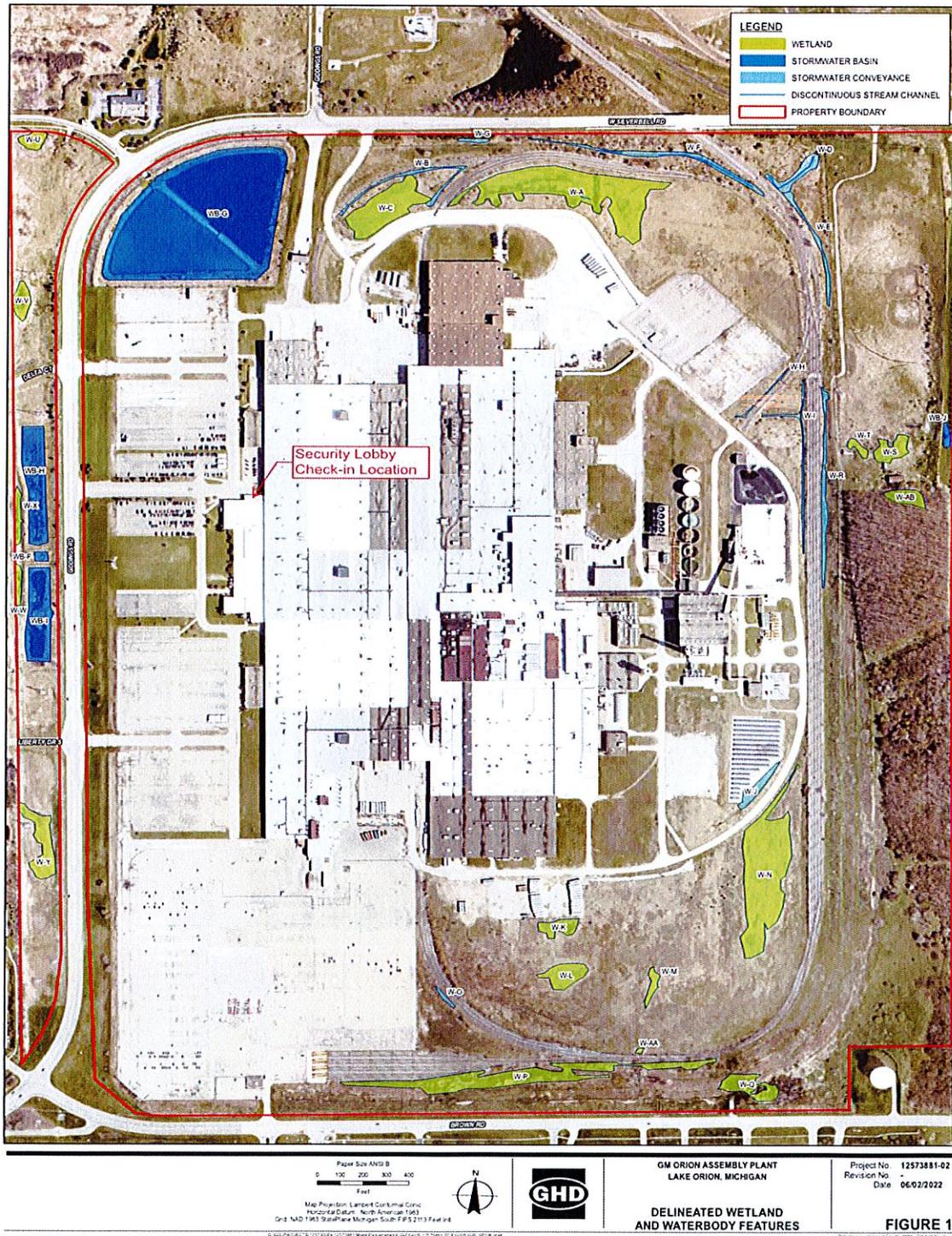




Figure 2.
EGLE Wetland Identification Overview
GM
Orion Township
WIP - HPG-HESW-13EXX

Legend:
 WIP Assessment Area
 EGLE Regulated Wetland
 EGLE Unregulated Wetland

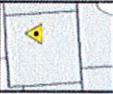
Scale:
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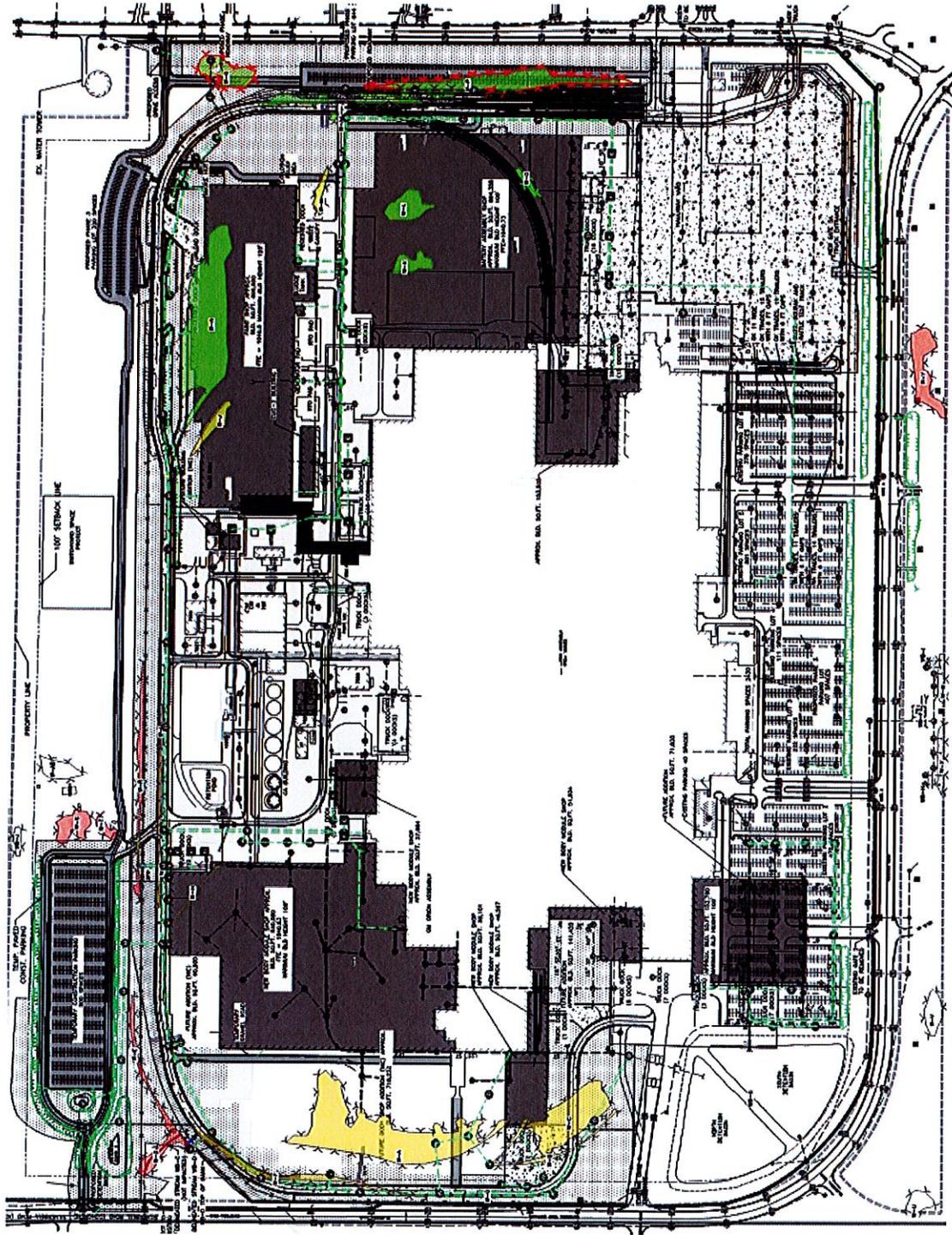
North Arrow:


Disclaimer:
 This drawing showing those areas that are wetlands and not containing wetland is an approximation of the boundaries flagged on-site.
 This drawing does not constitute a permit in and of itself. It is intended to be used in conjunction with a permit application to the National Wetlands Inventory and the National Environmental Protection Act, 1984 PA 451, as amended.

EGLE
 Environmental and Natural Resources
 Michigan Department of Environment and Great Lakes Protection
 1400 Townsend Drive
 Lansing, Michigan 48906
 Phone: 517.373.3000
 Fax: 517.373.3001
 Email: egle@egle.state.mi.us
 Website: www.egle.state.mi.us

Map created: May, 2022
 K. Cronk
 Wetlands, Lakes,
 and Streams Unit, E.GLE WRD

Map Location:

 Oakland County



Snip from Existing Wetland Plan (Amended Sheet G-006)



Wetland A: Looking Northeast



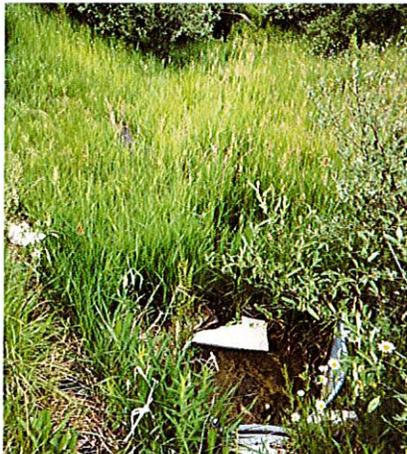
Wetland F: Looking East



Wetland D: Western End



Wetland P: Looking Southwest



Wetland H: I to H Culverts



Wetland M: Culvert to Storm Network



Wetland L: Moss

IMPACT OF THE PROPOSED PROJECT ON THE WETLANDS:

EGLE Regulated Impacts:

The applicant included a Wetland Exhibit plan set which accurately displays the proposed impacts of the final buildout of the GM Orion Assembly building including potential future expansions of the proposed building additions. A total of 5.57 (per EGLE JPA) EGLE regulated wetland acres are proposed for impacts based on the proposed improvements. Based on the EGLE/USACE Joint Permit Application (JPA), this includes 1.76 acres of impact from general filling operations, and 3.80 acres of impacts due to structure placement. See the table taken from the Wetland Exhibit plan set below:

Wetlands			
Location	Area (ft2)	Impacted Areas (ft2)	Impacted Areas (Acres)
W-R	15,323	690	0.02
W-I	6,945	6,945	0.16
W-H	1,672	1,672	0.04
W-E	9,168	-	-
W-D	12,662	-	-
W-F	19,347	19,347	0.44
W-A	135,467	135,467	3.11
W-B	9,086	9,086	0.21
W-C	53,552	53,552	1.23
WB-G*	423,454	-	-
W U*	8,136	-	-
W-V	11,140	-	-
WB-H	51,200	-	-
W-X	7,672	-	-
WB-F	2,553	-	-
W-W	5,533	-	-
WB-I	48,839	-	-
W-Y	26,696	-	-
W P*	81,438	81,438	1.87
W-O*	1,693	1,693	0.04
W-L	17,982	17,982	-
W-L*	17,860	17,860	0.41
W-K*	11,327	11,327	0.26
W-M	5,748	5,748	0.13
W-Q*	20,032	20,032	0.46
W-N*	117,739	117,739	2.7
W-AA*	737	737	0.01
W-AB*	5,748	-	-
W-S*	14,220	-	-
W-T*	4,200	-	-
WB-J	3,527	-	-
W-J	9,832	9,832	0.23
Total Regulated	864,027	242,340	5.56
Total Unregulated	706,584	250,826	5.75
Total	1,570,611	493,166	11.31
* Unregulated Wetlands			

In addition to the impacts shown in the table above, the applicant is proposing partial filling of a stream (as recognized by EGLE) for approximately 463 lineal feet, which totals 309 cubic yards of fill.

Township Regulated Impacts:

Excluding the wetland areas listed above, it appears that wetlands W-G, K, L, N, O, P, Q, and AA will be completely filled by the proposed improvements, totaling an additional 5.75 acres of wetland impacts. Wetlands W-U, and AB do not appear to be impacted by the proposed improvements. A table summarizing the wetland impacts was included on the Existing Wetland Plan (sheet G-006, shown above) in the site plan submittal.

Proposed Mitigation:

The applicant is proposing mitigation in multiple forms.

1. Purchasing credits into a wetland bank at a ratio of 1.5:1 for emergent wetlands and a ratio of 2:1 for forested wetlands. For the 5.57 acres of proposed impacts to the EGLE regulated wetlands, the applicant is proposing to purchase 8.61 acres worth of wetland credits.
2. Replacing the impacted stream on-site. For the fill of 463 linear feet of existing stream on-site, the applicant is proposing to relocate the stream and provide 500 linear feet of new stream on-site.
3. The proposed CPVC BMPs that are included in the storm management system will provide new areas for infiltration and may lead to new habitat growth in areas not proposed for future development. These BMPs will also provide stormwater management that is currently done naturally by some of the existing wetlands.

The difference in impacted wetland acres between the originally submitted Wetland Impact Permit Application and the Amended Wetland Impact Permit Application is 1.19 acres of additionally impacted Township regulated wetlands. This additional area is not regulated by EGLE and was not found to support plant or animal life of local importance. Therefore, no additional mitigation appears to be necessary based on the Amended Wetland Impact Application.

Per the Ordinance, the wetland application shall not be approved unless the following exist:

1. The action or use is not likely to or will not pollute, impair, or destroy a wetland. *In our opinion, the proposed impacts to the wetlands are offset by the applicant's efforts to mitigate the impacts. The majority of the high-quality wetlands are being preserved and the EGLE regulated wetlands are being banked at a rate over 1.5:1 overall.*
2. There are no feasible or prudent alternatives to the proposed action. *In our opinion, the proposed land use is consistent with the zoning of the property and the proposed impacts are consistent with typical developments to provide the required road access, utility networks, and storm water management.*
3. The approval is consistent with public interest, in light of the stated purposes of this Ordinance. *Based on the above findings, it is our opinion the requirements of the Wetlands Protection Ordinance are being met. The applicant is providing the required storm water management facilities and impacting the least amount of wetland area possible given the location of the improvements.*

CONCLUSION:

In our opinion, the Amended Wetland Impact Permit submittal for the GM Orion Assembly BET Expansion project is in substantial compliance with the Township's Wetlands Protection Ordinance.

Please note the Soil Erosion and Sediment Control (SESC) measures will be reviewed during the engineering review for each phase to ensure that the wetlands are protected from adjacent construction practices. Further measures such as multiple rows of silt fence, outlet filters, and vegetative buffers may be required as part of those reviews.

GM Orion Assembly BET Expansion Wetland – PC-2022-46
Amended Wetland Review
December 2, 2022
Page 9 of 9

Please feel free to contact us with any questions at (248) 751-3108 or joseph.lehman@ohm-advisors.com

Sincerely,
OHM Advisors



Joe Lehman, P.E.
Engineer



Mark A. Landis, P.E.
Project Manager

cc: Chris Barnett, Township Supervisor
David Goodloe, Building Official
Bill Basigkow, Director of Public Services
Tammy Girling, Director of Planning and Zoning
Lynn Harrison, Planning and Zoning Coordinator
Reuben Jones, General Motors, LLC
Erich Smith, Wade Trim, Inc.
Chris Carnell, Walbridge

File: P:\0101_0125\SITE_OrionTwp\2022\0121221041 GM Expansion\MUNI\Permits\Wetland\Amended Wetland Permit\2022.12.01_GM - Amended Wetland_Review.docx



December 2, 2022

Scott Reynolds, Planning Commission Chairperson
CHARTER TOWNSHIP OF ORION
2323 Joslyn Road
Lake Orion, MI 48360

RECEIVED

DEC 2 2022

Orion Township
Planning & Zoning

RE: GM Orion Assembly BET Expansion, PC-2022-46
Amended Site Plan Review #1

Received: November 17, 2022, by Orion Township

Dear Mr. Reynolds:

We have completed our review of the GM Orion Assembly BET Expansion plan set. The plans were prepared by Wade Trim and were reviewed with respect to the Township's Zoning Ordinance, No. 78, Stormwater Management and Soil Erosion & Sedimentation Control Ordinance, No. 139, and the Township's Engineering Standards.

EXISTING SITE CONDITIONS:

The site is located along the east side of Giddings Rd., south of W Silverbell Rd., and north of Brown Rd. within Section 34 of the Charter Township of Orion. The site is zoned Industrial Complex (IC) and is bound by parcels to the east zoned Mobile Home Park (MHP) and Industrial Park (IP), parcels to the north zoned Industrial Park (IP) and Limited Industrial (LI), parcels to the west zoned Suburban Estates (SE) and Industrial Park (IP), and to the south by the Township border with the City of Auburn Hills.

The existing site contains the GM Orion Assembly complex which is comprised of a nearly 3.7M square foot assembly building, including several smaller buildings along with infrastructure designed to support the manufacturing process. The smaller buildings on site include an air compressor cooling tower, a chemical storage tank pad, coal handling buildings, a cogen building, standard cooling towers, grit separators, a hazardous waste storage pad, a powerhouse/wastewater treatment building, a pump house, a salt storage building, a sludge building, a steel storage canopy, a switch house, and a tank farm. Along with the buildings, there are train tracks, large scale parking lots, several drive aisles and approaches on the surrounding roads, and large-scale storm conveyance and storage systems that handle the drainage from the site and some of the bordering areas. The existing site contains multiple independent easements. The majority of which are storm drainage easements. There is also a sanitary sewer easement located at the north end of the site, just east of Gate 1. Additionally, there is a large solar power license easement located east of the assembly building that is proposed to be removed.

The Amended Site Plan includes changes to proposed building footprint, ring road and parking bays. The railroad which was previously proposed for removal is now shown remaining partially on site with some additional rails proposed for switching rail freight within the site. In addition to the physical changes on site, the project is now broken up into additional phases. Phase 2A includes the Paint Shop, and Phase 4 includes the landscaping work. New building footprint square footage is as follows:



- Battery Assembly:	894,355 sft
- Paint Shop:	606,000 sft
- Body Module Shop:	840,090 sft
- Small New Body Module Shops (total between three buildings):	155,972 sft
- Building at Northwest Corner:	152,760 sft

WATER MAIN AND SANITARY SEWER:

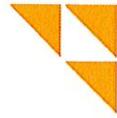
There is existing 24-inch water main located south of the site on Brown Rd. and west of the site on Giddings Rd. The existing water main on-site features two 16-inch connections to the Township water main network. One connection point is located on the south side of the site off Brown Rd, near the southeast corner. The second connection point is located on the west side of the site off Giddings Rd, approximately midway north/south. Both connections points include meter pits as the internal system is privately owned, operated, and maintained by GM. Internally, the water main is comprised of loops around the GM Orion Assembly building. The applicant is proposing to cut and cap several of the internal loops and extend temporary service through the Orion Assembly building to facilitate construction. Water main is shown extending along the proposed ring road with services connecting to the proposed paint shop southeast of the existing Orion Assembly building. Modifications to the alignment of the 16-inch main that extends from the south on Brown Rd. are also proposed to facilitate construction of the new buildings. It is our understanding that the applicant intends to replace and upgrade all site fire hydrants to the current Township hydrant model.

Per discussion with the applicant, the anticipated peak hour demand for water from the Township will be ~0.75 mgd. Significant improvements have been made over the years resulting in an increase in water efficiency at this site since its original development. The proposed improvements will result in a slight increase the usage of Township systems based on current usage. These figures are significantly less than the assembly plant used when it began operations in the 1980's. Per Township records, water use has been declining since the 2000's, for example, in 2006 the plant used just over 1 mgd of water. Per review of the Township's hydraulic model the Township's water main system has sufficient capacity to serve the proposed improvements.

There is existing 12-inch sanitary sewer located west of the site along Giddings Rd. and Silver Bell Rd. that extends north up Giddings to Waldon Rd as a 24-inch main. The existing site features an onsite industrial wastewater pretreatment plant within the Orion Assembly building. A series of sanitary sewer extensions collect the sewage and process water from the existing buildings located east of the Orion Assembly building. The extensions all connect to a single 18-inch sanitary sewer lead that enters the industrial wastewater pretreatment plant. From the treatment plant, the sanitary sewer extends north and connects to the Township's 24-inch sanitary sewer located north of the site at Silver Bell Rd. and Giddings Rd. Per discussion with the applicant, the anticipated peak hour flow for the sewer is 0.48 mgd or 0.75 cfs. Due to the increase in water efficiencies in the plant, there has been a resulting reduction in the sanitary sewer discharge over the years. While the anticipated flow the proposed improvement is slightly higher than the existing flow, previous models have allocated nearly 4cfs without any signs of downstream impacts. Based on this information, there is sufficient capacity in the Township sanitary sewer system to handle the increased flow from the proposed improvements.

Because the existing systems are owned and operated by GM, and the proposed improvements only include extensions of the existing water main and sanitary system internal to the site, no easements (proposed or existing) are shown or required.

The Amended Site Plan shows minor changes to the proposed water main and sanitary sewer. No changes appear to be proposed outside of the internal GM water main and sanitary networks. The revisions appear to facilitate construction of other revised features, such as the ring road, relocated parking, and changes to the building



footprints. No changes appear to be proposed at the connection points between GM's internal site systems and the Orion Township public water main and sanitary sewer systems. The proposed revisions appear acceptable for Site Plan. We defer further comment on the hydrant location and spacing to the Fire Marshal.

STORMWATER MANAGEMENT:

The existing site currently drains from the perimeter inward. The runoff from paved areas is collected almost exclusively via catch basins and conveyed via storm sewer to the two (2) detention basins located in the northwest corner of the site. Runoff from green space is captured in wetlands or catch basins located at low-points and conveyed via culverts or connected directly to the storm network that leads into the detention system. Some of the wetlands are low points without drainage courses available and appear to infiltrate overtime. The majority of the wetlands are hydraulically connected to the existing storm network and drain into the existing detention basins. All water collected by the storm network is released from detention in the northwest corner of the site into a 36-inch storm sewer that extends southward to the ultimate outlet location on the west side of Giddings Rd. into an existing wetland system that is connected to Carpenter Lake. The storm sewer networks along Brown Rd. and Giddings Rd. area are also included in the detention system drainage area and outlet at the same location.

Per review of historical records, it appears the existing detention basins in the northwest corner of the site were designed to detain two (2) consecutive 50-year storm events. The applicant is proposing to increase this requirement and provide detention for the 100-year storm event for the existing and proposed improvements. In addition, new impervious areas will include Channel Protection/infiltration per recently adopted OCWRC standards.

The applicant is proposing to remove some of the existing storm sewer which is located within the vicinity of the proposed building additions and reroute the conveyance around the complex along the proposed ring road. Additionally, the applicant is proposing one new detention basin on the east side of the site. The basin outlets into the storm network and discharges into the existing basins. Channel Protection is included in the plans in the form of bioswales. The detention currently operates via sluice gate at a restricted rate of 12 cfs, however the sluice gate is not opened until the basins on the west side of Giddings Rd. are near empty. The applicant included full detention calculations within the Site Plan submittal, as well as detention calculations under separate cover. The detention calculations appear to be acceptable.

Also included in the proposed improvements is the rerouting of the runoff from Brown Rd. that is currently captured and conveyed through the site's on-site detention system. The runoff from the Brown Rd. area is proposed to be detained in the off-site detention systems on the west side of Giddings Rd. Additional details will be required at engineering to ensure the existing/proposed ponds have adequate capacity to accept the runoff from Brown Rd.

The Amended Site Plan storm management system features slight changes to facilitate the proposed revisions, such as additional catch basins near the railroad tracks located in the southeast corner of the site, but also, Detention Basin #3 appears to have been removed from the proposed site plan. The Phase 3 parking spaces in the southeast corner don't appear to have any storm management features proposed in the vicinity of the parking lot. Some indication of sheet flow to a swale or positive drainage towards other storm facilities will be required at Engineering.

GRADING:

Existing grades were provided via one-foot contours. The existing site generally drains from the outside inward, with the majority of the inner area being relatively flat. The largest slopes on site are located in the southeast corner where there is terraced green space which drops from Brown Rd. to the existing train tracks on site. The upper side of the



slopes reach a high-point elevation of approximately 1145 located in the southeast corner of the site on the eastern border. The low points on site are located within the existing detention basins, in the northwest corner of the site, at an elevation of approximately 1010. The majority of the site which consists of the buildings and parking areas is between elevations of 1030 and 1040. The terraced slopes appear to vary but are generally around 1:3.

Proposed grades are shown via primarily one-foot contours with some spot grades at site features such as low-points, high-points, curb lines, and building elevations. The applicant appears to be proposing maximum site slopes of 1:3. Given the existing site conditions and the massive grade change throughout the site, 1:3 slopes will be accepted where proposed. The applicant should attempt to reduce slopes to 1:4 in areas with few grading constraints. The existing drainage pattern appears to be preserved with the ultimate outlet being at the main detention area in the northwest corner of the site. Limits of disturbance were included on the individual grading sheets, and contours are generally shown meeting with the existing contours and appear accurate.

Preliminary pavement grades were provided primarily in one-foot contours which appear to be acceptable. Pavement slopes should remain between 1% and 6% for drive areas, and between 1% and 4% for parking areas. Several proposed pavement-sections were included for Heavy Duty Concrete, Medium Duty Concrete, Construction Access Road Asphalt, Building Pad Aggregate, and several joint and intersection details. The proposed medium duty and heavy-duty concrete sections are slightly less than the township recommended section for IP zoning. However, the majority of the provided cross-sections meet the Orion Township Standards for their proposed use.

The Amended Site Plan does not appear to accurately reflect proposed grades for either of the parking lots on the south side of the site. The existing terraced slopes are still shown over the proposed Phase 3 parking lot and the lot south of the Battery Assembly Shop.

TRAFFIC & CIRCULATION:

A draft Traffic Impact Study (TIS) was included in the original Site Plan submittal. The draft TIS was limited in scope and focused on intersections adjacent to the site and proposed drive entrances. It is our understanding the final study will be broadened in scope to include additional intersections further away from the site including several I-75 interchanges as directed by the Road Commission for Oakland County (RCOC) and Michigan Department of Transportation (MDOT). Based on this information, we offer the following initial comments:

The TIS is based on the full build to be completed by 2024 and the plant operating with 3,916 employees between three shifts. Additionally, 683 trucks are anticipated to access the plant during each shift. Currently the plant operates with only one shift with 1,246 employees. The largest shift for the proposed expansion is anticipated to be the first shift with 1,477 employees which is an increase of 231 employees compared to existing.

The trip generation has been projected using a fitted curve equation. While the Orion Township zoning ordinance requires the use of a value of one standard deviation above the average value of the data set, section 27.14.D.5.c states “Alternately, a published or unpublished trip generation study for a comparable development may be utilized, if performed by a Professional Engineer and subject to review and approval by the Township Engineer.” Per follow-up discussions with the applicant, recent traffic data has been collected from the existing GM Orion and the existing GM Delta sites and has been provided as a basis for the trip generation. Typically, values are used from the Institute of Transportation Engineers (ITE) tables for trip generation. However, due to the lack of data for a manufacturing site of this size, the use of local data is more appropriate and is more likely to reflect expected conditions.

The study discusses the additional trips to account for the increase in the first shift employees from 1,246 to 1,477. Initially we had concern that the study did not appear to address the impacts of possible overlapping movements occurring during shift change, where an entirely different set of vehicles could be moving in the



opposite direction. Our concern being that the movement of these two groups of employees would be on the roadway during the same hour-long period. Per follow-up discussion with the applicant, it is our understanding there is an overlap of 30 minutes with shifts. Therefore, one shift does not exit until the next shift has arrived completely. Therefore, the peak hours of each shift will not occur at the same time. The below exhibit provided by the applicant shows the expected peak periods of each shift:



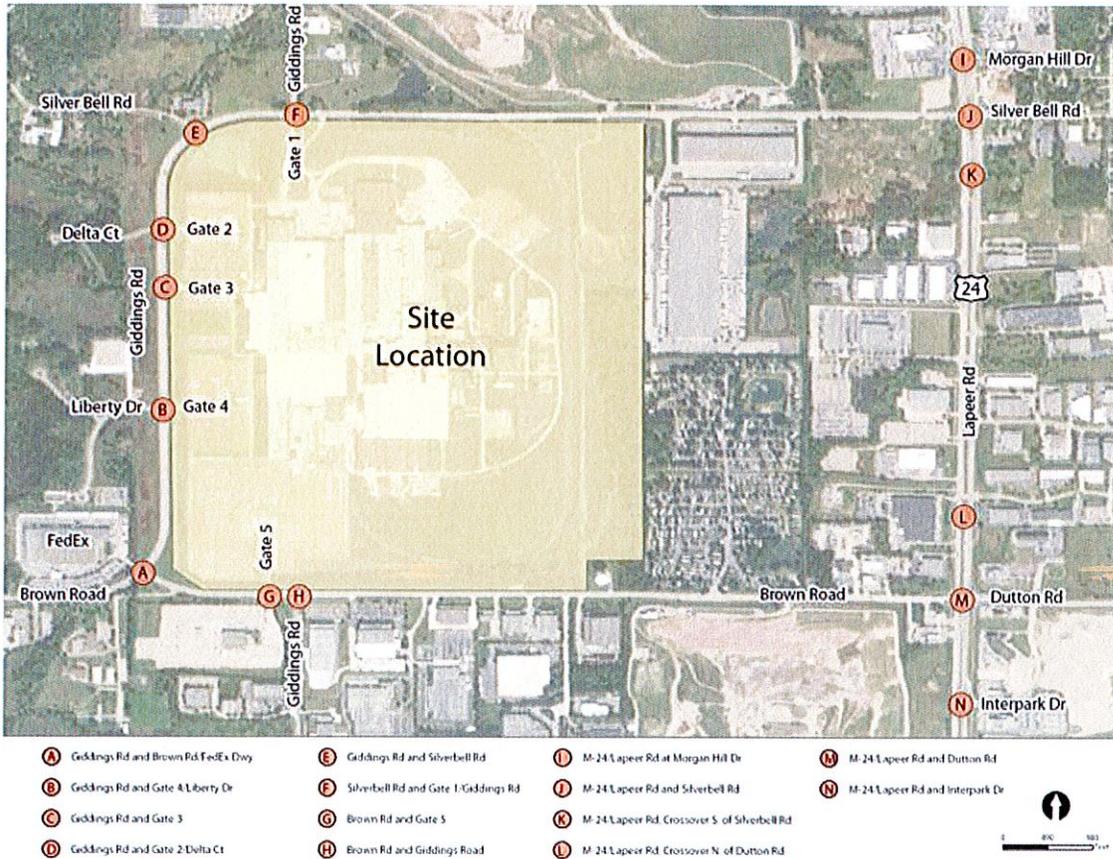
As noted in each case, the majority of the incoming shifts have already arrived before the majority of the outgoing shifts have exited.

Below is a map of the study area from the TIS noting gate and intersection locations. In addition, following is a summary of the proposed mitigation:

- Place the intersection of Silver Bell Rd & Giddings Rd/Gate 1 under traffic signal control
- Provide a right-turn taper at the following locations:
 - NB Giddings Rd approach to Gate 2
 - WB Brown Rd approach to Gate 7
- Construct a right-turn only lane with a minimum of 100' of storage length at the following location:
 - NB Giddings Rd approach to Gate 3
- Construct a left-turn only lane with a minimum of 150' of storage length at the following locations:
 - EB Brown Rd approach to Gate 7
 - WB Silver Bell Rd approach to Gate 8
- Provide signal timing adjustments at the following signalized intersections:
 - Giddings Rd & FedEx Driveway/Brown Rd
 - Giddings Rd & Liberty Dr/Gate 4
 - M-24 & the crossover north of Silver Bell Rd
 - M-24 & Silver Bell Rd
 - M-24 & the crossover south of Silver Bell Rd
 - M-24 & the crossover north of Brown/Dutton Rd
 - M-24 & Brown/Dutton Rd
 - M-24 & the crossover south of Brown/Dutton Rd



Figure 1-1. Study Area.



In summary, we currently have no objections to the draft TIS or it's recommendations. Further review and approval by Orion Township, RCOC and MDOT will be required once the final report is prepared.

The Amended Site Plan includes changes to the proposed approaches on Giddings and Brown Rd. Gate 5 will be demolished and split into Gate 5A (Giddings) and 5B (Brown) which will be for truck access. Gate 6 will provide direct access to both the southern parking bay and the ring road. Gate 7 will provide access to both the southern and southeastern parking bays. The Traffic Impact Study shall be revised based on the final approach/gate configurations for the site. We defer comment regarding fire access to the Fire Marshal.



LANDSCAPING/SOIL EROSION AND SEDIMENTATION AND CONTROL:

A Landscaping Plan was provided. Consideration should be given to avoid tree plantings directly over utilities. We defer further comment to the Township Planner.

NATURAL FEATURES:

Wetlands:

The Amended Site Plan requires revisions to the existing wetland impact permit, as Wetlands P and Q are now being impacted as part of the proposed revisions. Wetlands P and Q are located in an area that needs to be regraded to facilitate construction of the southern-most parking bay and the ring road. The applicant has submitted a revised wetland impact permit identifying all newly proposed impacts to any wetlands that weren't previously included in the originally approved wetland impact permit. Please refer to the wetland review letter which will be provided under separate cover for more information.

Woodlands:

It is our understanding that sites in the IC zoning district are not subject to Ordinance Section 21.12. We defer further comment to the Township Planner.

CONCLUSION:

In our opinion, the site plan as submitted is in substantial compliance with the Township's ordinances and engineering standards. We ask that any approval include the following:

1. Include proposed grading on the south side of the site for the proposed southern parking bay and the revised ring road.
2. Obtain a wetland permit from Orion Township for the proposed impacts to wetlands P&Q.
3. Once finalized, the Traffic Impact Study shall be revised and resubmitted based on the final approach/gate configurations for the site.
4. The engineering plan, designed in accordance with Zoning Ordinance No. 78, Stormwater Management and Soil Erosion & Sedimentation Control Ordinance No. 139, and the Township's Engineering Standards shall be submitted to the Township for review and approval prior to construction. A detailed cost estimate for the improvements shall be submitted with the plans signed and sealed by the design engineer.

The applicant should note the Township may require performance bonds, fees, and/or escrows for a preconstruction meeting and necessary inspections. Please feel free to contact us with any questions at (248) 751-3100 or mark.landis@ohm-advisors.com.

Sincerely,
OHM Advisors

Joe Lehman, P.E.
Project Engineer

Mark Landis, P.E.
Project Manager



cc: Chris Barnett, Township Supervisor
David Goodloe, Building Official
Bill Basigkow, Director of Public Services
Tammy Girling, Director of Planning and Zoning
Lynn Harrison, Planning and Zoning Coordinator
Jeff Williams, Township Fire Marshal
Reuben Jones, General Motors, LLC
Erich Smith, Wade Trim, Inc.
Chris Carnell, Walbridge
File

P:\0101_0125\SITE_OrionTwp\2022\0121221041 GM Expansion\MUNI\Site\Amended Site Plan - 1st Review\2022.12.02_GM Amended SP_ISC.docx



Charter Township of Orion

3365 Gregory Rd., Lake Orion MI 48359
www.oriontownship.org

Fire Department

Phone: (248) 391-0304, ext. 2000

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Fax: (248) 309-6993

DEC 1 2022

Orion Township
Planning & Zoning

To: Planning Commission/Planning & Zoning Director
From: Jeff Williams, Fire Marshal
Re: PC-22-46, GM Orion BET 2, Site Plan Amendment
Date: 11/21/2022

The Orion Township Fire Department has completed its review of Application PC-22-46 for the limited purpose of compliance with Charter Township of Orion Ordinance's, Michigan Building Code, and all applicable Fire Codes.

Based upon the application and documentation provided, the Fire Department has the following recommendation:

- X Approved with requirements – The plan is considered approved at this time by the fire department. All items listed below shall be addressed on future engineering submittals. It shall be understood any field items found to be non-compliant with International Fire Code will be subject to change as deemed necessary by the Orion Township Fire Department.

Requirements:

1. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced to provide all-weather driving capabilities during all construction phases.
2. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet exclusive of shoulders and an unobstructed vertical clearance of 13 feet of 6 inches during all construction phases.
3. Fire apparatus access road width where fire hydrants are present shall be not less than 26 feet in width
4. Fire apparatus access roads shall not exceed 10 percent grade at all times.
5. Where the vertical distance between the grad plane and the highest roof surface exceeds 30 feet, an approved aerial access road measuring 26 feet shall be provided on site. This measurement shall be exclusive of shoulders and shall be located within the immediate vicinity of the building. The location of the road shall be not less than 15 feet and no greater than 30 feet from the building.
6. All portions of the building's exterior walls shall be within 150 feet of the fire access road. Access roads may be extended to 200 feet for buildings equipped with an approved automatic sprinkler system installed in the structure. When fire apparatus access roads cannot be installed because of locations on property, topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection may be approved.
7. Dead end fire apparatus access roads more than 150 feet length shall be provided with an approved area for turning around fire apparatus.



Charter Township of Orion

3365 Gregory Rd., Lake Orion MI 48359
www.oriontownship.org

Fire Department

Phone: (248) 391-0304, ext. 2000
Fax: (248) 309-6993

8. The turning radius for the emergency apparatus road shall be in accordance with the Orion Township Fire Department turning performance analysis template. Overlays of the template shall be shown on the final revised site plan submittal.
9. A plan / schedule for fire access during construction shall be provided.
 - This schedule shall include all proposed fire suppression system shut down / out of service dates and times.
 - General Motors and or on-site contractors shall coordinate all scheduled fire suppression system shutdowns with the Orion Township Fire Prevention Division.
10. Details for No Parking Fire Lane signage including road striping (cross hatching) area shall be indicated on the plan.
11. Fire department access roads 20 to 26 feet wide shall be posted with NO PARKING FIRE LANE signage on both sides of the fire apparatus access road. Fire department access roads greater than 26 feet shall only require posting on one side of the roadway.
12. Security gates across fire apparatus access roads shall be approved by the fire code official. Where security gates are installed, they shall have an approved means of emergency operation. The security gates and emergency operation shall be always maintained operational. This information shall be included on the engineering submittal.
13. Traffic calming devices shall be prohibited except when approved by the fire code official.

Site Water and Fire Protection:

14. The most remote exterior portion of a non-sprinklered building shall be within 400 feet of a fire hydrant and no more than 600 feet for a sprinkled building measured by an approved route around the exterior of the facility or building. General spacing between fire hydrants shall not exceed 500 feet on main drive isles.
 - Additional fire hydrants shall be located in all proposed parking areas and Haulaway Yard.
15. Buildings equipped with a standpipe system installed in accordance with section 905 of IFC shall have a fire hydrant within 100 feet of the fire department connection.
16. All existing and proposed water mains and fire hydrant locations and sizes shall be indicated on the engineering plans.
 - All existing fire hydrants remaining on site shall be updated to meet Townships standards
 - Hydraulic flow information shall be provided for all fire hydrants located on site
 - The fire department is requesting a narrative regarding how the private fire suppression system operates and explains its components and design features
 - All private fire service mains shall be installed to meet the requirements of NFPA 24
 - All fire protection systems shall be maintained to meet the requirements of NFPA 25
17. Fire Department Connections (FDC) for sprinkler or standpipes shall be located with respect to hydrants, landscaping, and fire department access roads. Fire Department Connections shall be so located that the fire apparatus and hose connection to supply the system will not obstruct



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access to the building for other fire apparatus. The location of the fire department connection location shall be approved by the fire code official.

18. Fire Department Connection shall be located on the street side of the building or facing approved fire apparatus access roads, fully visible and recognizable for the street, fire apparatus access road or nearest point of the fire department vehicle access or otherwise approved by the fire code official.
19. A 3-foot clear space around fire hydrants and fire department connections shall be maintained at all times.
20. Where fire hydrants are subject to impact by a motor vehicle, guard post or other approved means shall be provided.

Emergency Responder Radio Coverage:

21. The facility shall have approved radio coverage for emergency responders within the building based on the existing coverage levels of the public safety communication system utilized by the jurisdiction, measured at the exterior of the building.

Utility Locations:

22. Utility locations shall be depicted on the engineering plans

This approval is limited to the application and materials reviewed which at this time do not raise a specific concern with regard to location and/or impact on health and safety. However, the approval is conditioned upon the applicant providing sufficient additional information at time of building permit application that includes data or documents, confirming full compliance with all applicable building codes, fire codes and Township Ordinances.

If there are any questions, the Fire Department may be reached at 248-391-0304 ext. 2004.

Sincerely,

Jeffrey Williams

Jeff Williams, Fire Marshal
Orion Township Fire Department



Charter Township of Orion
Planning & Zoning Department
2323 Joslyn Rd., Lake Orion MI 48360
P: (248) 391-0304 ext. 5000

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Orion Township
Planning & Zoning

Checklist for Site Plan Approval Application

Applications must be submitted by noon on Wednesday, three (3) weeks prior to a scheduled meeting. Meetings are held on the first and third Wednesday of each month, unless otherwise specified.

Pursuant to Zoning Ordinance 78, Section 30.01(C)(8) the applicant or a designated representative must be at all scheduled review meetings. Refer to Section 30.01(F) for the criteria the Planning Commission will use to evaluate a site plan.

The following must accompany your completed application; incomplete submittals will not be accepted.

- Complete application including original ink signatures of property owner and the applicant.
- The Site Plan Review fees calculated using Ordinance No. 41.
- Proof of ownership. Acceptable forms of documentation include: Warranty Deed, Quit Claim Deed, Land Contract, or Option to Purchase with a Copy of the Warranty Deed.
- Traffic Study if applicable.
- Wetlands Permit application if applicable.
- Four (4) sets of signed and sealed 24" x 36" detailed site plans containing all elements within Zoning Ordinance No. 78, Section 30.01(E). One (1) of the four (4) sets needs to be hand delivered or mailed to Giffels Webster, Attn: Matt Wojciechowski, 28 W. Adams St., Suite 1200, Detroit, MI 48226. Please note, if your project involves MDOT, one (1) additional copy is needed.
- Four (4) sets of all supporting documents, reports, studies etc.
- PDF format copy of all information submitted (may be emailed or provided on a USB/flash drive).
- Proof of submittal to outside agencies

The Township reserves the right to request additional copies of printed materials as necessary.

If you have any questions, please call the Planning & Zoning Director at (248) 391-0304 ext. 5000.



**Charter Township of Orion Planning Commission
 Site Plan Approval Application**

30.1 , A. Intent: The site plan review procedures and standards are intended to provide an opportunity for consultation and cooperation between the applicant and the Planning Commission so as to achieve maximum utilization of land with minimum adverse effects on adjoining property. Furthermore, it is the intent of these procedures and standards to allow for review of site plans by the Planning Commission, to provide a consistent and uniform method of review, and to ensure full compliance with the standards contained within Zoning Ordinance 78, and other applicable local ordinances and State and Federal laws.

Project Name: GM Orion BET 2

Name of Development if applicable: General Motors, LLC

Applicant	Name: <u>Reuben M. Jones, Orion Assembly Plant Director</u> Address: <u>4555 Giddings Road</u> City: <u>Orion</u> State: <u>MI</u> Zip: <u>48359</u> Phone: _____ Cell: <u>586-690-0068</u> Fax: _____ Email: <u>reuben.m.jones@gm.com</u>
*Property Owner(s)	Name: <u>Reuen M. Jones, Orion Assembly Plant Director</u> Address: <u>4555 Giddings Road</u> City: <u>Orion</u> State: <u>MI</u> Zip: <u>48359</u> Phone: _____ Cell: <u>586-690-0068</u> Fax: _____ Email: <u>reuben.m.jones@gm.com</u> * If the name on the deed does not match the name of the property owner on this application, documentation showing the individual is the same as the company name must be provided.
Plan Preparer Firm/Person	Name: <u>Wade Trim, Inc., (Erich Smith)</u> Address: <u>25251 Northline Road</u> City: <u>Taylor</u> State: <u>MI</u> Zip: <u>48180</u> Phone: <u>834-947-9700</u> Cell: <u>989-751-5370</u> Fax: _____ Email: <u>esmith@wadetrim.com</u>
Project Contact Person	Name: <u>Walbridge (Chris Carnell)</u> Address: <u>777 Woodward Ave ste 300</u> City: <u>Detroit</u> State: <u>MI</u> Zip: <u>48226</u> Phone: <u>313-963-8000</u> Cell: <u>313-215-8235</u> Fax: _____ Email: <u>ccarnell@walbridge.com</u>



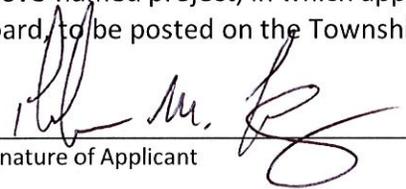
Charter Township of Orion
 Planning & Zoning Department
 2323 Joslyn Rd., Lake Orion MI 48360
 P: (248) 391-0304 ext. 5002

Project Name GM Orion BET 2
 PC# _____ Parcel#(s) 09-34-200-006, 09-34-400-011

Please select an option below:

Permission to Post on Web Site

By signing below as applicant and on behalf of my consultants, we agree to allow the plans for the above-named project, in which approval is being sought by the Planning Commission and/or Township Board, to be posted on the Township website.



 Signature of Applicant

11/16/22

 Date

Reuben M. Jones

 Printed Name of Applicant

Do not want plans posted on Web Site



Wade Trim Associates, Inc.
25251 Northline Road • Taylor, MI 48180
734.947.9700 • www.wadetrim.com

November 16, 2022

Orion Township
2323 Joslyn Road
Lake Orion, MI 48360

Attention: Ms. Tammy Girling
Director, Planning and Zoning

Re: GM Orion Assembly BET Expansion
Site Plan Amendment
Case Number PPC-2022-28

Dear Ms. Girling:

Wade Trim is submitting, for review and approval, an amended site plan for the referenced project. The following items have been updated since the initial site plan submitted on July 5, 2022 and approved on October 17, 2022.

Site Plan Changes

1. Sheet G-004 Rail Line and Ring Road – Portions of the rail are now slated to remain from the incoming rail lines under Silver Bell Road along the northeast side of the site. This has resulted in the internal Ring Road alignment being shifted accommodate the rail to remain.
2. Sheet G-004 South and Southeast Parking Lot – The configuration of the proposed parking lots has been refined to support employee headcounts for location of work areas.
3. Sheet G-004 New Drive Entrances – Three added along Brown Road and one added on Giddings Road. Gate 7 will provide access to employee parking. Gate 6 will provide access to employee parking, as well as provide emergency access inside the secured fence perimeter and truck delivery “reject” exit. The existing Gate 5 will be demolished, and a Gate 5A along Giddings Road will be constructed for inbound truck deliveries and Gate 5B along Brown Road for outbound trucks.
4. Sheet G-006 Township Wetlands W-P and W-Q will be impacted by the proposed parking lots and are requested to be removed.
5. Sheet G-004 Building Footprints – The following updates to building square feet have been made:
 - Battery Assembly from 899,900 to 894,355 square feet
 - Paint Shop from 605,981 to 606,000 square feet
 - Body Module Shop from 888,091 to 840,090 square feet
 - Small New Body Module Shops from 155,340 (total between three buildings) to 155,972 (total between three buildings) square feet
 - Building at Northwest Corner from 145,505 to 152,760 square feet

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6. Sheet AE2-100 Height Variance for RTO Stacks – A Zoning Board of Appeals variance request has been submitted to change the maximum height from 120' to 125'.

Very truly yours,

Wade Trim Associates, Inc.



Erich V. Smith, PE
Vice President

EVS:jlb
WAB 2003.01F
20221116_ORIONTWP-SitePlanAmend-LTR.DOCX
Attachment

cc: Mr. Chris Carnell, Walbridge
Ms. Savannah Japenga, Wade Trim
Mr. Gary Jensen, Walbridge
Mr. Brook Kiros, Walbridge
Mr. Mark Landis, OHM
Ms. Amanda Mort, Wade Trim
Mr. Tyler Philpot, Wade Trim
Mr. Adam Piper, Wade Trim
Mr. Joe Roman, Walbridge

TECHNICAL MEMORANDUM

TO: Orion Township Engineer

FROM: Erich Smith, PE/Wade Trim
Brian Han, EIT/Wade Trim

DATE: November 16, 2022

RE: GM Orion Assembly Stormwater Management

Project Number WAB2003.01F
File/path

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General Motors (GM) Orion Assembly site is covered under the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE), National Pollutant Discharge Elimination System (NPDES) general permit no. MIS1100000 (refer to the attached NPDES Permit). Effective from April 1, 2021, to April 1, 2026. The Certificate of Coverage (COC) authorizes General Motors, LLC to discharge an unspecified amount of stormwater to Carpenter Lake. The GM Orion Assembly facility is undergoing a major expansion to support electric vehicle (EV) production. Building expansions include 3.26 million square feet of additional body module shop, battery assembly shop, and a separate paint shop that will be connected to the main facility via overhead enclosed conveyor system. Additional employee parking areas and internal roadways to facilitate new truck docks will be constructed.

1.1 Existing Storm Water System

The existing stormwater conveyance system collects all runoff from the site, as well as the runoff from Brown Road and the adjacent businesses. This runoff discharges to two existing stormwater detention basins (north and south) located on the northwest corner of the site, which will be referred to as pond 1. Stormwater runoff is conveyed via two primary trunk sewers that generally serve the east and west portions of the site. The west half of the site (approximately 123 acres) discharges to the south detention basin. The east half of the site (approximately 294 acres) discharges to the north detention basin. Refer to Existing Condition Stormwater Exhibit. It should be noted that a portion of the eastern side of the site is diverted to a separate industrial containment sewer system which discharges to the onsite wastewater treatment plant. These treated areas, totaling 3.27 acres, include the tank farm and adjacent loading area, fire water and wastewater tanks, which have a containment dike, coal pad, containment pond, and salt shed slab. In addition, portions of the entrance drives located on the western part of the site, are not captured in the existing stormwater

conveyance system. These areas sheet flow towards the catch basins along Giddings Road and then discharges to the two existing basins located West of Giddings Road. The western area totals 14.89 acres, along with the east 3.27 acres are excluded from runoff calculations.

Information provided by the Township shows that the existing north and south basins were designed to hold two consecutive 50-year rains (refer to Stormwater Attachment I). This document also indicates that the site drains into 2 basins on the west side of Giddings Road and discharges at a rate not to exceed 12 cubic feet per second (cfs). Record drawings and field investigation have determined that the GM detention basins do not discharge into the ponds on the west side of Giddings, but exit through a series of culverts to the Brown Drain as shown in Stormwater Attachment I. In addition, this document notes that a total 9,000,000 cft of capacity is available in the existing detention basins (1985 plans noted 8,378,675 cft). However, this appears to exclude the permanent pool that the ponds operate with today. Therefore, we calculate a maximum available storage volume of 4,885,857 cubic feet (cft). This storage volume assumes that the pond operates with a water surface elevation between a range of 1010 - 1023 feet.

In 2018, the outlet to the existing north and south detention basins was upgraded with new gates and controls. These gates were installed to control the pond discharge rates, 12 cfs allowable per County records, and water levels as well as to provide the flexibility to maintain a permanent pool. The gates can be fully closed to contain all stormwater runoff from the site, allowing for complete containment of contaminated stormwater under an emergency condition.

Required detention for these existing conditions was calculated using Technical Release 55 (TR-55) Methodology.

TR-55 (SCS) Methodology (refer to attached Calculations)

Area = 416.56 acres

Curve Number = 73.6 (Total area separated into east and west subbasins)

Average Time of Concentration (T_c) = 15 min

100-Year 24-hour Storm = 5.43 inches

Required Detention Volume

4,187,350 cft

1.2 Proposed Stormwater Improvements

Proposed modifications to the stormwater system include removing the existing sewer within the new building footprints, relocating portions of the main trunk sewer on the east and west sides of the plant, and installing new stormwater management systems. These modifications address the specific requirements of Orion Township and the Oakland County Water Resources Commissioner Stormwater Engineering Design Standards dated November 22, 2021. An exhibit of the GM Orion Proposed Drainage Area is attached showing the sub-drainage boundaries, runoff coefficients, proposed stormwater detention and water quality features (refer to GM Orion Proposed Drainage Area).

The proposed system has been analyzed from an overall site perspective to provide planning-level estimates of stormwater management facilities required to meet the applicable design standards. For this effort, we have assumed the following design criteria:

1. The stormwater detention volume for the entire watershed draining to the existing ponds must be adequate to fully capture the runoff volume from a 100-year event. For this site, the 100-year storm rainfall depth is 5.43 inches.
2. Within the development areas where additional impervious area is proposed, an additional channel protection storage volume is required to retain runoff from the 1.3-inch event. The proposed additional impervious area is 86.01 acres of existing greenspace being developed to the proposed condition. Per Oakland County, the proposed channel protection control volume (CPCV) for the 86.01 acres is calculated to be 336,947cft (see attached calculations). The CPVC volume was removed the required storage volume in proposed conditions.
3. Due to the size of the site, stormwater runoff calculations used for modeling purposes are performed using the Soil Conservation Service (SCS) runoff curve number approach. The US Department of Agriculture (USDA) WinTR-55 model framework is being used for the calculations.
4. Runoff curve numbers (CN) were calculated as weighted values based on the hydrologic soil group and land cover type within each subarea.
5. All design runoff volumes are based on 24-hour rainfall depths (inches) from the National Oceanic and Atmospheric Administration (NOAA) Atlas-14 (see attached point precipitation frequency table)
6. For volumetric sizing of new stormwater management facilities associated with proposed impervious areas, calculations provided by the Oakland County Water Resources Commission have been used.
7. As site development moves forward, the conveyance capacity of the collection system will be evaluated assuming the following criteria:

- Flow must be contained within the crown of the pipe without surcharge for the 10-year storm
- During the 25-year storm, the hydraulic grade line can rise to within 1-foot of the ground surface.
- Any surface flooding that occurs during the 100-year storm must not impact buildings and structures on the site.

8. In-system storage capacity of 358,327 cft was calculated and subtracted from the required detention pond storage volume using a HGL of 1023 in the large diameter storm pipe (7' to 10') entering the detention basins from the west and east line, (see attached calculations).

Using the above design criteria, the following results were developed for proposed conditions.

TR-55 (SCS) Methodology (refer to attached calculations)

Area = 417.63 acres

Average Curve Number = 86.46 (Total area separated into 58 subbasins)

Average Time of Concentration (T_c) = 15 min

100-Year 24-hour Storm = 5.43 inches

Total Runoff Volume = 5,917,018 cft

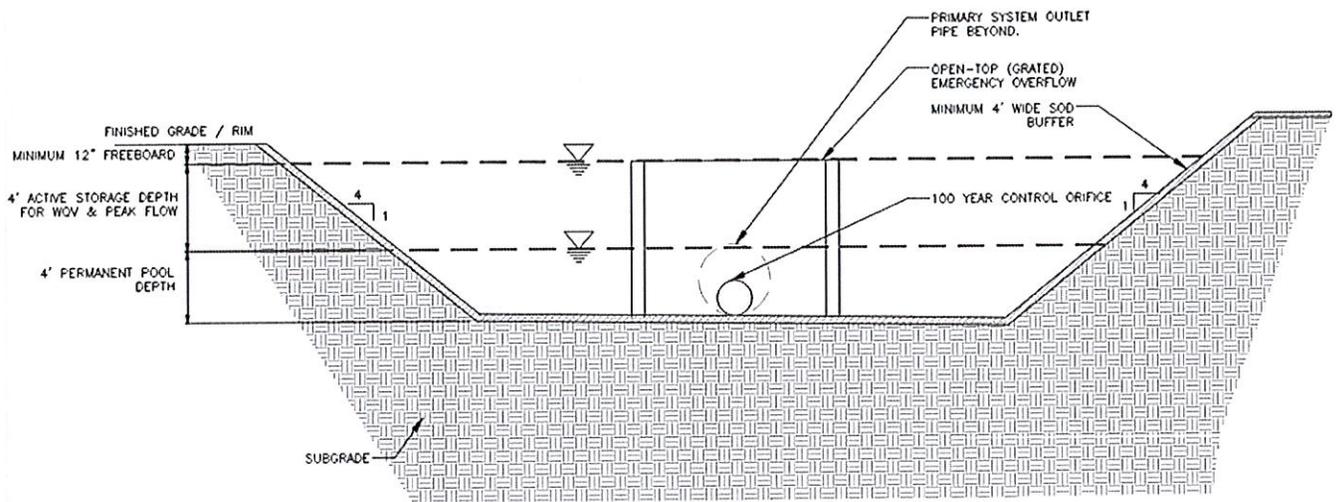
The allowable discharge volume was then calculated and removed from the storage requirement (see attached calculations). A summary of the site's required volumes, with the allowable 12 cfs discharge rate is summarized below:

Parameters	TR-55 Method
Post Runoff Volume (cft)	5,917,018
In-System Storage (cft)	(358,327)
CPVC Exfiltration Volume (cft)	(136,313)
Allowable Discharge Volume (underflow) (cft)	(718,278)
Pond Storage Volume Provided (cft)	4,885,857
(Excess Storage)/ Storage Required (cft)	(181,757)

While these calculations show that there is additional room for excess runoff, the calculations assume that 86.01 acres is the extent of the additional impervious, post development, area. The

internal roadway within the east side of the site, may contain additional impervious areas which are not yet accounted.

This proposed stormwater management system also includes one new detention pond. Pond 2 is proposed on the east side of the site, as shown on the GM Orion Proposed Storm Exhibit. The CPVC, CPRC, forebay, and detention volumes for the ponds were sized to manage stormwater from the adjacent parking lot areas. These stormwater management facilities will be open systems and will meet the requirements of the County's Best Management Practices (BMPs).



Open System Stormwater Facility

The outfall for the site will not be modified as part of the site development.

Offsite Improvements

Currently, the Brown Road's storm sewer system drains across the west parking lot of the GM Orion Assembly Site. The proposed plan is to disconnect the existing 30-inch storm sewer near the intersection of Brown and Giddings Roads and redirect this drain via a new storm sewer along the east side of Giddings Road, crossing to the west side of the road, and conveying into an open ditch to the existing detention basins (refer to GM Orion Proposed Storm Exhibit). Note that Giddings Road stormwater already discharges to these basins. Calculations are included showing the basins are designed to hold the stormwater runoff for a 100-year event from roadways.

Attachments and Exhibits

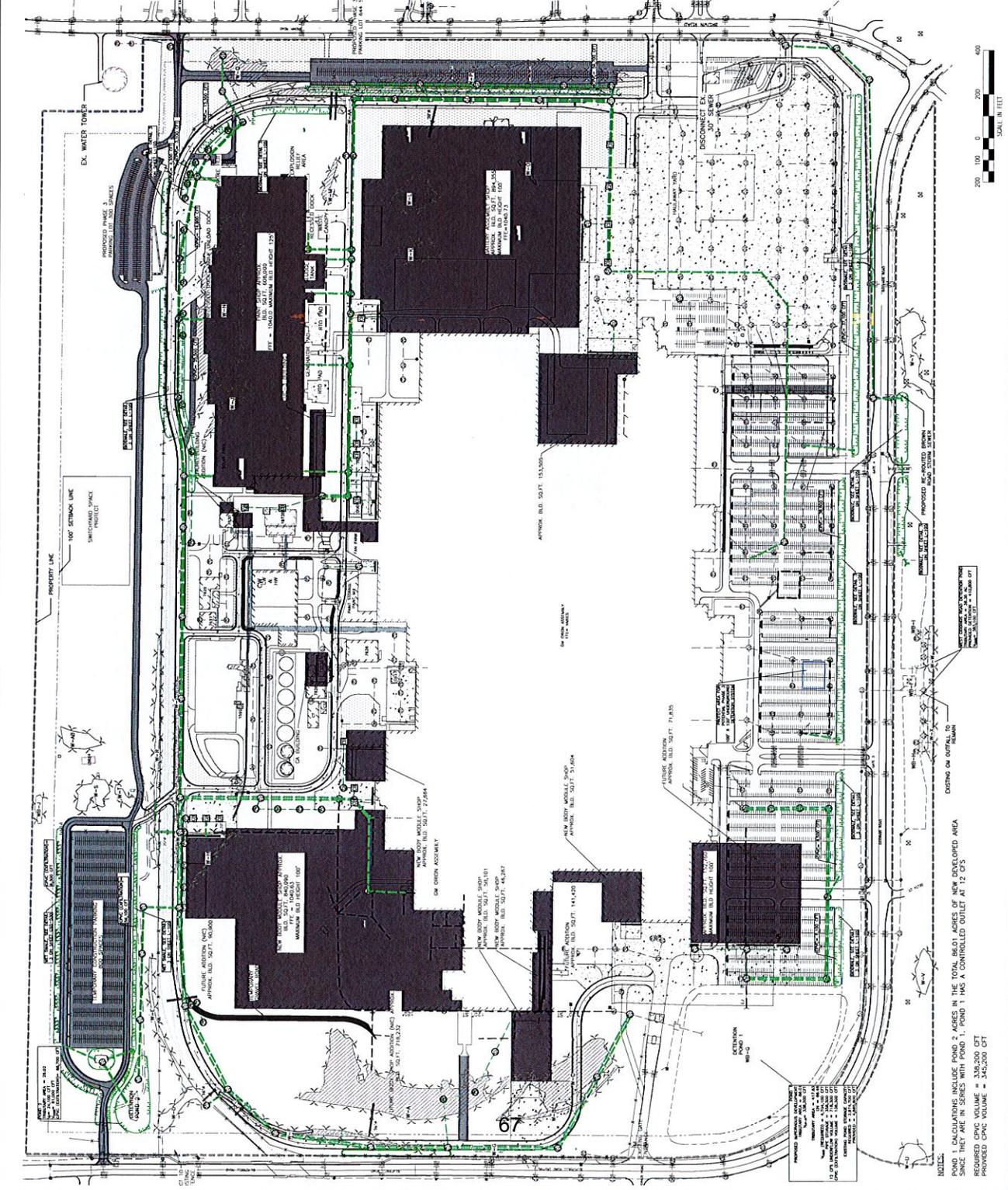
G-005F Existing Drainage Map
G-005E Proposed Drainage Map
G-005 Stormwater Master Plan
Stormwater Attachment I (from Orion Twp)
NPDES Permit
NOAA Point Precipitation Frequency Table
GM ORION STORMWATER CALC 20221116

<p>DATE: 11/16/2022</p> <p>PROJECT: STORMWATER MASTER PLAN</p> <p>CLIENT: General Motors Company</p> <p>LOCATION: 10000 Woodloch Forest, Warren, MI 48090</p> <p>DESIGNED BY: R. YANCHIO</p> <p>CHECKED BY: J.S. NOTED</p> <p>SCALE: AS NOTED</p>		<p>DATE: 11/16/2022</p> <p>PROJECT: STORMWATER MASTER PLAN</p> <p>CLIENT: General Motors Company</p> <p>LOCATION: 10000 Woodloch Forest, Warren, MI 48090</p> <p>DESIGNED BY: R. YANCHIO</p> <p>CHECKED BY: J.S. NOTED</p> <p>SCALE: AS NOTED</p>
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REVISIONS

NO.	DATE	REVISION
1	11/16/2022	ISSUE FOR PERMIT
2	11/16/2022	REVISED PERMIT COMMENTS
3	11/16/2022	REVISED PERMIT COMMENTS
4	11/16/2022	REVISED PERMIT COMMENTS
5	11/16/2022	REVISED PERMIT COMMENTS
6	11/16/2022	REVISED PERMIT COMMENTS
7	11/16/2022	REVISED PERMIT COMMENTS
8	11/16/2022	REVISED PERMIT COMMENTS
9	11/16/2022	REVISED PERMIT COMMENTS
10	11/16/2022	REVISED PERMIT COMMENTS

SITE KEY MAP



NOTES:

1. CALCULATIONS INCLUDE POND 2, AGES IN THE TOTAL 86.07 ACRES OF NEW DEVELOPED AREA. SINCE THEY ARE IN SERIES WITH POND 1, POND 1 HAS A CONTROLLED OUTLET AT 12' O.S.

2. REQUIRED STORAGE VOLUME = 2,300,000 GALLONS

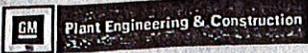
3. REQUIRED SPILL VOLUME = 84,000 GALLONS

ATTACHMENT I

Stormwater runoff from the proposed GM plant site will be directed to two retention basins sized to hold two consecutive 50-year rains. The proposed total basin capacity is 9,000,000 cubic feet, based on 100% runoff from 200 acres of hard surface (roof, parking lots, roads) and 35% runoff from 240 acres (unpaved areas). The basins will be equipped with skimmers to remove floating oil. The retention pond water will be monitored for pH and conductivity prior to discharge. The basins will be clay-lined to prevent bottom leakage and thereby ensure that the rate of discharge from the basins can be controlled.

An additional retention basin will be located by Oakland County in the Detroit Edison Power easement along the western edge of the site to collect stormwater runoff from Giddings Road and portions of other roads in the immediate area. Discharge from the GM retention basins will be staged through the Oakland County retention basin. Water from the county retention basin will be discharged to the wetlands using overflow weir boxes to provide sheetflow drainage. The county retention basin will be designed to limit the maximum rate of discharge to 12 CFS and thereby prevent any increase in the water level of Carpenter Lake. The timing and rate of discharge from the GM retention basins will be controlled, so that road runoff collected in the county basin will be discharged first. Water collected in the GM basins will then be released to the county basin, at a rate not to exceed 12 CFS.

PE & C 92
10-77



Detroit, Michigan

Project Low Pond System
Assembly Plant
Location Orion

Sheet No. LP-1 of _____
Job No. 5240
By LA Date 6-13-80

APPENDIX J

1. Total Drainage Area = 54.41 acres
 - a) 13.18 acres paved C = 100%
 - b) 41.23 acres unpaved C = 35%
 - c) $C_{equiv} = (13.18 \times 1 + 41.23 \times .35) \div 54.41 = 0.51$

2. Typical cross section thru pond looking south:



STORAGE POND SIZED FOR
100 YR - 24 HR STORM

36" ϕ CMP. M.H. W/ ORIFICE
HOLES SIZED TO LIMIT
Q TO MAX. 3 CFS @
PEAK STORAGE VOLUME

Low-Pond discharge pipe

MANHOLES & DISTRIBUTION
PIPE FROM SITE RET'N POND

FLOODED OUTLET PIPES FROM
SITE DISTRIBUTION MANHOLES. NUMBER
AND SIZE TO RESTRICT FLOW
TO Q = 12 TO 15 CFS

COMMON DISTRIBUTION WEIR BOX FOR
SITE RET'N POND DISCHARGE AND
LOW POND DISCHARGE. Q = 12 TO 18 CFS



APPENDIX J

3. Size pond for 100 yr - 24 hr storm

$$I = \frac{2.90}{T+3.1} \quad I_{24} = \frac{2.90}{24 \times 60 + 3.1} = .107$$

$$\text{Total Rain Fall} = 24 \times I_{24} = 4.73 \text{ inches}$$

$$\text{Storage Volume} = \frac{4.73}{12} \times 54.4 \text{ acres} \times 43560 \times 0.51$$

$$V_s = 476,449 = \underline{480,000 \text{ C.F.}}$$

4. ~~Try 3 ponds w/ culvert cross-connections @ Edison Towers located in central wetlands~~

$$\text{Low water} = \text{el. } 1000 \quad \text{High Water} = \text{el. } 1006 \quad H = 6'$$

$$\text{T/Berms} = \text{el. } 1008$$

Volume Calculation:

$$\begin{aligned} \text{South Pond: } & 275 \times 65 \times 6 + 2(275+65) \frac{6 \times 18}{2} \\ & = 143,970 \text{ C.F.} \end{aligned}$$

$$\begin{aligned} \text{Center Pond: } & = 410 \times 66 \times 6 + 2(410+66) \frac{6 \times 18}{2} \\ & = 213,768 \text{ C.F.} \end{aligned}$$

$$\begin{aligned} \text{North Pond: } & = 306 \times 73 \times 6 + 2(306+73) \frac{6 \times 18}{2} \\ & = 174,960 \text{ C.F.} \end{aligned}$$

$$\text{TOTAL VOLUME} = \underline{532,700 \text{ C.F.}}$$

5. Calculate orifice size (Total) and Q_{max} for 96 hour discharge

Refer to Erosion & Sediment Control Design Manual by Oakland County Drain Commission

$$Q = CA\sqrt{2GH} \quad C = 0.625 \quad A = \text{Total area of orifices}$$

$$A_m = \text{Mean Area} = \frac{V}{H_w} = \frac{480000 \text{ CF}}{6} = 80,000$$

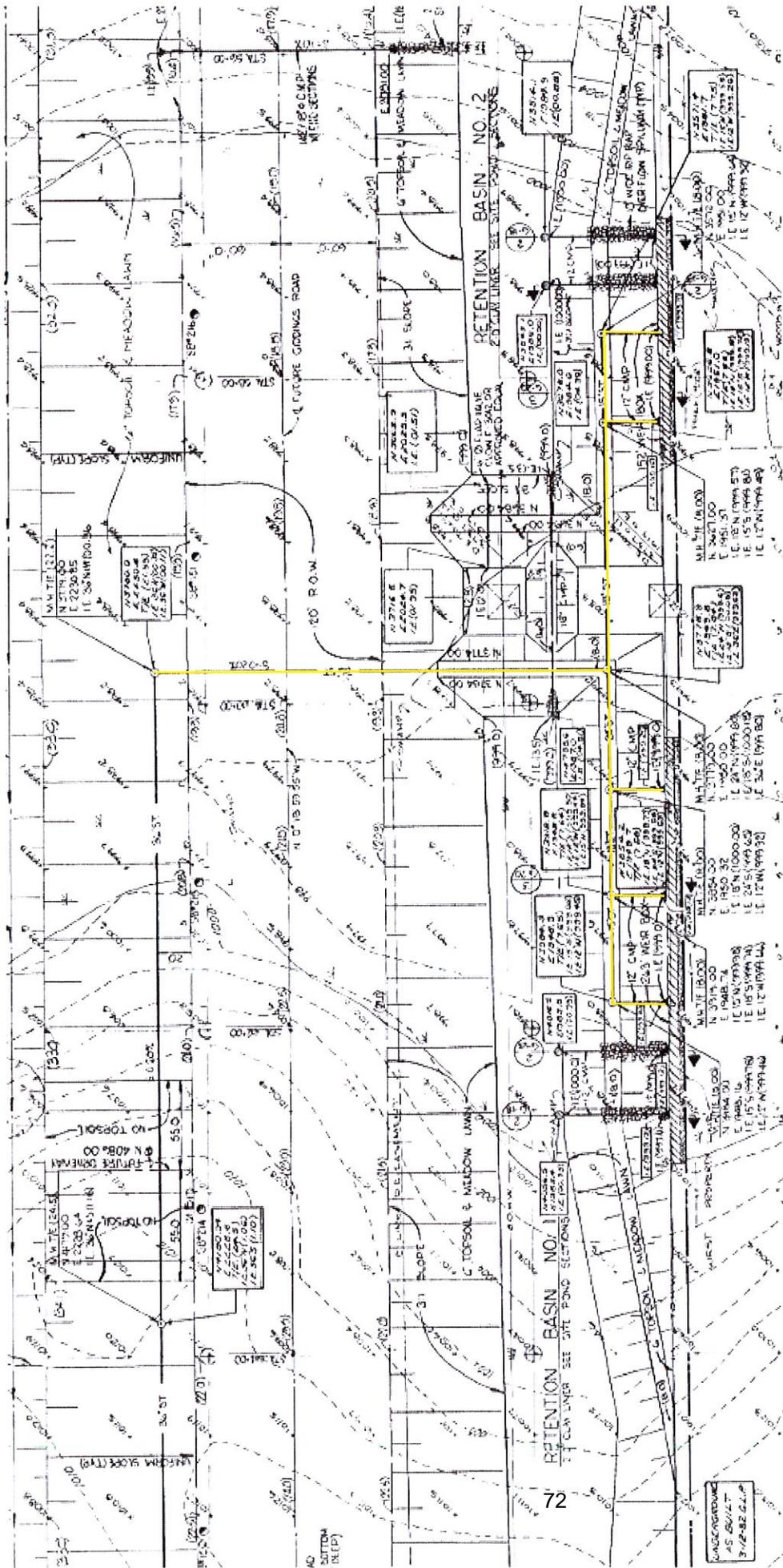
$$A = \frac{.3988 A_m \sqrt{H_w}}{T}$$

$$A = \frac{.3988 \times 80,000 \sqrt{6}}{96 \times 60 \times 60 \text{ sec}} = 0.227 \text{ S.F.}$$

$$Q_{max} = CA\sqrt{2GH}$$

$$= 0.625 \times .227 \sqrt{64.4 \times 6}$$

$$Q_{max} = \underline{\underline{2.79 \text{ CFS}}}$$



As-Built of Existing Discharge Piping for GM Detention Basins

PERMIT NO. MIS110000

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY



**AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**

**STORM WATER DISCHARGES NOT ASSOCIATED WITH SPECIAL-USE AREAS
FOR CYCLE-YEAR 1 WATERSHEDS**

In compliance with the provisions of the federal Clean Water Act (federal Water Pollution Control Act, 33 U.S.C., Section 1251 et seq., as amended); Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); Part 41, Sewerage Systems, of the NREPA; and Michigan Executive Order 2019-06, storm water associated with industrial activity as defined under Title 40 of the Code of Federal Regulations, Sections 122.26(b)(14)(i-ix), or as deemed necessary under Section 402(p)(2) of the Clean Water Act, and other storm water that is adequately regulated by this permit, is authorized to be discharged from facilities specified in individual Certificates of Coverage (COCs) in accordance with effluent limitations, monitoring requirements and other conditions set forth in this general National Pollutant Discharge Elimination System (NPDES) permit (permit).

The applicability of this permit shall be limited to facilities that discharge storm water to surface waters of the state located within a Cycle-Year 1 Watershed and have not been determined by the Michigan Department of Environment, Great Lakes, and Energy (Department) to need an individual NPDES permit. Discharges which may cause or contribute to a violation of a water quality standard are not authorized by this permit.

In order to constitute a valid authorization to discharge, this permit must be complemented by a COC issued by the Department. The permittee shall post a copy of the COC in a publicly accessible location, in plain sight, at the location granted discharge authorization under this permit by the COC.

Unless specified otherwise, all contact with the Department required by this permit shall be to the position indicated on the COC.

This permit takes effect on April 1, 2021. The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules.

This permit shall expire at midnight on **April 1, 2026**.

Issued: October 27, 2020.

Original signed by Christine Alexander
Christine Alexander, Manager
Permits Section
Water Resources Division

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PERMIT FEE REQUIREMENTS

In accordance with Section 324.3118 of the NREPA, the permittee shall make payment of an annual storm water fee to the Department for each January 1 the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. Payment may be made electronically via the Department's MiWaters system. The MiWaters website is located at <https://miwaters.deq.state.mi.us>. Payment shall be submitted or postmarked by March 15 for notices mailed by February 1. Payment shall be submitted or postmarked no later than 45 days after receiving the notice for notices mailed after February 1.

CONTESTED CASE INFORMATION

Any person who is aggrieved by this permit may file a sworn petition with the Michigan Administrative Hearing System within the Michigan Department of Licensing and Regulatory Affairs, c/o the Michigan Department of Environment, Great Lakes, and Energy setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department of Licensing and Regulatory Affairs may reject any petition filed more than 60 days after issuance as being untimely.

PART I**Section A. Final Effluent Limitations and Monitoring Requirements****1. Final Effluent Limitations and Monitoring Requirements**

During the period beginning on the effective date of this permit and the individual COC and lasting until the expiration of this permit or termination of the individual COC, the permittee is authorized to discharge storm water associated with industrial activity as defined under 40 CFR 122.26(b)(14)(i-ix) to surface waters of the state. Such discharge shall be limited and monitored by the permittee as specified below.

- a. **Narrative Standard**
In accordance with R 323.1050 of the Part 4 Rules promulgated pursuant to Part 31 of the NREPA, the receiving waters shall not have any of the following physical properties as a result of this discharge in unnatural quantities that are, or may become, injurious to any designated use: turbidity, color, oil films, floating solids, foams, settleable solids, suspended solids, or deposits.
- b. **Unusual Discharge Characteristics**
Storm water discharges shall be monitored as required by this permit to ensure there is no unusual characteristics (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) that would cause a violation of the narrative standard or other water quality standards.
- c. **Industrial Storm Water Certified Operator**
Storm water treatment and/or control measures associated with this discharge shall be under direct supervision of an industrial storm water operator certified by the Department, as required by Section 3110 of the NREPA.
- d. **Implementation of Storm Water Pollution Prevention Plan**
The permittee shall implement an acceptable Storm Water Pollution Prevention Plan (SWPPP) as required by this permit.

PART I**Section B. Storm Water Pollution Prevention Plan****1. Storm Water Pollution Prevention Plan**

The SWPPP is a written plan which identifies sources of significant materials associated with industrial activity and includes procedures intended to reduce the exposure of significant materials to storm water. An acceptable SWPPP shall include the facility name, address, COC number, and meet the conditions specified in Part I.B.2. through Part I.B.8. of this permit. The SWPPP template and other guidance materials are available on the Industrial Storm Water Program webpage at: www.michigan.gov/industrialstormwater.

2. Source Identification

To identify potential sources of significant materials that have reasonable potential to pollute storm water and subsequently be discharged to surface waters of the state, the SWPPP shall, at a minimum, include the following:

- a. A site map
The site map shall identify and label the following:
 - 1) buildings and other permanent structures;
 - 2) all areas of industrial activity, industrial equipment, and/or industrial material storage;
 - 3) storage, disposal, and/or recycling areas for significant materials;
 - 4) the location of all storm water discharge points and monitoring points (numbered or otherwise uniquely labeled for reference);
 - 5) the location of all storm water inlets (e.g. catch basins, roof drains, etc.) contributing to each storm water discharge point (numbered or otherwise labeled for reference);
 - 6) the location of non-storm water NPDES-permitted discharges;
 - 7) the location of all storm water conveyances (e.g. pipe, ditch, channel, etc.) and outlines of the drainage areas contributing to each storm water discharge point;
 - 8) all structural controls (e.g. secondary containment, inlet filters, etc.) and/or or storm water treatment equipment/devices;
 - 9) area(s) of vegetation (with appropriate labelling such as lawn, old field, marsh, wooded, etc.);
 - 10) area(s) that have the potential for soil erosion and sediment discharges (e.g. gravel lots, access roads, material stockpiles, outfalls, etc.);
 - 11) impervious surfaces (e.g., roofs, asphalt, concrete, etc.);
 - 12) name and location of receiving water(s); and
 - 13) contaminated areas of the site regulated under Part 201 (Environmental Remediation) of the NREPA.
- b. A list of all significant materials associated with industrial activity
The list shall include significant materials that have a reasonable potential to pollute storm water and identify the activity or area in which the significant materials are handled or stored. For each activity or area identified, the inlet(s) and discharge point(s) impacted in the event of a spill or release shall be included on the list. The following industrial activities and/or areas shall be evaluated for the potential to expose significant materials to storm water, if applicable:

PART I**Section B. Storm Water Pollution Prevention Plan**

- 1) loading, unloading, and other industrial material handling activities;
 - 2) outdoor industrial material storage areas, including secondary containment structures;
 - 3) outdoor manufacturing or processing activities;
 - 4) dust or particulate generating processes/activities;
 - 5) discharges associated with vents, stacks, and air emission controls;
 - 6) industrial waste or recyclable material storage or disposal areas;
 - 7) activities associated with the maintenance and cleaning of vehicles, machines, and equipment;
 - 8) area(s) that have the potential for soil erosion and sediment discharges (e.g., gravel lots, access roads, material stockpiles, outfalls, etc.);
 - 9) areas of contamination regulated under Part 201 (Environmental Remediation) of the NREPA;
 - 10) areas of significant material residues;
 - 11) areas where animals (wild or domestic) congregate and deposit wastes; and
 - 12) other areas where storm water may come into contact with significant materials.
- c. A listing of significant spills, leaks, or releases (see Part II.A. of this permit)
The list shall include the date, volume, location of the significant spill/leak/release, and the cleanup actions. The list shall include significant spills, leaks, or releases that occurred over the three (3) years prior to the effective date of a COC authorizing discharge under this permit. Significant spills, leaks or releases shall be controlled in accordance with the SWPPP and are cause for the SWPPP to be updated as specified in Part I.B.6. of this permit. The permittee shall notify the Department of significant spills, leaks, or releases as specified in Part II.C.6 and/or Part II.C.7. of this permit. Written reports regarding significant spills, leaks, or releases shall be retained with the SWPPP records in accordance with Part I.C.1. of this permit.
- d. A summary of storm water discharge sampling data
If data has been collected, the SWPPP shall include a list of the pollutants detected, sources identified, and the control measures implemented to reduce the discharge of the detected pollutants. Storm water discharge sampling data shall be retained in accordance with Part I.C.1. of this permit.
- e. A description of the illicit connection investigation
The permittee shall implement an illicit connection investigation and elimination program. The SWPPP shall include a written description of the actions taken to identify, investigate, and eliminate illicit connections to Municipal Separate Storm Sewer System (MS4) or surface waters of the state. Any discharge from an illicit connection to an MS4 or surface waters of the state is a violation of this permit.
- f. A description of the dust suppression material used onsite
The SWPPP shall include a description of the dust suppression material used onsite, the areas where the material is used, and the actions implemented to prevent an unauthorized discharge of the material. If the permittee does not use dust suppression material onsite, the SWPPP shall indicate this.

PART I

Section B. Storm Water Pollution Prevention Plan

3. Total Maximum Daily Loads (TMDLs)

The permittee is required to implement nonstructural and/or structural controls to reduce the discharge of the pollutant(s) associated with any TMDL(s) identified on the COC. The SWPPP shall include a list of all TMDL(s) identified on the COC, as well as references to control measures already listed in the SWPPP intended to reduce the discharge of the TMDL pollutant(s). The implementation of an acceptable SWPPP shall meet the control measure expectations of all TMDL(s) identified on the COC; however, the Department may require additional control measures if it is determined that the storm water discharge is negatively impacting the applicable TMDL(s). If no TMDLs are identified on the COC, this condition does not apply.

4. Nonstructural Controls

To manage and address sources of significant materials that have reasonable potential to pollute storm water and subsequently be discharged to surface waters of the state, the SWPPP shall, at a minimum, include the following nonstructural controls:

- a. **Preventative Maintenance**
Preventive maintenance procedures shall list the storm water management and control devices, treatment systems, industrial equipment, etc. that will be routinely serviced and maintained to prevent significant material exposure to storm water. The written procedures shall include a maintenance schedule for each item listed.
- b. **Good Housekeeping Inspections**
Good housekeeping procedures shall list the areas that will be routinely inspected and cleaned to prevent significant material exposure to storm water. The areas associated with the items listed in the preventative maintenance procedures shall also be included. The written procedures shall include an inspection and cleaning schedule for each area listed. A written report documenting the implementation of the inspection and cleaning schedule shall be retained in accordance with Part I.C.1. of this permit.
- c. **Comprehensive Site Inspections**
Comprehensive site inspection procedures shall include all items listed below in Part I.B.4.c.3) that will be inspected by an Industrial Storm Water Certified Operator to ensure compliance with this permit. At a minimum, one inspection shall be performed during normal facility operating hours within each of the following quarters unless the Department has approved an alternate schedule in accordance with Part I.C.10.: January – March, April – June, July – September, and October – December. A written report documenting the comprehensive site inspection shall be retained in accordance with Part I.C.1. of this permit and shall include the following information:
 - 1) Date of the inspection.
 - 2) The Industrial Storm Water Certified Operator's name(s) and certification number(s).
 - 3) All observations regarding significant material exposure and any necessary corrective actions related to the inspection of the following:
 - a) Areas identified in Part I.B.2.a. and Part I.B.2.b. of this permit.
 - b) Areas listed in Part I.B.2.c. of this permit where significant spills, leaks, or releases have occurred in the past three years.
 - c) All storm water inlets, conveyances (not including subsurface piping), and discharge points.
 - d) All structural controls and/or storm water treatment equipment/devices.

PART I**Section B. Storm Water Pollution Prevention Plan**

4) A review of the good housekeeping reports, and any other paperwork associated with the SWPPP.

5) A written statement, based on the results of the comprehensive site inspection, certifying compliance with the terms of this permit and with the permittee's SWPPP.

d. Visual Assessments

At a minimum, one (1) storm water sample shall be collected for visual assessment during normal facility operating hours at each discharge point within each of the following quarters unless the Department has approved an alternate schedule in accordance with Part I.C.10. of this permit: January – March, April – June, July – September, and October – December. Visual assessment guidance is available on the Industrial Storm Water Program webpage at www.michigan.gov/industrialstormwater.

The following are the requirements of the visual assessments and shall be included in the written procedures:

1) The storm water sample(s) shall be collected during normal hours of operation by an Industrial Storm Water Certified Operator, Qualified Personnel as defined in Part II.A. of this permit, or automatic sampling device.

2) The storm water sample(s) shall be collected:

a) with clean equipment and containers, and

b) within the first 30 minutes of the start of a discharge resulting from a qualifying storm event as defined in Part II.A. of this permit. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample shall be collected as soon thereafter as practicable. In the case of snowmelt, samples shall be collected during a period with measurable discharge from the site.

3) The visual assessment of the storm water sample(s) shall be performed and documented by an Industrial Storm Water Certified Operator. Documentation shall be retained in accordance with Part I.C.1. of this permit and shall include the following information:

a) Sample location(s).

b) Storm water sample collection date(s), time(s), and if applicable, an explanation as to why sample(s) were not collected within the first 30 minutes of discharge.

c) Visual assessment date and time.

d) Name and certification number of the Industrial Storm Water Certified Operator.

e) Storm event information, including the length of event expressed in hours, approximate size of event expressed in inches of precipitation, duration of time since previous event that caused a discharge, date and time the discharge began, and nature of event (i.e., rainfall or snowmelt).

f) Name(s) of personnel who obtained the storm water sample(s) or document that an automatic sampling device was used.

PART I**Section B. Storm Water Pollution Prevention Plan**

- g) Any notable observations of the discharge while the storm water samples were collected. This requirement is waived if an automatic sampling device was used to collect the storm water samples.
 - h) Sample(s) shall be observed in a colorless glass or plastic container for the following characteristics: color, oil sheen, turbidity, floating solids, suspended solids, settleable solids, foam, and any other unusual characteristics.
 - i) Unaltered, full-color photograph of the storm water sample(s) against a white background.
 - j) A description of corrective actions taken if any unusual characteristics are identified during the visual assessment.
- 4) When a visual assessment cannot be completed for any reason (e.g., adverse weather conditions, no discharge, qualifying event occurred outside the normal facility operating hours, etc.) during any quarter, written documentation explaining the reason for not completing the visual assessment shall be included with the SWPPP records. Adverse weather conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, electrical storms, or situations that otherwise make sampling impractical such as drought or extended frozen conditions.
- 5) If the facility has two (2) or more storm water discharge points that are believed to discharge substantially identical storm water effluents, the facility may conduct visual assessments of the discharge at one (1) of the storm water discharge points and report that the results also apply to the other substantially identical storm water discharge point(s). The determination of substantially identical storm water discharge points is to be based on the significant material evaluation conducted as set forth under Part I.B.2.b. of this permit and shall be clearly documented in the SWPPP. Visual assessments shall be conducted on a rotating basis of each substantially identical storm water discharge point throughout the period of coverage under this permit.
- e. **Material Handling and Spill Prevention / Response Procedures**
Significant material handling and storage procedures shall be developed to minimize the potential for leaks, spills and other releases that may be exposed to storm water. For each potential spill or release area, the procedures shall identify the significant material handling and storage requirements, spill response actions, and locations of spill kits. The SWPPP shall include language describing what a reportable spill or release is, and the appropriate reporting requirements in accordance with Part II.C.6. and Part II.C.7. of this permit.

For Polluting Materials (see Part II.A. of this permit), the SWPPP may reference any of the following plans:

- Pollution Incident Prevention Plan (PIPP) prepared in accordance with the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code)
- Hazardous Waste Contingency Plan prepared in accordance with 40 CFR 264 and 265 Subpart D, as required by Part 111 of the NREPA
- Spill Prevention Control and Countermeasure (SPCC) plan prepared in accordance with 40 CFR 112

PART I

Section B. Storm Water Pollution Prevention Plan

- f. Annual Employee Training Program
The SWPPP shall include a written description of the employee training program that will be implemented on an annual basis to inform appropriate personnel of the components of the SWPPP and requirements of this permit. Records of the annual employee training program shall be retained in accordance with Part I.C.1. of this permit.

5. Structural Controls

Structural controls shall be used to reduce significant material exposure and/or the concentration of significant materials in the discharge to ensure compliance with Part I.A.1.a. and Part I.A.1.b. of this permit. The SWPPP shall provide a list of all structural controls utilized onsite and the significant material(s) intended to be managed by the structural controls. The location of the structural controls shall be identified on the site map. Where applicable, structural controls shall, at a minimum, be utilized to achieve the following:

- a. prevent unauthorized discharges from industrial waste and recyclable material containers,
- b. prevent the discharge of sediment and other particulates that can be mobilized by storm water, and
- c. minimize channel/streambank erosion and scour in the immediate vicinity of outfalls.

6. Keeping SWPPPs Current

- a. The permittee and/or an Industrial Storm Water Certified Operator shall review the SWPPP annually after it is developed and maintain a written report of the review. Based on the review, the permittee or an Industrial Storm Water Certified Operator shall amend the SWPPP as needed to ensure continued compliance with the terms and conditions of this permit. A SWPPP Annual Review Report form is available on the Industrial Storm Water Program webpage at www.michigan.gov/industrialstormwater. The written report of the SWPPP Annual Review shall be retained in accordance with Part I.C.1. of this permit
- b. The SWPPP developed under the conditions of a previous permit shall be amended as necessary to ensure compliance with this permit.
- c. The SWPPP shall be updated or amended whenever changes at the facility have the potential to increase the exposure of significant materials to storm water, significant spills/leaks/releases occur at the facility, or when the SWPPP is determined by the permittee or the Department to be ineffective in achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. SWPPP updates necessitated by increased activity or significant spills at the facility shall include a description of how the permittee intends to control any new sources of significant materials or respond to and prevent spills in accordance with the requirements of this permit.
- d. The Department may notify the permittee at any time that the SWPPP does not meet minimum requirements of this permit. Such notification shall identify why the SWPPP does not meet minimum requirements of this permit. The permittee shall make the required changes to the SWPPP within 30 days after such notification from the Department and shall submit to the Department a written certification that the requested changes have been made.
- e. Amendments to the SWPPP shall be signed and retained on-site with the SWPPP pursuant to Part I.B.8. of this permit.

PART I

Section B. Storm Water Pollution Prevention Plan

7. Contact Information and Industrial Storm Water Certified Operator Update

- a. The SWPPP shall include contact information (i.e. name, mailing address, phone number, and email address) for the Facility Contact, Industrial Storm Water Certified Operator(s), environmental consultant, and/or any other appropriate individuals who manage the storm water program at the facility. The SWPPP shall be updated, as necessary, to ensure the contact information is current.
- b. If the primary Industrial Storm Water Certified Operator is replaced, the permittee shall provide the name and certification number of the new Industrial Storm Water Certified Operator to the Department by updating the facility's MiWaters site. If a facility has multiple Industrial Storm Water Certified Operators, the names and certification numbers of all shall be included in the SWPPP.

8. Signature and SWPPP Certification

- a. The SWPPP shall be reviewed and signed by an Industrial Storm Water Certified Operator and by either the permittee or an authorized representative in accordance with 40 CFR 122.22. The SWPPP and associated records shall be retained on-site at the facility that generates the storm water discharge.
- b. The permittee shall make the SWPPP and items required by Part I.C.1. of this permit available upon request to the Department. The Department makes the non-confidential business portions of the SWPPP available to the public.

PART I**Section C. Special Conditions****1. Record Keeping**

The permittee shall maintain records of all SWPPP-related activities. All such records shall be retained for three (3) years. The following records are required by this permit:

- a. good housekeeping inspection reports
- b. comprehensive site inspection reports
- c. visual assessment reports
- d. employee training records
- e. SWPPP annual review reports
- f. significant spill, leak, or release reports, and
- g. storm water discharge sampling data.

2. Non-Storm Water Discharges

Storm water is defined in Part II.A. to encompass non-storm water discharges included under the conditions of this permit. Any discharge of wastewater other than storm water as defined under the conditions of this permit shall be in compliance with an NPDES permit issued for the discharge. The non-storm water discharges included under the conditions of this permit are authorized under this permit, provided pollution prevention controls for the non-storm water component are identified in the permittee's SWPPP. The non-storm water discharges included under the conditions of this permit are as follows:

- a. discharges from fire hydrant flushing
- b. potable water sources, including water line flushing
- c. water from fire system testing and fire-fighting training without burned materials or chemical fire suppressants
- d. irrigation drainage
- e. lawn watering
- f. routine building wash-down that does not use detergents or other compounds
- g. pavement wash waters where contamination by toxic or hazardous materials has not occurred (unless all contamination by toxic or hazardous materials has been removed) and where detergents are not used
- h. uncontaminated condensate from air conditioners, coolers, and other compressors, and from the outside storage of refrigerated gases or liquids
- i. springs
- j. uncontaminated groundwater
- k. foundation or footing drains where flows are not contaminated with process materials such as solvents, and

PART I**Section C. Special Conditions**

- I. discharges from fire-fighting activities. Discharges from fire-fighting activities are exempted from the requirement to be identified in the SWPPP.

3. Request for Approval to Use Water Treatment Additives

Prior to use of any water treatment additive, the permittee shall obtain written approval from the Department. Requests for such approval shall be submitted via the Department's MiWaters system. The MiWaters website is located at <https://miwaters.deq.state.mi.us>. Instructions for submitting such a request may be obtained at <http://www.michigan.gov/eglenpdes> (near the bottom of that page, click on one or both of the links located under the Water Treatment Additives banner). Additional monitoring and reporting may be required as a condition for the approval to use the water treatment additive.

A request for approval to use water treatment additives shall include all of the following usage and discharge information for each water treatment additive proposed to be used:

- a. The Safety Data Sheet (SDS);
- b. Ingredient information, including the name of each ingredient, CAS number for each ingredient, and fractional content by weight for each ingredient;
- c. The proposed water treatment additive discharge concentration with supporting calculations;
- d. The discharge frequency (i.e., number of hours per day and number of days per year);
- e. The outfall(s) and monitoring point(s) from which the water treatment additive is to be discharged;
- f. The type of removal treatment, if any, that the water treatment additive receives prior to discharge;
- g. The water treatment additive's function (i.e., microbiocide, flocculant, etc.);
- h. The SDS shall include a 48-hour LC50 or EC50 for a North American freshwater planktonic crustacean (either *Ceriodaphnia sp.*, *Daphnia sp.*, or *Simocephalus sp.*). The results shall be based on the whole water treatment additive, shall not be results based on a similar product, and shall not be estimated; and
- i. The SDS shall include the results of a toxicity test for one (1) other North American freshwater aquatic species (other than a planktonic crustacean) that meets a minimum requirement of R 323.1057(2) of the Water Quality Standards. The results shall be based on the whole water treatment additive, shall not be results based on a similar product, and shall not be estimated. Examples of tests that would meet this requirement include a 96-hour LC50 for rainbow trout, bluegill, or fathead minnow.

4. Tracer Dye Discharges

This permit does not authorize the discharge of tracer dyes without approval from the Department. Requests to discharge tracer dyes shall be submitted to the Department in accordance with Rule 1097 (R 323.1097 of the Michigan Administrative Code).

PART I**Section C. Special Conditions****5. Facility Contact**

The "Facility Contact" was specified in the application. The permittee may replace the facility contact at any time. Within ten (10) days of taking such action, the permittee shall notify the Department in writing and update the Facility Contact in MiWaters, including the name, physical address, email address, and telephone number of the new facility contact. The MiWaters website is located at <https://miwaters.deq.state.mi.us> (log in, select the site from the left-side menu, click on Details, click on Contacts from the top menu, click Add Contact, fill out the required fields, and select "Facility Contact" from the list of roles).

- a. The facility contact shall be (or a duly authorized representative of this person):
 - for a corporation, a principal executive officer of at least the level of vice president, or a designated representative, if the representative is responsible for the overall operation of the facility from which the discharge described in the permit application or other NPDES form originates,
 - for a partnership, a general partner,
 - for a sole proprietorship, the proprietor, or
 - for a municipal, state, or other public facility, either a principal executive officer, the mayor, village president, city or village manager, or other duly authorized employee.
- b. A person is a duly authorized representative only if:
 - the authorization is made in writing to the Department by a person described in paragraph a. of this section; and
 - the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the facility (a duly authorized representative may thus be either a named individual or any individual occupying a named position).

Nothing in this section obviates the permittee from properly submitting reports and forms as required by law.

6. Portable Industrial Facilities

- a. Storm water discharges from satellite locations of a portable industrial facility may be authorized by obtaining a COC issued under this permit. To obtain a COC, an NOI or other Department-approved application shall be submitted to the Department for a primary mailing address of the owner or operator of the portable facility. Following receipt of a COC, if the portable facility is to be moved to a satellite location, the permittee shall notify the Department of the relocation, via MiWaters, at least ten (10) days prior to start-up at the satellite location. The notification shall include the location (township, range, section, and quarter-quarter section) of the current and proposed sites for the portable facility, the receiving water for the discharge, and the anticipated date of the move. Failure to notify the Department concerning the satellite location is a permit violation.
- b. The permittee shall submit an NOI or other Department-approved application for each portable facility that could be moved to a satellite location. A SWPPP shall be in place for each facility at the time of start-up and shall be modified for each new location as necessary.

PART I**Section C. Special Conditions****7. Expiration and Reissuance**

On or before October 1, 2025, a permittee seeking continued authorization to discharge under this permit beyond the permit's expiration date shall submit to the Department a written request containing such information, forms, and fees as required by the Department. Without an adequate request, a permittee's authorization to discharge will expire on **April 1, 2026**. With an adequate request, a permittee shall continue to be subject to the terms and conditions of the expired permit until the Department takes action on the request, unless this permit is terminated or revoked.

If this permit is terminated or revoked, all authorizations to discharge under the permit shall expire on the date of termination or revocation.

If this permit is substantively modified, the Department will notify the permittee of any required action. If a specific response is required by the Department and the permittee fails to submit an adequate response, the permittee's authorization to discharge will terminate on the effective date of the modified permit. If a specific response is required by the Department and the permittee submits an adequate response, the permittee shall be subject to the terms and conditions of the modified permit beginning on the effective date of the modified permit unless the Department notifies the permittee otherwise.

8. Termination of General Permit Coverage

A permittee may submit a request to the Department to terminate the COC for a facility when:

- a. all storm water discharges authorized under this permit are eliminated, or
- b. industrial activity has ceased, and no significant materials are exposed to storm water.

9. Requirement to Obtain Individual Permit

The Department may require any person who is authorized to discharge by a COC and this permit to apply for and obtain an Individual NPDES permit if any of the following circumstances apply:

- a. the discharge is a significant contributor to pollution as determined by the Department on a case-by-case basis
- b. the discharger is not complying, or has not complied, with the conditions of this permit
- c. a change has occurred in the availability of demonstrated technology or practices for the control or abatement of waste applicable to the point source discharge
- d. effluent standards and limitations are promulgated for point source discharges subject to this permit, or
- e. the Department determines that the criteria under which the permit was issued no longer apply.

Any person may request the Department to take action pursuant to the provisions of Rule 2191 (R 323.2191 of the Michigan Administrative Code).

PART I**Section C. Special Conditions****10. Alternate Schedule Request for Comprehensive Site Inspections and/or Visual Assessment**

The permittee may request Department approval of an alternate schedule for comprehensive site inspections and/or visual assessments. Such a request may be made if the permittee meets the following criteria: the permittee is in full compliance with this permit, the permittee has an acceptable SWPPP, the permittee has installed and/or implemented adequate structural controls at the facility, the permittee has all required inspection reports available at the facility, and the permittee has an Industrial Storm Water Certified Operator at the facility. The Department may revoke the approval of an alternate schedule at any time upon notification to the permittee if these criteria are not being met.

PART II

Part II may include terms and /or conditions not applicable to discharges covered under this permit.

Section A. Definitions

Acute toxic unit (TU_A) means 100/LC₅₀ where the LC₅₀ is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50% of the test organisms.

Annual monitoring frequency refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Authorized public agency means a state, local, or county agency that is designated pursuant to the provisions of Section 9110 of Part 91, Soil and Sedimentation Control, of the NREPA, to implement soil erosion and sedimentation control requirements with regard to construction activities undertaken by that agency.

Best management practices (BMPs) means structural devices or nonstructural practices that are designed to prevent pollutants from entering into storm water, to direct the flow of storm water, or to treat polluted storm water.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than 8 weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

Certificate of Coverage (COC) is a document, issued by the Department, which authorizes a discharge under a general permit.

Chronic toxic unit (TU_C) means 100/MATC or 100/IC₂₅, where the maximum acceptable toxicant concentration (MATC) and IC₂₅ are expressed as a percent effluent in the test medium.

Class B biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules, Land Application of Biosolids, promulgated under Part 31 of the NREPA. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying.

Combined sewer system is a sewer system in which storm water runoff is combined with sanitary wastes.

Continuous monitoring refers to sampling/readings that occur at regular and consistent intervals throughout a 24-hour period and at a frequency sufficient to capture data that are representative of the discharge. The maximum acceptable interval between samples/readings shall be one (1) hour.

PART II

Section A. Definitions

Daily concentration

FOR PARAMETERS OTHER THAN pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – Daily concentration is the sum of the concentrations of the individual samples of a parameter taken within a calendar day divided by the number of samples taken within that calendar day. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations. For guidance and examples showing how to perform calculations using results below quantification levels, see the document entitled “Reporting Results Below Quantification,” available at https://www.michigan.gov/documents/deq/wrd-npdes-results-quantification_620791_7.pdf.

FOR pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – The daily concentration used to determine compliance with maximum daily pH, temperature, and conductivity limitations is the highest pH, temperature, and conductivity readings obtained within a calendar day. The daily concentration used to determine compliance with minimum daily pH and dissolved oxygen limitations is the lowest pH and dissolved oxygen readings obtained within a calendar day.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. This value is calculated by multiplying the daily concentration by the total daily flow and by the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the “MAXIMUM” column under “QUANTITY OR LOADING” on the DMRs.

Daily monitoring frequency refers to a 24-hour day. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Department means the Michigan Department of Environment, Great Lakes, and Energy.

Detection level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

Discharge means the addition of any waste, waste effluent, wastewater, pollutant, or any combination thereof to any surface water of the state.

EC₅₀ means a statistically or graphically estimated concentration that is expected to cause 1 or more specified effects in 50% of a group of organisms under specified conditions.

Fecal coliform bacteria monthly

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a discharge event. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the “AVERAGE” column under “QUALITY OR CONCENTRATION” on the DMR. If the period in which the discharge event occurred was partially in each of two months, the calculated monthly value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a reporting month. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the “AVERAGE” column under “QUALITY OR CONCENTRATION” on the DMR.

PART II

Section A. Definitions

Fecal coliform bacteria 7-day

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days of discharge during a discharge event. If the number of daily concentrations determined during the discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean value for the month in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the DMRs. If the 7-day period was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days in a reporting month. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean for the month in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the DMRs. The first calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

Flow-proportioned composite sample – See definition of **24-hour composite sample**.

General permit means an NPDES permit issued authorizing a category of similar discharges.

Geometric mean is the average of the logarithmic values of a base 10 data set, converted back to a base 10 number.

Grab sample is a single sample taken at neither a set time nor flow.

IC₂₅ means the toxicant concentration that would cause a 25% reduction in a nonquantal biological measurement for the test population.

Illicit connection means a physical connection to a municipal separate storm sewer system that primarily conveys non-storm water discharges other than uncontaminated groundwater into the storm sewer; or a physical connection not authorized or permitted by the local authority, where a local authority requires authorization or a permit for physical connections.

Illicit discharge means any discharge to, or seepage into, a municipal separate storm sewer system that is not composed entirely of storm water or uncontaminated groundwater. Illicit discharges include non-storm water discharges through pipes or other physical connections; dumping of motor vehicle fluids, household hazardous wastes, domestic animal wastes, or litter; collection and intentional dumping of grass clippings or leaf litter; or unauthorized discharges of sewage, industrial waste, restaurant wastes, or any other non-storm water waste directly into a separate storm sewer.

Individual permit means a site-specific NPDES permit.

Industrial material means material handling equipment; industrial machinery; raw materials; industrial production and processes; and intermediate products, by-products, final products, and waste products.

Inlet means a catch basin, roof drain, conduit, drain tile, retention pond riser pipe, sump pump, or other point where storm water or wastewater enters into a closed conveyance system prior to discharge off site or into waters of the state.

PART II

Section A. Definitions

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both: 1) inhibits or disrupts a POTW, its treatment processes or operations, or its sludge processes, use or disposal; and 2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference].

Land application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC₅₀ means a statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

Maximum extent practicable means implementation of best management practices by a public body to comply with an approved storm water management program as required by a national permit for a municipal separate storm sewer system, in a manner that is environmentally beneficial, technically feasible, and within the public body's legal authority.

MBTU/hr means million British Thermal Units per hour.

MGD means million gallons per day.

Monthly concentration is the sum of the daily concentrations determined during a reporting period divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly concentration in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR.

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity [1 minus the quantity (monthly effluent concentration divided by the monthly influent concentration)], shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during a reporting period. The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly loading in the "AVERAGE" column under "QUANTITY OR LOADING" on the DMR.

Monthly monitoring frequency refers to a calendar month. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Municipal separate storm sewer means a conveyance or system of conveyances designed or used for collecting or conveying storm water which is not a combined sewer and which is not part of a POTW as defined in the Code of Federal Regulations at 40 CFR 122.2. 93

PART II

Section A. Definitions

Municipal separate storm sewer system (MS4) means all separate storm sewers that are owned or operated by the United States, a state, city, village, township, county, district, association, or other public body created by or pursuant to state law, having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law, such as a sewer district, flood control district, or drainage district, or similar entity, or a designated or approved management agency under Section 208 of the Clean Water Act that discharges to the waters of the state. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Clean Water Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

No observed adverse effect level (NOAEL) means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact cooling water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from toilet, kitchen, laundry, bathing or other facilities used for household purposes.

Nonstructural controls are practices or procedures implemented by employees at a facility to manage storm water or to prevent contamination of storm water.

NPDES means National Pollutant Discharge Elimination System.

Outfall is the location at which a point source discharge first enters a surface water of the state.

Part 91 agency means an agency that is designated by a county board of commissioners pursuant to the provisions of Section 9105 of Part 91 of the NREPA; an agency that is designated by a city, village, or township in accordance with the provisions of Section 9106 of Part 91 of the NREPA; or the Department for soil erosion and sedimentation control activities under Part 615, Supervisor of Wells; Part 631, Reclamation of Mining Lands; or Part 632, Nonferrous Metallic Mineral Mining, of the NREPA, pursuant to the provisions of Section 9115 of Part 91 of the NREPA.

Part 91 permit means a soil erosion and sedimentation control permit issued by a Part 91 agency pursuant to the provisions of Part 91 of the NREPA.

Partially treated sewage is any sewage, sewage and storm water, or sewage and wastewater, from domestic or industrial sources that is treated to a level less than that required by the permittee's NPDES permit, or that is not treated to national secondary treatment standards for wastewater, including discharges to surface waters from retention treatment facilities.

Point of discharge is the location of a point source discharge where storm water is discharged directly into a separate storm sewer system.

Point source discharge means a discharge from any discernible, confined, discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, or rolling stock. Changing the surface of land or establishing grading patterns on land will result in a point source discharge where the storm water from the site is ultimately discharged to waters of the state.

Polluting material means any material, in solid or liquid form, identified as a polluting material under the Part 5 Rules, Spillage of Oil and Polluting Materials, promulgated under Part 31 of the NREPA (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

PART II

Section A. Definitions

Portable Industrial Facility means a facility that is engaged in regulated industrial activity (e.g. concrete batch plants, asphalt plants, aggregate crushing plants, etc.) however it does not have a permanent fixed location and is designed to be moved and operated at various locations.

POTW is a publicly owned treatment work.

Predevelopment is the last land use prior to the planned new development or redevelopment.

Pretreatment is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

Public (as used in the MS4 individual permit) means all persons who potentially could affect the authorized storm water discharges, including, but not limited to, residents, visitors to the area, public employees, businesses, industries, and construction contractors and developers.

Public body means the United States; the state of Michigan; a city, village, township, county, school district, public college or university, or single-purpose governmental agency; or any other body which is created by federal or state statute or law.

Qualified Personnel means an individual who meets qualifications acceptable to the Department and who is authorized by an Industrial Storm Water Certified Operator to collect the storm water sample.

Qualifying storm event means a storm event causing greater than 0.1 inch of rainfall and occurring at least 72 hours after the previous measurable storm event that also caused greater than 0.1 inch of rainfall. Upon request, the Department may approve an alternate definition meeting the condition of a qualifying storm event.

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

Quarterly monitoring frequency refers to a three month period, defined as January through March, April through June, July through September, and October through December. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Regional Administrator is the Region 5 Administrator, U.S. EPA, located at R-19J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

Regulated area means the permittee's urbanized area, where urbanized area is defined as a place and its adjacent densely-populated territory that together have a minimum population of 50,000 people as defined by the United States Bureau of the Census and as determined by the latest available decennial census.

Secondary containment structure means a unit, other than the primary container, in which significant materials are packaged or held, which is required by state or federal law to prevent the escape of significant materials by gravity into sewers, drains, or otherwise directly or indirectly into any sewer system or to the surface waters or groundwaters of the state.

Separate storm sewer system means a system of drainage, including, but not limited to, roads, catch basins, curbs, gutters, parking lots, ditches, conduits, pumping devices, or man-made channels, which is not a combined sewer where storm water mixes with sanitary wastes, and is not part of a POTW.

PART II

Section A. Definitions

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process waste stream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Significant materials means any material which could degrade or impair water quality, including but not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; hazardous substances designated under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 40 CFR 372.65); any chemical the facility is required to report pursuant to Section 313 of Emergency Planning and Community Right-to-Know Act (EPCRA); polluting materials as identified under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code); Hazardous Wastes as defined in Part 111, Hazardous Waste Management, of the NREPA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills and significant leaks means any release of a polluting material reportable under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

Significant release means any release of a significant material from the facility to surface waters of the state or to a separate storm sewer system in excess of the effluent limitations set forth under this permit.

Special-use area means storm water discharges for which the Department has determined that additional monitoring is needed from: secondary containment structures required by state or federal law; lands on Michigan's List of Sites of Environmental Contamination pursuant to Part 201, Environmental Remediation, of the NREPA; and/or areas with other activities that may contribute pollutants to the storm water.

Stoichiometric means the quantity of a reagent calculated to be necessary and sufficient for a given chemical reaction.

Storm water means storm water runoff, snow melt runoff, surface runoff and drainage, and non-storm water included under the conditions of this permit.

Storm water discharge point is the location where the point source discharge of storm water is directed to surface waters of the state or to a separate storm sewer. It includes the location of all point source discharges where storm water exits the facility, including *outfalls* which discharge directly to surface waters of the state, and *points of discharge* which discharge directly into separate storm sewer systems.

Structural controls are physical features or structures used at a facility to manage or treat storm water.

SWPPP means the Storm Water Pollution Prevention Plan prepared in accordance with this permit.

Tier I value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Total maximum daily loads (TMDLs) are required by the Clean Water Act for waterbodies that do not meet water quality standards. TMDLs represent the maximum daily load of a pollutant that a waterbody can assimilate and meet water quality standards, and an allocation of that load among point sources, nonpoint sources, and a margin of safety.

PART II

Section A. Definitions

Toxicity reduction evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

Water Quality Standards means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of the NREPA, being R 323.1041 through R 323.1117 of the Michigan Administrative Code.

Weekly monitoring frequency refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

WWSL is a wastewater stabilization lagoon.

WWSL discharge event is a discrete occurrence during which effluent is discharged to the surface water up to 10 days of a consecutive 14-day period.

3-portion composite sample is a sample consisting of three equal-volume grab samples collected at equal intervals over an 8-hour period.

7-day concentration

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily concentrations determined. If the number of daily concentrations determined during the WWSL discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the WWSL discharge event in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations in the reporting month. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

PART II

Section A. Definitions

7-day loading

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily loadings determined. If the number of daily loadings determined during the WWSL discharge event is less than 7 days, the number of actual daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the WWSL discharge event in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days in a reporting month divided by the number of daily loadings determined. If the number of daily loadings determined is less than 7, the actual number of daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations in the reporting month. When required by the permit, report the maximum calculated 7-day loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

24-hour composite sample is a flow-proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period. A time-proportioned composite sample may be used upon approval of the Department if the permittee demonstrates it is representative of the discharge.

PART II

Section B. Monitoring Procedures

1. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Federal Act (40 CFR Part 136 – Guidelines Establishing Test Procedures for the Analysis of Pollutants), unless specified otherwise in this permit. **Test procedures used shall be sufficiently sensitive to determine compliance with applicable effluent limitations.** For lists of approved test methods, see the following website: <https://www.epa.gov/cwa-methods>. Requests to use test procedures not promulgated under 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Manager of the Permits Section, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy, P.O. Box 30458, Lansing, Michigan, 48909-7958. The permittee may use such procedures upon approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Control/Quality Assurance program.

3. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II

Section C. Reporting Requirements

1. Start-up Notification

If the permittee will not discharge during the first 60 days following the effective date of this permit, the permittee shall notify the Department within 14 days following the effective date of this permit, and then 60 days prior to the commencement of the discharge.

2. Submittal Requirements for Self-Monitoring Data

Part 31 of the NREPA (specifically Section 324.3110(7)); and R 323.2155(2) of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, allow the Department to specify the forms to be utilized for reporting the required self-monitoring data. Unless instructed on the effluent limitations page to conduct "Retained Self-Monitoring," the permittee shall submit self-monitoring data via the Department's MiWaters system.

The permittee shall utilize the information provided on the MiWaters website, located at <https://miwaters.deq.state.mi.us>, to access and submit the electronic forms. Both monthly summary and daily data shall be submitted to the Department no later than the 20th day of the month following each month of the authorized discharge period(s). The permittee may be allowed to submit the electronic forms after this date if the Department has granted an extension to the submittal date.

3. Retained Self-Monitoring Requirements

If instructed on the effluent limits page (or otherwise authorized by the Department in accordance with the provisions of this permit) to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Department. Retained self-monitoring results are public information and shall be promptly provided to the public upon request.

The permittee shall certify, in writing, to the Department, on or before January 10th (April 1st for animal feeding operation facilities) of each year, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately describes the discharge. With this annual certification, the permittee shall submit a summary of the previous year's monitoring data. The summary shall include maximum values for samples to be reported as daily maximums and/or monthly maximums and minimum values for any daily minimum samples.

Retained self-monitoring may be denied to a permittee by notification in writing from the Department. In such cases, the permittee shall submit self-monitoring data in accordance with Part II.C.2., above. Such a denial may be rescinded by the Department upon written notification to the permittee. Reissuance or modification of this permit or reissuance or modification of an individual permittee's authorization to discharge shall not affect previous approval or denial for retained self-monitoring unless the Department provides notification in writing to the permittee.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

Monitoring required pursuant to Part 41 of the NREPA or Rule 35 of the Mobile Home Park Commission Act (Act 96 of the Public Acts of 1987) for assurance of proper facility operation shall be submitted as required by the Department.

PART II

Section C. Reporting Requirements

5. Compliance Dates Notification

Within 14 days of every compliance date specified in this permit, the permittee shall submit a *written* notification to the Department indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

6. Noncompliance Notification

Compliance with all applicable requirements set forth in the Clean Water Act, Parts 31 and 41 of the NREPA, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

- a. 24-Hour Reporting
Any noncompliance which may endanger health or the environment (including maximum and/or minimum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission shall also be provided within five (5) days.
- b. Other Reporting
The permittee shall report, in writing, all other instances of noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

Written reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times, or, if not yet corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

7. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated on the second page of this permit (or, if this is a general permit, on the COC); or, if the notice is provided after regular working hours, call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706 (calls from **out-of-state** call 1-517-373-7660).

Within ten (10) days of the release, the permittee shall submit to the Department a full written explanation as to the cause of the release, the discovery of the release, response (clean-up and/or recovery) measures taken, and preventive measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

PART II

Section C. Reporting Requirements**8. Upset Noncompliance Notification**

If a process "upset" (defined as an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee) has occurred, the permittee who wishes to establish the affirmative defense of upset, shall notify the Department by telephone within 24 hours of becoming aware of such conditions; and within five (5) days, provide in writing, the following information:

- a. that an upset occurred and that the permittee can identify the specific cause(s) of the upset;
- b. that the permitted wastewater treatment facility was, at the time, being properly operated and maintained (note that an upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation); and
- c. that the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

9. Bypass Prohibition and Notification

- a. **Bypass Prohibition**
Bypass is prohibited, and the Department may take an enforcement action, unless:
 - 1) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - 2) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass; and
 - 3) the permittee submitted notices as required under 9.b. or 9.c. below.
- b. **Notice of Anticipated Bypass**
If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least ten (10) days before the date of the bypass, and provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions listed in 9.a. above.
- c. **Notice of Unanticipated Bypass**
The permittee shall submit notice to the Department of an unanticipated bypass by calling the Department at the number indicated on the second page of this permit (if the notice is provided after regular working hours, use the following number: 1-800-292-4706) as soon as possible, but no later than 24 hours from the time the permittee becomes aware of the circumstances.

PART II

Section C. Reporting Requirements

d. Written Report of Bypass

A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.

e. Bypass Not Exceeding Limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to ensure efficient operation. These bypasses are not subject to the provisions of 9.a., 9.b., 9.c., and 9.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.11. of this permit.

f. Definitions

- 1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.
- 2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of R 323.1098 and R 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and antidegradation demonstration have been submitted and approved by the Department.

11. Notification of Changes in Discharge

The permittee shall notify the Department, in writing, as soon as possible but no later than 10 days of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than five times the average level reported in the complete application (see the first page of this permit, for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

PART II

Section C. Reporting Requirements

12. Changes in Facility Operations

Any anticipated action or activity, including but not limited to facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under R 323.1098 (Antidegradation) of the Water Quality Standards or b) by notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.10.; and 4) the action or activity will not require notification pursuant to Part II.C.11. Following such notice, the permit or, if applicable, the facility's COC may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

13. Transfer of Ownership or Control

In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the permittee shall submit to the Department 30 days prior to the actual transfer of ownership or control a written agreement between the current permittee and the new permittee containing: 1) the legal name and address of the new owner; 2) a specific date for the effective transfer of permit responsibility, coverage and liability; and 3) a certification of the continuity of or any changes in operations, wastewater discharge, or wastewater treatment.

If the new permittee is proposing changes in operations, wastewater discharge, or wastewater treatment, the Department may propose modification of this permit in accordance with applicable laws and rules.

14. Operations and Maintenance Manual

For wastewater treatment facilities that serve the public (and are thus subject to Part 41 of the NREPA), Section 4104 of Part 41 and associated Rule 2957 of the Michigan Administrative Code allow the Department to require an Operations and Maintenance (O&M) Manual from the facility. An up-to-date copy of the O&M Manual shall be kept at the facility and shall be provided to the Department upon request. The Department may review the O&M Manual in whole or in part at its discretion and require modifications to it if portions are determined to be inadequate.

At a minimum, the O&M Manual shall include the following information: permit standards; descriptions and operation information for all equipment; staffing information; laboratory requirements; record keeping requirements; a maintenance plan for equipment; an emergency operating plan; safety program information; and copies of all pertinent forms, as-built plans, and manufacturer's manuals.

Certification of the existence and accuracy of the O&M Manual shall be submitted to the Department at least sixty days prior to start-up of a new wastewater treatment facility. Recertification shall be submitted sixty days prior to start-up of any substantial improvements or modifications made to an existing wastewater treatment facility.

PART II

Section C. Reporting Requirements

15. Signatory Requirements

All applications, reports, or information submitted to the Department in accordance with the conditions of this permit and that require a signature shall be signed and certified as described in the Clean Water Act and the NREPA.

The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

The NREPA (Section 3115(2)) provides that a person who at the time of the violation knew or should have known that he or she discharged a substance contrary to this part, or contrary to a permit, COC, or order issued or rule promulgated under this part, or who intentionally makes a false statement, representation, or certification in an application for or form pertaining to a permit or COC or in a notice or report required by the terms and conditions of an issued permit or COC, or who intentionally renders inaccurate a monitoring device or record required to be maintained by the Department, is guilty of a felony and shall be fined not less than \$2,500.00 or more than \$25,000.00 for each violation. The court may impose an additional fine of not more than \$25,000.00 for each day during which the unlawful discharge occurred. If the conviction is for a violation committed after a first conviction of the person under this subsection, the court shall impose a fine of not less than \$25,000.00 per day and not more than \$50,000.00 per day of violation. Upon conviction, in addition to a fine, the court in its discretion may sentence the defendant to imprisonment for not more than 2 years or impose probation upon a person for a violation of this part. With the exception of the issuance of criminal complaints, issuance of warrants, and the holding of an arraignment, the circuit court for the county in which the violation occurred has exclusive jurisdiction. However, the person shall not be subject to the penalties of this subsection if the discharge of the effluent is in conformance with and obedient to a rule, order, permit, or COC of the Department. In addition to a fine, the attorney general may file a civil suit in a court of competent jurisdiction to recover the full value of the injuries done to the natural resources of the state and the costs of surveillance and enforcement by the state resulting from the violation.

16. Electronic Reporting

Upon notice by the Department that electronic reporting tools are available for specific reports or notifications, the permittee shall submit electronically all such reports or notifications as required by this permit, on forms provided by the Department.

PART II**Section D. Management Responsibilities****1. Duty to Comply**

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit, more frequently than, or at a level in excess of, that authorized, shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit constitutes a violation of the NREPA and/or the Clean Water Act and constitutes grounds for enforcement action; for permit or Certificate of Coverage (COC) termination, revocation and reissuance, or modification; or denial of an application for permit or COC renewal.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the NREPA. Permittees authorized to discharge storm water shall have the storm water treatment and/or control measures under direct supervision of a storm water operator certified by the Department, as required by Section 3110 of the NREPA.

3. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

4. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, the permittee shall either:

- a. provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit; or
- b. upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize or prevent any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

PART II

Section D. Management Responsibilities

6. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code). For a POTW, these facilities shall be approved under Part 41 of the NREPA.

7. Waste Treatment Residues

Residuals (i.e. solids, sludges, biosolids, filter backwash, scrubber water, ash, grit, or other pollutants or wastes) removed from or resulting from treatment or control of wastewaters, including those that are generated during treatment or left over after treatment or control has ceased, shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the NREPA, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwaters of the state.

8. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department, or the Regional Administrator, upon the presentation of credentials and, for animal feeding operation facilities, following appropriate biosecurity protocols:

- a. to enter upon the permittee's premises where an effluent source is located or any place in which records are required to be kept under the terms and conditions of this permit; and
- b. at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods and equipment regulated or required under this permit; and to sample any discharge of pollutants.

9. Availability of Reports

Except for data determined to be confidential under Section 308 of the Clean Water Act and Rule 2128 (R 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit, shall be available for public inspection at the offices of the Department and the Regional Administrator. As required by the Clean Water Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Clean Water Act and Sections 3112, 3115, 4106 and 4110 of the NREPA.

10. Duty to Provide Information

The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or the facility's COC, or to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

PART II

Section E. Activities Not Authorized by This Permit

1. Discharge to the Groundwaters

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the NREPA.

2. POTW Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities at a POTW. Approval for the construction or modification of any physical structures or facilities at a POTW shall be by permit issued under Part 41 of the NREPA.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.9. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Clean Water Act except as are exempted by federal regulations.

5. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environment, Great Lakes, and Energy permits, or approvals from other units of government as may be required by law.



NOAA Atlas 14, Volume 8, Version 2
Location name: Lake Orion, Michigan, USA*
Latitude: 42.7153°, Longitude: -83.2591°
Elevation: 1038.83 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

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PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.301 (0.241-0.377)	0.358 (0.287-0.449)	0.453 (0.362-0.569)	0.533 (0.423-0.671)	0.645 (0.496-0.829)	0.732 (0.552-0.948)	0.821 (0.599-1.08)	0.913 (0.641-1.22)	1.03 (0.701-1.40)	1.13 (0.747-1.55)
10-min	0.440 (0.353-0.552)	0.524 (0.420-0.657)	0.663 (0.530-0.833)	0.780 (0.620-0.982)	0.944 (0.727-1.21)	1.07 (0.808-1.39)	1.20 (0.878-1.58)	1.34 (0.938-1.78)	1.52 (1.03-2.06)	1.66 (1.09-2.26)
15-min	0.537 (0.431-0.673)	0.639 (0.512-0.802)	0.808 (0.646-1.02)	0.951 (0.756-1.20)	1.15 (0.886-1.48)	1.31 (0.985-1.69)	1.47 (1.07-1.93)	1.63 (1.14-2.17)	1.85 (1.25-2.51)	2.02 (1.33-2.76)
30-min	0.740 (0.594-0.928)	0.884 (0.709-1.11)	1.12 (0.897-1.41)	1.32 (1.05-1.67)	1.61 (1.24-2.06)	1.82 (1.38-2.36)	2.05 (1.49-2.69)	2.28 (1.60-3.03)	2.58 (1.75-3.50)	2.82 (1.86-3.85)
60-min	0.951 (0.763-1.19)	1.14 (0.912-1.43)	1.45 (1.16-1.83)	1.72 (1.37-2.17)	2.11 (1.63-2.72)	2.42 (1.82-3.14)	2.73 (2.00-3.60)	3.06 (2.15-4.10)	3.52 (2.38-4.77)	3.87 (2.56-5.29)
2-hr	1.16 (0.940-1.45)	1.39 (1.13-1.73)	1.79 (1.44-2.22)	2.13 (1.70-2.65)	2.62 (2.04-3.35)	3.01 (2.29-3.88)	3.42 (2.52-4.48)	3.85 (2.73-5.12)	4.45 (3.04-6.01)	4.92 (3.28-6.68)
3-hr	1.30 (1.06-1.61)	1.55 (1.26-1.92)	1.98 (1.60-2.46)	2.37 (1.90-2.94)	2.93 (2.30-3.75)	3.39 (2.59-4.36)	3.87 (2.87-5.05)	4.38 (3.13-5.81)	5.10 (3.51-6.87)	5.67 (3.80-7.68)
6-hr	1.56 (1.27-1.91)	1.82 (1.49-2.24)	2.30 (1.87-2.82)	2.73 (2.21-3.36)	3.37 (2.68-4.31)	3.92 (3.03-5.02)	4.50 (3.37-5.85)	5.13 (3.70-6.78)	6.03 (4.18-8.09)	6.75 (4.55-9.08)
12-hr	1.84 (1.52-2.23)	2.10 (1.73-2.55)	2.57 (2.12-3.14)	3.02 (2.47-3.69)	3.71 (2.97-4.70)	4.29 (3.36-5.47)	4.93 (3.73-6.37)	5.62 (4.09-7.39)	6.62 (4.64-8.84)	7.44 (5.06-9.94)
24-hr	2.11 (1.76-2.55)	2.40 (1.99-2.89)	2.92 (2.42-3.53)	3.40 (2.80-4.12)	4.13 (3.34-5.19)	4.75 (3.74-6.00)	5.43 (4.14-6.95)	6.16 (4.51-8.02)	7.21 (5.09-9.54)	8.06 (5.53-10.7)
2-day	2.39 (2.00-2.85)	2.75 (2.31-3.29)	3.38 (2.83-4.05)	3.95 (3.28-4.74)	4.78 (3.87-5.92)	5.46 (4.32-6.81)	6.18 (4.74-7.83)	6.95 (5.13-8.96)	8.03 (5.71-10.5)	8.90 (6.15-11.7)
3-day	2.60 (2.20-3.10)	2.99 (2.52-3.56)	3.66 (3.07-4.36)	4.25 (3.55-5.08)	5.12 (4.17-6.30)	5.83 (4.64-7.23)	6.58 (5.07-8.29)	7.38 (5.46-9.46)	8.49 (6.06-11.1)	9.38 (6.51-12.3)
4-day	2.80 (2.37-3.31)	3.19 (2.70-3.78)	3.87 (3.26-4.60)	4.47 (3.75-5.33)	5.36 (4.38-6.58)	6.09 (4.86-7.52)	6.86 (5.30-8.61)	7.67 (5.70-9.81)	8.81 (6.31-11.5)	9.72 (6.77-12.7)
7-day	3.29 (2.80-3.87)	3.70 (3.15-4.36)	4.42 (3.75-5.21)	5.05 (4.26-5.97)	5.98 (4.92-7.27)	6.73 (5.41-8.26)	7.53 (5.86-9.39)	8.38 (6.27-10.6)	9.57 (6.90-12.4)	10.5 (7.38-13.7)
10-day	3.73 (3.19-4.37)	4.17 (3.56-4.89)	4.93 (4.20-5.79)	5.59 (4.74-6.59)	6.56 (5.42-7.95)	7.36 (5.93-8.97)	8.18 (6.39-10.2)	9.06 (6.81-11.5)	10.3 (7.44-13.2)	11.2 (7.93-14.6)
20-day	5.04 (4.35-5.85)	5.59 (4.82-6.49)	6.52 (5.60-7.58)	7.31 (6.25-8.53)	8.44 (7.01-10.1)	9.34 (7.58-11.3)	10.3 (8.07-12.6)	11.2 (8.48-14.0)	12.5 (9.13-16.0)	13.5 (9.62-17.4)
30-day	6.18 (5.36-7.14)	6.85 (5.93-7.91)	7.95 (6.86-9.19)	8.86 (7.61-10.3)	10.1 (8.43-12.0)	11.1 (9.05-13.3)	12.1 (9.54-14.7)	13.1 (9.93-16.3)	14.4 (10.6-18.3)	15.4 (11.0-19.8)
45-day	7.69 (6.70-8.83)	8.52 (7.41-9.78)	9.84 (8.54-11.3)	10.9 (9.41-12.6)	12.3 (10.3-14.5)	13.4 (11.0-15.9)	14.5 (11.4-17.5)	15.5 (11.8-19.1)	16.8 (12.3-21.2)	17.8 (12.7-22.7)
60-day	9.01 (7.88-10.3)	9.98 (8.72-11.4)	11.5 (10.0-13.2)	12.7 (11.0-14.6)	14.3 (11.9-16.7)	15.4 (12.6-18.2)	16.5 (13.1-19.8)	17.5 (13.4-21.5)	18.8 (13.8-23.5)	19.7 (14.2-25.1)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

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Job Information

Job Name: WAB2003 (Ditch 1)
Engineer: M Reineke
Date: 10/31/2022

Input Data

Surface area at high water stage, [Atop]:	26177 ft ²
Surface area at low water stage, [Abot]:	11680 ft ²
Permeability of filter sand, [k]:	3.5 ft/day
Driving head at high water stage, [Htop]:	4.55 ft
Driving head at low water stage, [Hbot]:	3.2 ft
Drawdown time, [t]:	3 days
Average flow path length, [Xo]:	1 ft
Exposed underdrain width, [Lo]:	8 ft
Slope of underdrain face, [S]:	999 ?H : 1V
Factor of safety for analysis, [FS]:	.15
Percent drawdown for analysis, [P]:	100 %
Background seepage rate, [Q]:	0 gpm

Results

Total length of side/bottom drain filter required:	11.60985 ft
Total length of side/bottom drain filter required to recover treatment volume only:	11.60985 ft
Total length of side/bottom drain filter required to accomodate background seepage:	0 ft
Maximum flow rate through filter:	0.661843 gpm / lin ft
Average flow rate through filter:	0.3309215 gpm / lin ft
Volume of water between Atop and Abot:	191165.6 gallons
Recovery (or treatment) volume:	191165.6 gallons
Recovery (or treatment) volume:	0.5866272 acre-ft

Note

Drain pipe diameter should be checked to insure that peak flow can be accomodated.

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Job Information

Job Name: WAB2003 (Ditch 2)
Engineer: M Reineke
Date: 10/31/2022

Input Data

Surface area at high water stage, [Atop]:	8599 ft ²
Surface area at low water stage, [Abot]:	5781 ft ²
Permeability of filter sand, [k]:	3.5 ft/day
Driving head at high water stage, [Htop]:	5.28 ft
Driving head at low water stage, [Hbot]:	3.2 ft
Drawdown time, [t]:	3 days
Average flow path length, [Xo]:	1 ft
Exposed underdrain width, [Lo]:	8 ft
Slope of underdrain face, [S]:	999 ?H : 1V
Factor of safety for analysis, [FS]:	.15
Percent drawdown for analysis, [P]:	100 %
Background seepage rate, [Q]:	0 gpm

Results

Total length of side/bottom drain filter required:	6.310342 ft
Total length of side/bottom drain filter required to recover treatment volume only:	6.310342 ft
Total length of side/bottom drain filter required to accomodate background seepage:	0 ft
Maximum flow rate through filter:	0.7680288 gpm / lin ft
Average flow rate through filter:	0.3840144 gpm / lin ft
Volume of water between Atop and Abot:	111879.9 gallons
Recovery (or treatment) volume:	111879.9 gallons
Recovery (or treatment) volume:	0.3433242 acre-ft

Note

Drain pipe diameter should be checked to insure that peak flow can be accomodated.

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Job Information

Job Name: WAB2003 (Ditch 3)
Engineer: M Reineke
Date: 10/31/2022

Input Data

Surface area at high water stage, [Atop]:	2564 ft ²
Surface area at low water stage, [Abot]:	1265 ft ²
Permeability of filter sand, [k]:	3.5 ft/day
Driving head at high water stage, [Htop]:	5.49 ft
Driving head at low water stage, [Hbot]:	3.2 ft
Drawdown time, [t]:	3 days
Average flow path length, [Xo]:	1 ft
Exposed underdrain width, [Lo]:	8 ft
Slope of underdrain face, [S]:	999 ?H : 1V
Factor of safety for analysis, [FS]:	.15
Percent drawdown for analysis, [P]:	100 %
Background seepage rate, [Q]:	0 gpm

Results

Total length of side/bottom drain filter required:	1.784485 ft
Total length of side/bottom drain filter required to recover treatment volume only:	1.784485 ft
Total length of side/bottom drain filter required to accomodate background seepage:	0 ft
Maximum flow rate through filter:	0.7985754 gpm / lin ft
Average flow rate through filter:	0.3992877 gpm / lin ft
Volume of water between Atop and Abot:	32798.23 gallons
Recovery (or treatment) volume:	32798.23 gallons
Recovery (or treatment) volume:	0.1006475 acre-ft

Note

Drain pipe diameter should be checked to insure that peak flow can be accomodated.

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Job Information

Job Name: WAB2003 (Ditch 4)
Engineer: M Reineke
Date: 10/31/2022

Input Data

Surface area at high water stage, [Atop]:	2124 ft ²
Surface area at low water stage, [Abot]:	1224 ft ²
Permeability of filter sand, [k]:	3.5 ft/day
Driving head at high water stage, [Htop]:	5.06 ft
Driving head at low water stage, [Hbot]:	3.2 ft
Drawdown time, [t]:	3 days
Average flow path length, [Xo]:	1 ft
Exposed underdrain width, [Lo]:	8 ft
Slope of underdrain face, [S]:	999 ?H : 1V
Factor of safety for analysis, [FS]:	.15
Percent drawdown for analysis, [P]:	100 %
Background seepage rate, [Q]:	0 gpm

Results

Total length of side/bottom drain filter required:	1.338732 ft
Total length of side/bottom drain filter required to recover treatment volume only:	1.338732 ft
Total length of side/bottom drain filter required to accomodate background seepage:	0 ft
Maximum flow rate through filter:	0.7360276 gpm / lin ft
Average flow rate through filter:	0.3680138 gpm / lin ft
Volume of water between Atop and Abot:	23293.14 gallons
Recovery (or treatment) volume:	23293.14 gallons
Recovery (or treatment) volume:	7.147934E-02 acre-ft

Note

Drain pipe diameter should be checked to insure that peak flow can be accomodated.

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Job Information

Job Name: WAB2003 (Ditch 5)
Engineer: M Reineke
Date: 10/31/2022

Input Data

Surface area at high water stage, [Atop]:	8232 ft ²
Surface area at low water stage, [Abot]:	6389 ft ²
Permeability of filter sand, [k]:	3.5 ft/day
Driving head at high water stage, [Htop]:	5.02 ft
Driving head at low water stage, [Hbot]:	3.2 ft
Drawdown time, [t]:	3 days
Average flow path length, [Xo]:	1 ft
Exposed underdrain width, [Lo]:	8 ft
Slope of underdrain face, [S]:	999 ?H : 1V
Factor of safety for analysis, [FS]:	.15
Percent drawdown for analysis, [P]:	100 %
Background seepage rate, [Q]:	0 gpm

Results

Total length of side/bottom drain filter required:	5.812859 ft
Total length of side/bottom drain filter required to recover treatment volume only:	5.812859 ft
Total length of side/bottom drain filter required to accomodate background seepage:	0 ft
Maximum flow rate through filter:	0.7302092 gpm / lin ft
Average flow rate through filter:	0.3651046 gpm / lin ft
Volume of water between Atop and Abot:	99535.52 gallons
Recovery (or treatment) volume:	99535.52 gallons
Recovery (or treatment) volume:	0.3054433 acre-ft

Note

Drain pipe diameter should be checked to insure that peak flow can be accomodated.

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Job Information

Job Name: WAB2003 (Ditch 7)
Engineer: M Reineke
Date: 10/31/2022

Input Data

Surface area at high water stage, [Atop]:	36608 ft ²
Surface area at low water stage, [Abot]:	3214 ft ²
Permeability of filter sand, [k]:	3.5 ft/day
Driving head at high water stage, [Htop]:	6.2 ft
Driving head at low water stage, [Hbot]:	3.2 ft
Drawdown time, [t]:	3 days
Average flow path length, [Xo]:	1 ft
Exposed underdrain width, [Lo]:	8 ft
Slope of underdrain face, [S]:	999 ?H : 1V
Factor of safety for analysis, [FS]:	.15
Percent drawdown for analysis, [P]:	100 %
Background seepage rate, [Q]:	0 gpm

Results

Total length of side/bottom drain filter required:	21.29182 ft
Total length of side/bottom drain filter required to recover treatment volume only:	21.29182 ft
Total length of side/bottom drain filter required to accomodate background seepage:	0 ft
Maximum flow rate through filter:	0.901852 gpm / lin ft
Average flow rate through filter:	0.450926 gpm / lin ft
Volume of water between Atop and Abot:	446862.5 gallons
Recovery (or treatment) volume:	446862.5 gallons
Recovery (or treatment) volume:	1.371281 acre-ft

Note

Drain pipe diameter should be checked to insure that peak flow can be accomodated.

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Job Information

Job Name: WAB2003 (Ditch 10)
Engineer: M Reineke
Date: 10/31/2022

Input Data

Surface area at high water stage, [Atop]:	5328 ft ²
Surface area at low water stage, [Abot]:	777 ft ²
Permeability of filter sand, [k]:	3.5 ft/day
Driving head at high water stage, [Htop]:	5.2 ft
Driving head at low water stage, [Hbot]:	3.2 ft
Drawdown time, [t]:	3 days
Average flow path length, [Xo]:	1 ft
Exposed underdrain width, [Lo]:	6 ft
Slope of underdrain face, [S]:	999 ?H : 1V
Factor of safety for analysis, [FS]:	.15
Percent drawdown for analysis, [P]:	100 %
Background seepage rate, [Q]:	0 gpm

Results

Total length of side/bottom drain filter required:	3.307523 ft
Total length of side/bottom drain filter required to recover treatment volume only:	3.307523 ft
Total length of side/bottom drain filter required to accomodate background seepage:	0 ft
Maximum flow rate through filter:	0.5672939 gpm / lin ft
Average flow rate through filter:	0.283647 gpm / lin ft
Volume of water between Atop and Abot:	45671.5 gallons
Recovery (or treatment) volume:	45671.5 gallons
Recovery (or treatment) volume:	0.1401515 acre-ft

Note

Drain pipe diameter should be checked to insure that peak flow can be accomodated.

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Job Information

Job Name: WAB2003 (Ditch 11)
Engineer: M Reineke
Date: 10/31/2022

Input Data

Surface area at high water stage, [Atop]:	7446 ft ²
Surface area at low water stage, [Abot]:	1100 ft ²
Permeability of filter sand, [k]:	3.5 ft/day
Driving head at high water stage, [Htop]:	5.21 ft
Driving head at low water stage, [Hbot]:	3.2 ft
Drawdown time, [t]:	3 days
Average flow path length, [Xo]:	1 ft
Exposed underdrain width, [Lo]:	6 ft
Slope of underdrain face, [S]:	999 ?H : 1V
Factor of safety for analysis, [FS]:	.15
Percent drawdown for analysis, [P]:	100 %
Background seepage rate, [Q]:	0 gpm

Results

Total length of side/bottom drain filter required:	4.648286 ft
Total length of side/bottom drain filter required to recover treatment volume only:	4.648286 ft
Total length of side/bottom drain filter required to accomodate background seepage:	0 ft
Maximum flow rate through filter:	0.5683849 gpm / lin ft
Average flow rate through filter:	0.2841925 gpm / lin ft
Volume of water between Atop and Abot:	64252.29 gallons
Recovery (or treatment) volume:	64252.29 gallons
Recovery (or treatment) volume:	0.1971701 acre-ft

Note

Drain pipe diameter should be checked to insure that peak flow can be accomodated.

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Job Information

Job Name: WAB2003 (Ditch 12)
Engineer: M Reineke
Date: 10/31/2022

Input Data

Surface area at high water stage, [Atop]:	25607 ft ²
Surface area at low water stage, [Abot]:	2718 ft ²
Permeability of filter sand, [k]:	3.5 ft/day
Driving head at high water stage, [Htop]:	5.79 ft
Driving head at low water stage, [Hbot]:	3.2 ft
Drawdown time, [t]:	3 days
Average flow path length, [Xo]:	1 ft
Exposed underdrain width, [Lo]:	6 ft
Slope of underdrain face, [S]:	999 ?H : 1V
Factor of safety for analysis, [FS]:	.15
Percent drawdown for analysis, [P]:	100 %
Background seepage rate, [Q]:	0 gpm

Results

Total length of side/bottom drain filter required:	18.35349 ft
Total length of side/bottom drain filter required to recover treatment volume only:	18.35349 ft
Total length of side/bottom drain filter required to accomodate background seepage:	0 ft
Maximum flow rate through filter:	0.63166 gpm / lin ft
Average flow rate through filter:	0.31583 gpm / lin ft
Volume of water between Atop and Abot:	274409.6 gallons
Recovery (or treatment) volume:	274409.6 gallons
Recovery (or treatment) volume:	0.842077 acre-ft

Note

Drain pipe diameter should be checked to insure that peak flow can be accomodated.

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Job Information

Job Name: WAB2003 (Ditch 13)
Engineer: M Reineke
Date: 10/31/2022

Input Data

Surface area at high water stage, [Atop]:	29103 ft ²
Surface area at low water stage, [Abot]:	3743 ft ²
Permeability of filter sand, [k]:	3.5 ft/day
Driving head at high water stage, [Htop]:	5.46 ft
Driving head at low water stage, [Hbot]:	3.2 ft
Drawdown time, [t]:	3 days
Average flow path length, [Xo]:	1 ft
Exposed underdrain width, [Lo]:	6 ft
Slope of underdrain face, [S]:	999 ?H : 1V
Factor of safety for analysis, [FS]:	.15
Percent drawdown for analysis, [P]:	100 %
Background seepage rate, [Q]:	0 gpm

Results

Total length of side/bottom drain filter required:	19.40761 ft
Total length of side/bottom drain filter required to recover treatment volume only:	19.40761 ft
Total length of side/bottom drain filter required to accomodate background seepage:	0 ft
Maximum flow rate through filter:	0.5956587 gpm / lin ft
Average flow rate through filter:	0.2978294 gpm / lin ft
Volume of water between Atop and Abot:	277664.7 gallons
Recovery (or treatment) volume:	277664.7 gallons
Recovery (or treatment) volume:	0.8520657 acre-ft

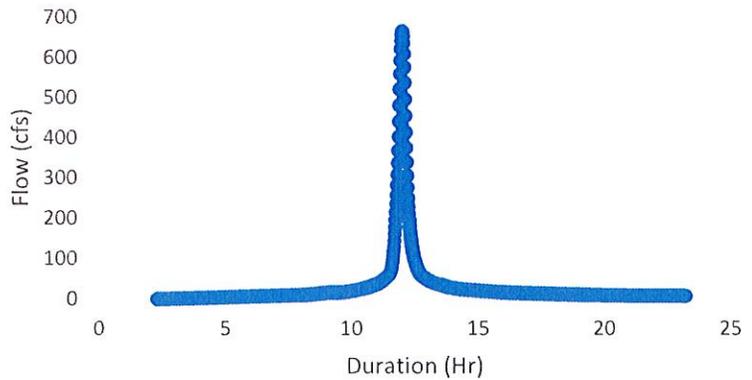
Note

Drain pipe diameter should be checked to insure that peak flow can be accomodated.

Existing Conditions

West Site Soils Area	Total (Ac)
Grass	
HSG A	6.51
HSG B	
HSG C	
HSG D	7.88
Impervious	108.67
	123.06

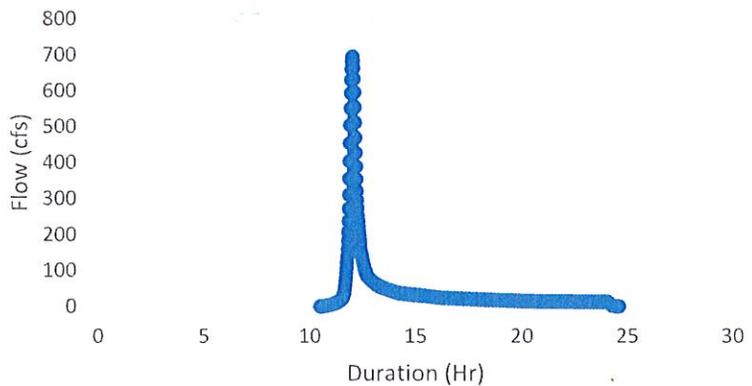
West Site Hydrograph



\int West Site Hydrograph (x) dx =	2,114,126
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East Site Soils Area	Total (Ac)
Grass	
HSG A	126.53
HSG B	18.82
HSG C	23.51
HSG D	11.32
Gravel	
HSG A	3.54
HSG B	3.03
HSG C	
HSG D	
Wooded	
HSG A	4.66
HSG B	8.96
HSG C	4.63
HSG D	
Impervious	88.5
	293.5

East Site Hydrograph



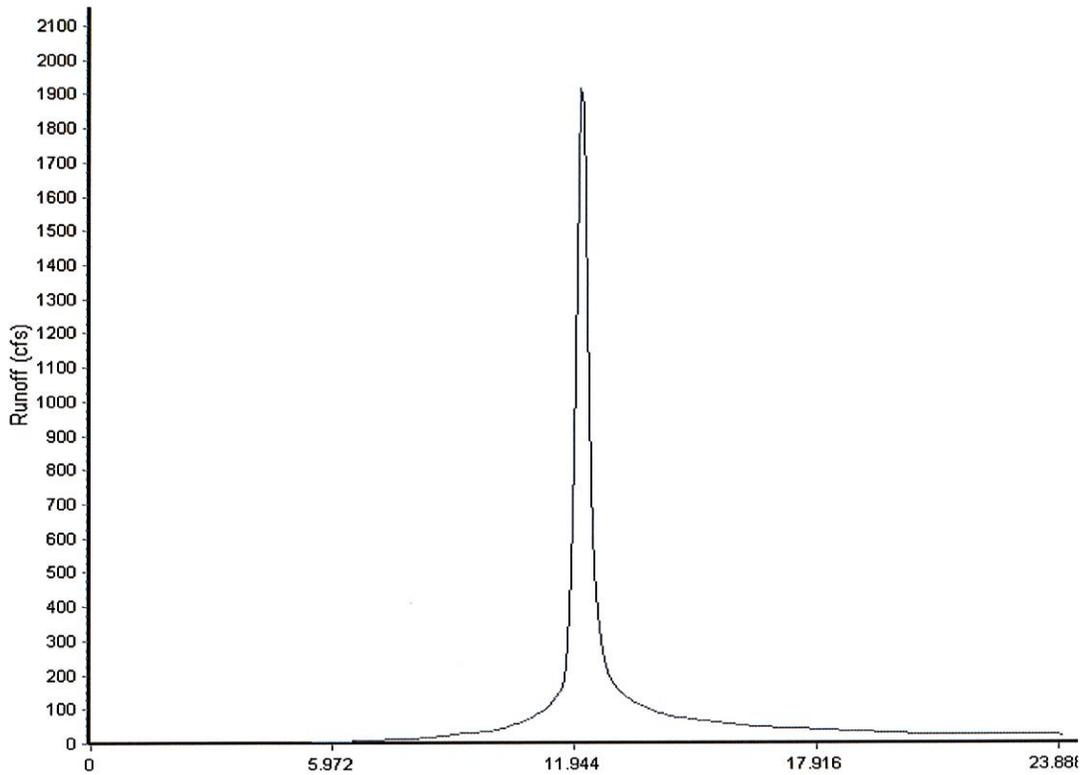
\int East Site Hydrograph (x) dx =	2,073,224
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Weighted CN	73.6
Total East and West Area (Ac)	416.56
Excluded Area (Ac)	18.16
Total Area (Ac)	434.72

Note:

The existing conditions of the site was modeled using WinTR-55. A hydrograph was developed and intergrated giving a runoff volume of 4,187,350 cft.

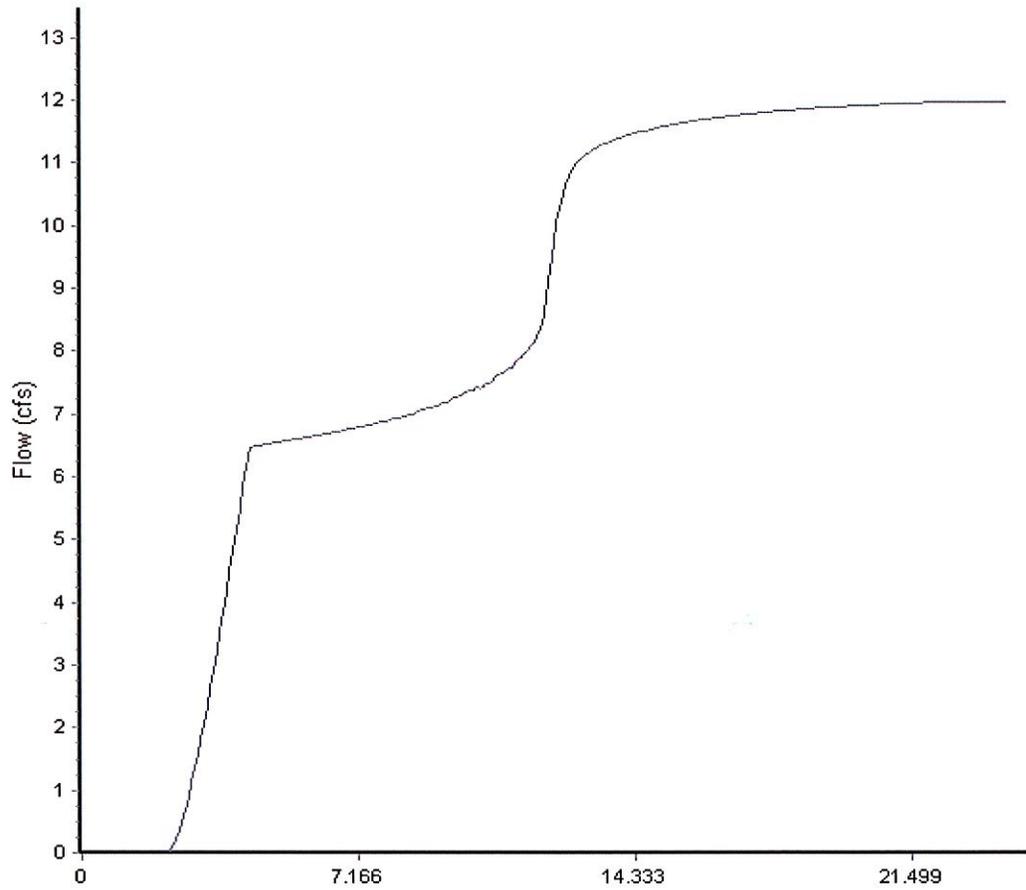
Proposed Conditions



Time period		Element ID	Sub-102
From:	07/01/2022, 12:00:00 AM	Maximum Runoff (cfs)	1916.72
To:	07/02/2022, 12:00:00 AM	Minimum Runoff (cfs)	0.00
Thresholds		Event Mean Runoff (cfs)	68.76
Exceedance:	0	Duration of Exceedances (hrs)	N/A
Deficit:	0	Duration of Deficits (hrs)	N/A
Detention storage		Number of Exceedances	N/A
Max flow:	0	Number of Deficits	N/A
		Volume of Exceedance (ft ³)	N/A
		Volume of Deficit (ft ³)	N/A
		Total Runoff (ft ³)	5917017.98
		Detention Storage (ft ³)	N/A

Tributary Area (Ac)	417.63
CN	86.46
T _c (min)	15
Rainfall Depth (in)	5.43
Total Runoff (cft)	5,917,000

Pond 1 Outflow Flow Volume



Time period From: <input type="text" value="07/01/2022, 12:00:00 AM"/> To: <input type="text" value="07/02/2022, 12:00:00 AM"/>		Element ID Gate-6	
Thresholds Exceedance: <input type="text" value="0"/> Deficit: <input type="text" value="0"/>		Maximum Flow (cfs) 11.98 Minimum Flow (cfs) 0.00 Event Mean Flow (cfs) 8.36	
Detention storage Max flow: <input type="text" value="0"/>		Duration of Exceedances (hrs) N/A Duration of Deficits (hrs) N/A Number of Exceedances N/A Number of Deficits N/A Volume of Exceedance (ft³) N/A Volume of Deficit (ft³) N/A Total Flow (ft³) 718277.99 Detention Storage (ft³) N/A	

12 cfs Underflow Volume = 718,278 cft

Pipe Storage

East Line

Diameter = 10'

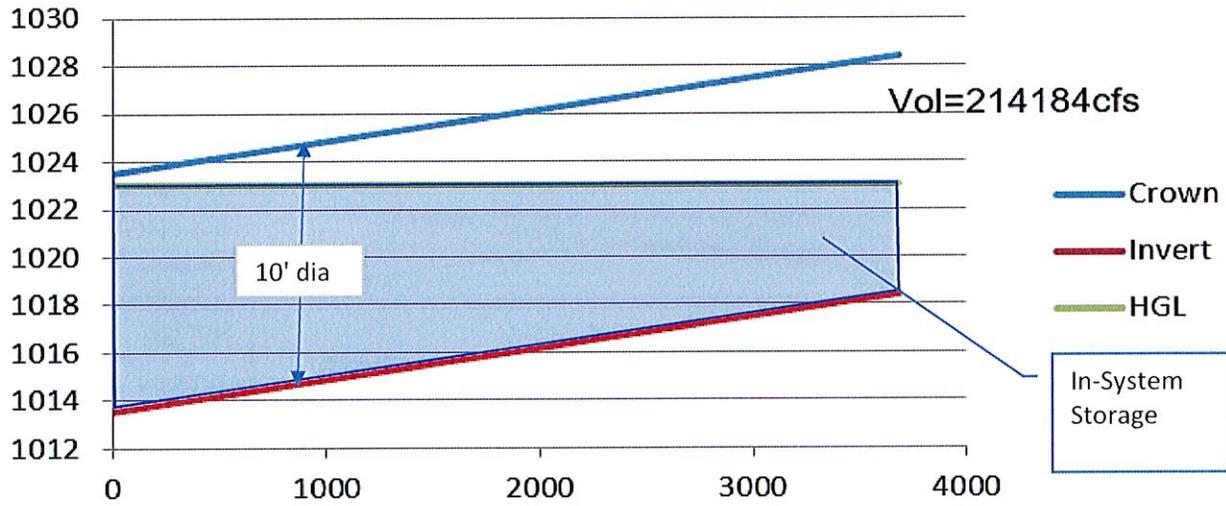
Pipe Length = 3,684 ft

DS Invert = 1013.51

US Invert = 1018.41

HGL = 1023

Storage Volume = 214,184 cft



Diameter = 9'

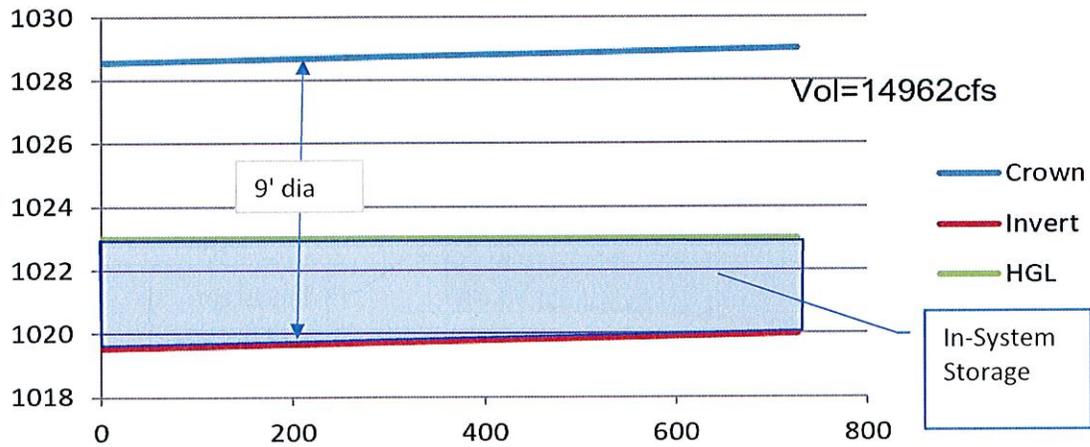
Pipe Length = 727 ft

DS Invert = 1019.54

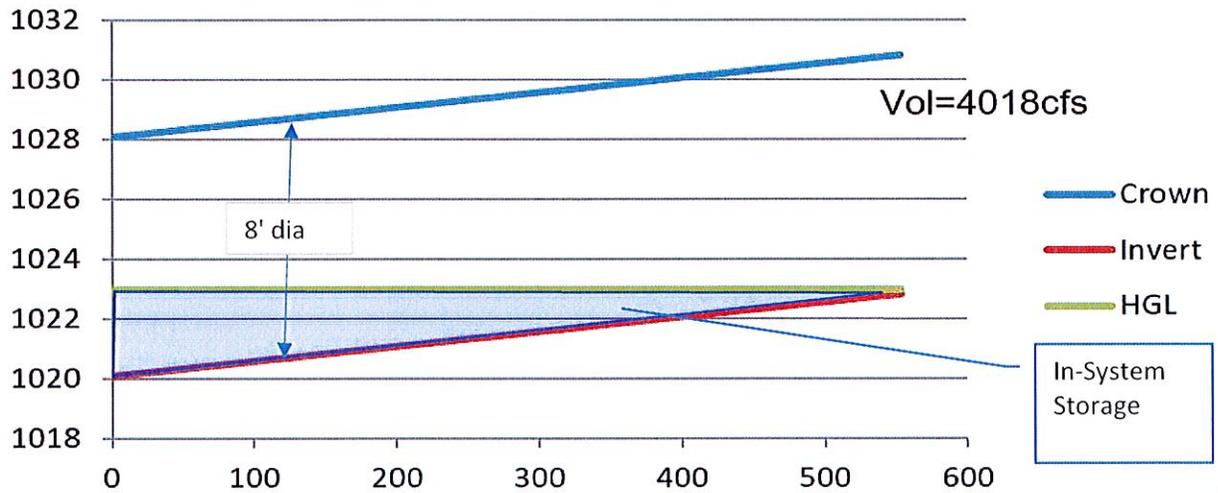
US Invert = 1019.99

HGL = 1023

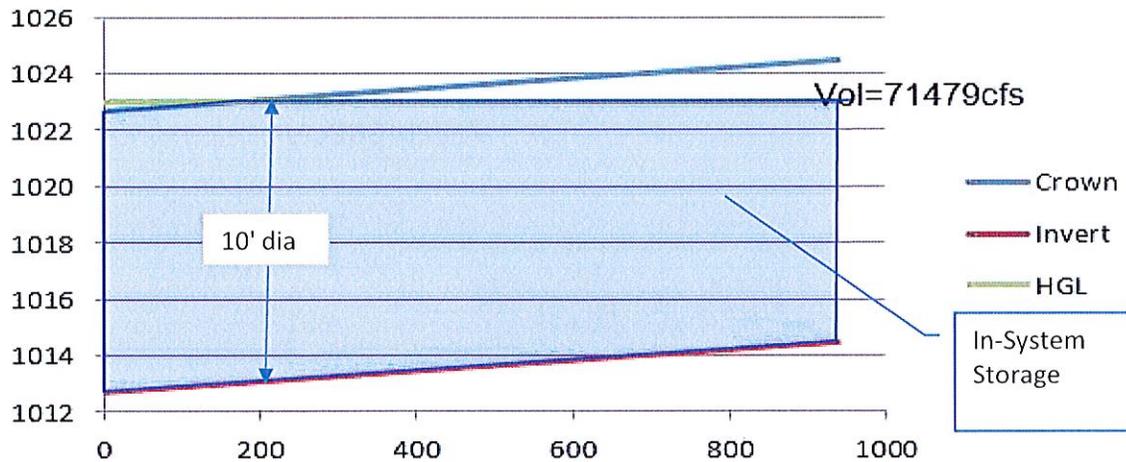
Storage Volume = 14,962 cft



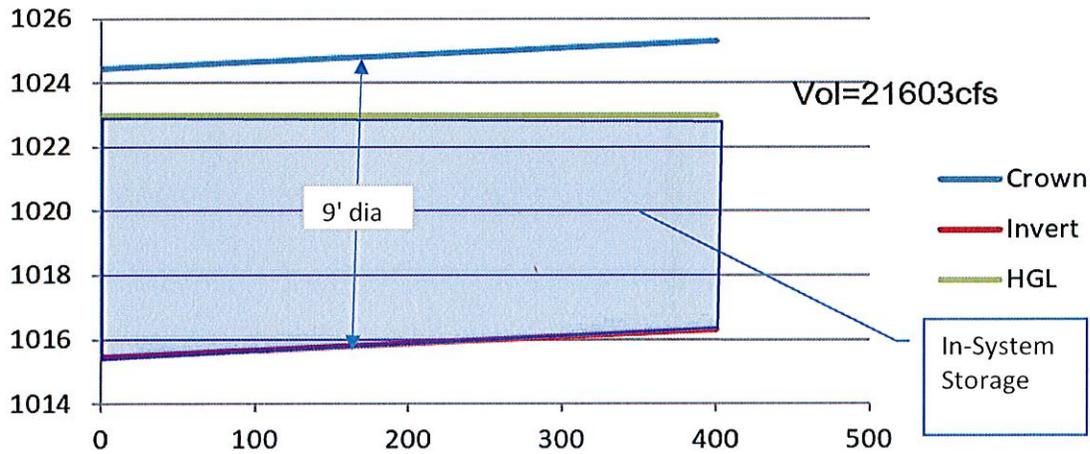
Diameter = 8'
 Pipe Length = 553 ft
 DS Invert = 1020.09
 US Invert = 1022.84
 HGL = 1023
Storage Volume = 4,018 cft



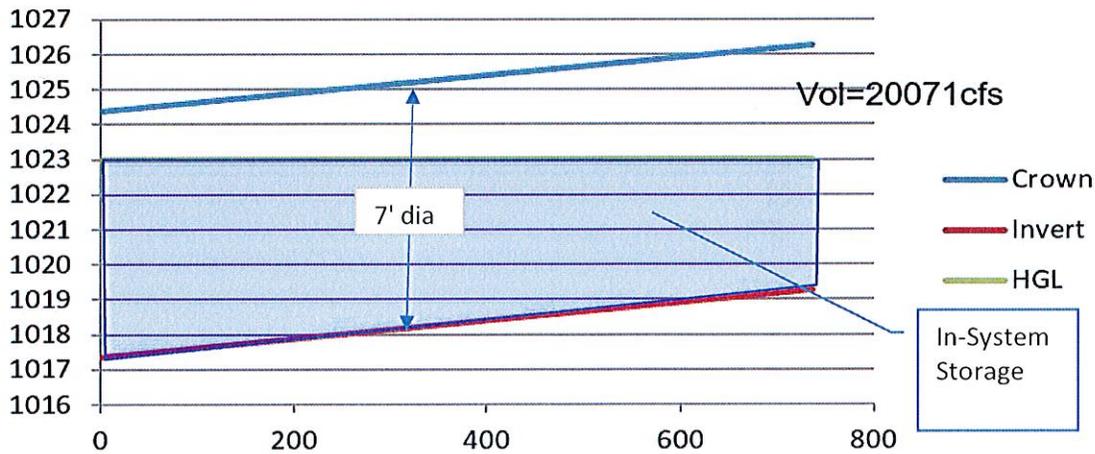
West Line
 Diameter = 10'
 Pipe Length = 954 ft
 DS Invert = 1012.7
 US Invert = 1014.44
 HGL = 1023
Storage Volume = 71,479 cft



Diameter = 9'
 Pipe Length = 400 ft
 DS Invert = 1015.44
 US Invert = 1016.30
 HGL = 1023
Storage Volume = 21,603 cft



Diameter = 7'
 Pipe Length = 737 ft
 DS Invert = 1017.37
 US Invert = 1019.27
 HGL = 1023
Storage Volume = 20,071 cft

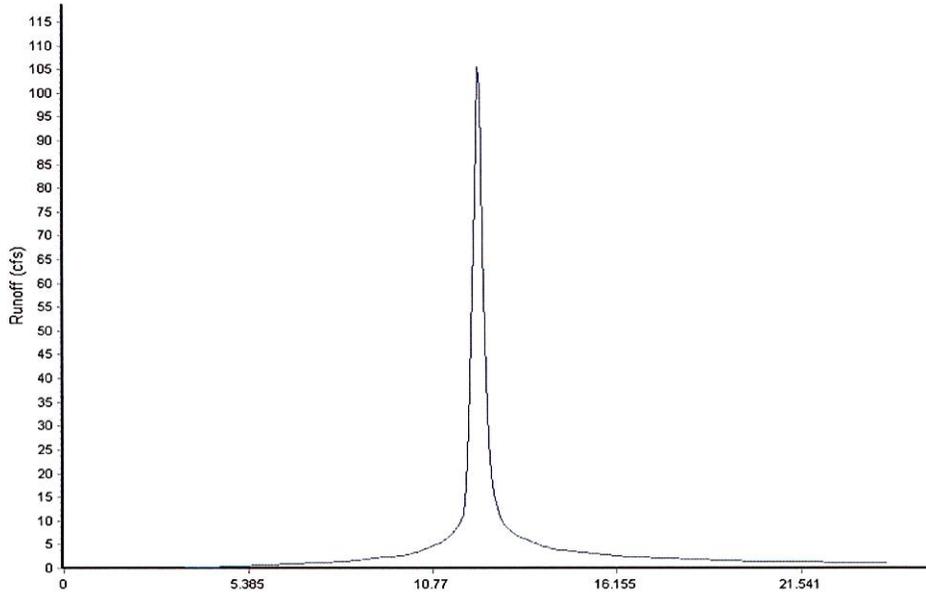


Existing 72" Bypass
 Submerged at HGL 1023
 Length = 425 Ft
 Diameter = 6'
Storage Volume = $3.14 \times 3^2 \times 425 = 12,010$ cft

Total Pipe Storage:	$214,184 + 14,962 + 4,018 + 71,479 + 21,603 + 20,071 + 12,010 = 358,327$ cft
----------------------------	--

Required CPVC Volume Calculation

Tributary Area (Ac)	86.01
CN	98
Rainfall Depth (in)	1.3
T _c	15

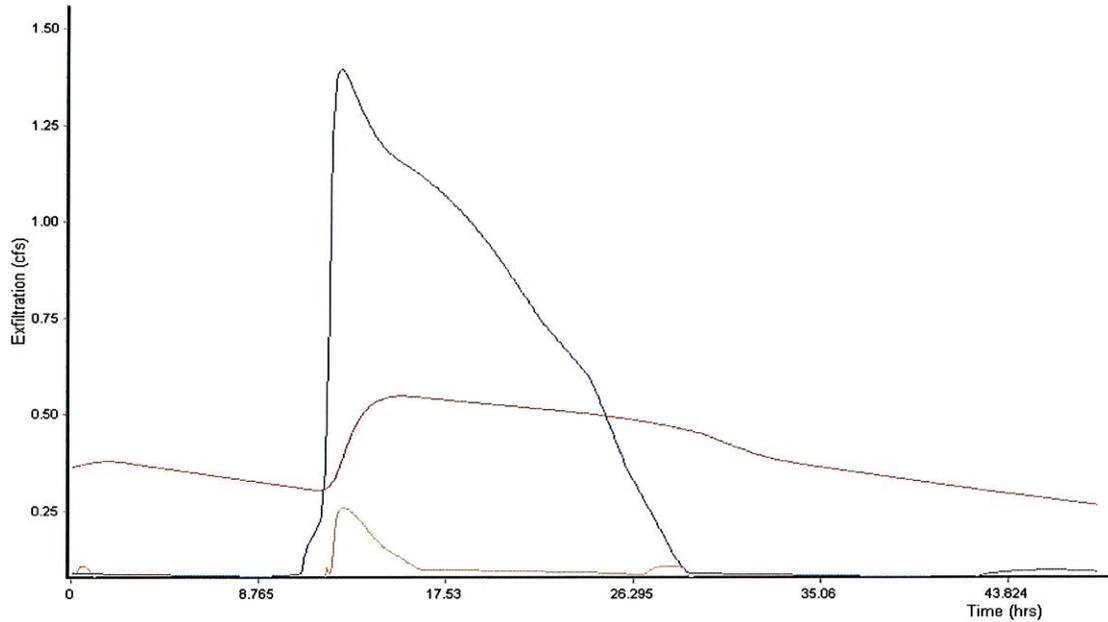


Runoff Summary

Time period		Element ID	Sub-73
From:	07/01/2022, 12:00:00 AM	Maximum Runoff (cfs)	105.64
To:	07/02/2022, 12:00:00 AM	Minimum Runoff (cfs)	0.00
Thresholds		Event Mean Runoff (cfs)	3.92
Exceedance:	0	Duration of Exceedances (hrs)	N/A
Deficit:	0	Duration of Deficits (hrs)	N/A
Detention storage		Number of Exceedances	N/A
Max flow:	0	Number of Deficits	N/A
		Volume of Exceedance (ft ³)	N/A
		Volume of Deficit (ft ³)	N/A
		Total Runoff (ft ³)	336947
		Detention Storage (ft ³)	N/A

Required CPVC Vol.	336,947 cft
--------------------	-------------

Provided CPVC Volume Calculation



Exfiltration Summary Table

Time period
 From:
 To:
 Thresholds
 Exceedance:
 Deficit:
 Detention storage
 Max flow:

Element ID	Ditch-8	Ditch-9	Pond-02
Maximum Exfiltration (cfs)	0.26	1.40	0.55
Minimum Exfiltration (cfs)	0.00	0.08	0.26
Event Mean Exfiltration (cfs)	0.05	0.34	0.40
Duration of Exceedances (hrs)	N/A	N/A	N/A
Duration of Deficits (hrs)	N/A	N/A	N/A
Number of Exceedances	N/A	N/A	N/A
Number of Deficits	N/A	N/A	N/A
Volume of Exceedance (ft³)	N/A	N/A	N/A
Volume of Deficit (ft³)	N/A	N/A	N/A
Total Exfiltration (ft³)	8364.78	59155.5	68794.79
Detention Storage (ft³)	N/A	N/A	N/A

CPVC Exfiltration Volume	
Feature	Exfiltration Volume (cft)
Ditch 8	8,364
Ditch 9	59,155
Pond 2	68,794
Total	136,313

CPVC Volume	
Feature	Volume (cft)
Swale 1	25,555
Swale 2	14,956
Swale 3	4,385
Swale 4	3,114
Swale 5	13,306
Swale 6	0
Swale 7	59,737
Swale 10	6,105
Swale 11	8,589
Swale 12	36,683
Swale 13	37,118
Total	209,549

*Refer to CPVC Swale Calculations

Provided CPVC Volume = 345,862

Stage Storage

Pond 1 Stage Storage						
South Pond		North Pond		Inc. Vol.	Total Vol.	
Elevation	Area	Elevation	Area			
1009	-	1009	-	-		
1010	150045.4	1010	156790.9	0		NWL
1011	155903.9	1011	162119.5	312413	312413	
1012	162186.9	1012	167862.4	324017.6	636430.6	
1013	169184.8	1013	174292.6	336740.9	973171.5	
1014		360877.24		352141.5	1325313	
1015		369760.45		365309.8	1690623	1015.42 1,847,530
1016		377429.95		373588.6	2064211	
1017		384822.71		381120.4	2445332	
1018		392088.43		388449.9	2833782	1018.34 2,968,322
1019		399336.58		395707	3229489	
1020		406628.61		402977.1	3632466	
1021		414022.11		410319.8	4042786	
1022		421502.37		417756.7	4460542	1022.41 4,634,921
1023		429137.79		425314.4	4885857	
1024		436936.24		433031.2	5318888	

Pond 2 Stage Storage					
Elevation	Area (ft2)	Inc. Vol.	Total Vol.		
1026	4302	-	-		
1027	5530	4903.169	4903.169		
1028	7038	6268.867	11172.04		
1029	8630	7820.485	18992.52		
1030	10384	9493.488	28486.01	NWL	
1031	12275	11316.33	39802.33	1031.02	40,069
				1031.82	50,754
1032	14467	13356	53158.34	1032.75	64,731
1033	16414	15430.26	68588.6		
1034	18628	17509.33	86097.93		
1035	20957	19781.07	105879		
1036	23399	22166.79	128045.8		
1037	25953	24664.98	152710.8		
1038	28622	27276.62	179987.4		
1039	31407	30003.73	209991.1		
1040	34306	32845.84	242836.9		
1041	37891	36083.66	278920.6		

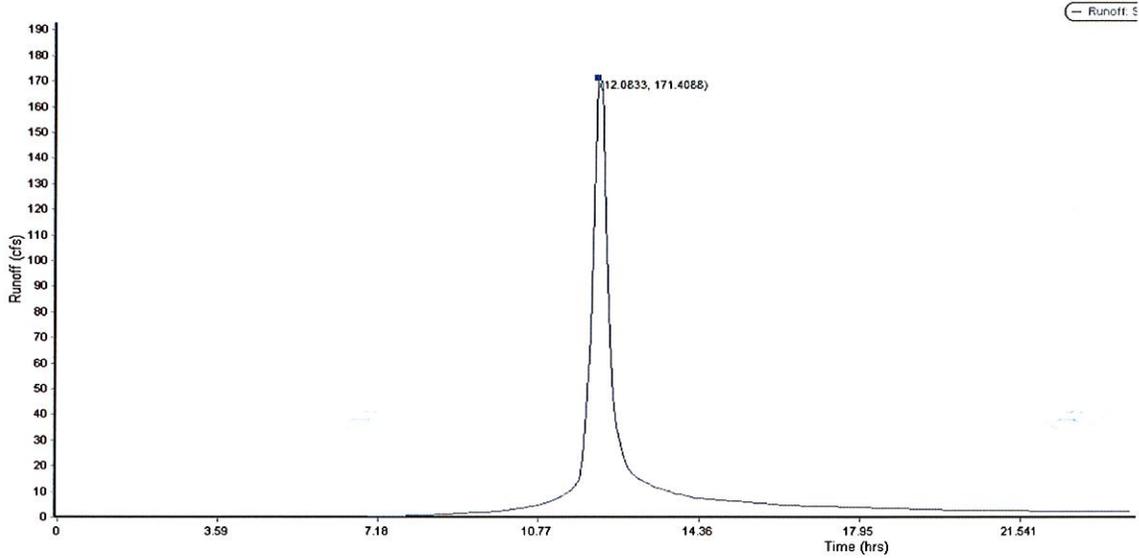
Giddings Road Detention					
Combined retention					
Elevation	Area	Inc. Vol.	Vol		
999	40977	-	-	NWL	
1000	49822	45327.52738	45327.53	1000.85	91,477
1001	58891	54293.34414	99620.87	1001.73	145,960
1002	68179	63478.34981	163099.2		
1003	77687	72881.29827	235980.5	1003.76	298,682
1004	87414	82502.7026	318483.2		
1005	97367	92345.79205	410829		

Total Runoff Volume = 5,917,018 cft
12 cfs Under flow Volume = 718,278 cft
Pipe Storage Volume = 358,327 cft
CPVC Exfiltration Volume = 136,313 cft
Required Storage Volume = 4,704,100 cft
Provided Pond 1 Volume = 4,885,857 cft

Giddings Rd Detention Calculation

Catchment Area	CN
33.02 Ac	82.17
9.24 Ac	79.77
Total	Weighted CN
42.26 Ac	81.65

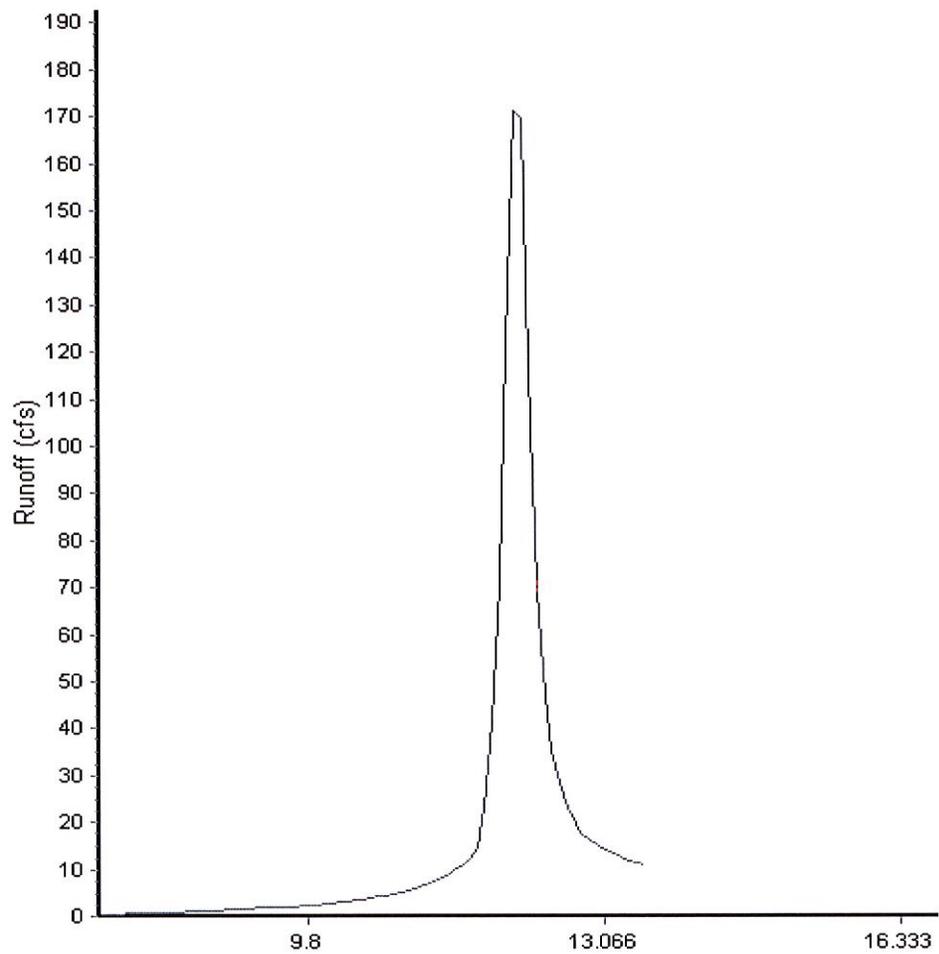
T _c (min)	15
Rainfall Depth (in)	5.43



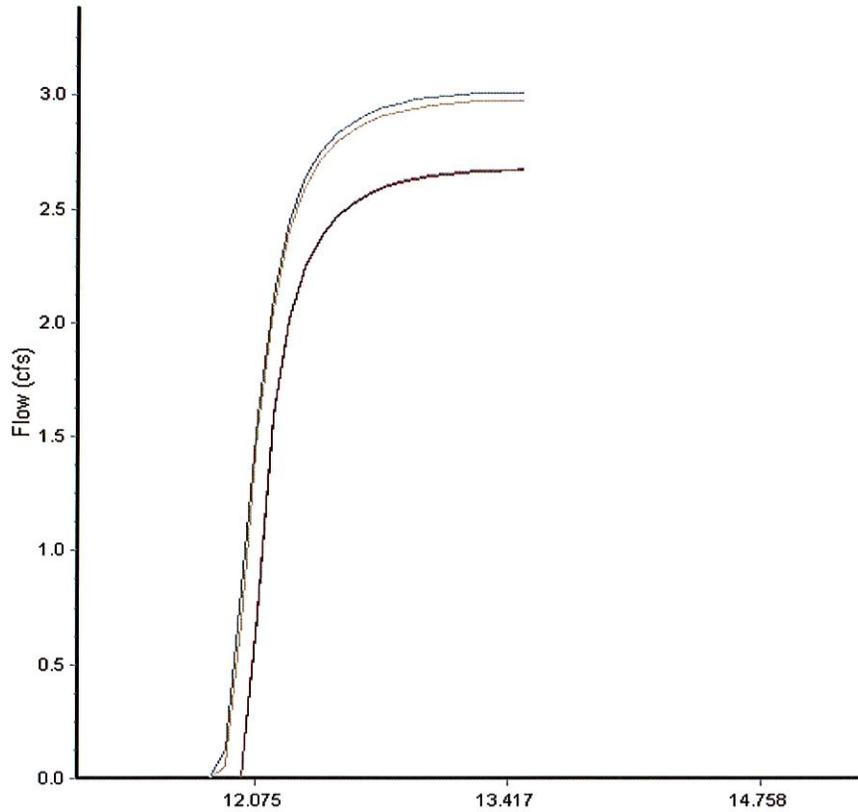
Runoff Summary Table	
Time period	Element ID: Sub-74
From: 07/01/2022, 12:00:00 AM	Maximum Runoff (cfs): 171.41
To: 07/02/2022, 12:00:00 AM	Minimum Runoff (cfs): 0.00
Thresholds	Event Mean Runoff (cfs): 6.09
Exceedance: 0	Duration of Exceedances (hrs): N/A
Deficit: 0	Duration of Deficits (hrs): N/A
Detention storage	Number of Exceedances: N/A
Max flow: 0	Number of Deficits: N/A
	Volume of Exceedance (ft³): N/A
	Volume of Deficit (ft³): N/A
	Total Runoff (ft³): 524267.73
	Detention Storage (ft³): N/A

Giddings Road Runoff Volume (cft)	524,268
-----------------------------------	---------

Peak event starts 13.31 hours after beginning of storm



Time period From: <input type="text" value="07/01/2022, 12:00:00 AM"/> To: <input type="text" value="07/01/2022, 01:30:00 PM"/>		Element ID Sub-74	
Thresholds Exceedance: <input type="text" value="0"/> Deficit: <input type="text" value="0"/>		Maximum Runoff (cfs) 171.41 Minimum Runoff (cfs) 0.00 Event Mean Runoff (cfs) 7.65 Duration of Exceedances (hrs) N/A Duration of Deficits (hrs) N/A Number of Exceedances N/A Number of Deficits N/A Volume of Exceedance (ft³) N/A Volume of Deficit (ft³) N/A Total Runoff (ft³) 367838.34 Detention Storage (ft³) N/A	
Detention storage Max flow: <input type="text" value="0"/>			



Time period		Element ID	Orifice-04	Orifice-07	Orifice-09	Orifice-10
From:	07/01/2022, 12:00:00 AM	Maximum Flow (cfs)	2.67	2.98	2.67	3.01
To:	07/01/2022, 01:30:00 PM	Minimum Flow (cfs)	0.00	0.00	0.00	0.00
Thresholds		Event Mean Flow (cfs)	0.27	0.31	0.27	0.32
Exceedance:	0	Duration of Exceedances (hrs)	N/A	N/A	N/A	N/A
Deficit:	0	Duration of Deficits (hrs)	N/A	N/A	N/A	N/A
Detention storage		Number of Exceedances	N/A	N/A	N/A	N/A
Max flow:	0	Number of Deficits	N/A	N/A	N/A	N/A
		Volume of Exceedance (ft³)	N/A	N/A	N/A	N/A
		Volume of Deficit (ft³)	N/A	N/A	N/A	N/A
		Total Flow (ft³)	12470.65	14595.16	12506.71	14861.7
		Detention Storage (ft³)	N/A	N/A	N/A	N/A

Total Runoff Vol. at Peak Event (cft)	367,838
Total Underflow Vol. at Peak Event (cft)	54,432

Total Storage Volume at Peak Event (cft)	313,406
Provided Storage Volume (cft)	318,500

GM Orion Assembly- Site Plan Amendment to EGLE Joint Permit Application (original attached).

November 28, 2022.

Wetland Impacts for unregulated wetlands W-P and W-Q.

Since the original site plan submittal on July 5, 2022, further development of the site layout, future employee headcounts, and travel distances to the employee work areas has impacted the layout for proposed parking on the south and southeast side of the site. The new parking layout and internal road access will impact wetland W-Q and remaining area for wetland W-P (refer to attached Exhibit G-006). This request is being made to Orion Township to remove these remaining wetland areas for the site plan amendment.

RECEIVED

NOV 30 2022

Orion Township
Planning & Zoning

Digital EGLE/USACE Joint Permit Application (JPA) for Inland Lakes and Streams, Great Lakes, Wetlands, Floodplains, Dams, Environmental Areas, High Risk Erosion Areas and Critical Dune Areas

version 1.30

(Submission #: HPJ-A9WK-QFGQ0, version 1)

Details

Submission ID	HPJ-A9WK-QFGQ0
Submission Reason	New
Status	In Process

Fees

Fee	\$2,000.00
Payments/Adjustments	(\$2,000.00)
Balance Due	\$0.00 (Paid)

Form Input

Instructions

[To download a copy or print these instructions. Please click this link \(recommended\).](#)

Contact Information

Applicant Information (Usually the property owner)**First Name Last Name**

Reuben Jones

Organization Name

General Motors-Orion Assembly

Phone Type Number Extension

Business 2483775100

Email

reuben.jones@gm.com

Address

4555 GIDDINGS RD

LAKE ORION, MI 48359

Is the Property Owner different from the Applicant?

No

Has the applicant hired an agent or cooperating agency (agency or firm assisting applicant) to complete the application process?

No

Are there additional property owners or other contacts you would like to add to the application?

Yes

Additional Contact Information (1 of 2)**Contact Role(s)**

Consultant

Contact Information**Prefix**

Mr.

First Name Last Name

Anthony DeMars

Title

Senior Natural Resource Specialist

Organization Name

GHD Services, Inc.

Phone Type Number Extension

Business 6125246868

Email

tony.demars@ghd.com

Address

900 LONG LAKE RD

STE 200

SAINT PAUL, MN 55112

Additional Contact Information (2 of 2)**Contact Role(s)**

Consultant

Contact Information**Prefix**

NONE PROVIDED

First Name Last Name

John Maher

Title

NONE PROVIDED

Organization Name

GM

Phone Type Number Extension

Mobile 17658608543

Email

john.maher@gm.com

Address31266 ALFRED SLOAN RD
GM GLOBAL TECH CENTER - SERV ENG
WARREN, MI 48092**Project Location****DEQ Site Reference Number (Pre-Populated)**

7208294043768178907

Project Location

42.71728619475128,-83.26199054718018

4555 GIDDINGS RD, LAKE ORION, MI

Project Location Address4555 GIDDINGS RD
GENERAL MOTORS-ORION ASSEMBLY
LAKE ORION, MI 48359**County**

Oakland

Is there a Property Tax ID Number(s) for the project area?

Yes

Please enter the Tax ID Number(s) for the project location

09-34-400-011, 09-34-200-006, 09-34-200-006, 09-34-400-011

Is there Subdivision/Plat and Lot Number(s)?

No

Is this project within Indian Lands?

No

Local Unit of Government (LUG)

Orion Township

Directions to Project Site

Heading northbound on I-75N, take Exit 83 on to Joslyn Road. Turn right onto Joslyn Road and travel .3 miles to Brown Road. Travel .8 miles on Brown Road to Giddings Road. Project Site is located at 4555 Giddings Road and is located northeast of the intersection of Brown Road and Giddings Road.

Background Information

Has the Michigan Department of Environment, Great Lakes, and Energy (EGLE) and/or United States Army Corps of Engineers (USACE) conducted a pre-application meeting/inspection for this project?

Yes

Provide the date of the pre-application meeting/inspection

3/29/2022

Pre-application File Number:

HPG-6JSJ-D89R8

EGLE and/or USACE staff person involved in the pre-application meeting/inspection:

Robert Primeau

Has the project scope or design changed since the pre-application meeting/inspection?

No

Has the EGLE completed a Wetland Identification Program (WIP) assessment for this site?

Yes

Please enter the WIP assessment number:

HPG-HESW-13EXX

Upload copy of WIP letter

[EGLE WRD Wetland Identification Report – 63-GM-Orion Twp.pdf - 06/17/2022 11:43 AM](#)

Comment

NONE PROVIDED

Environmental Area Number (if known):

NONE PROVIDED

Has the United States Army Corps of Engineers (USACE) completed either an approved or preliminary jurisdictional determination for this site?

No

Were any regulated activities previously completed on this site under an EGLE and/or USACE permit?

No

Have any activities commenced on this project?

No

Is this an after-the-fact application?

No

Are you aware of any unresolved violations of environmental law or litigation involving the property?

No

Is there a conservation easement or other easement, deed restriction, lease, or other encumbrance upon the property?

Yes

Easement Holder Contact Information

First Name **Last Name**
 John *Maier*

Organization Name
General Motors-Orion Assembly

Phone Type **Number** **Extension**
 Business 7658608543

Email
 john.maier@gm.com

Address
 4555 GIDDINGS RD
 LAKE ORION, MI 48359
 United States

Describe the type of easement or encumbrance

The property has multiple easements which are summarized in the attached Orion ASSY Easement-Sidetrack Agreement summary table. The following documents are attached.

Easement 12200000-Electrical Substation
 Easement 12201000-Sewer Line
 Easement 12259000-Drainage
 Easement 13670000-Water Line
 Easement 14393000-Water Supply
 Easement 15684000-Sanitary Sewer
 Easement 17210000-Vehicular and Pedestrian Access
 Easement 19921000-Drainage Easement
 Agreement H17210A-Railroad ROW/Sidetrack

Attach a copy of a description of the easement or encumbrance

[13670000 - Easement Agreement.pdf - 06/17/2022 12:24 PM](#)
[17210000 - Sketches.pdf - 06/17/2022 12:24 PM](#)
[19921000 - Easement Agreement.pdf - 06/17/2022 12:24 PM](#)
[12259000 - Easement Agreement.pdf - 06/17/2022 12:24 PM](#)
[14393000 - Easement Agreement.pdf - 06/17/2022 12:24 PM](#)
[13670000 - Sketch and Legal Description.pdf - 06/17/2022 12:24 PM](#)
[H17210A - Sidetrack Agreement.pdf - 06/17/2022 12:24 PM](#)
[14393000 - Drawing - incorrect # license for 1987 water system improvemnts .pdf - 06/17/2022 12:24 PM](#)
[12200000 - Easement Agreement.pdf - 06/17/2022 12:24 PM](#)
[15684000 - Easement Agreement.pdf - 06/17/2022 12:24 PM](#)
[12201000 - Easement Agreement.pdf - 06/17/2022 12:24 PM](#)
[17210000 - Easement Agreement.pdf - 06/17/2022 12:24 PM](#)
[Orion ASSY - Easement-Sidetrack Agreements 11Jun.pdf - 06/17/2022 12:29 PM](#)

Comment

NONE PROVIDED

Are there any other federal, interstate, state, or local agency authorizations associated with this project?

Yes

List all other federal, interstate, state, or local agency authorizations.

Agency	Type of Approval	Number	Date Applied	Approved/Denied/Undetermined
EPA	Waste : EPA ID	MID000718544	06/08/1982	Approved
MI EGLE AQD	Air : Title V Permit (US Only)	MI-ROP-B7227-2020	09/22/2020	Approved
Great Lakes Water Authority	Water : Pretreatment Permit	157-93957-IU	09/02/2020	Approved

Agency	Type of Approval	Number	Date Applied	Approved/Denied/Undetermined
Michigan DEQ	Water : NPDES Permit (US Only)	MIS110921	03/01/2021	Approved
EGLE	Waste : Infectious / Medical Waste Permit	MW0044288	07/19/2021	Approved

Comments

NONE PROVIDED

Permit Application Category and Public Notice Information**Indicate the type of permit being applied for.**

Individual Permit for all other projects

This type of permit application requires that you include contact information for the adjacent landowners to this project. If you are only entering in a small number of bordering parcel owners contact information, please select "Enter list of recipients". If there is a rather large number of affected property owners such as a project that significantly affects lake levels, please upload a spreadsheet of the property owners. Please include names and mailing addresses.

Upload a list.

Uploads/Attachments[Lake Orion Adjoining Properties - Parcel Data.pdf - 06/17/2022 12:54 PM](#)**Comment**

NONE PROVIDED

Project Description**Project Use: (select all that apply - Private, Commercial, Public/Government/Tribal, Receiving Federal/State Transportation Funds, Non-profit, or Other)**

Commercial

Project Type (select all that apply):

Development-Commercial/Industrial

Project Summary (Purpose and Use): Provide a summary of all proposed activities including the intended use and reason for the proposed project.

See ATT-A, ATT-B, ATT-C, ATT-D

Project Construction Sequence, Methods, and Equipment: Describe how the proposed project timing, methods, and equipment will minimize disturbance from the project construction, including but not limited to soil erosion and sedimentation control measures.

See ATT-A, ATT-B, ATT-C, ATT-D

Project Alternatives: Describe all options considered as alternatives to the proposed project, and describe how impacts to state and federal regulated waters will be avoided and minimized. This may include other locations, materials, etc.

See ATT-A, ATT-B, ATT-C, ATT-D

Project Compensation: Describe how the proposed impacts to state and federal regulated waters will be compensated, OR explain why compensatory mitigation should not be required for the proposed impacts. Include amount, location, and method of compensation (i.e., bank, on-site, preservation, etc.)

The Project will utilize future release of emergent wetland credits from the Oakland-Snell Mitigation Bank will provide all of the necessary credits to satisfy the Project needs related to emergent wetland impacts (7.73 credits). Further, the Krummrey Wetland Mitigation Bank can provide the necessary forested wetland credits to satisfy the Project needs related to forested wetland impacts (0.88 credits). It is proposed that the purchase of these credits be made to satisfy the Project's wetland mitigation requirements.

The project will include 500 linear feet of new intermittent stream channel to mitigate impacts for the loss of 463 linear feet of intermittent stream.

Upload any additional information as needed to provide information applicable to your project regarding project purpose sequence, methods, alternatives, or compensation.

[ATT-A_Orion Purpose Need Alternatives Analysis_06212022_rev4.pdf - 06/21/2022 04:49 PM](#)

[ATT-D_20220610-Stormwater-TECHNICAL Memorandum.pdf - 06/21/2022 04:49 PM](#)

[ATT-B_Governor Whitmer Signs Legislation Enab...pdf - 06/21/2022 04:49 PM](#)

[ATT-C_Gov. Whitmer Secures Historic \\$7 Billio...pdf - 06/21/2022 04:49 PM](#)

Comment

NONE PROVIDED

Resource and Activity Type

SELECT THE ACTIVITIES from the list below that are proposed in your project (check ALL that apply). If you don't see your project type listed, select "Other Project Type". These activities listed require additional information to be gathered later in the application.

Stream, River or Drain Construction Relocation and Enclosure Activities

The Proposed Project will involve the following resources (check ALL that apply).

Wetland

Stream or River

Proposed Stream Mitigation

Major Project Fee Calculation Questions

Is filling of 10,000 cubic yards or more proposed (cumulatively) within wetlands, streams, lakes, or Great Lakes?

Yes

Is dredging of 10,000 cubic yards (cumulatively) or more proposed within streams, lakes, or Great Lakes? (wetlands not included)

No

Is new dredging or adjacent upland excavation in suspected contamination areas proposed by this application?

No

Is a subdivision, condominium, or new golf course proposed?

No

Wetland Project Information and Impacts

Has a professional wetland delineation been completed for this site?

Yes

Attach a copy of wetland delineation report with data form.

12573881-RPT-GM Orion Assembly-Wetland Delineation Report.pdf - 06/17/2022 01:17 PM

Comment

NONE PROVIDED

Total acres of wetland affected by this project.

Category	Affected area (acres)
Permanent	5.57
Temporary	0
	Sum: 5.57

Is filling or draining of 1 acre or more (cumulatively) of wetland proposed?

Yes

Select all wetland types that will be affected by this project:

- Emergent
- Forested
- Scrub-shrub

If your project includes placing fill in wetland then select the proposed activities from the following list. If your activity is not shown, then select "None of the Above" and move to the next question. Only enter an impacted area in one of the impact tables (do not duplicate impact entries):

Road - New

Complete this table for projects involving Fill. Enter each activity/ location that corresponds with each activity selected in the previous question and enter the dimensions. Activities may be entered in one line of the table if they occupy the same impact footprint and cannot be broken out separately (Example: Activity - Driveway and Riprap slope). Multiple activities in different locations should be listed on different lines of the table.

Activity	Length (feet)	Width (feet)	Depth (feet)	Area (square feet)	Volume (cubic feet)	Volume (cubic yards)	Corrected value for complex impact AREAS (square feet)
W-R.4	85	9.176	2.5	779.96	1949.9	72	780
W-F.1	386.94	50	5	19347	96735	3583	19347
W-B.1	60.72	50	2.6	3036	7893.6	292	3036
W-C.1	929.64	50	1.25	46482	58102.5	2152	46482
W-I.1	138.9	50	1.7	6945	11806.5	437	6945
				Sum: 76589.96	Sum: 176487.5	Sum: 6536	Sum: 76590

Source of Fill Material:

On-site (show on plan)

Type of Fill.

Sand

Is riprap proposed?

No

Select from the following list for Excavation/Dredge Activities (if your proposed project is primarily a structure enter the impact as a structure. Only enter an impacted area in one of the impact tables in one impact section):

None of the above

If your project includes **STRUCTURES IN WETLAND** then select all of the proposed activities in the following list. If your activity is not shown, then select "None of the Above" and move to the next question. Only enter an impacted area in one of the impact tables (do not duplicate impact entries):

Building - non-residential new, Commercial/Industrial/Public

Culvert

Building - accessory Structure

Projects involving Structures:

Activity	Length (feet)	Width (feet)	Depth (feet)	Area (Sq. feet)	Volume (cubic feet)	Volume (cubic yards)	Corrected value for complex impact AREAS (square feet)
W-H.2	352	4.7025	1.7	1655.28	2813.9759999999997	104	1655.28
W-A.3	840	161.2757	14.75	135471.588	1998205.923	74008	135471.6
W-B.3	874	6.922	2.6	6049.8279999999995	15729.5528	583	6050
W-C.3	340	20.794	1.25	7069.96	8837.45	327	7070
W-M.5	298	19.288	6	5747.8240000000005	34486.944	1277	5748
W-J.5	220	44.69	9	9831.8	88486.2	3277	9832
				Sum: 165826.28	Sum: 2148560.0458	Sum: 79576	Sum: 165826.88

If your project includes **Other Activities in WETLAND** not listed in this section, then select from the proposed activities in the following list. If your activity in Wetland has not been listed in this Wetland Section, then select "Other" and enter a description of your activity. Only enter an impacted area in one of the impact tables (do not duplicate impact entries). If you selected a Fill, Excavation/Dredging, or Structure activity above in this section, but do not have an activity listed as Other, then select None of the Above for this question.

None of the above

Is Wetland Mitigation being proposed as part of this proposed project?

Yes

Mitigation Project Details for Wetlands

Impact Location (include identifier on site plan)	Impact Type:	Impact Amount (acres)	Replacement Ratio (include any reduction)	Mitigation Type	Mitigation Amount (acres)	Kind of Mitigation
W-A.3	Emergent	3.11	1.5:1	Emergent	4.67	Bank
W-B.1	Emergent	0.07	1.5:1	Emergent	0.11	Bank
W-B.3	Emergent	0.14	1.5:1	Emergent	0.21	Bank
W-C.1	Emergent	1.07	1.5:1	Emergent	1.61	Bank
W-C.3	Emergent	0.16	1.5:1	Emergent	0.24	Bank
W-F.1	Forested	0.44	2.0:1	Forested	0.88	Bank
W-H.1	Emergent	0.01	1.5:1	Emergent	0.02	Bank
W-H.2	Emergent	0.03	1.5:1	Emergent	0.05	Bank
W-I.1	Emergent	0.16	1.5:1	Emergent	0.24	Bank
W-J.5	Emergent	0.23	1.5:1 ₁₄₃	Emergent	0.35	Bank

Impact Location (include identifier on site plan)	Impact Type:	Impact Amount (acres)	Replacement Ratio (include any reduction)	Mitigation Type	Mitigation Amount (acres)	Kind of Mitigation
W-M.5	Emergent	0.13	1.5:1	Emergent	0.20	Bank
W-R.4	Emergent	0.02	1.5:1	Emergent	0.03	Bank
		Sum: 5.57			Sum: 8.61	

Wetland mitigation plan or associated documents

[12573881-LTR-GM Orion Mitigation Plan-062122.pdf - 06/21/2022 02:38 PM](#)

Comment

NONE PROVIDED

Stream Project Information (1 of 1)**Please provide a name for the stream, river, channel:**

Unnamed

Stream Water elevation reference* (show elevation on plans with description):

NAVD 88

Ordinary High Water Mark (OHWM) elevation (feet):

1025

Date of observation (M/D/Y)

4/27/2022

What length (feet) does the project activity(ies) extend waterward of the OHWM?

12

What length (feet) does the project activity(ies) extend landward of the OHWM?

100

Is the drainage area upstream of the proposed project area greater than 2 sq. miles?

No

What is the the width (feet) of the stream where the water begins to overflow its banks. This is called the Bankfull width.

12

Will a turbidity curtain be used during the proposed project?

No

Inland Lakes, Great Lakes and Stream Impacts (1 of 1)**The following impact description applies to: (select only one at a time, duplicate this entire section if there are impacts to multiple waterbody types):**

Stream

Linear feet of stream affected by your project

Category	Affected linear feet (ft)
Permanent	463
Temporary	0
	Sum: 463

Select from the following list all Fill Activities (select all that apply to this waterbody impacted):

Road - New

Complete this table for projects involving Fill below the Ordinary High Water Mark. Enter each activity/ location that corresponds with each activity selected in the previous question and enter the dimensions. Activities may be entered in one line of the table if they occupy the same impact footprint and cannot be broken out separately (Example: Activity - Driveway and Riprap slope). Multiple activities in different locations should be listed on different lines of the table.

Activity	Length (feet)	Width (feet)	Depth (feet)	Area (square feet)	Volume (cubic feet)	Volume (cubic yards)	Corrected Value for complex impact Area (square feet)
General Fill	463	12	1.5	5556	8334	309	NONE PROVIDED
				Sum: 5556	Sum: 8334	Sum: 309	Sum: NaN

Type of Fill

Sand

Source of Fill

On-site (show on plans)

Is riprap proposed?

No

Activities Involving Dredging or Excavation: Select from the following list for Excavation/Dredge Activities (select all that apply to this waterbody impacted):

No Dredging/Excavation Proposed

If your project includes STRUCTURES then select all of the proposed activities in the following list. If your activity is not shown, then select "None of the Above" and move to the next question. Only enter an impacted area in one of the impact tables (do not duplicate impact entries):

None of the above

If your project includes Other Activities not listed in this section, then select from the proposed activities in the following list. If your activity has not been listed in this Section, then select "Other" and enter a description of your activity. Only enter an impacted area in one of the impact tables (do not duplicate impact entries). If you selected a Fill, Excavation/Dredging, or Structure activity above in this section, but do not have an activity listed as Other, then select None of the Above for this question.

None of the above

Does the proposed project include mitigation?

stream mitigation

Streams Impacts

Impact Location (include identifier on site plan)	Impact Type (Enclosure, Relocation, Dredging, Armoring, or Other)	Impact Amount (linear feet)
See WB-D	Other: Channel will be filled in with existing flows routed to GM storm sewer system	463
		Sum: 463

Streams Mitigation

Mitigation Location (Label)	Mitigation Type (Replacement, Restoration, Preservation, or Other)	Mitigation Amount (linear feet)
See WB-D-Mitigation	Replacement	500
		Sum: 500

Stream Mitigation Uploads

EX5-GM ORION STREAM MITIGATION EXHIBIT.pdf - 06/21/2022 05:05 PM

Comment

NONE PROVIDED

Stream, River or Drain Construction Relocation and Enclosure Activities

STREAM INFORMATION

Is this a county drain?

No

Does the proposed project include an:

Relocation

Are stream relocations of 500 feet or more in length (cumulatively) proposed?

No

Dimensions of existing stream/drain channel

Length (feet)	Width (top of bank to top of bank) (feet)	Depth (feet)	Channel bottom width (feet)
463	12	1	1.5

Will existing channel be abandoned?

Yes

Length of channel to be abandoned (feet):

463

Will old/existing channel be backfilled to top of bank grade?

Yes

Existing channel average water depth in a normal year (feet)

.25

Dimensions of new or relocated stream channel:

Length (feet)	Width (feet)	Depth (feet)
500	4	.25

Is a two-stage or similar design proposed?

No

Volume of dredge/excavation (cubic yards)

5800

How will slopes and bottom be stabilized?

Slopes will be stabilized with erosion control blankets and seeded to a native bio-swale/short prairie seed mix and cover crop.

Proposed side slopes (vertical / horizontal):

1:4

For activities on legally established county drains, provide original design and proposed dimensions and elevations.

NONE PROVIDED

Comment

NONE PROVIDED

Upload of Proposed Site Plans

Required on all Site Plan uploads. Please identify that all of the following items are included on your plans that you upload with this application.

Site Plan Features	Existing and Proposed Plan Set
Scale, Compass North, and Property Lines	Yes
Fill and Excavation areas with associated amounts in cubic yards	Yes
Any rivers, lakes, or ponds and associated Ordinary High Water Mark (OHWM)	Yes
Exterior dimensions of Structures, Fill and Excavation areas associated with the proposed project	Yes
Dimensions to other Structures and Lot Lines associated with the project	Yes
Topographic Contour Lines from licensed surveyor or engineer when applicable	Yes

Upload Site Plans and Cross Section Drawings for your Proposed Project

[EX9-GM ORION WETLAND EXHIBIT - QUADRANT 4.pdf - 06/21/2022 05:23 PM](#)
[EX4-GM ORION PROPOSED STORM EXHIBIT.pdf - 06/21/2022 05:23 PM](#)
[EX3-GM ORION CONSTRUCTION ROAD CROSSING EXHIBIT.pdf - 06/21/2022 05:23 PM](#)
[EX12-GM SURF CROSS SECTION EXHIBIT - 2.pdf - 06/21/2022 05:23 PM](#)
[EX10-GM ORION WETLAND EXHIBIT.pdf - 06/21/2022 05:23 PM](#)
[EX5-GM ORION STREAM MITIGATION EXHIBIT.pdf - 06/21/2022 05:23 PM](#)
[EX8-GM ORION WETLAND EXHIBIT - QUADRANT 3.pdf - 06/21/2022 05:23 PM](#)
[EX7-GM ORION WETLAND EXHIBIT - QUADRANT 2.pdf - 06/21/2022 05:23 PM](#)
[EX11-GM SURF CROSS SECTION EXHIBIT - 1.pdf - 06/21/2022 05:23 PM](#)
[EX6-GM ORION WETLAND EXHIBIT - QUADRANT 1.pdf - 06/21/2022 05:23 PM](#)
[EX13-GM SURF CROSS SECTION EXHIBIT - 3.pdf - 06/21/2022 05:23 PM](#)
[EX1-EXISTING CONDITION WETLAND EXHIBIT - CONTOURS.pdf - 06/21/2022 05:23 PM](#)
[EX17-NE PARKING ACCESS ROAD CROSSING EXHIBIT.pdf - 06/21/2022 05:23 PM](#)
[EX15-GM SURF CROSS SECTION EXHIBIT - 5.pdf - 06/21/2022 05:23 PM](#)
[EX-14-GM SURF CROSS SECTION EXHIBIT - 4.pdf - 06/21/2022 05:23 PM](#)
[EX16-GM SURF CROSS SECTION EXHIBIT - PLAN.pdf - 06/21/2022 05:23 PM](#)
[EX2-EXISTING CONDITION WETLAND EXHIBIT.pdf - 06/21/2022 05:23 PM](#)
[EX18-WETLAND IMPACT SECTION REFERENCE.pdf - 06/21/2022 05:23 PM](#)

Comment

NONE PROVIDED

Additional Required and Supplementary Documents

NONE PROVIDED

Comment

NONE PROVIDED

Fees

Major Project Fee
+\$2000.00

Total Fee Amount:

\$2000.00

Is the applicant or landowner a State of Michigan Agency?

No

Attachments

Date	Attachment Name	Context	User
6/21/2022 5:23 PM	EX1-EXISTING CONDITION WETLAND EXHIBIT - CONTOURS.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX17-NE PARKING ACCESS ROAD CROSSING EXHIBIT.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX15-GM SURF CROSS SECTION EXHIBIT - 5.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX-14-GM SURF CROSS SECTION EXHIBIT - 4.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX16-GM SURF CROSS SECTION EXHIBIT - PLAN.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX2-EXISTING CONDITION WETLAND EXHIBIT.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX18-WETLAND IMPACT SECTION REFERENCE.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX9-GM ORION WETLAND EXHIBIT - QUADRANT 4.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX4-GM ORION PROPOSED STORM EXHIBIT.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX3-GM ORION CONSTRUCTION ROAD CROSSING EXHIBIT.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX12-GM SURF CROSS SECTION EXHIBIT - 2.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX10-GM ORION WETLAND EXHIBIT.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX5-GM ORION STREAM MITIGATION EXHIBIT.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX8-GM ORION WETLAND EXHIBIT - QUADRANT 3.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX7-GM ORION WETLAND EXHIBIT - QUADRANT 2.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX11-GM SURF CROSS SECTION EXHIBIT - 1.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX6-GM ORION WETLAND EXHIBIT - QUADRANT 1.pdf	Attachment	Anthony DeMars
6/21/2022 5:23 PM	EX13-GM SURF CROSS SECTION EXHIBIT - 3.pdf	Attachment	Anthony DeMars
6/21/2022 5:05 PM	EX5-GM ORION STREAM MITIGATION EXHIBIT.pdf	Attachment	Anthony DeMars
6/21/2022 4:49 PM	ATT-A_Orion Purpose Need Alternatives Analysis_06212022_rev4.pdf	Attachment	Anthony DeMars
6/21/2022 4:49 PM	ATT-D_20220610-Stormwater-TECHNICAL Memorandum.pdf	Attachment	Anthony DeMars
6/21/2022 4:49 PM	ATT-B_Governor Whitmer Signs Legislation Enab...pdf	Attachment	Anthony DeMars
6/21/2022 4:49 PM	ATT-C_Gov. Whitmer Secures Historic \$7 Billio...pdf	Attachment	Anthony DeMars
6/21/2022 2:38 PM	12573881-LTR-GM Orion Mitigation Plan-062122.pdf	Attachment	Anthony DeMars

Date	Attachment Name	Context	User
6/17/2022 1:17 PM	12573881-RPT-GM Orion Assembly-Wetland Delineation Report.pdf	Attachment	Anthony DeMars
6/17/2022 12:54 PM	Lake Orion Adjoining Properties - Parcel Data.pdf	Attachment	Anthony DeMars
6/17/2022 12:29 PM	Orion ASSY - Easement-Sidetrack Agreements 11Jun.pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	17210000 - Sketches.pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	19921000 - Easement Agreement.pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	12259000 - Easement Agreement.pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	14393000 - Easement Agreement.pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	13670000 - Sketch and Legal Description.pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	H17210A - Sidetrack Agreement.pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	14393000 - Drawing - incorrect # license for 1987 water system improvemnts .pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	12200000 - Easement Agreement.pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	15684000 - Easement Agreement.pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	12201000 - Easement Agreement.pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	17210000 - Easement Agreement.pdf	Attachment	Anthony DeMars
6/17/2022 12:24 PM	13670000 - Easement Agreement.pdf	Attachment	Anthony DeMars
6/17/2022 11:43 AM	EGLE WRD Wetland Identification Report – 63-GM-Orion Twp.pdf	Attachment	Anthony DeMars

Status History

	User	Processing Status
6/9/2022 3:35:10 PM	Anthony DeMars	Draft
6/21/2022 11:26:59 PM	Reuben Jones	Submitting
6/21/2022 11:27:14 PM	Reuben Jones	Submitted
6/21/2022 11:27:22 PM	Reuben Jones	In Process

GM Orion Assembly- Site Plan Amendment to EGLE Joint Permit Application (original attached).

November 28, 2022.

Wetland Impacts for unregulated wetlands W-P and W-Q.

Since the original site plan submittal on July 5, 2022, further development of the site layout, future employee headcounts, and travel distances to the employee work areas has impacted the layout for proposed parking on the south and southeast side of the site. The new parking layout and internal road access will impact wetland W-Q and remaining area for wetland W-P (refer to attached Exhibit G-006). This request is being made to Orion Township to remove these remaining wetland areas for the site plan amendment.



Charter Township of Orion

2323 Joslyn Rd., Lake Orion MI 48360
www.oriontownship.org

Planning & Zoning Department

Phone: (248) 391-0304, ext. 5000

TO: The Charter Township of Orion Planning Commission
FROM: Tammy Girling, Planning & Zoning Director
DATE: December 1, 2022
RE: PC-2021-51, Kay Industrial Building Elevations

As requested, I am providing suggested motions for the abovementioned project. Please feel free to modify the language. The verbiage below could substantially change based upon the Planning Commissions' findings of facts for the project. Any additional findings of facts should be added to the motion below.

Lapeer Road Overlay District Design Standards (Ord. No. 78, Section 35.04)

Motion 1: I move that the Planning Commission **approve/deny** the Lapeer Overlay Design Standards for PC-2021-51, Kay Industrial, located at 50 Kay Industrial Dr. (parcel 09-35-400-033) for plans date stamped received 10/27/2022 based on the following findings of facts (**motion make to insert findings of facts**).

RECEIVED

NOV 11 2022

Orion Township
Planning & Zoning

November 9, 2022

Orion Township Planning Commission
2525 Joslyn Road
Lake Orion, MI, 48360

Site Plan Review – PC Motion

Kay Industrial – West Building

Case Number:	PC-2021-51	Plan Date:	10/27/2022
Address:	50 Kay Industrial Drive	Zoning:	IP – Industrial Park, incl. Lapeer Road Overlay
Parcel ID:	09-033-400-033	Reviewer:	Eric Pietsch Rod Arroyo, AICP
Area:	3.12 acres		
Applicant:	Kay Industrial Land, LLC		

CONCLUSION FROM SITE PLAN REVIEW #3 UPDATED, ELEVATION SHEETS ONLY

The Planning Commission approved the above-referenced site plan on December 15, 2021, given the following conditions related to building and design standards of the Lapeer Overlay District. The modified elevations will be considered for approval by the Planning Commission. The remaining site modifications are considered administrative and are compiled on a separate review letter.

1. Facades greater than 100 feet in length, measured horizontally, shall incorporate projections or recesses, neither of which shall exceed 100 horizontal feet.

Planner Comment: This standard applies to each side of the building, as each side is greater than 100 feet in length. Projections are incorporated with burnish block columns, capped with limestone (3 on the north and south sides and 2 on the east side). The front (west) side of the building has limestone accent bands (columns) flanking either side of the main entrance, which includes the projection of an overhead canopy. A significant portion of the remaining west façade does not appear to incorporate additional projections or recessions. To provide breaks along the first floor's brick façade, the design includes exposed, painted columns that enhance visual interest.

2. Ground floor facades that face public streets shall have arcades, display windows, entry areas, awnings, or other such features along no less than 50% of their horizontal length.

Planner Comment: The west and north sides of the building face public streets, Lapeer Road, and Kay Industrial Drive respectively. The west elevation is where the main entrance is located and the remaining horizontal length is clad in glass windows on two levels, separated by brick veneer. **The ground floor of the north side facing Kay Industrial Drive provides only a few ground-floor windows and is lacking many features described in this section.**

3. Building facades must include repeating patterns of color, texture, and architectural or structural bays of 12 inches in width (i.e. offsets, reveals or projecting ribs).

Planner Comment: Except for the west façade, the second floor of the proposed building is clad in architectural, insulated, pre-finished, metal siding panels. The slight projections of the burnish block columns break the repetitive pattern on both levels, including the first floor, which is covered with pre-finished, split faced brick. As mentioned above, the exposed structural columns provide additional repetition that breaks up the flat surface of the brick. The Planning Commission may wish to discuss color patterns with the applicant to further address visual appeal as a design standard.

4. Each principal building shall have clearly defined, highly visible customer entrances consisting of a variety of architectural features such as:
- Canopies, porticos, or overhangs;
 - Recesses/projections;
 - Raised, corniced parapets above the door;
 - Peaked roof forms;
 - Display windows;
 - Integrated tile work and moldings;
 - Integral planters;
 - Pavement/material changes for pedestrian crosswalks

Planner Comment: Very little appears to have changed where the main entrance is located at the northwest corner of the building. The entranceway is clearly defined; however, the Planning Commission may wish to discuss additional features that may enhance the front-facing façade and the west and north sides of the building that face public streets.

5. Flat Roofs. Incorporate parapets to conceal rooftop equipment from public view. The heights of the parapets shall not exceed 1/3 of the height of the supporting wall.

Planner Comment: While the elevations of the building do not illustrate parapets or other concealing roof features, Note number 15 on the site plan states that all roof mounted equipment shall be screened per township requirements.

Please see separate PC Motion review for the east parcel, PC-2021-52.

Staff is available to discuss this review.

Respectfully,
Giffels Webster



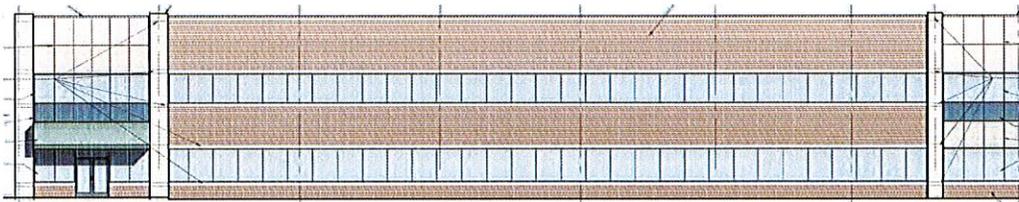
Rodney L. Arroyo, AICP
Partner Emeritus



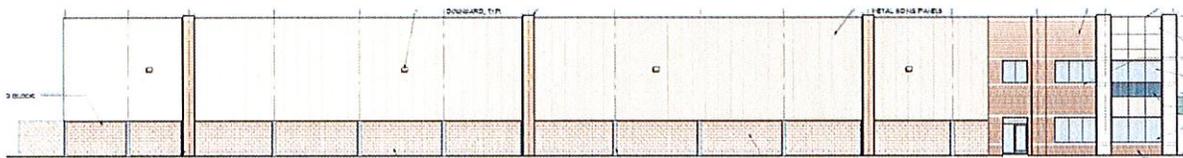
Eric Pietsch
Senior Planner



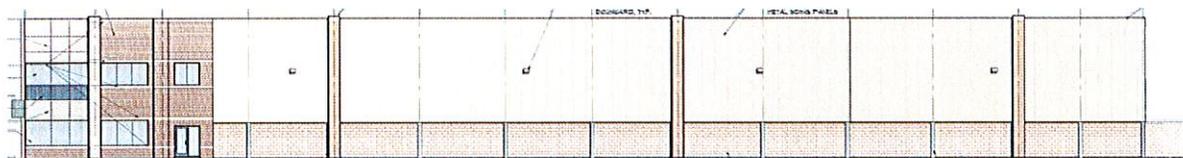
ELEVATIONS



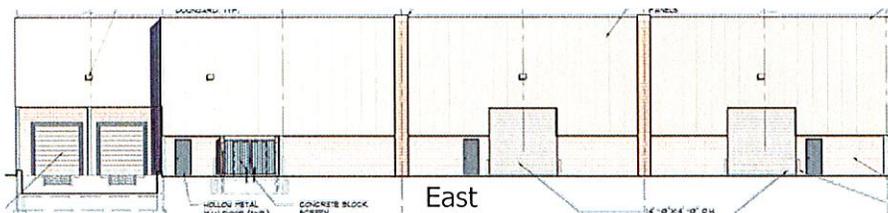
West



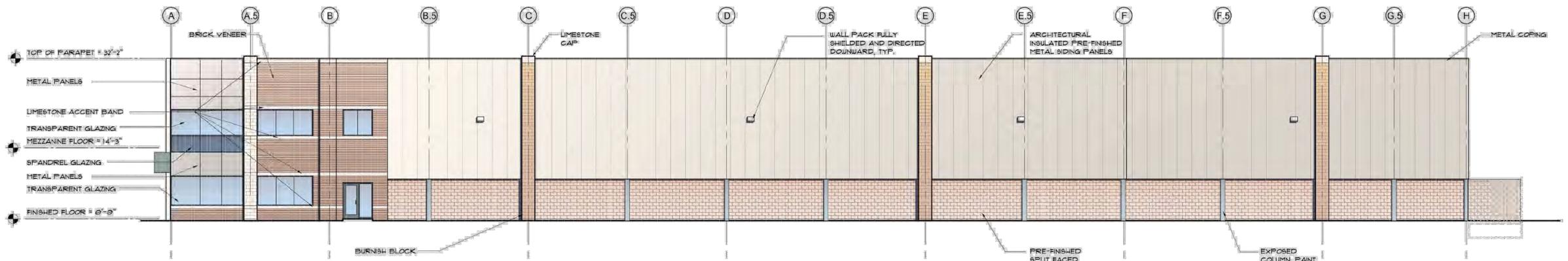
North



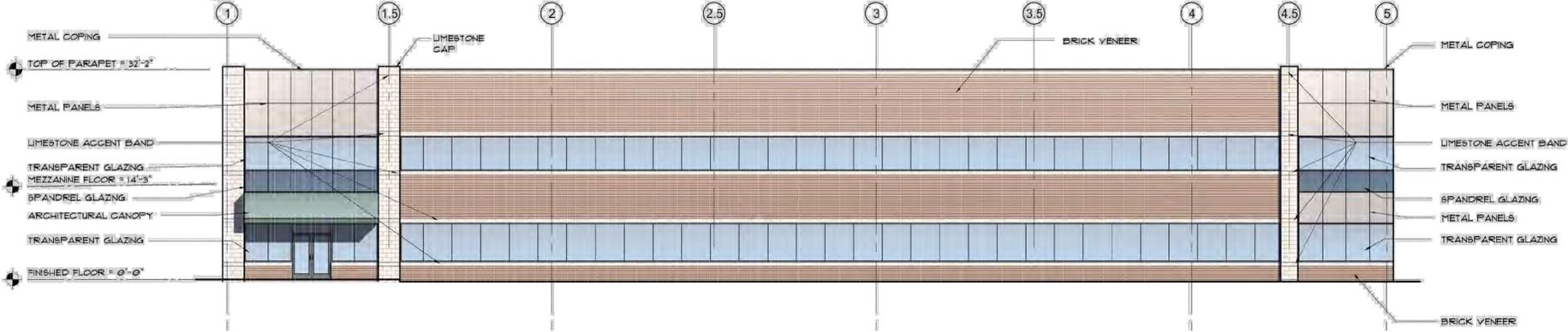
South



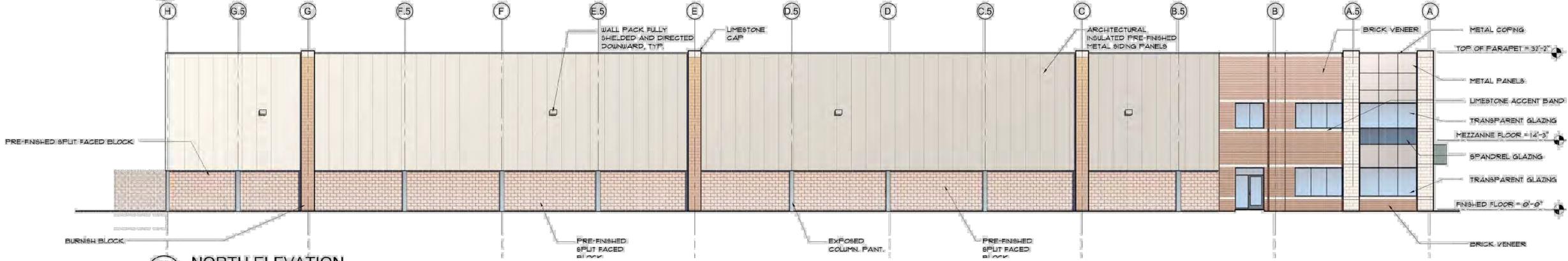
East



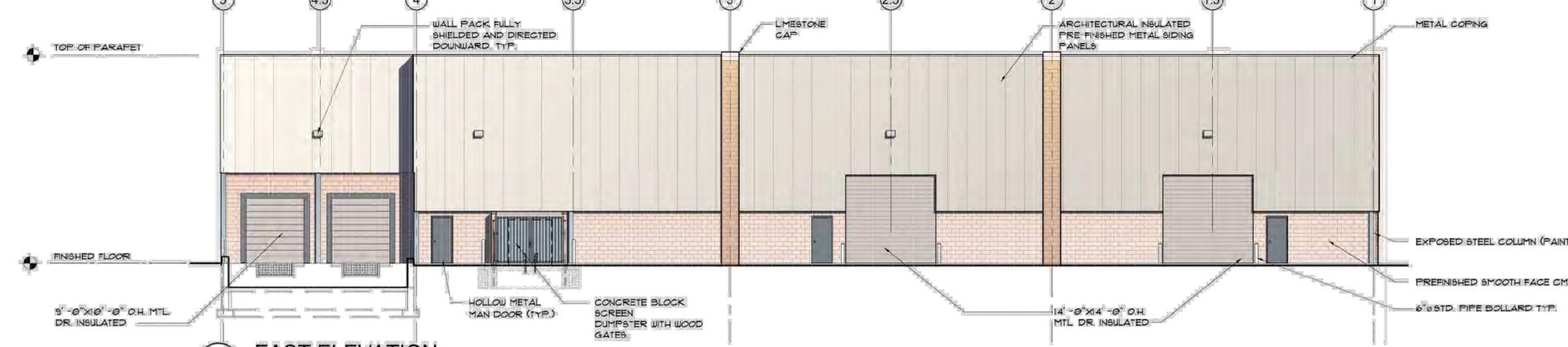
A SOUTH ELEVATION
 SCALE: 3/32"=1'-0"



B WEST ELEVATION
 SCALE: 3/32"=1'-0"



C NORTH ELEVATION
 SCALE: 3/32"=1'-0"



D EAST ELEVATION
 SCALE: 3/32"=1'-0"

Project
 50 KAY INDUSTRIAL DR.
 ORION TOWNSHIP, MI.

Client
 KAY INDUSTRIAL LAND, LLC
 38700 Van Dyke, Suite 200
 Sterling Hgts., MI 48312

REVISION SCHEDULE	
DATE	DESCRIPTION
12/23/2021	OWNER REVIEW
1/12/2022	CLIENT REVIEW
1/15/2022	OWNER REVIEW
1/25/2022	OWNER REVIEW
1/31/2022	OWNER REVIEW

DRAWN BY: MDT
CHECKED BY: BSG

BUILDING ELEVATIONS

RECEIVED
 October 27, 2022
 Orion Township
 Planning & Zoning

Project Number
21-219
 Drawing Number

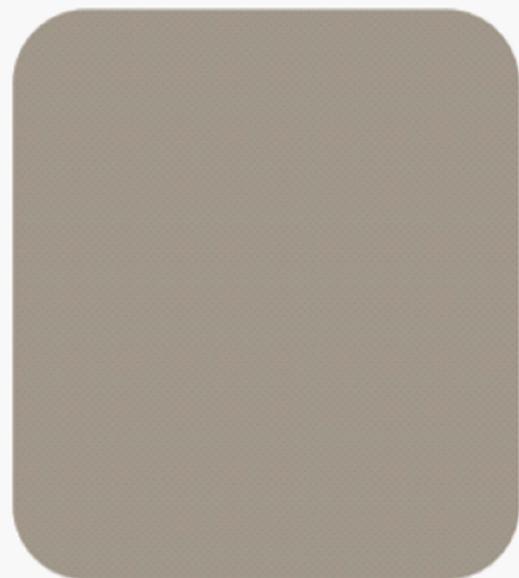
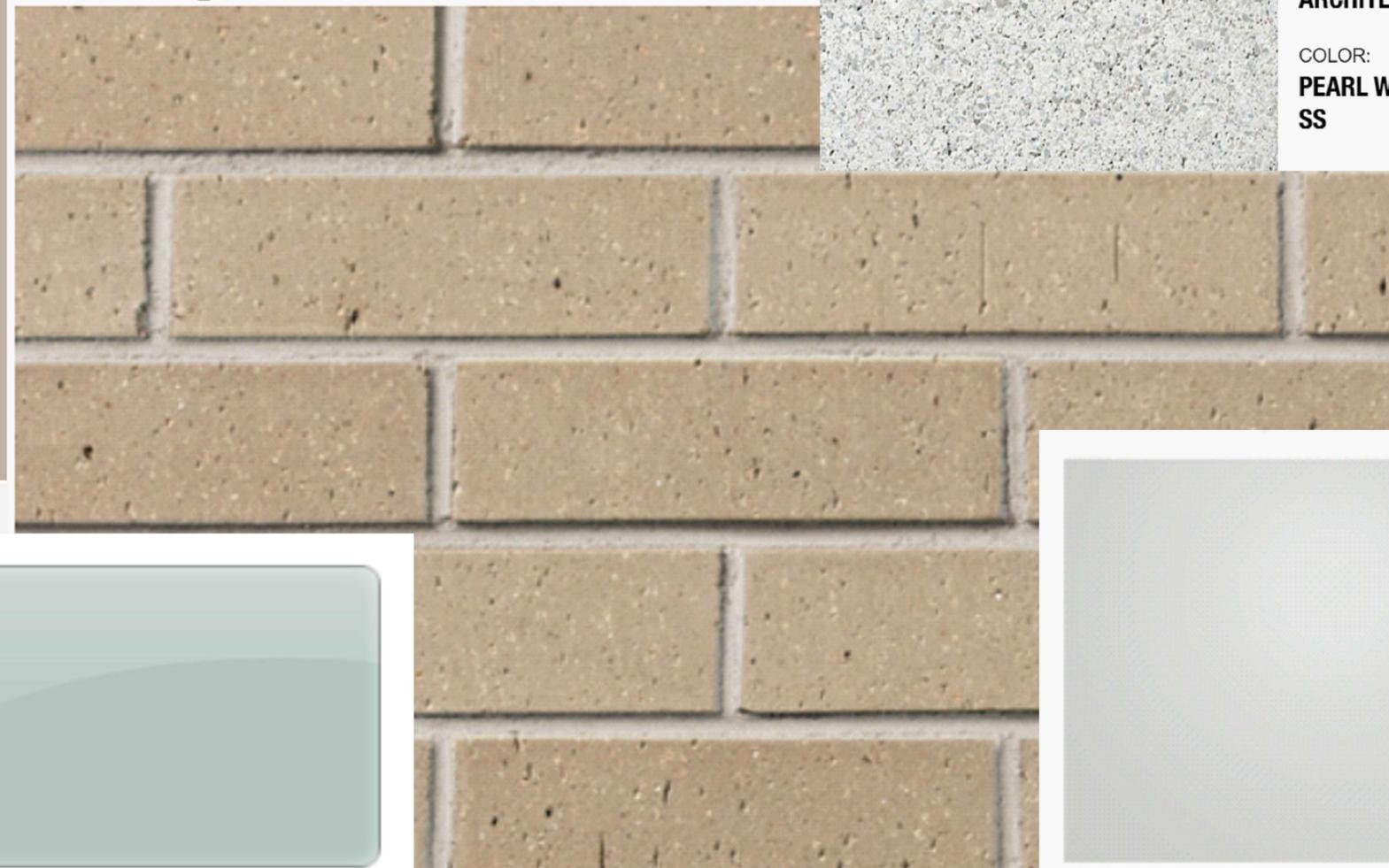
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Interior / Exterior
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Color Image:

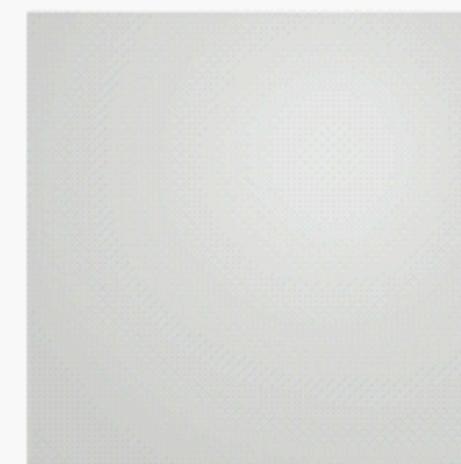
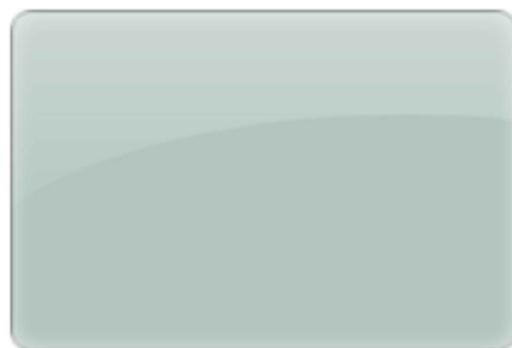


PRODUCT:
ARCHITECTURAL

COLOR:
**PEARL WHITE -
SS**



Taupestone
SR:0.27 E:0.86 SRI:26



Silversmith
SR:0.53 E:0.79 SRI:59

ISSUE: _____

- PRELIMINARY
- APPROVAL
- PERMIT
- CONSTRUCTION

REVISIONS:

- 05.24.2021 PRELIMINARY
- 10.17.2022 SITE PLAN APPROVAL

PROJECT:
50 KAY INDUSTRIAL

JOB CODE: _____

ADDRESS:
PART OF THE SE 1/4 OF SECTION 35, T4N, R18E
(ORION TOWNSHIP, OAKLAND COUNTY, MICHIGAN)

SHEET TITLE:
Material

SCALE: as noted

DRAWN BY: _____

CHECKED BY: _____

SHEET:

Material Chart

Secretary St. Henry said so this is the processing of marijuana for adult recreational use. He just wanted to understand exactly what the difference was between this and some of the other ones they have looked at.

Planning & Zoning Director Girling said there are several categories within Ord. #154, and this is one of the categories that is allowed.

Moved by Vice-Chairman Gross, seconded by Trustee Urbanowski, that the Planning Commission grants the approval of the application, as required per Ord. #154, for PC-2021-95, Lifted Investment for Adult Processing located at 4611 Liberty S. (parcel 09-34-300-018) based on the fact: that this property is located within an IP zoning district; it meets all the distance requirements as required in Ord. #154; is located in a building that has an ingress/egress to a road with less than 6,000 vehicles/day; is located in a building that has an ingress/egress road that does not serve as a road to residential zoning or residential properties. This recommendation approval is based upon the condition that it meets all other applicable Township Ordinances and standards of the Township and, prior to opening, shall demonstrate to the Township that it meets all the rules and regulations promulgated by the State Marijuana Regulatory Agency (MRA).

Roll call vote was as follows: Walker, yes; St. Henry, yes; Gross, yes; Gingell, yes; Brackon, yes; Urbanowski, yes; Reynolds, yes. **Motion carried 7-0**

8. UNFINISHED BUSINESS

A. PC-2021-51, Kay Industrial Site Plan, located at 50 Kay Industrial Dr., parcel 09-35-400-033.

Ms. Maria Lukosavich on behalf of Kay Industrial, LLC, 38700 Van Dyke Ave., Suite 200, Sterling Heights, MI presented.

Ms. Lukosavich stated that they are there again, and Mr. D'Agostini had every intention to be present tonight he was sick, and Sara is out of town on a commitment that she could not reschedule.

Ms. Lukosavich said that the 50 Kay Industrial is in the Kay Industrial Park, it fronts Lapeer Rd., and Kay Industrial Rd. This parcel is 3.12 acres, it is zoned (IP) Industrial Park, there are no wetlands to contend with. The footprint of the building is 45,060-sq. ft. with approximately 5,400-sq. ft. of office. It does have an optional mezzanine which would be a total square footage of 50,460. This is a speculative building it would be the building shell that they would be constructing initially and the outside improvements. They did receive some setback variances back in July. Apart of their meeting here today they would be requesting some waivers. The first waiver that they would like to discuss, they did not submit a floor plan because it is a speculative building, they don't have a tenant, so they don't have a firm interior floor plan to offer at this time. There was discussion in the plan reviews about tree survey and removal permit. The previous owner Joe Kay he did previously clear this lot some time ago. The trees that are there now, and she had pictures they are inferior trees or scrub trees, they are not specimen trees that they would think to preserve in this industrial park. These are developed lots that front a street, it has storm sewer, and utilities available. The tree survey was triggered by the requirement that parcels over 5-acres are subject to the tree removal permit requirement. There are two lots that they are presenting, they do share a corner, the corners do touch, they are not truly continuous in the sense that they have a large adjacent border where they would contemplate wanting to be able to control tree removal for land development purposes. Furthermore, the tree removal that is taking place is in the building envelop and the Ordinance

contemplates not requiring a tree permit in this type of situation, so they are asking for the Tree Removal Permit for both this lot and the next lot that they would be presenting.

Ms. Lukosavich stated that the landscape waiver, there is a detention area that fronts Lapeer Rd. and there is some vegetation and trees in this detention area. She added that in the plan review comments there is the hedgerow requirement on the west side of the west parking lot. For a couple of reasons, they would like to propose moving this hedgerow to the streetside. Primarily in their experience vegetation or landscaping that's immediately adjacent to the parking doesn't do so well with snow removal and salt. Also having the access to the pond for maintenance of the detention area, they would like to maintain that availability. There is a natural buffer which she thought the intent of the ordinance was to shield parking from any street sides, and because they have space there, and they are proposing trees along there, she thought they had an adequate buffer. The waiver that they would be requesting is possibly moving this hedgerow requirement to dress up the street side.

Ms. Lukosavich said regarding the façade, the one requirement that is most concerning for industrial use is over 100-linear ft. The ordinance requires projections or indentations in the facility, and this north side of the building which would be primarily the shop, complying with that ordinance would compromise the use and functionality of that shop. Typically, industrial users would either rack this wall, they would have equipment on the wall, they would have conduits, electrical services, and air-lines on the wall. Having indentations or projects on that wall would not be ideal for the functionality of the space. They do want to enhance this north side that faces Kay Industrial with a brick façade.

Ms. Lukosavich stated that regarding the elevations they are proposing a brick veneer with metal panel siding similar to what is on the opposite side of the street with Kay Automotive, and then they can soften it up with some landscape features. The façade that they are proposing would be on the front of the building a neutral utility brick, stone details, ribbon windows. They are capping the building with glazing on the corner. They are proposing an entrance canopy to draw attention to the front entrance. The façade, they believe meets the spirit of the Lapeer Overlay District.

Ms. Lukosavich said that other items that were brought up in the reviews were roof screening for rooftop units. They would comply with that obviously and provide any roof screening required. Right now, because it is a spec building, they don't know where rooftop units would be located on the building, so they haven't specified where that would be. For practical purposes, they strategically located rooftop units in the middle of the building so the parapet usually adequately screens any rooftop equipment. If it is towards the sides they will plan accordingly and will make sure everything is properly screened.

Ms. Lukosavich said regarding wheel stops they will comply and provide wheel stops where required in the parking lot where parking is up against landscaped areas. There were some details with the photometric that need to be updated so that the photometric plans fully comply, including the lighting fixtures being parallel with the ground, there were some fixtures specified that had a tilt on the head but they will put the ones that are parallel with the ground and any timing requirements with the lighting in terms of them either dimming or shutting off if not in use at the time.

Planner Arroyo read through his review date stamped November 24, 2021.

Engineer Landis read through his review date stamped November 24, 2021.

Commissioner Brackon asked regarding the floor plan waiver, he understood the reason for it given that there is not a tenant yet, is there a way to delay that until a tenant is found, and that tenant has to apply for the floor plan waiver? In other words, without having to give up the right to do whatever they want because they are waiving it now? Planner Arroyo replied that this comes up sometimes and he thought that they could come in at a later stage when they have a better feel. He thought it could be conditioned upon a floor plan being submitted. He thought it could be administratively reviewed unless there is a reason that the administration sees that it needs to come back. He had no issues with recommending that they approve that subject to an administrative review of the floor plan at a later date. Planning & Zoning Director Girling said that could also cover the screening of the HVAC.

Chairman Reynolds stated that he was happy to see a speculative being constructed for use. He echoed a couple of the professional consultant's comments specific to mechanical and things just to make sure that it is planned out that that would indeed be rooftop moving for not ground-mounted, they have had issues in the past with spec buildings being constructed and then they say, oops it doesn't fit and then they are moving stuff around and making it work. So, as long as there is a game plan for that in the future. Ms. Lukosavich said they strategically oversized joists in the design to contemplate either doing rooftop units to fully condition the space or these buildings oftentimes get makeup errors in a couple of strategic locations. There are not too many options on conditioning that building and they planned accordingly by sizing the joist so they can put them where they need to.

Chairman Reynolds said that he agreed with the comments from both consultants for the trees. It is something that is tricky there is a large development area and therefore most of the trees fit within that within the spirit of the ordinance. He would be open, he thought the ordinance outlines either landscape architects or an arborist to essentially just provide a letter saying that there are no landmark or historical trees, he would be open to that. As long as they are all on the same page and staff agrees to that letter. He was not in favor of waiving the Lapeer Overlay Design Standards he agreed that there were some nice materials being proposed but thought there was the ability to meet them, he didn't think the spirit of the ordinance was to inhibit interior use but rather create some rhythms and some potentially in masonry even with a four or twelve-inch step, that just breaks up a 100-ft. façade. He thought that could be easily met even with some of the materials that are being proposed.

Commissioner Brackon said he didn't understand the reason for wanting to move the landscaping? He said it seems like such a minor issue compared to everything else that is being asked for why even bother? Ms. Lukosavich replied that they do want to move that hedgerow to that north side. Commissioner Brackon said if they wanted everything else why not say, "hey we are willing to put in the hedgerow where it is planned and add the additional hedgerow". Ms. Lukosavich replied that they were actually good with that, for the maintenance of the pond, and just as property managers they know that the plantings don't do very well adjacent to parking areas with snow removal, salt, and such. To put a hedgerow if the Planning Commission feels strongly about it, they will surely comply. They do intend to soften the north property line dress it up with some plantings, and if they wanted to add some different maybe doing a combination of split-face brick and maybe different panel heights, they could propose some options. For the functionality of the inside, they don't want any major protrusions into the space, as long as they are able to maintain a straight wall on the inside that is important for the users. Chairman Reynolds said he didn't know if that answered Commissioner Brackon's question or not she was kind of answering both? Commissioner Brackon said he understood it as they would be willing to concede. Ms. Lukosavich said to satisfy the Planning Commission, move forward, and get approval they would be glad to put in that hedgerow on the west side as well as dressing up the north side with plantings.

Chairman Reynolds said he was not looking to inhibit interior floor space. They have asked other industrial buildings to do similar things, to create some pilasters, relief of the façade. He didn't think it was intended to necessarily be anything crazy ornate but rather create some nice scale and rhythm through those neighborhoods. He knew some of the buildings that have been the comments in the past when they have been super long facades and it is very plain Jane and they understand it is an industrial area but they still want to continue to raise the bar and promote nice facilities.

Commissioner Walker said he compares this to the request for the PUDs that they have gotten recently. The petitioner is in front of them asking for a number of things and thought it was the second time that they have been here on the subject. He thought there were way too many moving parts as far as he was concerned. He is the tree guy on the board, and the cavalier that these are just scrub trees, they don't have to deal with that, but they have a Tree Ordinance to do that. Even if those trees didn't qualify for that ordinance, you would think it would be nice for them to say that they will put some greenery around the project. There are a number of objections still from the Planner and from the Engineer and thought there was too much. They often go too far he would rather have them back having this stuff fixed and then asking. The Zoning Board has already granted them six variances on this property. It is not that the Township is taking a really hard look at this they are trying to help them but thought what they were asking for was asking them to help them too much as it is presented right now.

Ms. Lukosavich said that they would be glad to have their landscaping architect, actually, he was already out to the site to give them an opinion of the vegetation that is out there, they would be glad to have their landscape architect write the letter that they had suggested. With respect to some of the comments on both the Giffels and OHM reviews and speaking with Engineering Landis, she felt they agreed in their previous discussions that a lot of those comments could be addressed and erected during the engineering phase of the development. Engineer Landis said that there were comments on the next case that he thought that they could push to engineering. The items on the letter for this particular case he thought should be addressed at site plan. Ms. Lukosavich said that the limitations of disturbance where it matches the existing grades that is something that she understood that they could address during the engineering phase. With the photometrics, in identifying the lighting poles that peripheral photometrics, where it was deficient around the perimeters, they were going to add the lighting poles to the perimeters. The description of the land use because it is a speculative building short of being an industrial shell, they don't have a land use at this time. The pavement section having more detailed sections she thought that these were items that could be done during the engineering phase. The letter they discussed, addressed the tree survey ordinance with a letter. She respectfully requests that the site plan be approved as it is today, and they can address these comments in the engineering phase if at all possible.

Commissioner Gross thought that there are a number of these issues that are basically administrative items that need to be resolved during the actual submission of detailed engineering plans. He liked the fact that the applicant is maintaining the large setback from Lapeer Rd. with the detention pond in the front which is complimentary to the detention pond property to the north. That additional setback does provide some relief to the architectural façade of the building. He thought that the façade that they are showing for the Lapeer Rd. frontage is acceptable in terms of their overlay district. The north wall could use some additional relief just some architectural relief to soften it up and the applicant has indicated that there is an opportunity to use different materials along that north wall to provide some visual relief of that north wall. He thought both the planner and the engineer have identified some issues that can be resolved internally and administratively. He was prepared to move forward with this.

Chairman Reynolds said that he agreed he is always in favor of moving forward with projects with the chance to keep development rolling along. He stated that he will still promote to not waive the Lapeer Overlay Standards, he thought that should be demonstrated and a revised elevation was his only response to that. He would be in favor of some administrative reviews of some of the other items as long as they don't trigger the intent changing drastically from what they were seeing now. Ms. Lukosavich asked if the revised elevation was that something that they could move forward with? She asked if he was suggesting approving conditioned upon a revised elevation for the north façade? Chairman Reynolds replied correct; it doesn't necessarily just apply to just the north façade but rather the design standards outlined in Giffels review but specific to providing relief on a 100-ft. façade of canopy's, projections, recesses, just various things that relieve that façade.

Trustee Urbanowski said her problem with that is it is not an administrative thing. They could resubmit it and then who is going to review it? That is one of the things they do is the waivers, it is not an administrative thing.

Ms. Lukosavich said one of the things that she did want to point out was she didn't know how familiar everybody was with the subdivision. It is an older development and the surrounding facilities this is the Kay Industrial facility that is right across the street. Again, they see brick below with the siding above. This building will very much meet or exceed the architecture already in the development, and the spirit of the elevations she thought was consistent with the Lapeer Overlay District. The facility would look very similar to this with the canopies that were proposed over the entryways.

Commissioner Brackon said in order to grant a waiver for this ordinance there is a standard that has to be demonstrated that was presented here. Consistency with the buildings around it is not part of that standard. The standards required would prevent reasonable use of the site. He hasn't heard anything that the ordinance requirements would prevent reasonable use of the site. Ms. Lukosavich said for the reasons that she mentioned before were their concerns with the shop portion of the building. If they had indentations along these walls that are primarily shop walls it would compromise the functionality of the space, and for industrial users that is very important.

Commissioner Brackon said they don't even know if there are going to be shop walls yet because there is no tenant. Ms. Lukosavich stated that there is no tenant at this time but they own and property manage several million square feet of space and the requirements are somewhat typical. They want straight walls for either racking, crane weighs, equipment modules, robotic modules, assembly lines, various things, it is very much a linear footprint.

Ms. Lukosavich said to Chairman Reynolds point they could do some different things with the masonry to enhance the perimeter elevations as long as it doesn't compromise the interior of the building.

Commissioner Brackon said the existing site design, he thought that they don't even have that yet, the architectural, parking driveways, which would make the application of the standard impractical. He asked if that had been addressed? Or is it too early to even address that? Ms. Lukosavich replied no; what has got them adjusted, as long as it doesn't compromise the interior having straight clean lines on the shop, they could achieve the masonry details that get adjusted. Chairman Reynolds said that Commissioner Brackon's comment that's potentially something that would present a fact of support or lack of support of the waiver. Commissioner Brackon said that was something that he was trying to balance in his head, is it support or lack of support? Chairman Reynolds replied that comment specifically he thought it was more about

if there was a site feature or a site width or something along those lines that would make it impractical to provide that feature.

Secretary St. Henry said what they are proposing is exterior masonry modifications to break up the straight wall, which would most likely have no impact on the interior wall. And they have agreed to that on all walls over 100-ft. long. Ms. Lukosavich replied correct.

Ms. Lukosavich said that the hope was being able to proceed with full engineering and getting the project underway. With lead times and shortages of labor and everything else, they were anxious to get this to the next phase of plan review. If the requirement or the decision of the Planning Commission is to bring it back with some revised masonry details, they will have to live with that decision and get it done expeditiously as possible.

Planner Arroyo stated that one option here could be potentially for conditional approval by the Planning Commission subject to bringing back revised façade drawings which would allow them to start the process of engineering drawings, come back, bring the façade drawings, doesn't slow them down but still gives them the opportunity to see those and approve those separately.

Chairman Reynolds asked for thoughts, ideas on motions, considerations for motions? He added that they have had some mixed discussions here, but it might be worthwhile having something on the table to discuss or amend and work through.

Chairman Reynolds stated that what he would like to do is approve the site plan, get the site plan approval with conditions that were outlined by the engineer and the planner, and delay and action on an Overlay Design Standards Waiver until a resubmission is made relative to the design of the building. That would allow the applicant to move forward with the engineering work on the plans and give them an opportunity to return to them within the next 30-60 days with a revised elevation.

Moved by Vice-Chairman Gross, seconded by Secretary St. Henry relative to the site plan for PC-2021-51, Kay Industrial site plan located at 50 Kay Industrial Dr., 09-35-400-033, that the Planning Commission **grant** site plan approval for the plans date stamped and received 11/10/2021 due to the fact: that waivers have been granted by the Zoning Board of Appeals on July 12, 2021, for a greenbelt and parking setbacks, and dumpster locations. This approval is based upon the conditions that the applicant comply with the Township Planners review letter of November 23, 2021, with items #1 through #5; and that the applicant resolves the issues relative to the Township Engineers review letter of November 23, 2021 items #1 through #6 with the understanding that a tree review will be done by a qualified arborist or a landscape architect regarding the tree inventory and quality of the trees on the site; **the design of the exterior building relative to the Lapeer Overlay Design Standards be postponed until a revised design plan has been submitted to the Planning Commission relative to the design standards within the district.**

Discussion on the motion:

Chairman Reynolds said there were comments on the visibility of the FDC connection. Ms. Lukosavich stated that the FDC connection right now they have proposed it coming in towards the back of the building. She would suggest putting it somewhere on the south façade where they could have their strobe easily visible and it is on a no parking fire lane, that was a poor choice, she didn't know who proposed that there but the best location would be somewhere in the south façade probably towards the front because

they don't want to be towards the dock wall, and it would come straight off that water main that is being looped around.

Chairman Reynolds said essentially there is an understanding that those comments would be addressed to the liking and approval of the Fire Marshal? Vice-Chairman Gross replied yes.

Chairman Reynolds said so clarification of the motion, is that how you understood it? Secretary St. Henry replied yes.

Chairman Reynolds said on the table they have conditional approval to essentially allow for the applicant to come back with a revised façade that meets the Lapeer Overlay Design Standards to come back before them, along with the opportunity to address all of the comments outlined in Giffels Webster's review, along with OHM's review, and the Fire Marshal review. And those are to be administratively reviewed and are any of those to come back before them as a Planning Commission to review? Vice-Chairman Gross replied if they think it is necessary.

Chairman Reynolds said anyone in Robert Rules can amend a motion, and if there is a disagreement about the motion on the table, they are happy to discuss it.

Commissioner Walker said he heard the motion maker say the actions taken by the Zoning Board as a granting of waivers as opposed to a granting of variances. He didn't know if that would torpedo a motion or not, but he thought that should be clarified. Vice-Chairman Gross confirmed that he meant granted variances by the Zoning Board of Appeals.

Trustee Urbanowski questioned where the dumpster was going? Ms. Lukosavich replied that they are not moving the dumpster. The Fire Department had a concern with the FDC connection, the Fire Department connection into the building is being brought in through the back and is being proposed back by the dumpster. He agreed with the Fire Department, it is a poor location as a practical matter, there is a possibility for there to be debris placed here. The appropriate area for an FDC connection would probably be somewhere along the south side of the building where it is fully accessible to a fire/water truck to charge the system. It would come straight off that water main that is proposed, and just have a lead straight into the building.

Chairman Reynolds wanted to clarify that it would be the intent for these to be rereviewed by their professional consultants. He asked if that was their intent? Vice-Chairman Gross said that those are details within the various engineering standards and intended for them to be rereviewed.

Ms. Lukosavich stated that they are very eager and anxious to get development going in this Township. They are excited to do business here. Between the two buildings, they anticipate this being about an 8-million-dollar investment on the shells. They would be glad to bring a new proposed façade back for the Planning Commission's review and would be very excited to move forward on a conditional basis with all of the other items addressed. She added that she did want some clarification, was it a letter or, did they want a full tree inventory? Vice-Chairman Gross replied revied by a landscape architect or an arborist. Ms. Lukosavich said that they did have a landscape architect out to look at the site and was confident that they could fully satisfy that request.



Charter Township of Orion

2323 Joslyn Rd., Lake Orion MI 48360
www.oriontownship.org

Planning & Zoning Department

Phone: (248) 391-0304, ext. 5000

TO: The Charter Township of Orion Planning Commission
FROM: Tammy Girling, Planning & Zoning Director
DATE: December 1, 2022
RE: PC-2021-52, Kay Industrial Building Elevations

As requested, I am providing suggested motions for the abovementioned project. Please feel free to modify the language. The verbiage below could substantially change based upon the Planning Commissions' findings of facts for the project. Any additional findings of facts should be added to the motion below.

Lapeer Road Overlay District Design Standards (Ord. No. 78, Section 35.04)

Motion 1: I move that the Planning Commission **approve/deny** Lapeer Overlay Design Standards for PC-2021-52, Kay Industrial, located at unaddressed parcel 09-35-400-044 (a parcel south of 100 Kay Industrial Dr.) for plans date stamped received 10/27/2022 based on the following findings of facts (**motion make to insert findings of facts**).

RECEIVED

NOV 11 2022



November 11, 2022

Orion Township Planning Commission
2525 Joslyn Road
Lake Orion, MI, 48360

Orion Township
Planning & Zoning

Site Plan Review – PC Motion Kay Industrial – East Building

Case Number:	PC-2021-52	Plan Date:	10/27/2022
Address:	50 Kay Industrial Drive	Zoning:	IP – Industrial Park, incl. Lapeer Road Overlay
Parcel ID:	09-035-400-044	Reviewer:	Eric Pietsch Rod Arroyo, AICP
Area:	4.39 acres		
Applicant:	Kay Industrial Land, LLC		

CONCLUSION FROM SITE PLAN REVIEW #3 UPDATED, ELEVATION SHEETS ONLY

The Planning Commission approved the above-referenced site plan on December 15, 2021, given the following conditions related to building and design standards of the Lapeer Overlay District. The modified elevations will be considered for approval by the Planning Commission. The remaining site modifications are considered administrative and are compiled on a separate review letter.

1. Facades greater than 100 feet in length, measured horizontally, shall incorporate projections or recesses, neither of which shall exceed 100 horizontal feet.

Planner Comment: This standard applies to each side of the building, as each side is greater than 100 feet in length. Projections are incorporated with burnish block columns, capped with limestone (5 on the north and south sides and 2 on the west side where the loading bays are located). The front (east) side of the building has limestone accent bands (columns) flanking either side of the main entrance, which includes the projection of an overhead canopy. The remaining east façade incorporates a brick veneer façade, transparent windows trimmed with limestone accent bands, and an additional projecting limestone column.

The rear and two sides of the building are primarily clad with architectural insulated pre-finished metal siding panels on the upper portion and pre-finished, split-faced block on the lower portions. Smooth-face CMU block is utilized on the back side around the loading areas.

2. Ground floor facades that face public streets shall have arcades, display windows, entry areas, awnings, or other such features along no less than 50% of their horizontal length.

Planner Comment: The east side of the building faces the public street, Kay Industrial Drive. The south side of the east elevation is where the main entrance is located and the remaining horizontal length is clad in glass windows on two levels, separated by limestone accent bands and brick veneer. The first-floor entrance includes an overhead, aluminum canopy.

3. Building facades must include repeating patterns of color, texture, and architectural or structural bays of 12 inches in width (i.e. offsets, reveals or projecting ribs).

Planner Comment: Except for the east façade, the second floor of the proposed building is clad in architectural, insulated, pre-finished, metal siding panels. The slight projections of the burnish block columns break the repetitive pattern on both levels, including the first floor, which is covered with pre-finished, split faced brick, except for the rear which uses smooth-face CMU block. The Planning Commission may wish to discuss color patterns with the applicant to further address visual appeal as a design standard.

4. Each principal building shall have clearly defined, highly visible customer entrances consisting of a variety of architectural features such as:
- Canopies, porticos, or overhangs;
 - Recesses/projections;
 - Raised, corniced parapets above the door;
 - Peaked roof forms;
 - Display windows;
 - Integrated tile work and moldings;
 - Integral planters;
 - Pavement/material changes for pedestrian crosswalks

Planner Comment: The entranceway on the east side of the building, facing the street, is clearly defined; however, the Planning Commission may wish to discuss additional features that may enhance the front-facing, east façade that faces the public street.

5. Flat Roofs. Incorporate parapets to conceal rooftop equipment from public view. The heights of the parapets shall not exceed 1/3 of the height of the supporting wall.

Planner Comment: While the elevations of the building do not illustrate parapets or other concealing roof features, Note number 15 on the site plan states that all roof mounted equipment shall be screened per township requirements.

Please see separate PC Motion review for the west parcel, PC-2021-51.

Staff is available to discuss this review.

Respectfully,
Giffels Webster



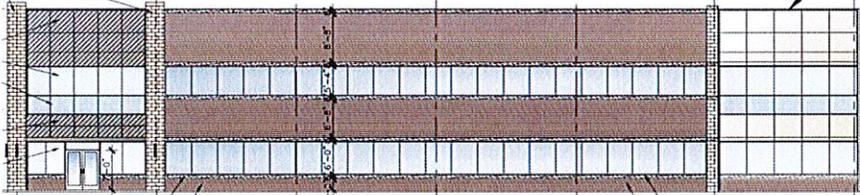
Rodney L. Arroyo, AICP
Partner Emeritus



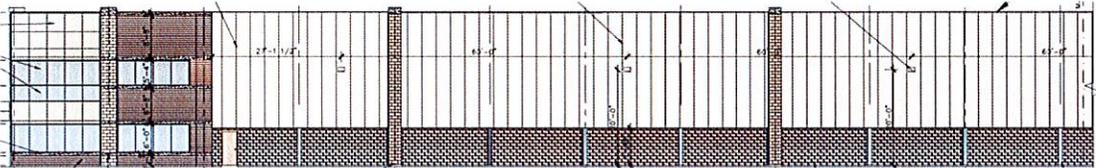
Eric Pietsch
Senior Planner



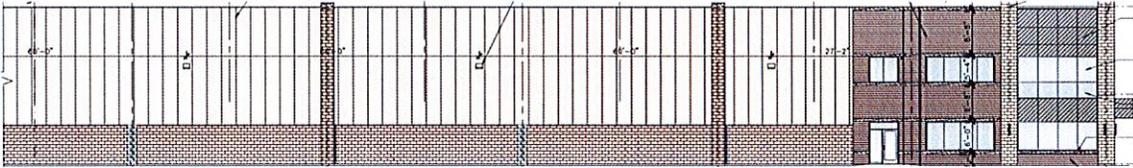
ELEVATIONS



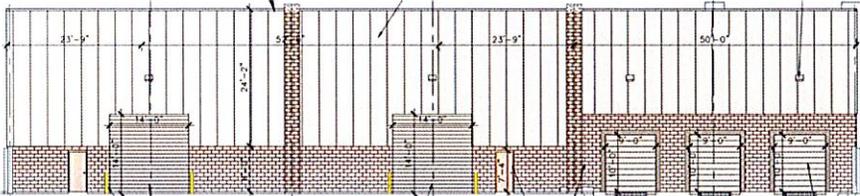
East



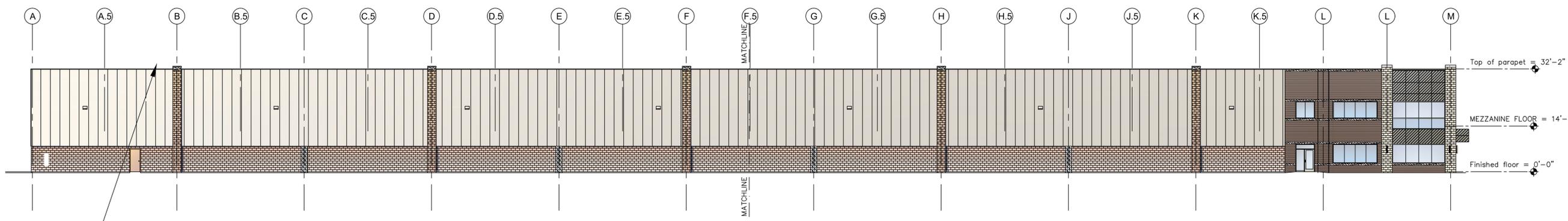
North (portion)



South (portion)

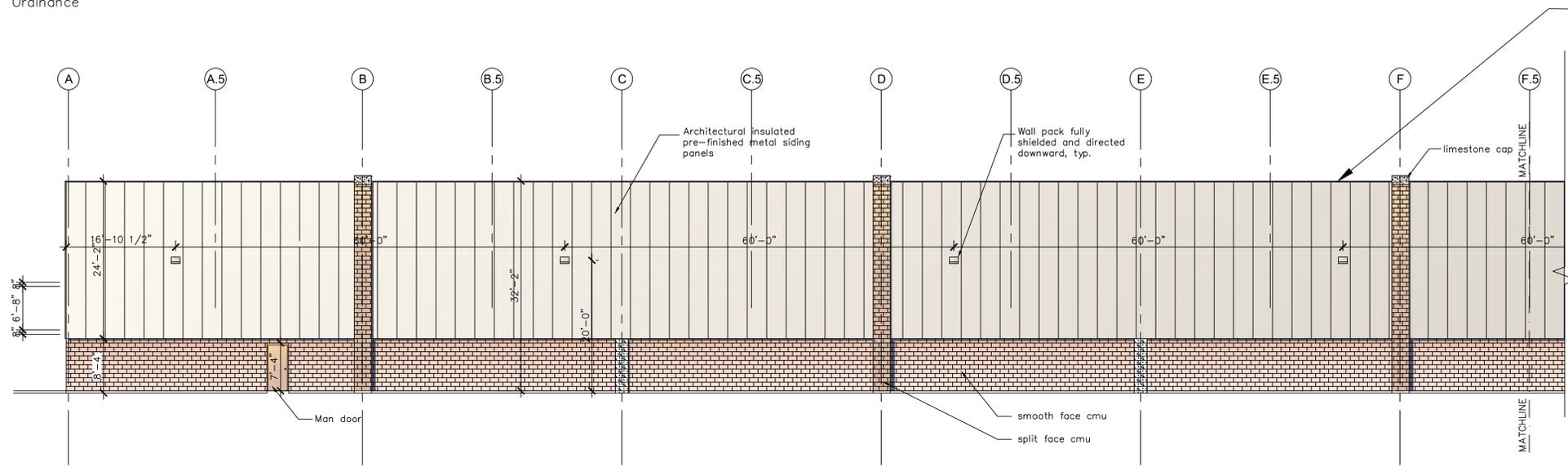


West



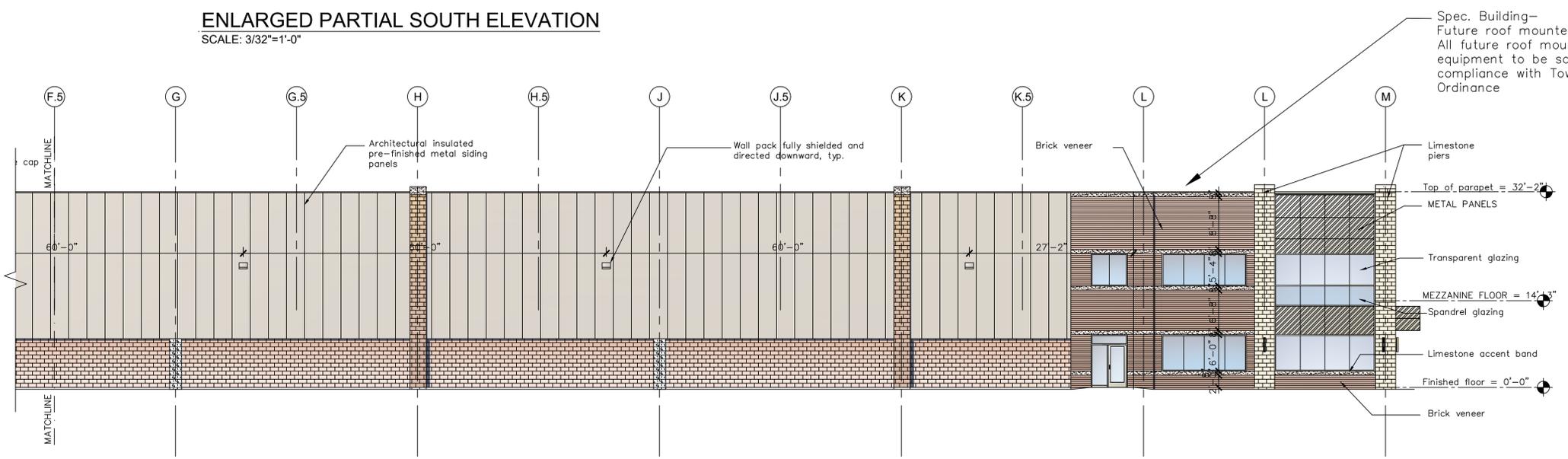
Spec. Building—
 Future roof mounted equipment.
 All future roof mounted equipment to be screened in compliance with Township Ordinance

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



Spec. Building—
 Future roof mounted equipment.
 All future roof mounted equipment to be screened in compliance with Township Ordinance

ENLARGED PARTIAL SOUTH ELEVATION
 SCALE: 3/32"=1'-0"



Spec. Building—
 Future roof mounted equipment.
 All future roof mounted equipment to be screened in compliance with Township Ordinance

ENLARGED PARTIAL SOUTH ELEVATION
 SCALE: 3/32"=1'-0"

Project
 200 KAY INDUSTRIAL DRIVE
 ORION TOWNSHIP, MI

Client
 KAY INDUSTRIAL LAND, LLC
 38700 Van Dyke, Suite 200
 Sterling Hgts., MI 48312

Revision Schedule	
Date	Description
12/23/2021	OWNER REVIEW
1/4/2022	CLIENT REVIEW
1/5/2022	OWNER REVIEW
1/25/2022	OWNER REVIEW
7/13/2022	OWNER REVIEW

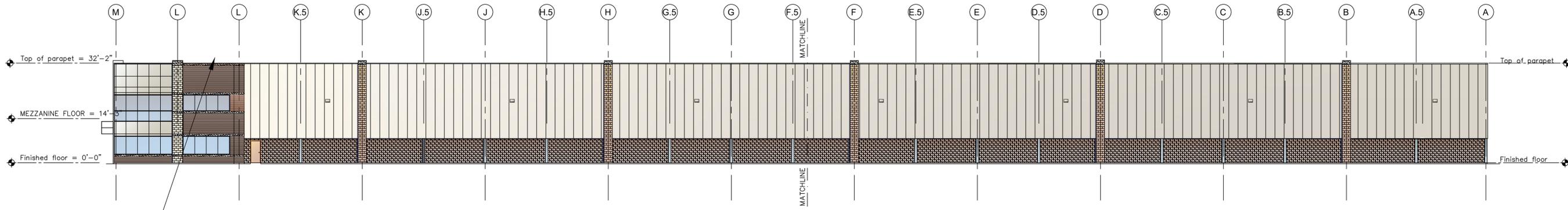
Drawn By: MDT
Checked By: BSG

Drawing Title
BUILDING ELEVATIONS

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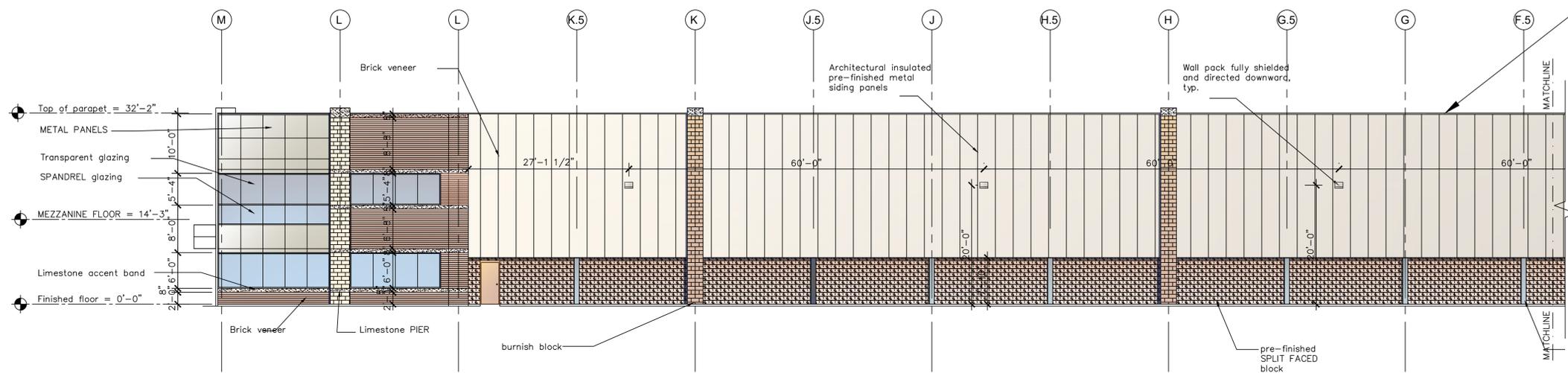
Project Number
21-218
Drawing Number





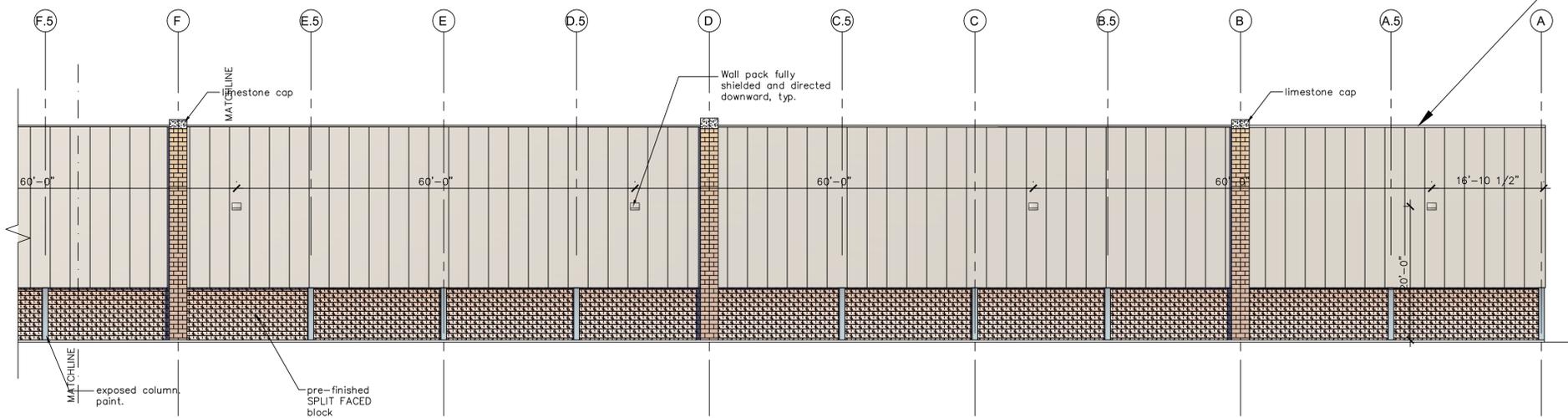
Spec. Building—
Future roof mounted equipment.
All future roof mounted equipment to be screened in compliance with Township Ordinance

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



Spec. Building—
Future roof mounted equipment.
All future roof mounted equipment to be screened in compliance with Township Ordinance

ENLARGED PARTIAL NORTH ELEVATION
SCALE: 3/32"=1'-0"



Spec. Building—
Future roof mounted equipment.
All future roof mounted equipment to be screened in compliance with Township Ordinance

ENLARGED PARTIAL NORTH ELEVATION
SCALE: 3/32"=1'-0"

Project
200 KAY INDUSTRIAL DRIVE
ORION TOWNSHIP, MI

Client
KAY INDUSTRIAL LAND, LLC
38700 Van Dyke, Suite 200
Sterling Hgts., MI 48312

Revision Schedule	
Date	Description
12/23/2021	OWNER REVIEW
1/4/2022	CLIENT REVIEW
1/5/2022	OWNER REVIEW
1/25/2022	OWNER REVIEW
7/13/2022	OWNER REVIEW

Drawn By: MDT
Checked By: BSG

BUILDING ELEVATIONS

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Project Number
21-218
Drawing Number

Project
200 KAY INDUSTRIAL DRIVE
 ORION TOWNSHIP, MI

Client
 KAY INDUSTRIAL LAND, LLC
 38700 Van Dyke, Suite 200
 Sterling Hgts., MI 48312

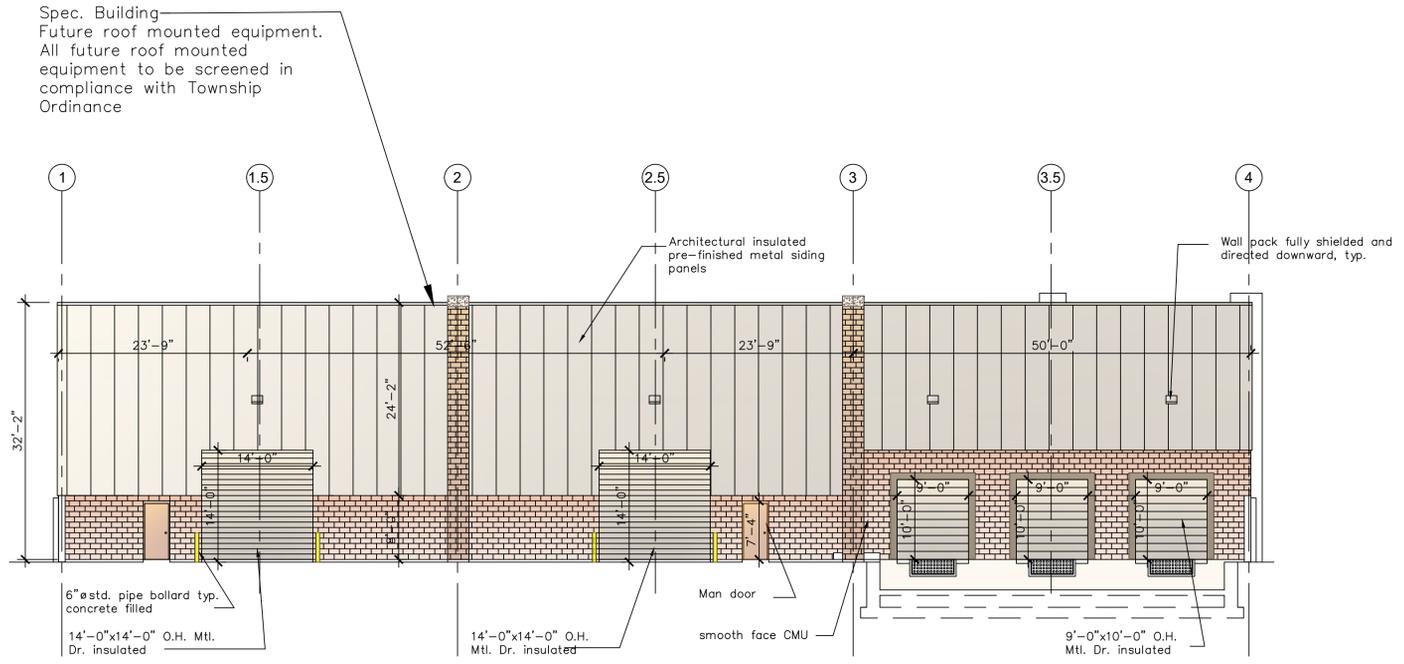
Revision Schedule	
Date	Description
12/23/2021	OWNER REVIEW
1/4/2022	CLIENT REVIEW
1/5/2022	OWNER REVIEW
1/25/2022	OWNER REVIEW
7/13/2022	OWNER REVIEW

Drawn By: MDT
Checked By: BSG

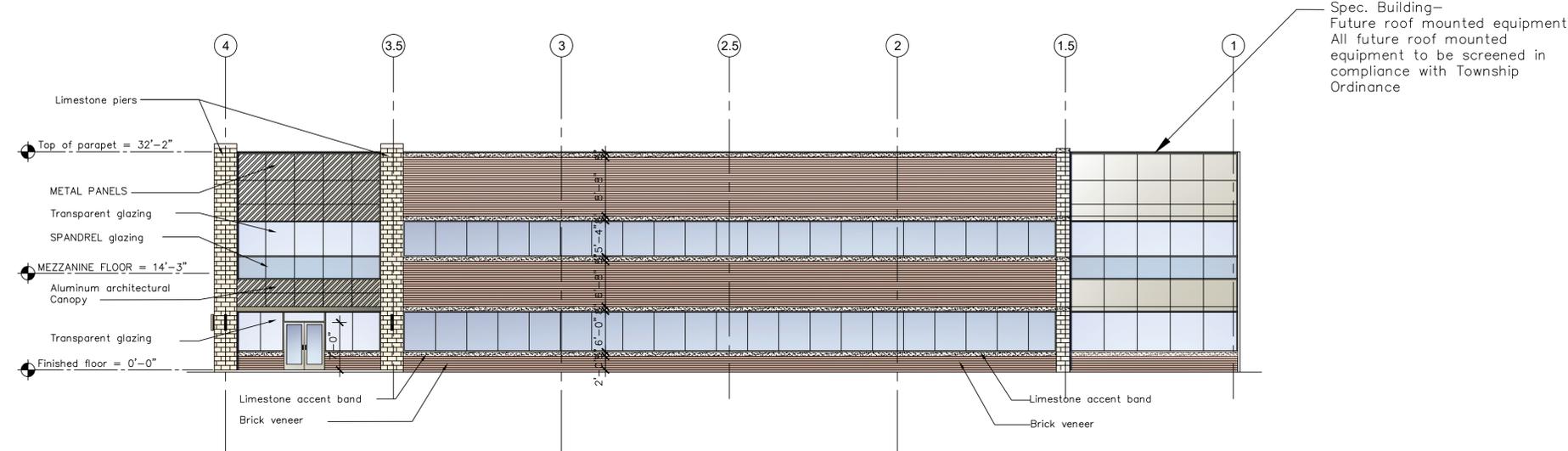
BUILDING ELEVATIONS

Project Number
21-218
Drawing Number

7 of 13



WEST ELEVATION
 SCALE: 3/32"=1'-0"



EAST ELEVATION
 SCALE: 3/32"=1'-0"

SW 7037
Balanced Beige
Interior / Exterior
Location Number: 249-C2

Exterior Wall Paint

Gray Velour
Color Image:

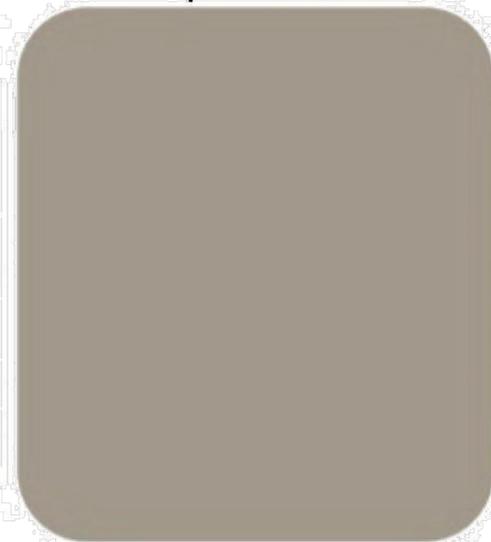
Brick

Stone
Band

PRODUCT:
ARCHITECTURAL

COLOR:
**PEARL WHITE -
SS**

Shop Wall Metal Panel



Taupestone
SR:0.27 E:0.86 SRI:26



Glass

Office
Architectural
Panels

Silversmith
SR:0.53 E:0.79 SRI:59

ISSUE:

- PRELIMINARY
- APPROVAL
- PERMIT
- CONSTRUCTION

REVISIONS:

05.24.2021 PRELIMINARY
10.17.2022 SITE PLAN APPROVAL

PROJECT:

KAY INDUSTRIAL

JOB CODE:

ADDRESS:
PART OF THE SE 1/4 OF SECTION 35, T4N, R10E
ORION TOWNSHIP, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
Material

SCALE: as noted

DRAWN BY:

CHECKED BY:

SHEET:

13 of 13

Roll call vote was as follows: St. Henry, yes; Gingell, yes; Brackon, yes; Urbanowski, yes; Walker, no; Gross, yes; Reynolds, yes. **Motion carried 6-1**

B. PC-2021-52, Kay Industrial Site Plan, located at unaddressed parcel 09-35-400-044 (a parcel south of 100 Kay Industrial Dr.

Chairman Reynolds asked the applicant to state their name and address for the record.

Ms. Maria Lukosavich on behalf of Kay Industrial Land, LLC. 38700 Van Dyke Ave., Suite 200, Sterling Heights, MI, presented.

Ms. Lukosavich said this site is right around the corner from the previous site they talked about. There is the corner where the overlap of the two parcels meets. Some of the conditions are similar to those that they discussed for the previous site. This is a 4.39-acre parcel, it is zoned (IP) there are no wetlands to contend with. The building's square footage is 66,955 with approximately 6,000-sq. ft. of office, and 60,955-sq. ft. of the shop. There is an optional 6,000-sq. ft. mezzanine which would lead to the total square footage of 72,955-sq. ft. Again, this is a speculative building they don't have a specific user, for the reasons discussed in the previous presentation. They would be requesting the Building Floor Plan waiver because they don't have a definite floor plan for the interior of the space. That would be generated once a tenant is identified. The tree survey and tree removal permit for the reasons stated before would be glad to get a letter confirming that none of the trees are of historic nature or would require preservation. The facades they would also be willing to entertain coming back to the Planning Commission moving forward on a conditional basis and addressing any façade issues that they have with the reconvening with the Planning Commission at a later time.

Ms. Lukosavich stated that there were no objections by the Fire Department on this site plan. She said she will let Engineer Landis speak more on the conclusions but there was a couple of items that they determined were not a concern, items #1 & #2 on the items that needed to be corrected and the other items that were discussed in both approvals. The rooftop screening again they were not able to identify where the rooftops went, they strategically locate them so the parapet can cover them if they are not able to be covered by the parapet, they would provide the appropriate screening at that time. There were a few deficiencies on the perimeter of the photometric which they would correct, as well. As stated, the fixtures being parallel, and the timing of the lighting being shut off between 11 p.m. and sunrise they would make sure that the facility once occupied complied until their use required otherwise.

Planner Arroyo read through his review date stamped November 24, 2021.

Engineer Landis read through his review date stamped November 24, 2021.

Chairman Reynolds said as mentioned by the applicant the Fire Marshal did review the project and recommended approval with no additional comments.

Vice-Chairman Gross asked if they had a rendering of the proposed building? Ms. Lukosavich replied they do and showed the Board the elevations. She noted that they don't have a computer-generated rendering, but they did this similar façade at a different facility and a lot of the architectural features that they were proposing are on that building in Shelby Twp. Vice-Chairman Gross asked this is basically at the entrance though? Ms. Lukosavich replied correct. Vice-Chairman Gross said but otherwise it is just a block building? Ms. Lukosavich replied correct. She added that it would be painted CMU on the sidewalls that are adjacent to other buildings, with metal panel siding. The front façade will have stone details spandrel glass, envision glass, and then a canopy, with some metal architectural panels to call out the front

entrance. Vice-Chairman Gross asked if it had glass windows along the front? Ms. Lukosavich said correct.

Chairman Reynolds said that he has similar comments to the previous one. He thought there were some measures that could be taken to meet that Lapeer Overlay Standard. He understood that it was an industrial building but would love to see something a little bit more than just low masonry especially painted CMU and a façade that is blank.

Vice-Chairman Gross said like the previous plan the site plan seems to comply with all the other ordinance requirements. There are some engineering concerns that have to be reviewed but was sure that there will be others as the plan is reviewed that there will have to be some revisions, as well, but it won't affect the site plan. There were some variances granted by the Zoning Board of Appeals previously, the greenbelt.

Moved by Vice-Chairman Gross, seconded by Trustee Urbanowski, the Planning Commission grants site plan approval for PC-2021-52, Kay Industrial Site Plan, located at unaddressed parcel 09-35-400-044 (a parcel south of Kay Industrial Dr.) for the plans date stamped received 11/10/2021 based on: the conditions being satisfied, and the planner's review of 11/23/2021 which apparently have been addressed, as well as the engineers report of 11/23/2021. The fact that the Zoning Board of Appeals granted variances on July 12, 2021, relative to greenbelt and parking setbacks, therefore the plan complies with ordinance requirements. Further, that a review by an arborist or a landscape architect regarding the tree inventory and the character be submitted as a part of the condition. He would recommend approval with the stipulation and condition that the final design of the project be resubmitted to the Planning Commission to ensure that there is compliance with the design standards of the Lapeer Overlay District as required on the sides of the building.

Discussion on the motion:

Chairman Reynolds stated that he did not believe that all of the Giffels Webster comments have been addressed. He asked if he was correct? He added that there is still the hedgerow. Vice-Chairman Gross said that he had indicated that his interpretation is that it complied.

Planner Arroyo said that regarding the hedgerow it appears that it could comply, but they just need more information to confirm the species and the height of the hedge on top of the berm. Provided that is acceptable then it would comply. He thought it looked like they are attempting to meet the spirit of the ordinance, but he just needed some more information. It is an administrative type of review, but they need additional information.

Chairman Reynolds said he would be more comfortable with it because he would like one or both of those reviews to still be included because there are comments on the tree survey. He understood in the motion he is clarifying that but would feel more comfortable especially in the Giffels Webster review in which references mechanical screening and things, as they move forward and kind of reiterate some of the Lapeer Overlay Design Standards that he thought they were looking to meet and would like to include those comments to be met and reviewed.

Vice-Chairman Gross amended the motion, Trustee Urbanowski re-supported that address the comments #1 through #5 in the Giffels Webster review plus anything bold in essentially the review summary. The overlay redesign would still have to come back to the Planning Commission, it would not be done administratively.



Charter Township of Orion
Planning & Zoning Department
2323 Joslyn Rd., Lake Orion MI 48360
P: (248) 391-0304 ext. 5000

TO: The Charter Township of Orion Planning Commission
FROM: Tammy Girling, Planning & Zoning Director
DATE: December 1, 2022
RE: PC-22-39, Hudson Square PUD Concept and Eligibility Plan

As requested, I am providing a suggested motion for the matter mentioned above. Please feel free to modify the language. The verbiage below could change based upon the Planning Commissions' findings of facts. Any additional findings of facts should be added to the motion below. Please note that it was suggested to me that on matters that involve rezonings, PUD's, Special Land Uses, or variances, that I provide language indicating that the matter can be **approved, denied, or postponed.**

Planned Unit Development (Ordinance #78, Section 30.03)

Motion 1: I move that the Planning Commission forwards a recommendation to the Township Board to **approve/deny** PC-22-39, Hudson Square Planned Unit Development Concept and Eligibility plan, located at 3030 S. Lapeer Rd. (Sidwell #09-26-101-021) for plans date stamped received October 20, 2022. This recommendation to **approve/deny** is based on the following findings of facts:

That the applicant **has/has not** met the following eligibility criteria of Section 30.03(B) of the Township Zoning Ordinance and **has/has not** met the intent of a PUD as stated in 30.03A of the Township Zoning Ordinance:

- A. Recognizable Benefit
 - * How will a PUD approval result in a recognizable and substantial benefit to the ultimate users of the project and the community (insert findings of fact)
 - * How would such benefit otherwise be unfeasible or unlikely to be achieved (Insert findings of facts),

- B. Density Impact
 - * Will the proposed type and density of use result in a material increase in the use of public services, facilities, and utilities, in relation to what would be permitted if the property were developed without using the PUD (Insert findings of facts),
 - * Will the proposed PUD place an unreasonable burden upon the subject and/or surrounding land and/or property owners and occupants/or the natural features (Insert findings of facts),

- C. Township Master Plan
 - * Will the proposed development be consistent with the intent and spirit of the Master Plan and community (Insert finding of facts),

- D. Economic Impact
 - * Will the proposed PUD result in an unreasonable negative economic impact upon surrounding properties in relation to the economic impact that would occur from a more traditional development (Insert finding of facts),

- E. Guaranteed Open Space
 - * Does the proposed PUD contain at least as much usable open space as would be required in the Ordinance for the most dominant use in the development (Insert findings of facts),

- F. Unified Control
 - * Is the proposed PUD under single ownership or control such that there is a single person or entity having responsibility for completing the project with this Ordinance (insert findings of facts)

If Recommendation to Approve:

This recommendation is subject to the following conditions:

- A. (Motion maker to list any unresolved issues related to the Township Planner's review letter).
- B. (Motion maker to list any unresolved issues related to the Township Engineer's review letter).
- C. (Motion maker to list any unresolved issues related to the Fire Marshal's review letter).
- D. (Motion maker to list any additional conditions).

Or

I move that the Planning Commission **postpone** action on PC-22-39, Planned Unit Development Concept and Eligibility plan, 3030 S. Lapeer Rd. (Sidwell #09-26-101-021) for plans date stamped received October 20, 2022, for the following reasons (insert findings of facts).

November 10, 2022

Orion Township Planning Commission
2525 Joslyn Road
Lake Orion, MI, 48360

RECEIVED
NOV 11 2022
Orion Township
Planning & Zoning

Site Plan Review no. 1

Hudson Square PUD Concept

Case Number:	PC-2022-39	Zoning:	R-2 – Single-Family Residential GB – General Business, Conditional Rezoning / Special Circumstances
Address:	3030 S. Lapeer Road	Reviewer:	Eric Pietsch Rod Arroyo, AICP
Parcel ID:	09-26-101-021		
Area:	7.07 acres		
Applicant:	Detroit Riverside Capital		
Plan Date:	10/20/2022		

Dear Planning Commission Members:

We have reviewed the above application and PUD Concept Plan, and a summary of our findings is below. Items in **bold** require specific action by the Planning Commission. Items in *italics* can be addressed administratively.



PROJECT SUMMARY

The proposed Planned Unit Development (PUD) is located at the northwest corner of S. Lapeer and Waldon Roads. The 7.07-acre parcel consists of two underlying zoning districts, R-2 Single-family residential and GB General Business. Sole vehicular access to the commercial and residential development is provided along the east boundary via S. Lapeer Road. An existing wetland, largely within the southwest quadrant of the site, will serve as a protected natural feature, incorporating open space and a pedestrian pathway from Waldon Road into the residential area of the development. A drive-through restaurant and classic car club, with attached sit-down restaurant are planned for the eastern half of the site, within the underlying General Business zoning district. The 24 residential apartment units are proposed within the northwest quadrant of the development which consists of the R-2 zoning district.

SUMMARY OF REVIEW

1. **Intent.** The applicant is proposing a Mixed PUD with 24 multi-family dwelling units, a drive-thru only coffee shop, a sit-down restaurant, and a classic car club. Such a mix of uses may be permitted in a PUD subject to Section 30.03.C.3 of the zoning ordinance.
2. **Land Use.** The PUD concept provides for a more appropriate transition from commercial development along Lapeer Road to the higher density, multi-family residential and single family (existing) to the west. The density plan alternative would result in a more abrupt transition between single-family lots and the commercial uses. The new Master Plan reflects a desire for more attached dwelling units, including duplex, quadplex, and other missing middle housing units in appropriate locations. The proposed residential uses are attached multi-family quadplex units.
3. **Conditional Rezone.** In 2019, a conditional rezone allowed for the site for the southeast quadrant of the site to rezoned from R-2 to GB. The rezoning was conditioned upon the preclusion of a number of uses, one of which was drive-thru restaurants. The applicant intends to amend this restriction by way of the rezone to a PUD, and thus allow for the drive-thru restaurant to be considered as a special land use in the GB district.
4. **Off-street Parking.** The residential apartment units satisfy the parking requirements with 2-car, attached garages. An additional 9 on-street, visitor parking spaces are provided. The surface parking spaces provided in the GB zone satisfy the requirement of all proposed uses.
5. **Loading & Unloading.** The plans shall indicate the number of designated loading spaces, with full dimensions that demonstrate there is no interference or obstruction of the functionality and vehicular circulation of the proposed site layout.
6. **Preservation of natural features.** The central-west portion of the site contains wetland / natural features and is proposed to be preserved. A tree survey for the entire site has not yet occurred and is noted to occur at site plan review and Final PUD. The applicant should address any existing trees that are intended to be preserved and those intended for removal.
7. **Landscaping.** A landscape plan is required for a full review at the final plan review stage in order to demonstrate street & parking lot landscaping standards are met.
8. **Lighting.** A lighting plan is required at final plan approval for a full review of overall lighting standards.
9. **Building Height.** The height of the proposed buildings in the GB District (25 ft.) and R-2 District (30 ft.) complies with the ordinance standards.

10. **Improvements in traffic patterns.** The applicant should address how the project was designed to minimize the impact of traffic generated by the proposed development on surrounding uses, as outlined in 30.03.C.7. *We defer to the Township Engineer for further comment.*
11. **Pedestrian access.** The applicant emphasizes the desire to propose building and connecting the safety path network adjacent to the subject site. Internal pedestrian connections from all safety paths to the residential and commercial uses is shown. The applicant should consider an additional safety path link within the public right-of-way to the proposed public amenity, which is currently only accessible via internal private sidewalk links.
12. **Density plan submittal.** The applicant shall specifically state the proposed density of the development. Review and analysis indicate the residential density is approximately 6.52 dwelling units per acre which is higher than the Future Density Plan designation of 3-5 dwelling units per acre. The applicant has provided a parallel plan for comparison.
13. **Building materials.** Conceptual building elevations have been provided, but detailed building material documentation has not yet been submitted. The residential units will be of a modern farmhouse style and material.
14. **PUD Eligibility.** Planning Commission should review the PUD Eligibility Requirements following the waivers section below, and in the ordinance as part of this process. Public benefits proposed by the Applicant include preservation of wetland and wooded areas (28% of site preserved), safety path enhancements, aesthetic site elements, and a public art feature at the corner of Lapeer and Waldon Roads.

Waivers

1. A waiver to allow reduced setbacks of the drive-thru restaurant and its parking facilities to the north property line. Refer to plans and table below.
2. A waiver to allow the three multi-family residential buildings to encroach 5 ft. into the required 35-ft. setback along the north property line.
3. A waiver request to allow portions of the two eastern-most multi-family buildings to cross into the GB zoning district.
4. A waiver request to allow a reduction in width of the drive-thru maneuvering lanes to have adequate width that permit safe one-way traffic movement.
5. A waiver request to allow for one loading facility for the overall commercial development. A secondary loading area is substandard in length and would obstruct a dumpster enclosure.
6. A waiver to allow the internal roadway width, from Lapeer Rd. to the west termination, to be less than 60 feet with 30-foot paving section.



PUD Criteria

The Planning Commission should carefully review the PUD Criteria in Section 30.03. In general, the Planning Commission may recommend variations from PUD guidelines. By doing so, the intent is for the development to result in a corresponding benefit to the community.

The following are some highlighted areas:

Recognizable Benefit.

- a. Preservation of natural features. A tree survey for the entire site has not yet occurred. Some wetland and natural areas are being preserved.
- b. Preservation of cultural, architectural, or historic buildings. N/A
- c. Improvements in traffic patterns. The PUD Intent section states that enhanced traffic circulation should be provided, and a less sprawling form of development should be encouraged. Limiting access to the development to a single point along Lapeer Road will preserve the existing natural features along the Waldon Road right-of-way. The applicant should consider a westward extension of the internal street to tie into a future street network. Refer to additional comment by the Township Engineer.
- d. Improvements in public safety or welfare. Defer to Township engineer regarding traffic safety and public facilities. See letters from other departments for additional input.
- e. High-quality architectural design. The applicant has indicated that attention has been given to enhanced, high quality design. Color renderings have not yet been provided, but elevations with listed materials are included in the plans.

See applicant submittal packet for additional information.

Density impact. The applicant has submitted a parallel subdivision plan. We note that it appears that the plan is not feasible under existing zoning, as access would be directly from a public street that connects to a private drive.

The applicant provided a density plan which compares the site with existing zoning. Maximizing the commercial square footages requires a significant coverage of surface parking. The parking lot is accessible from both Lapeer and Waldon Roads creating a second traffic conflict point. The R-2 district can accommodate 6 single-family homes with the density and natural features limitations, which is the same number of multi-family buildings proposed with the PUD. The applicant acknowledges the increased demand in public services but believes the overall impact is appropriate and in line with the township Master Plan.

Note: The ultimate density shall be recommended by the Planning Commission and determined by the Twp. Board and shall be based upon the underlying zoning or a density as designated by the Master Plan.

Township Master Plan. The Future Land Use map in the new Master Plan is generally consistent with the proposal. The Future Land Use category is High Density Residential, which designates 3-5 dwelling units per acre and encourages the clustering of units around natural features to encourage open space. The portion of the site that fronts S. Lapeer Road is categorized Special Circumstance from when the parcel was rezoned to GB.

Economic impact. This section states that the Planning Commission should determine that in relation to the existing zoning, the proposed development shall not result in a material negative economic impact upon surrounding properties.

Guaranteed open space. Section 30.03.B.5. states that 15% of the site shall be guaranteed open space including usable active and passive upland spaces and trails. Park-like amenities may be provided, and open space shall be equally available to all residents of the development with maintenance and ownership documentation shall be submitted. The plan reflects compliance with the percentages.

Unified control. This is a coordinated and interconnected development under the control of the applicant as outlined in the packet.

OTHER KEY PUD ISSUES.

Compatibility with adjacent uses.

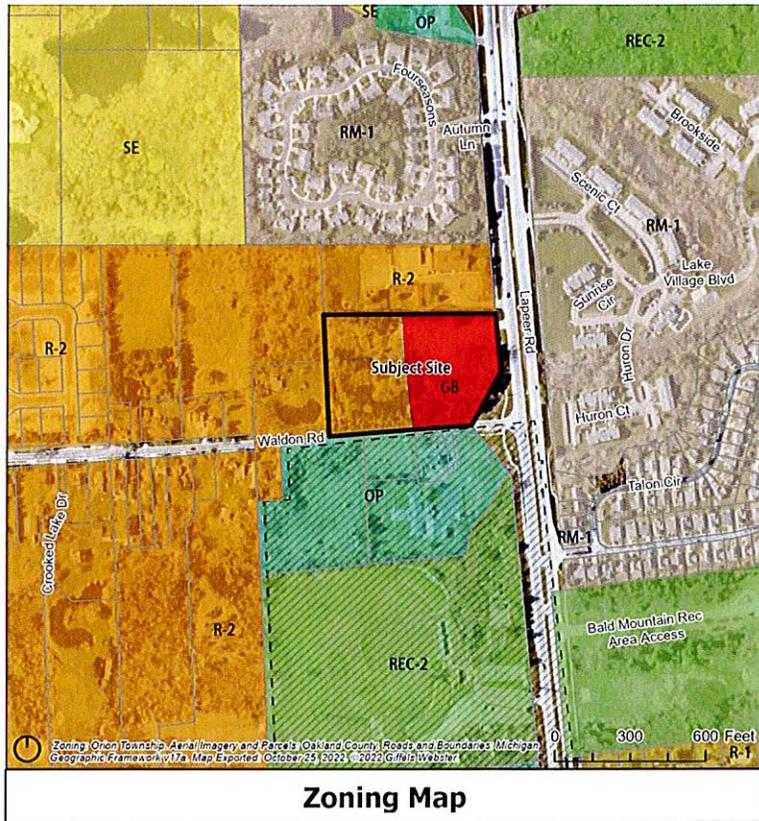
Consideration shall be given to:

- a. The bulk, placement, and materials of construction of proposed structures.
- b. The location and screening of vehicular circulation and parking areas in relation to surrounding development.
- c. The location and screening of outdoor storage, outdoor activity or work areas, and mechanical equipment in relation to surrounding development.
- d. The hours of operation of the proposed uses.
- e. The provision of landscaping and other site amenities.

Transition areas. The applicant is proposing open space and tree preservation as a transition area abutting single-family residential districts to the west and north of the site. Planning Commission should review these transitions with the applicant. The Zoning Ordinance requires that if the grade change adjacent to a single-family residential area is to be varied by more than three feet, the site plan shall include cross sections illustrating existing and proposed grades in relation to existing and proposed building heights.

Architectural and site element design. Residential facades should not be dominated by garages. Where attached garages are proposed, at least 50% of the garages should be side-entry or recessed, where the front of the garage is at least five feet behind the front line of the living portion of the principal dwelling. The intent of encouraging recessed or side entry garages is to enhance the aesthetic appearance of the development and minimize the visual impact resulting from the close clustering of units allowed under these regulations. Some additional detail will be needed to review. The proposed site design features side entry garages, which is consistent with this requirement.

Direction	Zoning	Use
North	R-2 – Single-Family Residential	Divine Grace Church & school
South	OP – Office & Professional	Orion Animal Care Center & Vacant
East	RM-1 – Multi-Family Residential	Indian Lake Village Apartments
West	R-2 – Single-family Residential	Single-family Residential & Vacant



Zoning Ordinance Compliance Tables

1. Underlying District Standards. General Business (GB)

TABLE OF LAND USE AND ZONING		
PIN: 09-26-101-021		
PROPOSED ZONE: PLANNED UNIT DEVELOPMENT (PUD)		
UNDERLYING ZONE: GENERAL BUSINESS (GB)		
PROPOSED USE		
RESTAURANT WITH DRIVE-THRU SIT DOWN RESTAURANT CLASSIC CAR CLUB		
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT AREA	12,000 SF (0.275 AC)	163,195 SF (3.75 AC)
MAXIMUM LOT COVERAGE	30%	5.4% (8,754 SF)
MAXIMUM BUILDING HEIGHT	25 FT	< 25 FT
MINIMUM FRONT YARD SETBACK	30 FT	56.0 FT
MINIMUM SIDE YARD SETBACK	20 FT	N / A
MINIMUM REAR YARD SETBACK	30 FT	52.8 FT
MINIMUM BUILDING CLEAR SPACE	20 FT	PROVIDED
MINIMUM R.O.W. GREENBELT BUFFER	20 FT	52.7 FT
MINIMUM SINGLE-FAMILY GREENBELT BUFFER	30 FT	30.0 FT
MINIMUM OPEN SPACE	10%	PROVIDED
DRIVE-THRU / SINGLE FAMILY SETBACK	100 FT	52.8 FT (M)

(M) MODIFICATION

	GB
Front Yard Setback	30 ft.
Rear Yard Setback	30 ft.
Side Yard Setback	20 ft. on each side
Minimum Lot Area	12,000 sq. ft.
Maximum Lot Coverage	30%
Maximum Heights of All Structures	25 ft.
Minimum Clear Space Around Structures	20 ft.

General Business (GB) Standards (Article XIV)			
Section	Requirement		Comment
14.01 Permitted Uses	All uses within the General Business District shall be restricted to those listed as either permitted principal uses and/or special uses in the underlying zoning district. Single-tenant space shall not exceed 55,000 square feet of GFA.		Restaurant (no drive-thru): Permitted by Right Restaurant (drive-thru): Special Use Car Club (automobile): Permitted by Right
14.02 Conditions for Drive-Thru Special Use	A.	1. Setback. All buildings, drive-thru canopies, or speaker boxes shall be set back no less than 100 ft. from the lot line of a single-fam. or multi-fam. zoned and/or used parcel. Associated parking lots, maneuvering lanes, drive-thru lanes (if applicable) shall be set back no less than 50 ft. from the lot line of single-fam. or multi-fam. zoned and/or used parcels.	Setbacks from North PL Building: 52.8' Drive-thru lane: 30' Menu board: 77' A PC Waiver is required for these standards.
		2. Buffering. All <u>parcel perimeters</u> which abut a single-fam. zoned and/or used parcel shall have no less than a 6 ft. continuous buffer. The buffer may consist of a solid fence or wall, a double staggered row of evergreens, and/or a combination of each.	<i>The final plans shall show compliance of this requirement within the 30' setback from the north PL abutting an R-2 zone.</i>
		3. Noise. Any noise associated with an extended hour use shall not exceed 60 decibels when measured at the property line. The noise shall also not be intermittent in nature, high frequency, or that which causes vibration.	<i>The plans shall demonstrate compliance.</i>
		4. Lighting. Any operation or activity which produces glare shall not cause illumination in excess of 0.3 foot-candles when measured along the lot line of a single-fam. zoned and/or used parcel. Btw. dusk and dawn, the light levels shall be further reduced to 0.0 foot-candles when measured at the same property lines.	<i>The final plans shall include a photometric plan that demonstrates compliance of all lighting standards.</i>
	I.	Drive thru facilities as permitted in this Sect. shall be subject to the landscaping and screening wall requirements of Sec. 27.05	See General Provisions section below.
14.03 Required Conditions	Minimum Parcel Size		
	B.	The minimum lot area shall be 12,000 square feet.	163,195 sq. ft. of the parcel is zoned GB.
	Off-Street Parking		
	C.	1.B. One (1) parking space per 100 sq. ft. of GFA for restaurants.	Drive-thru restaurant: 17 sp. req., 17 sp. provided Sit-down restaurant: 40 sp. req., 40 sp. provided
		1.D. Parking requirements for all other uses in the GB district shall be based upon 1 parking space per 200 sq. ft. of GFA.	Classic Car Club: 15 sp. req., 15 sp. provided
	3. No parking area or driveway shall be closer than 30 ft. to the adj. property lines when the parcel abuts residential zoned or used property. When the parcel abuts commercial/office or	This standard is met.	

	industrial zoned property, no parking area or driveway shall be closer than 20 ft. to the adj. property lines.	
	2. Driveways & parking areas shall be curbed & consist of hard surfaced concrete, blacktop, or equiv. as approved. by the PC.	This standard is met.
	3. All off-street parking shall conform to the standards set forth in Sect. 27.04 of this Ordinance.	See General Provisions section below.
	4. The required setback for parking may be reduced in width or waived by the PC when the parcel abuts commercial/office, or industrial zoned property, & when existing off-street parking, drives, and/or structures are located within the setback area.	This standard is not applicable.
Landscaping		
D.	1. A landscape plan shall be submitted to the PC for approval. The landscape plan shall specify plant materials & landscape treatment, based on the requirements of Sect. 27.05 of this Ord. for such items. This landscape plan shall be part of, or accompany, the site plan.	<i>A landscape plan is required to further demonstrate these design standards, as well as street & parking lot landscaping standards. To be reviewed at final.</i>
	2. A landscaped greenbelt at least 20 ft. in width shall be provided along the entire perimeter of a GB District, except where ingress or egress drives are located when the parcel abuts commercial/office or industrially zoned property. However, when the parcel abuts residentially used or zoned property, the landscape greenbelt shall be at least 30 ft. in width except where ingress or egress drives are located.	This standard is met.
	3. The off-street parking areas & access driveways shall be screened from view from any adjoining residential property. Such screening shall consist of earth berms, permanent walls, or evergreen landscaping subject to approval of the PC.	<i>The landscape plan, once provided, shall demonstrate compliance.</i>
	4. All landscaping & screening shall be maintained in an attractive, litter-free, safe & healthy condition. Maintenance of all landscaping shall be of sufficient frequency to prevent overgrowth & deterioration from the original condition.	<i>The landscape plan, once provided, shall comply.</i>
	5. The landscaped greenbelt required along with the perimeter of the parcel may be reduced in width or waived by the PC when the parcel abuts commercial/office or industrially zoned property. The PC may, at their discretion, modify or waive certain landscaping requirements in accordance with the considerations outlined in Sect. 27.05.	Not applicable. The subject parcel does not abut commercial, office, or industrial zoned property.
	6. Where comm. uses abut res. uses, the PC may req. a greenbelt buffer, berm, or obscuring wall or combination of these methods of screening in accord. with Sect. 27.05 (A)(5).	<i>Staggered evergreen screening is proposed as a buffer btw. the eastern commercial facilities & the western res. facilities.</i>
Sign Regulation		
E.	All signs shall comply with the standards set forth in Orion Twp. Sign Ordinance No. 153.	<i>Signage will be reviewed at final submittal.</i>

Lighting Regulations		
F.	1. A lighting plan shall be submitted with all site plans as set forth in Sect. 27.11 of this Ord. All other Zoning Ord. regulations shall apply unless otherwise noted in this Ord.	<i>A photometric plan is required for review of ordinance standards at final.</i>
	2. Exterior site lighting shall be fully shielded and directed downward to prevent off-site glare.	
	3. Site illumination on properties adj. to res. properties shall not exceed 0.3 foot-candle along property lines, or 1.0 foot-candle along non-residential property lines. Parking lot lighting shall be governed by Sect. 27.11.	
Public Road Access		
G.	Any use developed or proposed within this district shall have direct access to a dedicated public road having an existing or proposed right-of-way of at least 120 ft.	The proposed commercial development has direct access to S. Lapeer Rd., a public right-of-way of 180 ft. wide.
Utilities		
H.	All utilities servicing the bldgs. or structures shall be buried underground.	<i>The plans shall comply.</i>
Covered Trash Areas		
I.	1. Covered trash receptacles, surrounded on 3 sides by masonry brick-type walls 1 ft. higher than the receptacle shall be provided in the rear yard of the bldg. or principal use struct.	<i>The commercial conceptual PUD plans appear to comply. The final plans shall provide greater detail of the covered trash areas.</i> <i>The plans shall indicate how the multi-family portion will dispose of solid waste.</i>
	2. The fourth side of the trash receptacle enclosure shall be equipped with an opaque lockable gate that is the same height as the brick-type wall.	
	3. The PC may, at their discretion, waive the req. for a covered trash receptacle as described herein, if, after considering the nature of the operation being proposed, the PC determines that the amount of trash generated can be adequately disposed of without use of an outside trash receptacle.	
Loading & Unloading		
J.	1. Loading and unloading areas shall be located in the rear or side yard of a non-residential district.	These standards appear to be met.
	2. Loading and unloading areas shall not be located where they will interfere with parking or obstruct ingress and egress.	
	3. All loading and unloading areas shall be in conformance with the requirements set forth in Sect. 27.04.	<i>Refer to the General Provisions sect.</i>
Performance Guarantee Requirement		
K.	The PC shall require a performance guarantee to be deposited with the Twp. Clerk in accordance with the provisions set forth in Sect. 30.09, to ensure that necessary and required improvements proposed on the site plan will be completed.	<i>Applicant to confirm.</i>
Safety Paths		
L.	Construction of safety paths for pedestrian use & use by non-motorized vehicles shall be required in conjunction with the	<i>See General Provisions section below.</i>

	development of all parcels in this zoning district. The safety paths shall conform to the specs. outlined in Section 27.06 & Ord. No. 97.	
Tree Preservation Regulations		
M.	The tree permit requirements apply to developments in this District, according to the terms of Sect. 27.12.	<i>See General Provisions section below.</i>
Wetlands Setbacks		
N.	The wetland setback requirements apply to all developments in this District, according to the terms of Section 27.17.	<i>See General Provisions section below.</i>
Noise		
H.	Regulations regarding the abatement & control of excessive noise are found w/i the Chrtr. Twp. of Orion Noise Ord. No. 135.	<i>The applicant shall comply.</i>

2. Underlying District Standards. R-2 Single-Family Residential

	R-1	R-2	R-3
Minimum Lot Area	14,000 sq. ft.	10,800 sq. ft.*	8,400 sq. ft.*
Minimum Width of Lot	100 ft.	80 ft.	70 ft.
Minimum Lot Setbacks (in feet)			
Front Yard**	40 ft.	35 ft.	30 ft.
Each Side Yard***	10 ft.	10 ft.	10 ft.
Rear Yard	35 ft.	35 ft.	35 ft.
Minimum Floor Area/Unit	1,320 sq. ft.	1,080 sq. ft.	960 sq. ft.
Maximum Lot Coverage	25%		
Total Maximum Floor Area of All Accessory Buildings	See Section 27.02, A, 8		
Height of Structures	30 ft.	30 ft.	30 ft.

*In those instances where public sewers are not provided, a minimum lot area of 12,500 sq. ft. shall be provided.
 ** Where the front setbacks of two (2) or more principal structures in any block (in the case of platted properties) or within three hundred (300) feet (in the case of unplatted properties) in existence at the time of passage of this Ordinance, within the district zoned and on the same side of the street, are less than the minimum front setbacks required herein, then any building subsequently erected within said block (or three hundred (300) feet) shall not be less and not be greater than the average depth of the front setbacks of the existing structures.
 *** Where a garage door or opening faces a side lot line, said side lot setback shall be thirty (30) feet.

TABLE OF LAND USE AND ZONING		
PIN: 09-26-101-021		
PROPOSED ZONE: PLANNED UNIT DEVELOPMENT (PUD)		
UNDERLYING ZONE: SINGLE-FAMILY (R-2)		
PROPOSED USE		
MULTIPLE-FAMILY RESIDENTIAL		
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT SIZE	10,800 SF	N / A
MINIMUM LOT WIDTH	80 FT	N / A
MAXIMUM LOT COVERAGE	25%	N / A
MAXIMUM BUILDING HEIGHT	30 FT	< 30 FT
MINIMUM FRONT YARD SETBACK	25 FT	248.0 FT
MINIMUM SIDE YARD SETBACK	35 FT	65.8 FT
MINIMUM REAR YARD SETBACK	35 FT	30.3 FT (M)
MINIMUM BUILDING CLEAR SPACE	20 FT	30.0 FT
MINIMUM FLOOR AREA / UNIT	1,080 SF	N / A
MINIMUM OPEN SPACE	15%	PROVIDED

(M) MODIFICATION

3. **General Provisions.** The standards in the table below are a summary of the applicable Zoning Ordinance standards in Article XXVI; please refer to the individual sections referenced herein for the full Zoning Ordinance text.

General Provisions (Article 27)			
Condition	Requirement	Comment	
27.03 Yard & Bulk Requirements	Projections Into Required Yards		
	C.	1) In <u>all</u> yards. Awnings and canopies; steps 4 ft. or less above grade which are necessary for access to a permitted bldg. or for access to a zoning lot from a street or alley; chimneys projecting 24 in. or less into the yard; approved free-standing signs; arbors and trellises; flagpoles; window unit air conditioners projecting not more than 18 in. into the req. yard; & fences or walls, subject to applicable ht. restrictions.	<i>The 3 multi-fam. apartment bldgs. closest to the north prop. line encroach into the req. setback by 5'. See section "F" below.</i> <i>PC Waiver / Modification required.</i>
		2) In <u>front</u> yards. Open, paved terraces not over 3 ft. above the avg. grade of the adjoining ground & not projecting farther than 10 ft. beyond the bldg., but not including roofed-over terraces or porches; 1-story bay windows & other architectural features projecting 3 ft. or less into the yards; & overhanging eaves & gutters proj. 3 ft. or less into the yard.	This standard appears to be met.
		3a) In <u>rear</u> yards. Balconies; fallout shelters; breezeways; open porches; one-story bay windows, & other architectural features projecting 3 ft. or less into the yard; & overhanging eaves or gutters projecting 3 ft. or less into the yard.	This standard does not apply. The north prop. line is the side yard from Lapeer Rd. frontage.
		3b) In rear yards. Decks may be permitted to project into a required rear yard when the following conditions are met...	Decks are not proposed with this development.
		4) In side yards. 1-story bay windows and other architectural features projecting into the required yard by not more than 2 in. for each 1 ft. width of side yard; and overhanging eaves and gutters projecting 18 in. or less into the yard.	This standard does not appear to apply.
	Location of Required Open Space.		
	E.	All yards & other open spaces allocated to a bldg. or group of bldgs. shall be located on the same zoning lot as such bldg. or group of bldgs.	<i>The 2 eastern-most multi-fam. bldgs. cross into the GB zoning dist.</i>
	Variances to Yard Regulations.		
	F.	The ZBA or PUD process may modify yard regulations by granting a variance for individual cases where literal enforcement of the provisions of the Ord. would not be reasonably possible or would result in unnecessary hardship. Examples where such variances from yard regulations would be appropriate include: 1) A planned development in a multiple-family district;	<i>See section "C" above.</i> <i>The encroachment into the req. yard necessitates a PUD PC Waiver from 35 ft. R-2 Dist. side yard min.</i>

	<p>2) Cases where the applicability of the regulations on lots existing & of record at the time this Ord. became effective cannot be determined.</p> <p>3) Lots that are peculiar in shape, topography, or site configuration.</p>	
<p>Corner Clearance.</p>		
G.	<p>No fence, wall, structure, or planting shall be erected, established, or maintained on any corner lot which will obstruct the view of drivers in vehicles approaching the intersection. Fences, walls, structures, or plantings located in the triangular area described below shall not be permitted to exceed a height of 30 in. above the lowest point of the intersecting road. The unobstructed triangular area referred to above may consist of either:</p> <p>1) The area formed at the corner intersection of 2 public ROW lines, the 2 sides of the triangular area being 30 ft. in length measured along abutting public rights-of-way lines, and the 3rd side being a line connecting these 2 sides, or</p> <p>2) The area formed at the corner intersection of a public right-of-way and a driveway, 2 sides of a triangular area being 10 ft. in length measured along the ROW & driveway lines and the 3rd side being a line connecting these 2 sides.</p>	<p>These standards appear to be met.</p>
<p>Off-Street Parking</p>		
27.04 Parking and Loading	<p>1a) Scope of Requirements.</p>	
	<p>i.) For all bldgs. & structures erected & all uses of land established after the effective date of this Ord., off-street parking shall be provided as required by the regulations of the districts in which such bldgs. or uses are located.</p>	<p><i>The provided off-street parking shall comply with the parking standards required by the ord.</i></p>
	<p>ii) If the intensity of use of any bldg., structure, or premises is increased through the addition of dwelling units, GFA, seating capacity, or other units of measurement specified herein for req. parking, additional off-street parking shall be provided for such increase in intensity of use.</p>	<p>The site consists of no existing bldgs. proposing additions.</p>
	<p>iii) Whenever the existing use of a bldg. or structure is changed to a new use, parking facilities shall be provided as req. by this Ord. for the new use, regardless of any variance which might have been in effect prior to the change of use.</p>	
	<p>1c) Additional Off-Street Parking. Nothing in this Ord. shall be deemed to prevent voluntary establishment of off-street parking facilities to serve any existing use or land or bldgs., provided that all regulations herein governing the location, design, & operation of such facilities are adhered to.</p>	<p><i>The off-street parking spaces in excess of the ord. requirements must comply with all parking design standards.</i></p>
	<p>1f) Electric Vehicle Charging Stations.</p>	
<p>i) Permitted Locations. When accessory to a principal permitted use, electric vehicle charging stations are permitted in all zoning districts.</p>	<p><i>Due to the foreseeable increase in electric vehicle demand, the PC may consider a</i></p>	

	<p>2a) Electric vehicle charging stations located within parking lots or garages may be included in the calculation of minimum required off-street parking spaces.</p> <p>2b) Public electric vehicle charging stations are reserved for parking and charging electric vehicles only. Electric vehicles may be parked in any space designated for public parking subject to the restrictions that would apply to any other vehicle that would park in that space.</p> <p>2c) Electric vehicle charging stations shall be sized the same as a standard parking space as required in the Off-Street Parking Chart herein.</p>	<p><i>percentage of EV parking spaces as a condition of PUD and site plan approval.</i></p>
	<p>2. General Requirements</p> <p>a) Location. Off-street parking for other than residential uses shall be either on the same lot, or within 300 ft. of the bldg. or use it is intended to serve, if said spaces & uses are located in the same zoning district or zoned Parking District measured from the nearest point of the bldg. or use & the nearest point of the off-street parking lot.</p>	<p>This standard is met.</p>
	<p>Unless otherwise specified in the regulations for each dist., a min. setback of 20 ft. shall be maintained btw. any off-street parking area & adj. property lines. Enclosed bldgs. & carports containing off-street parking shall be subject to applicable yard requirements for the dist. in which they are located.</p>	<p>This standard is met.</p>
	<p>b) Residential Parking. Off-street parking spaces in single-family res. districts shall consist of a parking strip, driveway, garage, or combination thereof & shall be located on the premises they are intended to serve.</p>	<p>This standard is not applicable for this development.</p>
	<p>d) Access. Except on lots accommodating single-fam. dwellings, each off-street parking space shall open directly onto an aisle or driveway of sufficient width & design as to provide safe & efficient means of vehicular access. All off-street parking facilities shall be designed with appropriate means of vehicular access to a street or alley in a manner which will least interfere with traffic movement. Backing directly onto a street shall be prohibited. Ingress and egress to an off-street parking area lying in the area zoned for other than res. use shall not be across land zoned for res. use.</p>	<p>This standard appears to be met.</p>
<p>27.04 Parking & Loading</p>	<p>A. e) Collective Use of Off-Street Parking. Off-street parking space for separate buildings or uses may be provided collectively. If parking facilities for separate buildings or uses are provided collectively, the total number of spaces so provided shall not be less than the number which would be required if the spaces were provided separately. The ZBA may reduce the total number of spaces provided collectively by up to 25% if such reduction is specifically approval as part of the required site plan approval process. Such approval shall be granted only on a showing that the parking demands of the 2 uses do not overlap.</p>	<p>This standard is met. 8 of the 17 req. parking spaces for the drive-thru. restaurant are provided in the surface lot south of the access drive. The number of collective spaces satisfies the ord. requirements.</p>

	<p>h) Parking Space for Physically Handicap</p> <p>1) Number. Each parking lot that services a bldg. entrance, except single or two-family residential or temporary structures, shall have a number of level parking spaces as set forth in the following table, and identified by above grade signs as reserved for physically handicapped persons.</p> <p>2) Size. Accessible Parking Spaces for cars shall be a minimum of 13 ft. wide (8' wide parking space plus a 5' wide marked access aisle). Van-Accessible Parking Spaces shall be a minimum of 16 ft. wide (8' wide parking space plus an 8' wide marked access aisle).</p> <p>3) Location. Parking spaces for the physically handicapped shall be located as close as possible to elevators, ramps, walkways, and entrances. Parking spaces shall be located so that the physically handicapped persons are not compelled to wheel or walk behind parking cars to reach entrances, ramps, walkways, or elevators.</p> <p>4) Curbs. Where a curb exists btw. a parking lot surface & a sidewalk surface, an inclined curb approach or a curb cut with a gradient of not more than 1 ft. in 12 ft. & a width of not less than 4 ft. shall be provided for wheelchair access.</p> <p>5) (See, also, State of Michigan Barrier-Free Rules.) The State rules, if they are more restrictive, shall apply in place of the Charter Twp. of Orion Ordinance provisions.</p> <p>6) Number of Required Off-Street Spaces. Off-street parking spaces shall be provided in the quantities req. by the regulations for the districts in which the bldgs. or uses are located. For the purposes of computing the number of parking spaces required, the definition of "Structure Area" as set forth in Article II shall govern.</p>	<p><i>Pertaining to h.3 & h.4, the 73-space surface parking facility, collectively servicing 3 separate establishments, shall improve pedestrian & ADA accessibility & connection btw. all bldgs.</i></p> <p><i>Details can be addressed at the final plan review phase</i></p>
	<p>3. Layout and Construction</p> <p>a) Dimensions. Plans for the layout of off-street parking facilities shall be in accord with the requirements set forth in the Off-Street Parking Chart contained herein.</p>	<p>These standards appear to be met. <i>Detailed final site plans shall incl. all dimensional components of the pr. parking facilities.</i></p>
	<p>b) Maneuvering Lanes. Maneuvering lanes shall have adequate width to permit safe one-way traffic movement, with the exception of the 90 pattern, which shall provide for safe 2-way traffic movement. Each entrance and exit to & from a parking lot shall be at least 25 ft. from the nearest point of any property zoned for res. use.</p>	<p>The one-way drive aisle adj. to the dumpster encl. of the drive-thru rest. appears to consist of an insufficient width. Applicant to confirm compliance during final review.</p>
	<p>c) Surfacing and Drainage. Unless otherwise specified in the regulations for each dist., all off-street parking areas, access lanes, & driveways required under this section shall be surfaced with concrete, asphalt, or an equivalent hard,</p>	<p>These standards appear to comply.</p>

		dustless surface as approved by the PC. Off-street parking areas, except those serving single or 2-family res. & railroad freight yards, shall also be curbed. Off-street parking areas, access lanes, & driveways shall be graded & drained so as to not drain onto adjacent property or toward bldgs. The grading, surfacing, & drainage plans shall be in conformance with the specifications of the Twp. Surfacing of all parking areas, access lanes, & driveways must be completed within 1 year of the date the permit is issued.	<i>Grading & drainage review is completed by the Township Engineer.</i>
27.04 Parking & Loading	A.	d) Lighting. Any lighting used to illuminate off-street parking areas shall be directed on the parking area only and away from nearby res. properties & public streets. In no case shall lighting exceed 3 foot-candles measured at the lot line.	<i>A lighting plan that meets all applicable standards shall be provided.</i>
		e) Screening and Landscaping. Except for those serving single and 2-family dwellings, all off-street parking areas shall be screened from view from any adjoining residential property. Such screening shall consist of earth berms, permanent walls, or evergreen landscaping, subject to approval of the PC & in accordance with the provisions set forth in Sect. 27.05. In cases where a wall extends to any alley which serves as a means of ingress & egress to a parking area, the wall may be ended within 10 ft. from the nearest edge of the alley so as to provide a wider access route to the parking area.	<i>A landscape plan is required at final to demonstrate compliance of all detailed landscaping standards.</i>
		f) Wheel Stops. Except for those serving single & 2-family dwellings, all parking lots shall be provided w/ wheel stops or bumper guards so located that no part of parked vehicles will ext. beyond the prop. line or into req. landscaped areas.	<i>The final plans shall comply with these standards.</i>
		h) Signs. Accessory signs shall be permitted in parking areas in accordance with the provisions set forth in the Orion Twp. Sign Ord. No. 153.	
	Off-Street Loading and Unloading		
27.04	B.	1. Scope and Application	<i>Details of loading & unloading areas shall be represented on the final site plan(s) for each facility.</i>
		a) For all bldgs. & structures erected & all uses of land established after the effective date of this Ord., off-street loading and unloading space shall be provided as required by the provisions set forth in this sec. and by the regulations of the districts in which such bldgs. or uses are located.	
		2. General Requirements	<i>Circulation to be reviewed by Township engineer.</i>
a) Location. Permitted and req. loading berths shall be located as provided in the regulations for each zoning district. Except as provided under Central Loading below, all req. loading berths shall be located on the same zoning lot as the use served. No permitted or req. loading berth shall be located within 30 ft. of the nearest intersect. of any 2 streets. Loading and unloading facilities shall not be so located as to interfere with ingress or egress or off-street parking.			
		b) Size. Unless otherwise specified, any required off-street loading berth shall be at least 10 ft. in width by at least 50 ft.	

Parking & Loading		in length, exclusive of aisle and maneuvering space, and shall have a vertical clearance of at least 14 ft.	
		c) Access. Each required off-street loading berth shall be designed with appropriate means of vehicular access to a street or alley in a manner which will least interfere with traffic movement. A determination that this standard has been met shall be made by the PC during site plan review.	
		d) Surfacing. All off-street loading berths & loading dock approaches shall be surfaced with a permanent, durable surface, such as concrete, asphalt, or an equivalent material as approved by the PC. The grading, drainage, & surfacing plans for the loading area shall be in conformance with the specifications of the Twp. Engineer.	
		3. Specific Requirements	
		a) Residence Districts. Off-street loading facilities accessory to uses allowed in districts zoned for res. use shall be provided in accordance w/ the following min. requirements:	These standards do not apply to the multi-fam. units in the underlying R-2 zoning district.
		a1) For the uses listed hereunder, 1 loading berth shall be provided for bldgs. containing 10,000 to 100,000 sq. ft. of GFA, plus 1 additional loading berth for each additional 100,000 sq. ft. of GFA or fraction thereof: "All other non-residential uses in a residentially zoned dist."	
		b) Business Districts (OP, RB, <u>GB</u> , SP-1, SP-2, REC-1, REC-2)	<i>Subject to further review at final plan stage.</i>
		b) i) Establishments containing less than 10,000 sq. ft. of GFA shall be provided with adequate [loading] facilities, accessible by motor vehicle off any adj. alley, service drive, or designated delivery area on the same zoning lot.	
		Restriction of Open Parking and/or Storage in All Districts Except Where Permitted; Regulation in Single-Family Residential Districts.	
		C.	1) These regulations are intended to control the open parking & storage of trailers, boats, & similar recreational vehicles so as to maintain the orderly appearance of the Twp.'s single-fam. neighborhoods.
27.05 Landscaping, Fences, & Walls	Landscaping		
	A.	3. Landscaping Design Standards	
		Landscape Plan Submittal Requirements to be reviewed a final plan stage.	
27.06 Streets, Roads, and Other Means of Access	Access Across Residential District Land		
	B.	No land which is located in a residential district shall be used for a driveway, walkway, or access purposes to any land which is located in a non-residential district, unless such access shall be by a public street.	If approved, this standard would not be applicable under the PUD rezone.

27.06 Streets, Roads, and Other Means of Access	Acceleration/Deceleration/Passing Lanes		
	C.	1) Driveways providing ingress and egress to all 2-lane, paved major thoroughfares or collector streets shall be provided with paved acceleration and deceleration & passing lanes.	<i>These standards are subject to review & approval by the Township Engineer.</i>
		2) Driveways providing ingress and egress to roads of 4 or more lanes in width shall be provided with paved tapers for traffic entering the site.	
		3) Driveways providing ingress and egress to any gravel major thoroughfare or collector street shall be provided with tapers for traffic entering the site.	
		4) Required lanes or tapers shall be indicated schematically on the site plan and shall be constructed in accordance with the current standards for such facilities as est. by the RCOC.	
		5) Where it can be shown that such lanes or tapers already exist, the requirement may be waived or modified by the PC when site plan review is required by said body or by the Board of Appeals in all other instances.	
	Internal Roadways		
	D.	1) Width. Unless otherwise specified in Ordinance No. 60, Land Division and Private Roads, an internal or on-site roadway shall be at least 18 ft. in width.	This standard is met.
		a) For any zoning district other than single-fam. res. that has 3 or more structures proposed to front on an internal road, the ROW shall be 60 ft., with an improved surface of 30 ft.	The internal roadway width, from Lapeer Rd. to the west termination, does not meet these standards. See eng. rev. A PUD Waiver is req.
		b) For any zoning district other than single-fam. res. that has a single structure served by a driveway, the right-of-way shall be a minimum of 30 ft. with an improved surface of 18 ft.	
		2) Surfacing and Drainage. Unless otherwise specified, all internal or on-site roadways shall be surfaced with concrete, asphalt or an equivalent hard, dustless surface as approved by the PC. Roadways shall be graded & drained so as to not drain onto adjacent property or toward bldgs. The grading, surface, & drainage plans shall be in conformance with the specifications of the Twp. & approved by the Twp. Engineer.	<i>This standard appears to be met.</i>
	Service Roads		
	E.	If the PC determines that proposed or anticipated development will result in an excessive number of entrance or exit drives onto a major thoroughfare, thereby creating potentially hazardous traffic conditions and diminishing the carrying capacity of the thoroughfare, the Commission may require construction of service roads on abutting parcels to allow traffic circulation from 1 parcel to another without re-entering the public thoroughfare. Such service roads shall conform to the following standards:	
		1) Location and Dimensions. The front edge of the service road shall be located no closer than the future right-of-way line of the thoroughfare & shall be at least 24 ft. in width.	May require PUD waiver. See engineer review.
		2) Easement. Use of the service road shall be secured through an easement permitting the use of the service road for traffic circulation from 1 parcel to another. Said easement	<i>The applicant shall provide all required,</i>

27.06 Streets, Roads, and Other Means of Access		shall be in written form acceptable to the Commission and adopted by the Twp. Board prior to issuance of a building permit. No permanent structures other than the service road shall be permitted within the easement. Said easement shall be recorded with the Oakland County Register of Deeds.	<i>recorded documentation pertaining to the cross-access easement(s) if applicable.</i>	
		3) Surfacing and Drainage. Service roads shall be surfaced with concrete, asphalt or an equivalent hard, dustless surface as approved by the PC. Roadways shall be graded & drained so as not to drain toward bldgs. The grading, surfacing, & drainage plans shall be in conformance with the specifications of the Twp. & approved by the Twp. Engineer.	This standard appears to be met.	
		4) Maintenance. Each property owner shall be responsible for maint. of the easement & service road so that it remains usable as a means of circulating from 1 parcel to another.		
	Safety Pathways			
	F.		1) Location and Width. Req. pathways shall be 8 ft. in width & shall be located in the road ROW, with a setback of 1 ft. from the property line. The PC may modify this req. in consideration for the location of utilities, existing landscaping, or other site improvements.	<i>The plans (site & landscape) should indicate the path along Waldon Rd. is in the future ROW. The 1 ft. setback from the property lines should be shown throughout.</i>
			2) Design Standards. Required pathways shall be constructed of asphalt or concrete in accordance with adopted engineering standards for the Twp.	
		3) Alignment with Adj. Pathways. Req. pathways shall be aligned horizontally & vertically with existing pathways or sidewalks on adj. properties. The PC may waive this req. if existing adjacent pathways or sidewalks are not constructed in conformance with the standards set forth herein.		
		4) Signage. The PC may require installation of signage for the purposes of safety where it is necessary to separate vehicular traffic from ped. and bicycle traffic, or where it is necessary to alert vehicular traffic of the presence of the pathways.		
		5) Maintenance. The owner of the property which fronts on the required pathway shall be responsible for maintenance of the pathway, including patching cracked or deteriorated pavement and removal of glass and other debris.		
		6) Permits. It shall be the responsibility of the owner or developer to secure any required permits from the RCOC or MDOT to allow pathway construction in the road ROW.		
27.11 Lighting Regs.	Lighting Plan Submittal Requirements to be reviewed a final plan stage.			

Staff will be available to discuss this review at the next Planning Commission meeting.

Respectfully,
Giffels Webster



Rodney L. Arroyo, AICP
Partner Emeritus



Eric Pietsch
Senior Planner



November 9, 2022

Scott Reynolds, Planning Commission Chairperson
CHARTER TOWNSHIP OF ORION
2323 Joslyn Road
Lake Orion, MI 48360

RECEIVED

NOV 09 2022

RE: Hudson Square PUD, PC-22-39
Concept PUD Review #1

Orion Township
Planning & Zoning

Received: October 20, 2022, by Orion Township

Dear Mr. Reynolds:

We have completed our review of the Hudson Square Concept PUD plan set. The plans, dated October 10, 2022, were prepared by Stonefield Engineering & Design, and were reviewed with respect to the Township's Zoning Ordinance, No. 78, Stormwater Management and Soil Erosion & Sedimentation Control Ordinance, No. 139, and the Township's Engineering Standards.

EXISTING SITE CONDITIONS:

The site is located on the west side of M-24 on the north side of Waldon Rd., within the northwest 1/4 of Section 26 of the Charter Township of Orion. The site has two different zonings. The eastern half is Conditionally zoned General Business (GB) and the western half is Single-Family Residential (R-2). The site is bound by parcels to the north and west zoned Single-Family Residential (R-2), to the south by parcels zoned Office and Professional (OP-1). The parcels east of the site across M-24 are zoned Multi-Family Residential (RM-1).

The site is a single parcel with split zoning. The General Business zoned parcel is 3.41 acres and the Single-Family Residential parcel is 3.66 acres, totaling 7.07 acres combined. The site was previously used as a flower shop and landscape supplier. The Existing Conditions Plan shows a parking lot, garage, green houses, storefront, and house that were used by the previous business owner. The majority of these buildings have been recently demolished. The Existing Conditions Plan shall be updated to provide the actual existing conditions of the site. The site is heavily wooded and contains a water course featuring a man-made pond in line with an existing stream and wetlands. The applicant is proposing to construct six (6), two-story, four-unit apartment buildings, two (2) restaurants (one drive-thru), and a Classic Car Club attached to the restaurant that does not include a drive-thru. It should be noted that the Classic Car Club and restaurant were previously approved under a separate submittal but has not yet been constructed.

The proposed development appears to protect the pond on site but encloses the existing stream that is considered a linear wetland and is part of an existing drainage course and stormwater network that affects several parcels east and west of this site. The applicant needs to show the relocated stream on the Site and Density Plan. Currently, the relocated stream is only shown on the proposed Grading Plan.

DENSITY PLAN:

A Density Plan was included and shows larger versions of the proposed Car Club and restaurant along with six (6) Single-Family units west of the Car Club and restaurant. Additionally, the Density Plan includes significantly more parking than the proposed Concept Plan. Impacts to the pond are proposed but do not appear necessary to facilitate building and parking lot construction. Enclosure of the stream and wetland appear to still be proposed in the Density Plan; however, no stormwater network features were included. It should also be noted that enclosing the stream and wetland that connect the pond to the ultimate outlet for the site may require mitigation and replacement of those wetland areas by both EGLE and Orion Township. Channel Protection is required as part of the new Oakland County Stormwater Management requirements and was not included in the plans. Including these storm and wetland features within the proposed project may not reduce the number of units proposed in the Density Plan but would likely reduce the available parking area and building footprints of the Car Club and/or restaurant. These features need to be included in the Density Plan to accurately assess the available constructable area onsite.

WATER MAIN & SANITARY SEWER:

There is existing 16-inch water main along the west side of M-24 that also extends westward down the center of Waldon Rd. Existing water main was included in the plans, however proposed water main was not included in the submittal. Preliminary water main layout shall be included in the Final PUD plans. Preliminary Basis of Design, pipe size, and material type will be required at Final PUD. A 12-foot-wide easement will be required, centered along all proposed water main onsite.

If a single water service is proposed for each of the residential buildings, meter rooms with Knox boxes accessible by the Township shall be provided. The meter room requirements and Knox box access needs to be coordinated with the Township DPW.

There is existing 10-inch sanitary sewer along the west side of M-24 and along the north side of Waldon Rd. Existing sanitary sewer appears to have accurately been represented in the plans, however proposed sanitary sewer was not included in the submittal. Preliminary sanitary sewer layout shall be included in the Final PUD plans. Preliminary Basis of Design, pipe size, and material type will be required at Final PUD. A 20-foot-wide easement will be required, centered along all proposed water main onsite.

Preliminary franchise utility locations and easements shall be included at Final PUD. The franchise utility easement shall not overlap proposed water main and sanitary sewer easements except at perpendicular crossings and other infeasible locations.

Per Township sanitary sewer and water main modeling systems, sufficient sanitary capacity and water main flow is available to serve the proposed development.

STORMWATER MANAGEMENT:

The existing site drains inward toward the existing pond and stream prior to discharging into a 60-inch storm sewer that conveys drainage across M-24 and ultimately drains to Lower Trout Lake. The onsite drainage features handle significant amount of upstream flow from wetland areas that is routed through the pond, stream, and culvert. The stream is weir controlled and ends with a small pooling location at the 60-inch pipe inlet.

The proposed stormwater management plan appears to include a series of catch basins that connect to a 'potential' water quality unit and underground detention area prior to discharging into the 60-inch pipe that crosses M-24. MDOT approval for modifications to the storm sewer crossing M-24 will be required. Channel protection does not appear to be provided in the plans. NRCS Soil Maps indicate that onsite soils are suitable for infiltration and drainage (loamy sands) and no information to the opposite affect was provided. Therefore, CPVC should be assumed necessary until infiltration testing is complete. Relocating the stream will not count towards the Channel Protection Volume for this site as it is a key feature in a much larger existing stormwater management network.

Protecting the existing stream could be considered a BMP if Channel Protection is not viable based on future infiltration tests. Overall, the proposed system appears to follow the existing drainage pattern for the stormwater runoff onsite.

Preliminary detention volume and composite site C-value calculations shall be provided at Final PUD per Township Standards for the improvements to the site. A drainage area map for the upstream conveyance and flow calculations provided to support the design of the relocated stream will be required at engineering.

TRAFFIC & CIRCULATION:

A Traffic Impact Study (TIS) was not provided at the time of our review. We understand the applicant is in the process of preparing a TIS for review and approval.

Sidewalk adjacent parking spaces needs to be 7-feet wide to account for vehicle overhang. Please widen the sidewalk along the east side of the parcel and any other spaces that need to meet this condition. An ADA compliant crossing will be required at the approach. Please show ramps/landings at Final PUD. Detailed corner grades will be required at Engineering to assess compliance.

A sidewalk directly adjacent to the back of curb (carriage walk) is proposed in the Concept Plan. It is recommended that the carriage walk be relocated to be a minimum of 5 feet off the back of curb within the General Business portion of the site.

The applicant appears to be tying into the existing asphalt on the west side of the site via internal site sidewalk. The removal for the asphalt approach is shown on the Existing Conditions Plan but does not appear to indicate connection to the proposed public pathway. Please alter the limits of removal or the Site Plan to show the existing asphalt connecting to the public pathway with the approach onto Waldon Rd. removed.

The multi-family portion of the development is more than 150 feet in length and requires an approved turnaround for fire safety access. Please refer to the Fire Department for additional comment on fire truck access.

PAVING & GRADING:

Existing grades were provided via 2-foot contours and spot grades along pavement areas and natural water features. The high-point onsite is at approximately 990 along the northern border of the site, with the low-point being at approximately 968 where the existing stream outlets. Proposed grades were provided via mostly 2-foot contours with some 1-foot contours included along with spot grades at top-of-curb and bottom-of-curb. Finish floor grades for each building were also included. Contours near the existing pond and northern property border appear to indicate maximum site slopes of 1:3 which is higher than the recommended maximum allowable slope per Township Standards. The site grading shall be revised to meet the Township recommended maximum allowable slope of 1:4.

Pavement slopes appear to be acceptable for Concept PUD review and will be reviewed in greater detail at Engineering. In general, pavement slopes are to remain between 1 and 4% in parking areas and 1 and 6% in drive aisles. Ramp and landing corner grades will be required at Engineering to assess ADA compliance. Pavement sections for the sidewalk, public pathway, MDOT approach, drive aisles, and dumpster pads will be required at Final PUD.

NATURAL FEATURES:

WOODLANDS

There is a large quantity of existing trees onsite. The highest concentration appears to be in the southeast corner of the site. A tree survey identifying landmark trees and tabulating the necessary tree removals and replacement trees will be required at Final PUD.

WETLANDS

There are wetlands located in the southern half of the site. There is currently sheet piling and a weir on the east side of the wetlands which allows controlled drainage to flow down an existing stream prior to entering a small pond that has a secondary weir which allows water into the 60-inch storm sewer that conveys the water east across M-24. The applicant is proposing to remove the stream, small pond, and both weirs from the site, in favor of a new drainage course using a proposed swale-drain along the south side of the site. Other wetland impacts include proposed storm sewer, water main, paving and retaining walls within the 25-foot wetland buffer. It should be noted that the Classic Car Club site originally included some of the impacts to these wetlands and was approved for wetland impact activities. The EGLE Wetland Impact Permit was included with the application and is valid until May 12, 2025. An additional or amended permit from EGLE and Orion Township will be required for the stream removal and other impacts to the wetland including the 25-foot buffer. The permit application to Orion Township will be required at Final PUD.

LANDSCAPING:

A Landscape Plan was not included in the plans and will be required at Final PUD. The applicant shall provide sufficient separation between public utilities (water main and sanitary sewer), and trees.

CONCLUSION:

In our opinion, the Concept PUD is not in substantial compliance with the Township's ordinances and engineering standards. We ask that the following comments be addressed:

1. A Traffic Impact Study (TIS) should be provided for review and approval.
2. Stream relocation, Channel Protection, and stormwater detention need to be included in the Density Plan.
3. Channel Protection will be required for this site and should be shown in the Concept plan.
4. The relocated stream needs to be reflected on all sheets within the set.
5. An approved turnaround needs to be provided at the end of the multi-family portion of the development.
6. Site grading shall be revised to meet the Township recommended maximum allowable slope of 1:4.
7. The existing survey should be updated to reflect the current parcel configuration and provide a legal description.
8. The Sheet Index on the cover sheet needs to be revised to match the plan set.

Please feel free to contact us with any questions at (248) 751-3108 or joseph.lehman@ohm-advisors.com.

Sincerely,

OHM Advisors



Joe Lehman, PE
Project Engineer



Mark A. Landis, PE
Project Manager

cc: Chris Barnett, Township Supervisor
David Goodloe, Building Official
Bill Basigkow, Director of Public Services
Tammy Girling, Director of Planning and Zoning
Lynn Harrison, Planning and Zoning Coordinator
Jeff Williams, Township Fire Marshal
Rod Arroyo, Township Planning Consultant
John Canine, Applicant
Michael Wayne, Detroit Riverside Capital
File

Hudson Square PUD, PC-22-39
Concept PUD Review #1
November 9, 2022
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December 1, 2022

Scott Reynolds, Planning Commission Chairperson
CHARTER TOWNSHIP OF ORION
2323 Joslyn Road
Lake Orion, MI 48360

RECEIVED

DEC 2 2022

Orion Township
Planning & Zoning

RE: Hudson Square PUD, PC-22-39
Concept PUD Review #2 – TIS rev1

Received: November 10, 2022, by Orion Township

Dear Mr. Reynolds:

We have completed our review of the Hudson Square Concept PUD Traffic Impact Study. The study, dated November 9, 2022, was prepared by Fleis & Vandenbrink, and was reviewed with respect to the Township's Zoning Ordinance, No. 78 and the Township's Engineering Standards.

TRAFFIC & CIRCULATION:

Per the TIS, traffic signals are warranted at the three (3) intersections (see below map from the study):

- SB Lapeer Road (M-24) & NB-to-SB Crossover, North of Waldon Road
- SB Lapeer Road (M-24) & Waldon Road
- NB Lapeer Road (M-24) & SB-to-NB Crossover, South of Waldon Road

However, the study states that queues are not significant for the SB Lapeer Road (M-24) & NB-to-SB Crossover, North of Waldon Road and therefore a signal should not be installed at this intersection. While the queues do not present a significant issue, level of service and delay are of concern. In the AM peak, the delay at the intersection is 58.7 seconds during existing conditions and nearly doubles to 102.8 seconds during the future conditions. Furthermore, crash and progression signal warrants should be performed for this intersection. Recommendation for the placement of a signal at this intersection should be further considered.

The provided Synchro models include the signalized intersection of the crossover north of Greenshield Road. The inclusion of this upstream signal-controlled intersection allows for consideration of vehicle progression and queuing. Traffic volumes should be provided at this location to validate signal progression and queuing results from the model.



FIGURE 1 SITE LOCATION MAP

HUDSON SQUARE TIS - ORION TOWNSHIP, MI

LEGEND

 SITE LOCATION



Under the existing conditions the NB Lapeer Road (M-24) & SB-to-NB crossover south of Waldon Road has vehicle queuing issues especially in the PM peak hour. Per the study, long vehicle queues for the southbound to northbound U-turn movement at the crossover were occasionally observed to exceed the available storage area and block the southbound through traffic. These long vehicle queues are the result of vehicles struggling to find adequate gaps within the NB Lapeer Road (M-24) through traffic. Additionally, when the available SB-to-NB crossover storage area becomes blocked, vehicles along eastbound Waldon Road attempting to travel north on Lapeer Road (M-24) were observed to not progress through the intersection of SB Lapeer Road (M-24) & Waldon Road, even when adequate gaps were present within the southbound traffic flow.

Under the Future Conditions without mitigation, the PM peak hour indicates long vehicle queues for the southbound to northbound U-turn movement at this same crossover. The study indicates these vehicle queues often exceed the available storage area, resulting in southbound traffic backing into and blocking the other study intersections along SB Lapeer Road (M-24). As a result, when the available SB-to-NB crossover storage area becomes blocked, increased delays and longer vehicle queues are experienced for all traffic on the eastbound Waldon Road approach and on the eastbound site driveway approach.

While the existing conditions note queuing issues with the SB-to-NB crossover south of Waldon Road, the proposed development will further worsen the condition without mitigation.

It should be noted that M-24 is under the jurisdiction of MDOT and Waldon Road under the jurisdiction of RCOC. Those agencies will have the ultimate authority to permit installation of the suggested signals. While the TIS recommends traffic signals be installed at the M-24/Waldon intersection and at the SB to NB crossover south of Waldon Rd, it is our understanding the applicant does not intend to include this mitigation as part of the PUD. Since MDOT has yet to complete their review of the TIS, it is unknown if MDOT will require and/or permit the recommended signals. Hence, the applicant will need to coordinate with MDOT on the required mitigation following their review.

CONCLUSION:

In our opinion, the Traffic Impact Study is in substantial compliance with the Township's ordinances and engineering standards. We ask that any approval include the following:

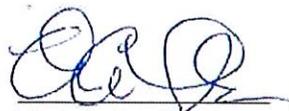
1. Further consideration should be given to recommending a traffic signal at the SB Lapeer Road (M-24) & NB-to-SB crossover, North of Waldon Road intersection.
2. Provide traffic volumes for the crossover north of Greenshield Road to validate signal progression and queuing results from the model.
3. The TIS recommends traffic signals be installed at the M-24/Waldon Road intersection and at the SB to NB crossover on M-24 south of Waldon Road. The applicant will need to coordinate with MDOT on the required mitigation.

Please feel free to contact us with any questions at (248) 751-3108 or joseph.lehman@ohm-advisors.com.

Sincerely,
OHM Advisors



Joe Lehman, PE
Project Engineer



Mark A. Landis, PE
Project Manager

Hudson Square PUD, PC-22-39
Concept PUD Review #2 – TIS rev1
December 1, 2022
Page 4 of 4

cc: Chris Barnett, Township Supervisor
David Goodloe, Building Official
Bill Basigkow, Director of Public Services
Tammy Girling, Director of Planning and Zoning
Lynn Harrison, Planning and Zoning Coordinator
Jeff Williams, Township Fire Marshal
John Canine, Applicant
Michael Wayne, Detroit Riverside Capital
File

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Charter Township of Orion

3365 Gregory Rd., Lake Orion MI 48359
www.oriontownship.org

Fire Department

Phone: (248) 391-0304, ext. 2000
Fax: (248) 309-6993

RECEIVED

OCT 31 2022

Orion Township
Planning & Zoning

To: Planning Commission/Planning & Zoning Director
From: Jeff Williams, Fire Marshal
Re: PC-222-39, Hudson Square PUD Concept Plan
Date: 10/31/2022

The Orion Township Fire Department has completed its review of Application PC-22-39 for the limited purpose of compliance with Charter Township of Orion Ordinance's, Michigan Building Code, and all applicable Fire Codes.

Based upon the application and documentation provided, the Fire Department has the following concerns regarding the concept plan.

Concerns:

- The access drive that leads to the multifamily development is more than 150' in length and does not have an approved turn around. This item must be addressed before the fire department can give final approval. Please be advised that a future cross connection to a possible development located to the West of this property will not be considered and or approved.

If there are any questions, the Fire Department may be reached at 248-391-0304 ext. 2004.

Sincerely,

Jeffrey Williams

Jeff Williams, Fire Marshal
Orion Township Fire Department



WRC
WATER RESOURCES COMMISSIONER
Jim Nash

October 21, 2022

Lynn Harrison
Orion Township
Planning & Zoning
2323 Joslyn Road
Lake Orion, MI 48360

Reference: **Hudson Square – CAMS #202200828**
Part of the NW ¼ of Section 26, Orion Township

Dear Ms. Harrison,

This office has received one set of plans for the Hudson Square Project to be developed in the Northwest ¼ of Section 26, Orion Township.

Our stormwater system review indicates that the proposed project has no direct involvement with any legally established County Drain under the jurisdiction of this office. Therefore, a storm drainage permit will not be required from this office.

The water system is operated and maintained by Orion Township and plans must be submitted to Orion Township for review.

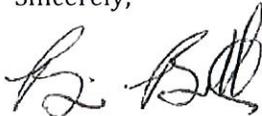
The sanitary sewer is within the Clinton-Oakland Sewage Disposal System. Any proposed sewers of 8" or larger may require a permit through this office.

Please note that all applicable permits and approvals from federal, state or local authorities, public utilities and private property owners must be obtained.

Any related earth disruption must conform to applicable requirements of Part 91, Soil Erosion and Sedimentation Control of the Natural Resource and Environmental Protection Act, Act 451 of the Public Acts of 1994. An application should be made to Orion Township for the required soil erosion permit.

If there are any questions regarding this matter, please contact Dan Butkus at 248-897-2744.

Sincerely,



Brian Bennett, P.E.
Civil Engineer III



A site walk was conducted on November 2, 2022. The site has been reviewed at least 2 other times within the last 3 years. The site is located at the northwest corner of Lapeer Road and Waldon Road. The previous building has been demolished and the property is vacant. It is heavily wooded with a pond and stream along the southern property. There is dense foliage along the Waldon Road property line.

The property abuts a church to the north. To the south is a veterinary office building and dog kennel.

Previous requests included a 2 story car club and restaurant and a multistory apartment complex.

Respectfully submitted,

Donald Gross, Planning Commissioner

Donald Gross, Planning Commissioner
Charter Township of Orion
2525 Joslyn Rd., Lake Orion MI 48360
dgross@oriontownship.org
<http://www.oriontownship.org>

RECEIVED

NOV 02 2022

Orion Township
Planning & Zoning

Orion Township Board of Trustees

RECEIVED

Please also forward to the Orion Township Planning Commission

NOV 17 2022

Orion Township
Planning & Zoning

Re: Proposed Hudson Square PUD – Bigby Coffee Drive-Through facility

I would like to expand on a comment I made at the meeting November 16th regarding air quality and vehicle exhaust. We are still a long way from fully electric transportation and gasoline exhaust will continue to be a problem for quite a few years. As someone with respiratory compromise I smell and feel exhaust at lower levels than most, but it is not healthy for any of us.

My condo is situated on the north side of the church and so not very far from the proposed drive through where cars will be idling in line. I am already impacted by the rush hour exhaust levels on Lapeer Road, particularly in the mornings and worse in cold and overcast weather. Keeping my windows closed makes little difference because my HVAC system pulls it in via the fresh air intake which is near the ground where those heavier particles accumulate.

I request that an evergreen buffer be required between the proposed coffee shop and the church property to screen, absorb, and convert some of the exhaust gasses and offset their impact on the nearby residents.

I note there is a setback reduction waiver to the north property line included in the plan for the drive-through facility. The setback should actually be increased to allow room for an evergreen buffer.

The many blue spruces on our property are sick, severely thinning and dying. I notice the difference in the Lapeer Road noise and exhaust now that we are losing their protection compared to a few years ago when those trees were still healthy. The healthy trees did make a big difference.

I hope you give this request serious consideration and implement an evergreen requirement along the northern length of the drive-through driveway.

Respectfully,

Susan Johnston

348 Four Seasons Dr.

989-274-0221

Debra Walton

From: Tom Pentis <tom.pentis@atlascoopco.com>
Sent: Tuesday, November 29, 2022 12:58 PM
To: Debra Walton
Cc: Pastor Mark Voss; AJSReinhold@gmail.com
Subject: PC-22-39, Sidwell #09-26-101-021

RECEIVED

NOV 29 2022

Orion Township
Planning & Zoning

Hello Deb,

Please provide the following information to the Planning Commission.

I am writing regarding the development proposed for the corner of Waldon and Lapeer roads on the North side of Waldon (Hudson Square development, PC-22-39, Hudson Square Planned Unit Development (PUD) Concept Plan, located at 3030 S. Lapeer Rd. (Sidwell #09-26-101-021)). I reviewed the video from the November 16 meeting and wanted to clarify some information that was presented. I am a member at the church on the North side of the proposed development.

During discussion of the setbacks (starting at around 2hrs 7min in the video) between Scott Reynolds and the developer representative, comments were made regarding the actual use of the property. The developer was indicating that the church property is not residential (as zoned), but more institutional. This is a mis-representation as there is a home on the South side of the church property that is occupied as a residence. This home is directly adjacent to the area between the proposed drive thru and first residential building as can be seen in the aerial view presented during the meeting. As noted in the meeting, the setback should be 100 ft. to a residential property and 50 ft. to a business. I understand that property line screening, tree survey, etc. had not been completed at the time of the meeting. I would ask that consideration be made to more permanently screen the new development from the existing residence to minimize noise (cars, speaker at the drive thru) and garbage intrusion from the restaurant/drive thru including items such as a wall, fencing, plantings, etc.

I am not opposed to the development, but would ask that these property line details be considered for the development regardless of the setback but especially if a deviation to the regular setback is granted. Please contact me with any comments or to discuss further.

Thank you,

Tom Pentis
2423 Brabant St.
Lake Orion
586-634-6201

254 Four Seasons Drive
Lake Orion, MI 48360

October 31, 2022

Planning Commission
Orion Township Hall
2323 Joslyn Road
Lake Orion, MI 48360

RECEIVED

NOV 01 2022

Orion Township
Planning & Zoning

To: Lake Orion Township

re: PC-22-39, Hudson Square Planned Unit Development
3030 S. Lapeer Road, (Sidwell #09-26-101-021)

I oppose the rezone of this property from single family residential and conditional general business to planned unit development w/mixed use . . . drive up coffee shop and sit down restaurant w/attached car club and 6 building multi-family residential.

My reason for my objection is the additional vehicle traffic that will be brought on by the drive thru coffee shop and restaurant on this intersection. The traffic is always backed up on Waldon Road turning right on Lapeer - this is just not acceptable as there is no light or ?? to help the traffic flow. I can just see the line up of vehicles for coffee which will interfere with the Church, condo complex, Animal Hospital, and those turning right on to Waldon Road, along with the walkers and bike riders. The traffic speed is 55 mph+ - having this congestion at this site is many accidents waiting to happen. I've seen the back up of traffic from the Starbucks in town. Do we really another situation like that in this area?

Please reject this proposal, please!

Sincerely,



Cheryl Querro

NOV 07 2022

Orion Township
Planning & Zoning

**Objection to rezoning of 3030 S. Lapeer Rd, Sidwell #09-26-101-021.
PC-22-39, Hudson Square Planned Unit Development**

I would like to voice my objection to the rezoning of property at 3030 S. Lapeer Rd PC-22-39.

A free standing drive-thru coffee shop, a car club with sit down restaurant and multi family homes, wow that's a lot going on ..it is too much for this corner of Lapeer and Waldon in my opinion.

I feel as if the developer is pushing the envelope to see where the line will be in regards to how much they can pack into this area ...this is just "scope creep" pain and simple.

I urge the Planning commission to reject this request for rezoning and to find a development that "fits" the area in regards to the master plan and the surrounding community.

Thank you for your time and consideration,

Michael Caldwell
336 Four Seasons Dr
Lake Orion, MI 48360

October 31, 2022

Mr. Scott Reynolds
Orion Township Planning Commission
2323 Joslyn Rd.
Lake Orion, MI., 48360

RECEIVED

NOV 07 2022

Orion Township
Planning & Zoning

Dear Mr. Reynolds,

I am writing this letter in response to the recently proposed development at 3030 S. Lapeer Rd. Like many in our community, my Husband and I moved to this area after many years working in a congested urban environment. We chose this community because of the amenities it offered, but most importantly the slower pace and peaceful lifestyle that this community afforded. In addition to our fellow retirees, we have encountered many young families who chose to raise their children away from the chaos of urban life. We felt we had it all, a slower simpler lifestyle, reasonable traffic, the absence of noise and all the negative aspects of densely populated areas. Through the years development, both commercial and residential have fundamentally changed the landscape of this once laid-back community. Navigating the roads at certain times of the day is virtually impossible. Simple trips must now be timed to avoid endless gridlock. Traffic noise and pollution are drowning out a once peaceful existence. Crime, although still relatively low, is sure to follow unchecked expansion. This can only further drain limited resources, the cost of which will far outstrip the limited tax revenue generated by this reckless development. The true cost will be borne by hardworking residents and retirees with limited resources. It won't be long before the taxpayers are asked to approve tax mileages to widen roads and install infrastructure to support a system not originally intended for its current use. None of this is in keeping with the nature of the community or the desires of those who moved here to escape that toxic lifestyle. My Husband and I made great sacrifices during our working years to be able to live in a place where we could enjoy the peace and quiet of our golden years. We are not however possessed with infinite resources that allow us to pick up and go elsewhere. In our vulnerable years we are at the mercy of those tasked with maintaining the dignity of this community and the essence of a lifestyle we worked very hard to obtain. How many coffee shops, restaurants, car clubs, strip malls, and gas stations do we really need? Respectfully, we must ask you and your colleagues to reject this further development, lest the damage already done become irreversible.

Sincerely
Beverly Walton

RECEIVED

NOV 15 2022

From: Linda Martin-Seng <lindamartinseng77@gmail.com>

Sent: Tuesday, November 15, 2022 6:57 AM

To: Tammy Girling <tgirling@oriontownship.org>; Lynn Harrison <lharrison@oriontownship.org>

Cc: info@sweetamyseatinghouse.com

Subject: New restaurant/coffee shop approval!

Orion Township
Planning & Zoning

Good morning,

I am writing to express my excitement for a new Sweet Amy's restaurant in Orion Township! Although we are from Clarkston, we frequented the previous facility often (at least once a week) because it was good, clean food with options for people with food sensitivities and allergies. We eat very clean- generally organic, and definitely never fast food! Sweet Amy's has always provided a great source of excellent options for food.

Last year when I had a difficult diagnosis and was fasting once a month for 3 days during my treatments, Sweet Amy's was our go to place to break my fast and enjoy healthy food. The people there were always so kind and the atmosphere was very enjoyable.

I have taken countless friends to that establishment from many different communities. We ended up shopping in Lake Orion and visiting other places in the area. We even celebrated Mother's Day two years ago with 15 people at the previous Sweet Amy's and the entire family loved it and went back several times afterward from all over the metro Detroit area.

We are hoping you will approve these new plans as this looks to be a perfect spot and opportunity for a very beneficial restaurant in the area.

My go to coffee is Biggby as opposed to any other big brand. So I hope that will also be approved as there are few Biggby's in the northern area of the Detroit Metro region.

Thank you for your consideration. This place means so much to so many. I truly hope you will approve this wonderful project and support this fantastic family business!

Linda and Michael Seng
6625 Shelley Drive
Clarkston, MI 48348
(248) 910-1198



RECEIVED

NOV 15 2022

Orion Township
Planning & Zoning

943 Watersmeet Drive Oxford, MI 48371 248.515.7364

November 15, 2022

Dear Tammy Girling,

Attached are Sweet Amy's Eating House recent Facebook posts regarding the potential new Sweet Amy's development, and a portion is reflective of the community feedback of the overall Hudson Square parcel. I am attaching below the number of likes, loves, comments, etc. that we received. If we purely evaluate the comments received, the ratio of negative is 4% and positive is 96%. This feedback represents an overwhelming broad support for this project.

I am requesting that you include these statistics as positive support in the Hudson Square file.

Feel free to contact me with any questions you may have.

Kind regards,

Amy Harris

Amy Harris, Proprietor

Sweet Amy's Eating House (legal name- Honest to Goodness Breakfast & Smoothies, LLC)

Facebook Post General Feedback

- 494 overall post likes
- 151 overall post loves
- 8 overall post "wow" face (shock)
- 1 overall post sad face
- 2 overall care face (emoji w/ heart)
- 249 positive comments
- 11 negative comments
- 191 positive likes to comments
- 17 positive loves to comments
- 3 positive care to comments
- 8 negative likes to comments
- 27 shares
- 6 individuals provided negative comments (included in 11 negative comments above)

RECEIVED

NOV 15 2022

Orion Township
Planning & Zoning

From: Rilee Harris <rilharris@gmail.com>
Sent: Tuesday, November 15, 2022 11:37 AM
To: Tammy Girling <tgirling@oriontownship.org>
Cc: Lynn Harrison <lharrison@oriontownship.org>; Amy Work (HTG Breakfast) (info@htgbreakfast.com) <info@htgbreakfast.com>
Subject: Letter of Support: Sweet Amy's Eating House

Dear Orion Township offices and residents,

I am writing in support of the proposed development that will make possible the opening of Sweet Amy's Eating House and a Biggby Coffee location in Lake Orion. The addition of these two businesses will provide a dining solution and jobs for a variety of individuals. Biggby fills a need for the hurried school goer, business professional, and commuters. Whereas Sweet Amy's Eating House provides a unique scratch kitchen alternative, that expands dining options for those with dietary restrictions.

As some of you may know, Amy and Scott Harris are my parents. Since beginning their venture in 2016, I have watched them pour their time, money, and energy into making their vision to provide a healthy and distinct eating option in Lake Orion a reality. I worked as a server and was a frequent dine-in guest over the six year span Sweet Amy's was open previously. During this time, I heard firsthand the positive feedback and gratitude for having their restaurant available in Lake Orion.

Every business owner is presented with challenges, I can attest Amy and Scott experienced their fair share too. For example, the very first day the restaurant was open for business our head chef injured himself and couldn't work that day. Instead of shutting down on opening day, the kitchen crew adapted their approach and Scott, my dad, rolled up his sleeves and assisted the team to the best of his ability. Additionally, they weathered the uncertainty of the COVID-19 pandemic. Adapting their service models and menus to combat the ever changing staff availability and supply chain issues. Overall, if grit could be defined by people, I would immediately point you in the direction of Amy and Scott.

The community would be remiss to lose out on the opportunity to have another business supported by Amy and Scott in the area. Please feel welcome to contact me with any questions. I can be reached at rilharris@gmail.com or (248) 842-2389.

Thank you,

--

Rilee Harris
(248) 842-2389

RECEIVED

NOV 15 2022

Orion Township
Planning & Zoning

From: Giselle Graham <giselledgraham@gmail.com>
Sent: Tuesday, November 15, 2022 2:31 PM
To: Tammy Girling <tgirling@oriontownship.org>
Cc: Lynn Harrison <lharrison@oriontownship.org>; Amy Harris <info@sweetamyseatinghouse.com>
Subject: New Sweet Amy's Restaurant Development

To whom it may concern,

I am sending you this email in support of the new development on Lapeer & Waldon Rd for the new Sweet Amy's Restaurant, in hopes this establishment will return to Lake Orion, Mi.

Our family is a big fan of what Sweet Amy's provided to our community. Great food & healthy food for those with food allergies, like my husband & more. Giving us options like cage free eggs & gluten free options on their menu. There is no other place to eat like this in Lake Orion or cities close to us. Sweet Amy's became a staple for our family to eat out and we truly miss it.

The new restaurant will accommodate more patrons and clean up the corner of Lapeer & Waldon Rd. Making this area very desirable to all who drive by and plan to support this establishment. We can't wait to eat at Sweet Amy's again.

Yours truly,

Giselle Graham

354 Craigend Ct.

Lake Orion, Mi. 48362

NOV 15 2022

Orion Township
Planning & Zoning

From: Haas, Carlee <chaas@fbinsmi.com>
Sent: Tuesday, November 15, 2022 3:04 PM
To: Tammy Girling <tgirling@oriontownship.org>; jharrison@oriontownship.org
Cc: info@sweetamyseatinghouse.com
Subject: Development at Waldon

Hi there,

My Name is Carlee Haas

I am unable to attend the township meeting/public hearing tomorrow at the Orion township offices, but wanted to send a letter in backing/supporting the development going in at Waldon Rd.

Amy & Scott Harris employed me from 2019- 2022 until the closing of their restaurant. As someone who eats specific diets, it is harder to get these accommodations around our area... the Harris's have made eating easy and delicious with their unique style of natural offerings at their restaurant.

I believe that their style of food is just what we need in our area and would love to see the development happen

Thanks so much & have a great day! 😊

Sincerely,

Carlee Haas

Marketing & Promotions Manager | Farm Bureau Insurance

14 S Washington St, | Oxford, MI 48371

E-mail: chaas@fbinsmi.com

Office: 248-929-5896 (Call or text) | Fax: 248-800-8866

"Follow" us on facebook: [facebook.com/InsuranceMomMI](https://www.facebook.com/InsuranceMomMI)

"Protecting the people of Michigan from the risks of everyday life"

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RECEIVED

NOV 16 2022

Orion Township
Planning & Zoning

From: Jessica Merchberger <jmerch217@yahoo.com>
Date: November 15, 2022 at 10:08:29 PM EST
To: Tammy Girling <tgirling@oriontownship.org>
Cc: Lynn Harrison <lharrison@oriontownship.org>, info@sweetamyseatinghouse.com
Subject: Support for SWEET AMY'S EATING HOUSE

To Whom it may concern,

I am sending this email in support of Sweet Amy's Eating House. Their new development at Waldon and M24 is going to add value to Orion Township and it's surrounding areas. Their restaurant was so unique and really added a safe place for so many to dine to our area. We need this restaurant back to meet the needs of our residents who have allergies and dietary needs. Amy and her family have done so many wonderful things for our community and I have no doubt by adding their new Restaurant they will continue on the Sweet Amy's Legacy.

Thank you for your time.

Respectfully,

Jessica Williams

5592 Lakeview Blvd.

Goodrich MI 48438

General Information

Applicant Name: John & Nanci, LLC.

Applicant Contact: Dr. John Canine – (248) 396-4793; jdcanine@comcast.net

Plan Preparer: Detroit Riverside Capital

Plan Preparer Contact: Michael Wayne – (248) 953-4891; Michael@DetroitRiversideCapital.com

Project Name: Hudson Square

Subject Parcel ID(s): 09-26-101-021

Subject Parcel Address: 3030 S. Lapeer Rd. Orion Township, MI 48359

Common Description of Parcel: The subject parcel is at the corner of Lapeer Rd. and Waldon Rd. in Orion Township, MI. The parcel totals 7.07 acres. The current parcel is partially wooded and contains an existing wetland near the southwest quadrant of the site.

Legal Description of Parcel: Attached to application package as *Exhibit A*, titled Legal Description

Comprehensive Statement of Intent

Hudson Square is a mixed-use development featuring 24 residential units for lease, 5,700 SF of retail, and a 3,000 SF classic car club facility. The residential component will feature both 2- and 3-bedroom dwelling units. These will range in size from 1,200 SF to 1,600 SF and will each be serviced by an attached two car garage. The two-bedroom units will each feature a 190 SF outdoor patio and the three-bedroom units will feature a 400 SF outdoor patio. The residential component will be spread across 6 separate two-story buildings, each containing four dwelling units. Each two-story building is approximately 7,400 SF in total.

The retail space is divided between two independent users. Approximately 1,700 SF will be occupied by Biggby Coffee in a freestanding drive-through building in the Northeast quadrant of the site. The remaining 4,000 SF will be a sit-down, upscale restaurant occupied by Sweet Amy's Eating House, a former Orion Township staple restaurant that will relocate and revamp their offerings in this new facility.

The 3,000 SF classic car facility will be attached to the restaurant space to form one 7,000 SF building. This is done deliberately to allow the classic cars to be a showpiece for restaurant-goers. The spaces will be separated from one another, except for the visual connection created by certain windows within the demising wall that separates the two spaces.

Hudson Square is a phenomenal addition to the current landscape of Orion Township, delivering much needed residential for-lease housing options to existing and future Orion Township residents. These residential dwellings will attract and service the existing Orion Township demographic of "empty nesters" looking to relieve themselves of maintenance responsibilities, or young families looking for a transitional residential option before investing in their dream home. These dwellings will also attract

new residents to the Township, who may not be able to find accommodation within the existing residential landscape of Orion Township to fill this need.

The commercial component of the project will also address a tremendous need for both quick-service retail by way of Biggby Coffee, as well as a sit-down, upscale dining establishment like Sweet Amy's Eating House. This fills a vast unmet need in the township and does so in an area of the township that is particularly lacking existing dining options.

Market Concept

Detroit Riverside Capital's analysis of the existing multi-family market in Orion Township and the surrounding area indicates that there is significant demand for additional multi-family dwellings. The following is a list of existing multi-family properties within the surrounding area and their respective current occupancy:

1. Heron Springs Townhomes & Apartments - 99%
2. Indian Lake Village Apartments (immediately adjacent to proposed development) - 100%
3. Abbey Ridge Apartments - 100%
4. Parkways of Auburn Hills - 100%
5. Redwood Lake Orion Apartment Homes - 100%

These occupancy rates indicate that the existing supply of apartments within Orion Township and the surrounding area has been fully absorbed and additional supply of multi-family dwellings are needed to sustain community growth.

Additionally, the population within a 5-mile-radius of the proposed site is expected to grow by more than 2,300 by 2025, or 2.5%. For Orion Township to capture their share of this growing population, with the existing supply fully occupied, additional dwellings must be built to support the growing demand.

With respect to the proposed Biggby Coffee, the existing supply of comparable offerings to Biggby Coffee are sparse. There is one existing coffee shop almost 2 miles north on Lapeer Rd., however it currently does not offer a drive through. There are no comparable coffee shop locations south on Lapeer Rd. of the proposed Biggby location.

With respect to the proposed Sweet Amy's Eating House, the existing supply of comparable offerings is practically non-existent. There are a few existing sit-down, upscale dining establishments in the Township, however, none are equivalent to the market offering of Sweet Amy's. Sweet Amy's will bring a unique dining option through their natural-based menu, which provides strict accommodations for common dietary restrictions. This type of offering is currently unavailable anywhere in the Township.

With respect to the proposed Orion Classic Car Club, this is truly a one-of-a-kind destination. This 3,000 SF facility will be a place for car enthusiasts to gather and socialize over a shared love of the automobile. This space will function as a unique showpiece feature for Sweet Amy's clientele.

The inherent lack of supply of existing comparable offerings directly highlights the demand for the proposed commercial elements of Hudson Square. With a growing population and other residential

development in the area, it is critical to provide additional commercial dining options to satisfy the needs of existing and future Orion Township community members.

Superiority of PUD Plan

The Proposed PUD plan is superior to a plan that complies with the existing zoning. The Density plan included in the PUD application reflects a site plan that is compliant with existing zoning. The PUD plan is superior because it is less intense than the density plan. The density plan provides for over 20,000 SF of commercial space, while the PUD plan only proposes 8,700 SF. The density plan also co-mingles heavy commercial with high density single-family residential on the same parcel. The single-family homes access from the back parking lot of the commercial. This is not desirable for single family homeowners. The PUD plan provides a gentle transition from the commercial uses on the East half of the subject parcel to the multi-family use on the West half of the subject parcel to the adjacent parcel zoned single-family. This transition is more desirable than heavy commercial transitioning directly to single-family residential. The proposed PUD also only requires access from Lapeer Rd., while the Density plan has access to both Lapeer Rd. and Waldon Rd. This creates additional, undesired traffic congestion on Waldron Rd., while the PUD plan avoids this.

PUD Eligibility Criteria – Zoning Ordinance Section 30.03 (B)

1. **Recognizable Benefit** - *How will a PUD approval result in a recognizable and substantial benefit to the ultimate users of the project and the community?*

Lapeer & Waldon has been specifically designed with the preservation of natural features in mind. The site currently features a beautiful wetland feature roughly half an acre in size in the Southwest quadrant of the site. This feature will be preserved in full and accented through the proposed PUD site plan. The site also features beautiful, well-aged trees near the North property line. These will all be preserved within the 30-foot landscape buffer along the North property line. The remainder of the site features other existing natural features. Once a tree survey is prepared during the Final PUD phase, we will be able to provide additional details about how tree/natural feature preservation was prioritized in site design. Under the current proposed PUD site plan, roughly 28% of the existing site has been preserved in its natural condition.

Hudson Square will be a direct improvement to the aesthetic qualities of the existing site and surrounding area. The existing site is currently unusable and inaccessible to the community. Hudson Square will turn the existing, underutilized site into a beautiful mixed-use development, introducing needed housing and commercial elements to the community. Per the ordinance, Hudson Square will provide safety path connection to the surrounding area of the Township. Currently, the existing safety path runs roughly 2,500 feet to the north of the subject parcel, but it does not currently connect to Waldon Rd. or the existing 500 feet of safety path that exists to the south of Waldon Rd. along Lapeer Rd. Hudson Square will provide for the connection of these two existing paths to create a total of 3,600 feet of connection from North to South along Lapeer Rd.

Hudson Square also provides the connection to a tremendous, 3.3-mile section of safety path that exists to the West of the subject parcel along Waldon Rd. This existing safety path runs all the way from the intersection of Waldon & Lapeer Roads to Waldon and Baldwin Roads. This path is currently not accessible from the existing 2,500 feet of safety path to the north of the subject parcel. As a result of the proposed PUD plan, the safety path from the north end of Home Depot will connect all the way to Baldwin Rd., a section of safety path totaling 3.85 miles.

Hudson Square will feature gorgeous high-end architectural design throughout the development. The residential dwellings will feature a modern farmhouse style exterior façade, complete with traditional and board and batten siding, stone accents, and architectural details. The 400 SF outdoor patios will be accessible from the second floor, three-bedroom dwellings, providing a tremendously unique architectural feature not available in any existing residential dwellings within the Township (See elevations of residential dwellings within PUD plan for reference). This architectural detail will give interest to the site lines of the residential components from neighboring properties. The residential dwellings will blend with the existing surrounding area in mass, scale, height, and aesthetic.

The interior of the units would be equally high-end, complete with stainless steel appliances, quartz countertops, soft-close cabinetry, name-brand plumbing and lighting fixtures, and smart-home elements such as electronic access system and smart thermostats.

The commercial elements of Hudson Square are designed with high-quality architecture to mirror that of the residential component. The elevations, including anticipated façade materials, of the restaurant and car club building are included in the PUD plan for reference. The buildings provide for a unique visual connection between the two uses, as well as a largely glass façade on the West and south portions of the restaurant façade to highlight the beautiful adjacent wetland and other natural features surrounding the building.

A final recognized community benefit of Hudson Square is the public art feature proposed near the Southeast corner of the site that is visible at the intersection of Waldon and Lapeer Roads. This art feature will be built with a grade-level 10-foot in diameter concrete pad and a 3-foot in diameter pedestal centered within the grade-level pad to display the art feature. The area will include seating and lighting to accent the art feature. The art feature will be developed in collaboration with the Detroit Institute of Art and will be subject to final approval by the Township.

-
2. **Density Impact** - *Will the proposed type and density of use result in a material increase in the use of public services, facilities, and utilities, in relation to what would be permitted if the property were developed without using the PUD?*

The subject parcel is currently split between two zoning categories, general business (GB) on the Eastern portion of the site and high-density single family residential (R2) on

the West portion of the site. Per the provided density plan in the PUD application, the R-2 portion of the site could accept roughly 6 single family houses in accordance with the R-2 zoning ordinance. Assuming an average of 3 occupants per single family dwelling and 6 single family dwellings, that would indicate 18 total occupants. By comparison, assuming an average of 2 occupants per multi-family dwelling unit and 24 multi-family dwellings, would indicate 48 total occupants. So, while the number of dwelling units of the proposed is 4x greater than what the density plan supports, the number of occupants living in the proposed units are only 2.6x greater, or 30 people greater in total.

As a result, the development as proposed will increase the use of public services, facilities, and utilities compared to what is provided by the existing zoning. However, the impact on public services will be negligible when viewed in relation to the township overall. The additional 30 people in the proposed residential dwellings will provide zero material impact to public services like roads, facilities, police, fire, and EMS.

DRC commissioned a traffic study with Feliz & Vanderbrink to highlight the negligible impact Hudson Square has on existing traffic congestion. This study will be available for submission and review on 10/31/22.

From the perspective of water and sewer utilities, there is sufficient existing capacity in Orion Township to service the proposed development. The addition of the 18 dwelling units (30 people) does not cause an adverse, or even material effect to the water and sewer capacity in the township.

3. Township Master Plan - Will the proposed development be consistent with the intent and spirit of the Master Plan and community?

The current zoning for this parcel is split between Single-Family Residential (R2) to the West and General Business (GB) to the East. The future land use map also shows a split between single-family residential (R2) and Special Circumstance indicating the conditional rezoning to General Business (GB). Therefore, the intent and spirit of the proposed development is to provide a development with both residential and commercial elements that aligns with the future land use of each parcel. Lapeer & Waldon will provide additional residential housing for the Township on the West parcel and a commercial development comprised of retail and a classic car club facility on the East parcel.

The future land use designation of the updated masterplan calls for multi-family low density residential in areas along Lapeer Rd. to function as a buffer for the more rural residential neighborhoods to the East/West of the corridor. This description is a direct representation of Hudson Square, as it does exactly that to the existing residential neighborhoods to the West.

In addition, Hudson Square was designed specifically to comply with the goals and objectives presented in the 2022 Orion Township Master Plan. Examples of compatibility include the following:

1. High-Quality & Diverse Housing Options Zoning Action 1a: Develop zoning standards for “missing middle” housing, including but not limited to duplex, triplex, quadplex and cottage court bungalow dwellings in multiple family districts.

Lapeer & Waldon will provide a Missing Middle housing type that provides a high-quality, marketable option between the scales of single-family homes and mid-rise flats for walkable urban living. It is designed to meet the specific needs of shifting demographics and a new market demand, which are key components for diverse housing, which aligns with the Township’s Master Plan.

2. Economic Development Objective 1: Achieve a balanced variety of neighborhood-, community-, and regionally oriented facilities that will meet the shopping and service needs of the community and nearby metropolitan area populations without unnecessary duplication.

The subject parcel is located along the Lapeer Road corridor where the Townships Master Plan designates commercial and mixed-use developments should be located. Direct access to a major thoroughfare is key to the viability of this use. The master plans future land use references Neighborhood Commercial zoning should be located in close proximity to residential neighborhoods which will help meet the day-to-day shopping needs of nearby Township residents. The subject parcel is compatible with the adjacent parcel uses given that the future land use map calls out for General Commercial to the south, Neighborhood Commercial to the north and Residential to the East and West.

3. Section IV. Environmental Resources Goal A: To Preserve the Natural Resources of Orion Township

Hudson Square was created with nature preservation at the forefront of the site design. The half-acre of existing wetland will be surrounded by an additional 1.2 acres of preserved natural/open space. It was imperative to our design that we did not eliminate, restrict or reduce the size of this wonderful natural feature. Hudson Square, as proposed, does not do so.

In addition to Hudson Square being compliant with the intent and spirit of the master plan, it is also perfectly blends and is compliant with the existing land uses of adjacent parcels. To the north is an existing church, or institutional use. Church-goers will benefit from the adjacent Biggby coffee and Sweet Amy’s Eatery for before and after services. To the south is an existing veterinary clinic and a commercial/office use. Customers and employees alike can benefit from both the commercial and residential elements of Hudson Square. To the East, across Lapeer Rd. is a multi-family residential community. This is an identical use with the proposed residential component of Hudson Square.

Finally, to the West is an existing single-family home and a vacant parcel zoned high density single-family residential. The residential component of Hudson Square is of single-family residential height, scale, mass, and character. Therefore, it complies with the adjacent single-family use.

4. **Economic Impact** - *Will the proposed PUD have a material negative economic impact upon surrounding properties?*

The proposed PUD places no negative economic impact on the surrounding land or other property owners. Hudson Square acts as a gentle transition between the high-trafficked Lapeer Rd. corridor and the single-family residential land to the West on Waldon Rd.

The residential units in the proposed development are two-story with a height of 30 feet. From the perspective of these two elements of the existing zoning ordinance, the proposed residential is compliant. Therefore, the proposed residential dwellings will be of similar height, mass, and character to the residential dwellings of the surrounding parcels. Furthermore, the proposed residential dwellings are configured in six separate structures, the same number of structures that are permitted in the Density plan based on underlying single-family zoning. From the exterior, the proposed residential dwellings appear more like six large single-family dwellings than they do a single 24-unit multi-family structure.

The commercial component of the proposed development is compliant with the general business zoning district of Orion Township. While the subject parcel is conditionally rezoned to general business for a specific use, the conditional zoning could be amended to allow for the proposed development within the general business zoning category. Given that the proposed commercial uses are in the same general character as the conditionally rezoned use, the proposed commercial component provides zero adverse economic impact to surrounding land or property owners. On the contrary, the proposed provides an economic benefit to the surrounding property owners and the community by providing for two new commercial users to serve the community.

5. **Guaranteed Open Space** - *Does the proposed PUD contain at least as much usable open space as would be required in the Ordinance for the existing zoning?*

The proposed development contains both a residential use and a non-residential use. On the residential portion of the proposed PUD plan, the proposed development provides for roughly 35% open space compared to the minimum threshold of 15% required open space for residential uses. This open space will be preserved in its natural habitat. In areas where development requires removal of existing landscape, those areas will be compensated through added landscaping in other places throughout Hudson Square.

On the commercial portion of the proposed PUD plan, the proposed development provides for roughly 15% open space compared to the minimum threshold of 10% required open space for non-residential uses.

-
6. **Unified Control** - *Is the proposed PUD under single ownership or control such that there is a single person or entity having responsibility for completing the project with this Ordinance?*

The subject parcel is currently owned by the applicant, Dr. John Canine (John and Nanci, LLC.), therefore demonstrating unified control of the subject parcel.



Charter Township of Orion
 Planning & Zoning Department
 2323 Joslyn Rd., Lake Orion MI 48360
 P: (248) 391-0304 ext. 5000

Case # _____

Meeting Date: _

**Charter Township of Orion Planning Commission
 Planned Unit Development (PUD) Application**

Project Name: **Hudson Square**

Applicant	Name: <u>Dr. John Canine</u> Address: <u>3604 Clarkston Rd.</u> City: <u>Clarkston</u> State: <u>MI</u> Zip: <u>483248</u> Phone: <u>248-595-9969</u> Cell: <u>248-396-4793</u> Fax: _____ Email: <u>jdcanine@comcast.net</u>
*Property Owner(s)	Name: <u>Same as above</u> Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Cell: _____ Fax: _____ Email: _____ * If the name on the deed does not match the name of the property owner on this application, documentation showing the individual is the same as the company name must be provided.
Plan Preparer Firm/Person	Name: <u>Detroit Riverside Capital</u> Address: <u>3300 Auburn Rd. Suite 300</u> City: <u>Auburn Hills</u> State: <u>MI</u> Zip: <u>48326</u> Phone: _____ Cell: <u>248-953-4891</u> Fax: _____ Email: <u>Michael@DetroitRiversideCapital.com</u>
Project Contact Person	Name: <u>Same as plan preparer</u> Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Cell: _____ Fax: _____ Email: _____

Property Description

Sidwell Number(s): 09-26-101-021

Location or Address of Property: 3030 S. Lapeer Rd.

Side of Street: West Nearest Intersection: Lapeer & Waldon

Acreage: 7.07 Current Use of Property: Vacant

Frontage (in feet): 441' Depth (in feet): 708'

Subject Property Zoning: R2/GB Adjacent Zoning: N. Institutional S. OP E. RM-1 W. R-2

Is the complete legal description printed on the site plan? Yes No (if no please attach to the application)
Included in application as Exhibit A

Intent/Eligibility/Design Standards

Comprehensive Statement of Intent: Give a detailed description of the proposed development (refer to Ord. 78, Section 30.03(A)). Please indicate the number and size of the buildings or units be proposed (attach a separate sheet).

Narrative Description of Project: Provide info of the market concept of the project, and explaining the manner in which the criteria set forth for eligibility (Ord. 78, Section 30.03(B)) and design (Ord. 78, Section 30.03(C)-(E)) have been met (attach a separate sheet detailing each criteria).

Per Ord. 78, 30.03(C)(6), all Zoning Ordinance requirements for the underlying zoning district shall remain in full force unless waived or modified by the Planning Commission and Township Board. Below is a list of requirements, please list the current zoning requirement and what is being proposed. Please also detail how the specific design criteria listed is being met.

	Per Zoning Ordinance	Proposed
Lot size and width	_____	_____
Lot coverage	_____	_____
Min floor area	_____	_____
Front, side, and rear setbacks	_____	_____
Height	See sheet C-2 of PUD plan	
Parking and loading	_____	_____
Fencing	_____	_____
Landscaping	_____	_____
Setback for side entry garage	_____	_____
Other	_____	_____

Does the project have adequate:

Perimeter setback and berming? Yes

Thoroughfare design? Yes

Drainage design? Preliminary

Utility design? Preliminary

Underground utilities? Preliminary

Pedestrian circulation system from vehicular thoroughfares and ways? Yes

Achievement of an integrated development with respect to signage, lighting, landscaping, and building materials? Yes

Noise reduction and visual screening mechanisms (particularly where nonresidential uses adjoin off-site residentially zoned property)? Yes

Outside Agencies

Per Ord. 78, Section 30.01(C), a copy of this application and two (2) copies of the site plan must be submitted to each of the following agencies. Please provide the Township with a copy of each transmittal as proof of delivery.

AT&T
54 Mill St.
Pontiac, MI 48342

Oakland County Water Resources Commission
(To be submitted by the Township)

Consumers Power Company
530 W. Willow St.
Lansing, MI 48906

Oakland County Health Department
Building 34 East
1200 N. Telegraph Rd.
Pontiac, MI 48341

DTE Energy Co.
ATTENTION: NW Planning & Design
1970 Orchard Lake Rd.
Sylvan Lake, MI 48320

Road Commission of Oakland County (if applicable)
ssintkowski@rcoc.org
(Electronic submittal only)

Michigan Department of Transportation (if applicable)
800 Vanguard Dr.
Pontiac, MI 48341

Required Signage

Per Ord. 78, Section 30.04(H), a sign indicating the requested rezone shall be installed on the parcels(s) no less than 15 days prior to the scheduled public Hearing. Please check one:

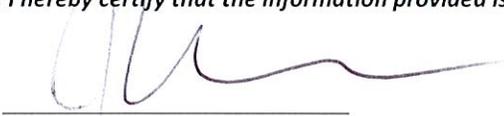
- I will install the sign(s) as required (see below for specifications).
- I would like to lease signage from the Township (including installation).
(please complete attached Sign Request Form).

The sign shall have the following wording (see Ord. 78, Section 30.04(H) for additional requirements):

ZONING CHANGE PROPOSED	- (min 8" high letters)
For more information call:	- (min 3" high letters)
Charter Township of Orion	- (min 4" high letters)
Planning and Zoning Department	- (min 4" high letters)
248-391-0304 ext. 5002	- (min 4" high letters)

*Please note, the Township does offer the ability to rent the required signage (see attached form). Please contact the Planning and Zoning Department with any questions.

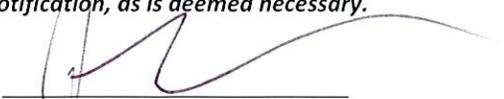
I/We, the undersigned, do hereby submit this application for Rezoning, pursuant to the provisions of the Charter Township of Orion Zoning Ordinance No. 78, Sections 30.03 and 30.01 and any other applicable ordinance requirements. In support of this request, the above facts are provided. I hereby certify that the information provided is accurate and the application that has been provided is complete.

Signature of Applicant:
(must be original ink signature) 

Date: 10/19/22

Print Name: Dr. John Canine

I, the property owner, hereby give permission to the applicant listed above to act as my agent in submitting applications, correspondence and to represent me at all meetings. I also grant permission to the Planning Commission members to visit the property, without prior notification, as is deemed necessary.

Signature of Owner*:
(must be original ink signature) 

Date: 10/19/22

Print Name: Dr. John Canine

*If the deed of ownership does not show an individual, ie a corporation, partnership, etc., documentation must be provided showing the individual signing this application has signing rights for the entity.

Exhibit A
Legal Description

 First American TitleTM	ALTA Commitment for Title Insurance
	ISSUED BY First American Title Insurance Company
Schedule C	

Commitment No.: A-6930

The land is described as follows:

Parcel 1:

Part of the Northwest 1/4 of Section 26, Town 4 North, Range 10 East, Orion Township, Oakland County, Michigan, described as follows: Beginning at a point on the West line of Lapeer Road (M-24) distant South 88 degrees 31 minutes 30 seconds West 119.70 feet, South 6 degrees 30 minutes 36 seconds East 214.15 feet and South 6 degrees 43 minutes 26 seconds East 204.25 feet from the North 1/4 corner of said Section 26; thence Southerly along the said West line of Lapeer Road, South 6 degrees 43 minutes 26 seconds East 300.00 feet to the center line of Waldon Road; thence Westerly along the center line of Waldon Road, South 84 degrees 41 minutes 30 seconds West 1007.28 feet; thence North 4 degrees 00 minutes 30 seconds West 300.00 feet; thence North 84 degrees 41 minutes 30 seconds East 993.05 feet to the point of beginning EXCEPT the West 300 feet of said parcel.

Parcel 2:

Part of the Northwest 1/4 of Section 26, Town 4 North, Range 10 East, Orion Township, Oakland County, Michigan described as follows: Beginning at a point distant South 88 degrees 31 minutes 30 seconds West 119.70 feet and South 06 degrees 30 minutes 36 seconds East 214.15 feet and South 06 degrees 43 minutes 26 seconds East 64.25 feet from the North 1/4 corner, thence South 06 degrees 43 minutes 26 seconds East 140.00 feet; thence South 84 degrees 41 minutes 30 seconds West 693.05 feet, thence North 04 degrees 00 minutes 30 seconds West 185.92 feet; thence North 88 degrees 31 minutes 30 seconds East 686.92 feet to the point of beginning.

Parcel ID: 09-26-101-021

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I-Requirements; and Schedule B, Part II-Exceptions.

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Exhibit B

EGLE Permit



NOTICE OF AUTHORIZATION

Permit Number: WRP022393 v. 1

Site Name: 63-3030 South Lapeer Road-Orion Township

Issued Date: May 12, 2020

Expiration Date: May 12, 2025

The Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division, P.O. Box 30458, Lansing, Michigan 48909-7958, under provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended; specifically:

Part 301, Inland Lakes and Streams.

Part 303, Wetlands Protection.

Authorized activity:

Impact 0.06 acres of wetland and 230 feet of open stream and 34 feet of enclosed stream with a total of 239 cubic yards of clean fill and riprap in wetland , and excavation of 9 cubic yards of fill in wetland, for the purposes of constructing a parking lot and a portion of a commercial building. Install 20 linear feet of 2-inch diameter watermain, 20 linear feet of 4-inch diameter watermain, 160 linear feet of 8-inch diameter watermain, 20 linear feet of 8-inch sanitary sewer line, and 34-linear feet of 18-inch diameter storm sewer line as depicted in the attached approved plans.

Relocate 230 linear feet of existing stream to 425 linear feet of new stream, which includes a 275 linear foot-long two-stage channel and a 150 linear foot-long portion enclosed in a 42-inch corrugated metal pipe. Restore 0.05 acres within the two-stage channel with a shrub and wetland mix seed mix as specified in the approved attached plans. Plant remaining riprap within the two-stage channel with live stakes as indicated in the approved attached plans. Remove an unregulated water control structure connecting the existing stream to an upstream in-line pond and construct a new water outflow to the relocated stream as described in the attached approved plans.

Construct a stormwater detention pond and install a stormwater overflow connection from the stormwater detention pond to the existing in-line pond as described in the approved attached plans.

All work shall be in accordance with the attached approved plans and the specific terms and conditions of the permit.

To be conducted at property located in: Oakland County, Waterbody: Unnamed stream, unnamed wetland Section 26, Town 04N, Range 10E, Orion Township

Permittee:

John Canine
936 Baldwin Road
Clarkston, MI 48348

Robert Primeau
Warren District Office
Water Resources Division
586-256-7274

This notice must be displayed at the site of work.

Laminating this notice or utilizing sheet protectors is recommended.

Please refer to the above permit number with any questions or concerns.

EGLE-Web
WRP022393 v.1.0
Approved
Issued Date: 05/12/2020
Expires Date: 05/12/2025



MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
WATER RESOURCES DIVISION
PERMIT

Issued To:

John Canine
936 Baldwin Road
Clarkston, MI 48348

Permit No: WRP022393 v.1
Submission No.: HNV-VAKH-QM75C
Site Name: 63-3030 South Lapeer Road-Orion Township
Issued: May 12, 2020
Revised:
Expires: May 12, 2025

This permit is being issued by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division, under the provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); specifically:

- Part 301, Inland Lakes and Streams
- Part 303, Wetlands Protection

Permission is hereby granted, based on permittee assurance of adherence to State of Michigan requirements and permit conditions, to:

Authorized Activity:

Impact 0.06 acres of wetland and 230 feet of open stream and 34 feet of enclosed stream with a total of 239 cubic yards of clean fill and riprap in wetland , and excavation of 9 cubic yards of fill in wetland, for the purposes of constructing a parking lot and a portion of a commercial building. Install 20 linear feet of 2-inch diameter watermain, 20 linear feet of 4-inch diameter watermain, 160 linear feet of 8-inch diameter watermain, 20 linear feet of 8-inch sanitary sewer line, and 34-linear feet of 18-inch diameter storm sewer line as depicted in the attached approved plans.

Relocate 230 linear feet of existing stream to 425 linear feet of new stream, which includes a 275 linear foot-long two-stage channel and a 150 linear foot-long portion enclosed in a 42-inch corrugated metal pipe. Restore 0.05 acres within the two-stage channel with a shrub and wetland mix seed mix as specified in the approved attached plans. Plant remaining riprap within the two-stage channel with live stakes as indicated in the approved attached plans. Remove an unregulated water control structure connecting the existing stream to an upstream in-line pond and construct a new water outflow to the relocated stream as described in the attached approved plans.

Construct a stormwater detention pond and install a stormwater overflow connection from the stormwater detention pond to the existing in-line pond as described in the approved attached plans.

All work shall be in accordance with the attached approved plans and the specific terms and conditions of the permit.

Waterbody Affected: Unnamed stream, unnamed wetland
 Property Location: Oakland County, Orion Township, Town/Range/Section 04N10E26, Property Tax No. 09-26-101-009, 09-26-101-015

Authority granted by this permit is subject to the following limitations:

- A. Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all terms and conditions of this permit.
- B. The permittee, in exercising the authority granted by this permit, shall not cause unlawful pollution as defined by Part 31 of the NREPA.
- C. This permit shall be kept at the site of the work and available for inspection at all times during the duration of the project or until its date of expiration.
- D. All work shall be completed in accordance with the approved plans and specifications submitted with the application and/or plans and specifications attached to this permit.
- E. No attempt shall be made by the permittee to forbid the full and free use by the public of public waters at or adjacent to the structure or work approved.
- F. It is made a requirement of this permit that the permittee give notice to public utilities in accordance with 2013 PA 174 (Act 174) and comply with each of the requirements of Act 174.
- G. This permit does not convey property rights in either real estate or material, nor does it authorize any injury to private property or invasion of public or private rights, nor does it waive the necessity of seeking federal assent, all local permits, or complying with other state statutes.
- H. This permit does not prejudice or limit the right of a riparian owner or other person to institute proceedings in any circuit court of this state when necessary to protect his rights.
- I. Permittee shall notify EGLE within one week after the completion of the activity authorized by this permit by completing and forwarding the attached preaddressed postcard to the office addressed thereon.
- J. This permit shall not be assigned or transferred without the written approval of EGLE.
- K. Failure to comply with conditions of this permit may subject the permittee to revocation of permit and criminal and/or civil action as cited by the specific state act, federal act, and/or rule under which this permit is granted.
- L. All dredged or excavated materials shall be disposed of in an upland site (outside of floodplains, unless exempt under Part 31 of the NREPA, and wetlands).
- M. In issuing this permit, EGLE has relied on the information and data that the permittee has provided in connection with the submitted application for permit. If, subsequent to the issuance of a permit, such information and data prove to be false, incomplete, or inaccurate, EGLE may modify, revoke, or suspend the permit, in whole or in part, in accordance with the new information.
- N. The permittee shall indemnify and hold harmless the State of Michigan and its departments, agencies, officials, employees, agents, and representatives for any and all claims or causes of action arising from acts or omissions of the permittee, or employees, agents, or representative of the permittee, undertaken in connection with this permit. The permittee's obligation to indemnify the State of Michigan applies only if the state: (1) provides the permittee or its designated representative written notice of the claim or cause of action within 30 days after it is received by the state, and (2) consents to the permittee's participation in the proceeding on the claim or cause of action. It does not apply to contested case proceedings under the Administrative Procedures Act, 1969 PA 306, as amended, challenging the permit. This permit shall not be construed as an indemnity by the State of Michigan for the benefit of the permittee or any other person.
- O. Noncompliance with these terms and conditions and/or the initiation of other regulated activities not specifically authorized shall be cause for the modification, suspension, or revocation of this permit, in whole or in part. Further, EGLE may initiate criminal and/or civil proceedings as may be deemed necessary to correct project deficiencies, protect natural resource values, and secure compliance with statutes.
- P. If any change or deviation from the permitted activity becomes necessary, the permittee shall request, in writing, a revision of the permitted activity from EGLE. Such revision request shall include complete documentation supporting the modification and revised plans detailing the proposed modification. Proposed modifications must be approved, in writing, by EGLE prior to being implemented.
- Q. This permit may be transferred to another person upon written approval of EGLE. The permittee must submit a written request to EGLE to transfer the permit to the new owner. The new owner must also submit a written request to EGLE to accept transfer. The new owner must agree, in writing, to accept all conditions of the permit. A single letter signed by both parties that includes all the above information may be provided to EGLE. EGLE will review the request and, if approved, will provide written notification to the new owner.

- R. Prior to initiating permitted construction, the permittee is required to provide a copy of the permit to the contractor(s) for review. The property owner, contractor(s), and any agent involved in exercising the permit are held responsible to ensure that the project is constructed in accordance with all drawings and specifications. The contractor is required to provide a copy of the permit to all subcontractors doing work authorized by the permit.
- S. Construction must be undertaken and completed during the dry period of the wetland. If the area does not dry out, construction shall be done on equipment mats to prevent compaction of the soil.
- T. Authority granted by this permit does not waive permit requirements under Part 91, Soil Erosion and Sedimentation Control, of the NREPA, or the need to acquire applicable permits from the County Enforcing Agent (CEA).
- U. Authority granted by this permit does not waive permit requirements under the authority of Part 305, Natural Rivers, of the NREPA. A Natural Rivers Zoning Permit may be required for construction, land alteration, streambank stabilization, or vegetation removal along or near a natural river.
- V. The permittee is cautioned that grade changes resulting in increased runoff onto adjacent property is subject to civil damage litigation.
- W. Unless specifically stated in this permit, construction pads, haul roads, temporary structures, or other structural appurtenances to be placed in a wetland or on bottomland of the water body are not authorized and shall not be constructed unless authorized by a separate permit or permit revision granted in accordance with the applicable law.
- X. For projects with potential impacts to fish spawning or migration, no work shall occur within fish spawning or migration timelines (i.e., windows) unless otherwise approved in writing by the Michigan Department of Natural Resources, Fisheries Division.
- Y. Work to be done under authority of this permit is further subject to the following special instructions and specifications:
1. Authority granted by this permit does not waive permit or program requirements under Part 91 of the NREPA or the need to acquire applicable permits from the CEA. To locate the Soil Erosion Program Administrator for your county, visit www.mi.gov/eglestormwater and select "Soil Erosion and Sedimentation Control Program" under "Related Links."
 2. The authority to conduct the activity as authorized by this permit is granted solely under the provisions of the governing act as identified above. This permit does not convey, provide, or otherwise imply approval of any other governing act, ordinance, or regulation, nor does it waive the permittee's obligation to acquire any local, county, state, or federal approval or authorization necessary to conduct the activity.
 3. No fill, excess soil, or other material shall be placed in any wetland, floodplain, or surface water area not specifically authorized by this permit, its plans, and specifications.
 4. This permit does not authorize or sanction work that has been completed in violation of applicable federal, state, or local statutes.
 5. The permit placard shall be kept posted at the work site in a prominent location at all times for the duration of the project or until permit expiration.
 6. This permit is being issued for the maximum time allowed and no extensions of this permit will be granted. Initiation of the construction work authorized by this permit indicates the permittee's acceptance of this condition. The permit, when signed by EGLE, will be for a five-year period beginning on the date of issuance. If the project is not completed by the expiration date, a new permit must be sought.
 7. The proposed channel relocation shall be constructed in the dry. Upstream and downstream plugs shall remain in place until the new channel is capable of handling flows without causing erosion.
 8. The project is limited to area of permittee's ownership and riparian interest. All spoils, including organic and inorganic soils, vegetation, and debris, shall be placed above the ordinary high water mark, leveled, and stabilized with sod and/or seed and mulch in such a manner as not to erode into any waterbody or wetland.

9. All upland excavation shall be completed prior to connection with an existing lake or stream. The water in the authorized channel or canal shall be open to the public.
10. Prior to the initiation of any permitted construction activities, a sedimentation barrier shall be constructed immediately down gradient of the construction site. Sedimentation barriers shall be specifically designed to handle the sediment type, load, water depth, and flow conditions of each construction site throughout the anticipated time of construction and unstable site conditions. The sedimentation barrier shall be maintained in good working order throughout the duration of the project. Upon project completion, the accumulated materials shall be removed and disposed of at an upland (non-wetland, non-floodplain) site and stabilized with seed and mulch. The sedimentation barrier shall then be removed in its entirety and the area restored to its original configuration and cover.
11. All raw areas in uplands resulting from the permitted construction activity shall be effectively stabilized with sod and/or seed and mulch (or other technology specified by this permit or project plans) in a sufficient quantity and manner to prevent erosion and any potential siltation to surface waters or wetlands. Temporary stabilization measures shall be installed before or upon commencement of the permitted activity, and shall be maintained until permanent measures are in place. Permanent measures shall be in place within five (5) days of achieving final grade.
12. All dredge spoils not used for berm construction shall be placed on the adjacent uplands.
13. If the project, or any portion of the project, is stopped and lies incomplete for any length of time other than that encountered in a normal work week, every precaution shall be taken to protect the incomplete work from erosion, including the placement of temporary gravel bag riprap, temporary seed and mulch, or other acceptable temporary protection.
14. The unenclosed portion of the channel relocation described in the approved attached plans as the two-stage channel shall be restored with the approved attached specified seed mix and live stake and planting plan as a condition of this permit.
15. Installation of riprap shall be limited to the areas specified in the approved attached plans, specifically in the two-stage channel, the stormwater outfall structure, and the outfall area linking the in-line pond to the two-stage channel.
16. All work shall be in accordance with the approved attached plans and the specific terms and conditions of this permit.
17. The restoration of the two-stage channel shall be completed with the correct wetland seed mix and planting plan as described in the approved and attached plans before the removal of temporary erosion control devices. The permittee shall submit photographs of the two-stage channel once such activities have been completed and upload them to the site's permit details documents section of MiWaters within 30 days of complete of the project, or to primeaur@michigan.gov. Staff will use such pictures for monitoring compliance with your permit. Failure to submit these photos is an event of noncompliance.

Issued By:



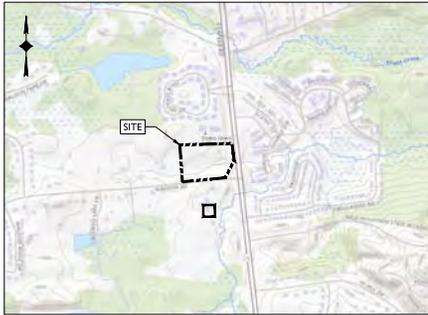
Robert Primeau
Warren District Office
Water Resources Division
586-256-7274

John Canine

5

WRP022393 v.1

cc: Orion Township Clerk
Orion Township - MEA
Oakland County Water Resources Commission
Oakland County
Matt Carmer, Land Planning Solutions, LLC



SOURCE: USGS MAPS, DATE RETRIEVED: 10/11/2022

LOCATION MAP
SCALE: 1" = 800'±

SITE DEVELOPMENT PLAN FOR HUDSON SQUARE 3030 SOUTH LAPEER ROAD PROPOSED MULTI-USE PLANNED UNIT DEVELOPMENT

PID: 09-26-101-021
3030 SOUTH LAPEER ROAD
ORION TOWNSHIP, OAKLAND COUNTY, MICHIGAN

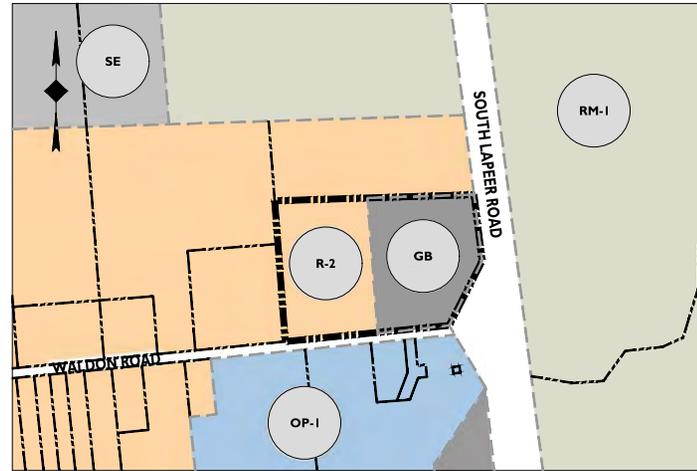
APPLICANT

DETROIT RIVERSIDE CAPITAL
3300 AUBURN ROAD
AUBURN HILLS, MI 48226
313-964-5552
MICHAEL.WAYNE@DETROITRIVERSIDECAPITAL.COM



SOURCE: NEARMAP DATE RETRIEVED: 10/11/2022

AERIAL MAP
SCALE: 1" = 200'±



SOURCE: OAKLAND COUNTY PROPERTY GATEWAY & ORION TOWNSHIP ZONING MAP, DATE RETRIEVED: 10/11/2022

ZONING MAP
SCALE: 1" = 200'±

PLANS PREPARED BY:



Detroit, MI · New York, NY · Boston, MA
Princeton, NJ · Tampa, FL · Rutherford, NJ
www.stonefieldeng.com

607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

PLAN REFERENCE MATERIALS:

1. THIS PLAN SET REFERENCES THE FOLLOWING DOCUMENTS INCLUDING, BUT NOT LIMITED TO:
 - SURVEY PROVIDED BY KEFT ENGINEERING, INC.
 - ARCHITECTURAL PLANS PROVIDED BY DEISINGHAUS ARCHITECTURE
 - AERIAL MAP FROM NEARMAPS ONLINE MAPPING SYSTEM, DATE RETRIEVED 10/11/2022
 - LOCATION MAP FROM USGS ONLINE MAPPING SYSTEM, DATE RETRIEVED 10/11/2022
2. ALL REFERENCE MATERIAL LISTED ABOVE SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THESE MATERIALS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF EACH REFERENCE AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.



SHEET INDEX	
DRAWING TITLE	SHEET #
COVER SHEET	C-1
SITE PLAN	C-2
AERIAL OVERLAY PLAN	C-3
DENSITY PLAN	C-4
GRADING PLAN	C-5

ADDITIONAL SHEETS	
DRAWING TITLE	SHEET #
EXISTING CONDITIONS PLAN	1 OF 1



Know what's below
Call before you dig.

NO.	DATE	ISSUE	DESCRIPTION
1	10/18/2022	FOR PUD APPROVAL	

NOT APPROVED FOR CONSTRUCTION

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607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLAN
HUDSON SQUARE
3030 S. LAPEER ROAD
PROPOSED MULTI-USE
PLANNED UNIT DEVELOPMENT
 PID: 09-26-101-021
 3030 SOUTH LAPEER ROAD
 ORION TOWNSHIP,
 OAKLAND COUNTY, MICHIGAN



SCALE: AS SHOWN PROJECT ID: DET-20210113-01

TITLE: **COVER SHEET**

DRAWING: **C-1**

TABLE OF LAND USE AND ZONING		
PIN: 09-26-191-021		
PROPOSED ZONE: PLANNED UNIT DEVELOPMENT (PUD)		
STORAGE	REQUIRED	PROPOSED
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT AREA	435,600 SF (10 AC)	307,764 SF (7.07 AC) (M)
MINIMUM LOT COVERAGE	70% (302,520 SF)	17.4% (53,440 SF)

(M) MODIFICATION

TABLE OF LAND USE AND ZONING		
PIN: 09-26-191-021		
PROPOSED ZONE: PLANNED UNIT DEVELOPMENT (PUD)		
UNDERLYING ZONE: GENERAL BUSINESS (GB)		
PROPOSED USE		
RESTAURANT WITH DRIVE THRU		
SIT DOWN RESTAURANT		
CLASSIC CAR CLUB		
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT AREA	12,000 SF (0.275 AC)	163,195 SF (3.75 AC)
MINIMUM LOT COVERAGE	20%	5.4% (8754 SF)
MAXIMUM BUILDING HEIGHT	25 FT	< 35 FT
MINIMUM FRONT YARD SETBACK	30 FT	56.0 FT
MINIMUM SIDE YARD SETBACK	20 FT	N/A
MINIMUM REAR YARD SETBACK	30 FT	52.8 FT
MINIMUM BUILDING CLEAR SPACE	20 FT	PROVIDED
MINIMUM 0.5 W. GREENBELT BUFFER	30 FT	52.7 FT
MINIMUM SINGLE-FAMILY GREENBELT BUFFER	30 FT	30.0 FT
MINIMUM OPEN SPACE	10%	PROVIDED
DRIVE-THRU / SINGLE FAMILY SETBACK	100 FT	52.8 FT (M)

(M) MODIFICATION

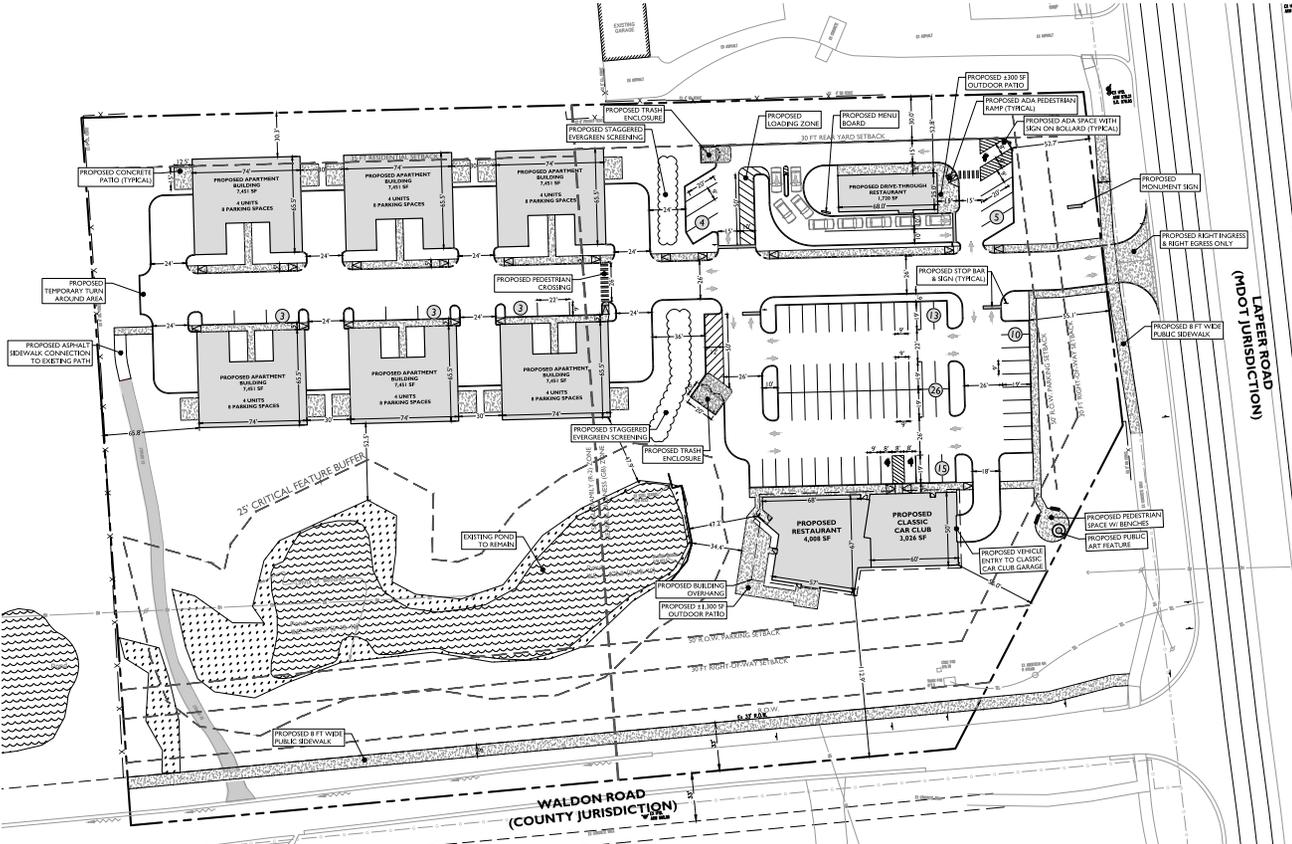
TABLE OF LAND USE AND ZONING		
PIN: 09-26-191-021		
PROPOSED ZONE: PLANNED UNIT DEVELOPMENT (PUD)		
UNDERLYING ZONE: SINGLE-FAMILY (S-F)		
PROPOSED USE		
MULTIPLE-FAMILY RESIDENTIAL		
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT SIZE	10,800 SF	N/A
MINIMUM LOT WIDTH	80 FT	N/A
MAXIMUM LOT COVERAGE	25%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	< 30 FT
MINIMUM FRONT YARD SETBACK	25 FT	248.0 FT
MINIMUM SIDE YARD SETBACK	35 FT	65.8 FT
MINIMUM REAR YARD SETBACK	25 FT	30.2 FT (M)
MINIMUM BUILDING CLEAR SPACE	20 FT	30.0 FT
MINIMUM FLOOR AREA / UNIT	1,880 SF	N/A
MINIMUM OPEN SPACE	15%	PROVIDED

(M) MODIFICATION

OFF-STREET PARKING REQUIREMENTS		
CODE SECTION	REQUIRED	PROPOSED
§ 14-61C	DRIVE-THROUGH RESTAURANT: 1 SPACE PER 100 SF OF OFA + (1,730 SF) SPACE (100 SF) = 17 SPACES RESTAURANT (SEE BELOW): 1 SPACE PER 100 SF + (4,000 SF) SPACE (100 SF) = 40 SPACES CLASSIC CAR CLUB: 1 SPACE PER 200 SF OF OFA + (3,025 SF) SPACE (200 SF) = 15 SPACES TOTAL: 17 + 40 + 15 SPACES = 72 SPACES	72 SPACES
§ 27-04A	MULTIFAMILY APARTMENT: 2 SPACES PER UNIT (24 UNITS) SPACE (UNIT) = 48 SPACES	48 SPACES
§ 14-61A	APARTMENT GUEST PARKING: 1 SPACE PER 1 UNIT (24 UNITS) SPACE (1 UNIT) = 24 SPACES	24 SPACES
§ 27-04A	90° PARKING: 9 FT X 19 FT WITH 22 FT ASLE	9 FT X 19 FT WITH 22 FT ASLE
§ 14-61A	PARALLEL PARKING: 9 FT X 22 FT	9 FT X 22 FT
§ 27-04A	OFF STREET LOADING: 10 FT X 50 FT	10 FT X 50 FT

* OFF-STREET PARKING DETERMINED USING GENERAL BUSINESS DISTRICT REQUIREMENTS

SYMBOL	DESCRIPTION
---	PROPERTY LINE
---	SETBACK LINE
---	PROPOSED CURB & GUTTER
---	PROPOSED FLUSH CURB
○	PROPOSED SIGN / BOLLARDS
▭	PROPOSED BUILDING
▭	PROPOSED CONCRETE PAVEMENT
▭	PROPOSED WALL
▭	PROPOSED BUILDING DOORS
▭	PROPOSED EVERGREEN LANDSCAPING SCREEN



- GENERAL NOTES**
- THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC PRIOR TO THE START OF CONSTRUCTION.
 - THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ENFORCE THAT ALL REQUIRED APPROVALS HAVE BEEN OBTAINED PRIOR TO THE START OF CONSTRUCTION. COPIES OF ALL REQUIRED PERMITS AND APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
 - ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, IDENTIFY AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC AND ITS SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEE ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
 - THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
 - THE CONTRACTOR SHALL NOT REPAIR ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PERSON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
 - THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURES OR SITE FEATURES THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTOR'S EXPENSE.
 - THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW BY STONEFIELD ENGINEERING & DESIGN, LLC. THE CONTRACTOR SHALL SUBMIT ALL SUBMITTALS IN ACCORDANCE WITH THE SUBMITTALS IN ACCORDANCE WITH THE DESIGN INTENT AS REFLECTED WITHIN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES LATEST EDITION.
 - THE CONTRACTOR IS REQUIRED TO REFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE PROCUREMENT OF STREET OPENING PERMITS.
 - THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION OR DURING ACTIVITIES.
 - SHOULD AN IMPROVEMENT OF STONEFIELD ENGINEERING & DESIGN, LLC BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.



NO.	DATE	ISSUE	DESCRIPTION
1 <td>10/18/2023 <td>FOR PUD APPROVAL <td></td> </td></td>	10/18/2023 <td>FOR PUD APPROVAL <td></td> </td>	FOR PUD APPROVAL <td></td>	

NOT APPROVED FOR CONSTRUCTION

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Princeton, NJ - Tampa, FL - Raleigh, NC
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Phone: 248.247.1115

SITE DEVELOPMENT PLAN

HUDSON SQUARE

3030 S. LAPEER ROAD

PROPOSED MULTI-USE PLANNED UNIT DEVELOPMENT

PUD: 09-26-191-021
3030 S. LAPEER ROAD
ORION TOWNSHIP, MICHIGAN

MEAD ECKHART P.E.
MICHIGAN REG. NO. 601024928
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
Engineering & Design

SCALE: 1" = 40' PROJECT ID: DET-2023-03-01

TITLE: **SITE PLAN**

DRAWING: **C-2**



SYMBOL	DESCRIPTION
---	PROPERTY LINE
---	SETBACK LINE
---	PROPOSED CURB & GUTTER
---	PROPOSED FLUSH CURB
○	PROPOSED SIGNS / BOLLARDS
▭	PROPOSED BUILDING
▭	PROPOSED CONCRETE PAVEMENT
▭	PROPOSED WALL
▭	PROPOSED BUILDING DOORS
▭	PROPOSED EVERGREEN LANDSCAPING SCREEN

- GENERAL NOTES**
1. THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC PRIOR TO THE START OF CONSTRUCTION.
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 3. ALL CONTRACTORS SHALL TO THE FULLEST EXTENT PERMITTED BY LAW, INSURE AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC AND ITS SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEE ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
 4. THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
 5. THE CONTRACTOR SHALL NOT REMOVE ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PRISON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
 6. THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURE OR SITE FEATURE THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTOR'S EXPENSE.
 7. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW BY STONEFIELD ENGINEERING & DESIGN, LLC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN INTENT AS REFLECTED WITHIN THE PLAN SET.
 8. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
 9. THE CONTRACTOR IS REQUIRED TO REFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE REQUIRING OF STREET CLOSING PERMITS.
 10. THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION OF OPEN ACTIVITIES.
 11. SHOULD AN EMPLOYEE OF STONEFIELD ENGINEERING & DESIGN, LLC, BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.



NO.	DATE	ISSUE	DESCRIPTION
1	10/18/2023	FOR P&ID APPROVAL	

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SITE DEVELOPMENT PLAN

HUDSON SQUARE

3030 S. LAPEER ROAD

PROPOSED MULTI-USE PLANNED UNIT DEVELOPMENT

PROJ: 09-24-10-021
3030 S. LAPEER ROAD
OAKLAND TOWNSHIP
OAKLAND COUNTY, MICHIGAN

STONEFIELD
engineering & design

SCALE: 1" = 40' PROJECT ID: DET-2019131

TITLE: **AERIAL OVERLAY PLAN**

DRAWING: **C-3**

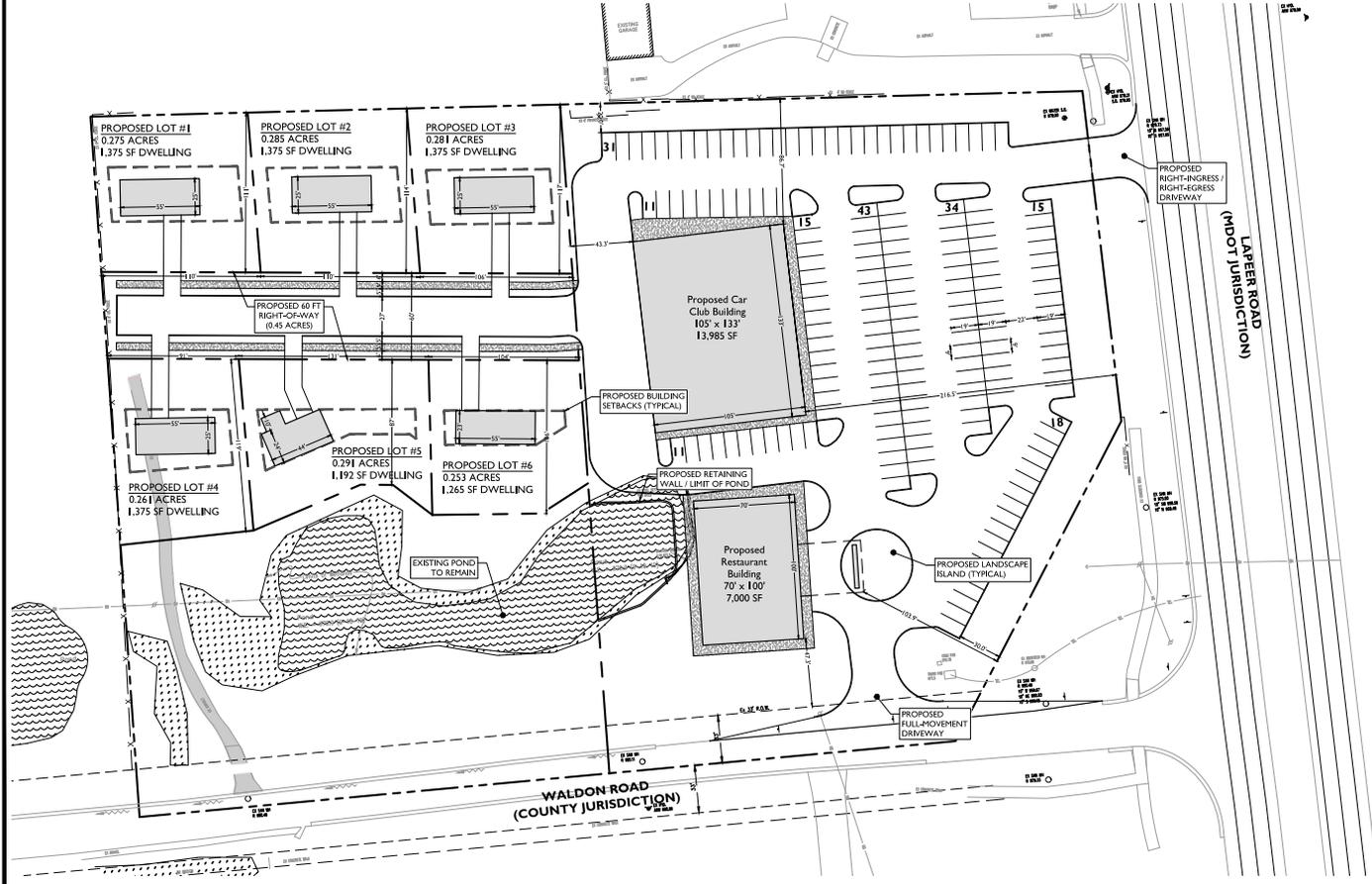
TABLE OF LAND USE AND ZONING		
PIN: 09-26-101-021		
PROPOSED ZONE: PLANNED UNIT DEVELOPMENT (PUD)		
UNDERLYING ZONE: GENERAL BUSINESS (GB)		
PROPOSED USE		
RESTAURANT WITH DRIVE-THRU 50' DOWN RESTAURANT CLASSIC CAR CLUB		
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT AREA	12,000 SF (0.275 AC)	14,570 SF (0.332 AC)
MAXIMUM LOT COVERAGE	20% (4,837 SF)	14.5% (32,985 SF)
MAXIMUM BUILDING HEIGHT	25 FT	35 FT
MINIMUM FRONT YARD SETBACK	30 FT	47.3 FT
MINIMUM SIDE YARD SETBACK	20 FT	N/A
MINIMUM REAR YARD SETBACK	30 FT	4.2-3 FT
MINIMUM BUILDING CLEAR SPACE	30 FT	30.0 FT
MINIMUM R.O.V. GREENBELT BUFFER	30 FT	30.0 FT
MINIMUM OPEN SPACE	10%	PROVIDED

TABLE OF LAND USE AND ZONING		
PIN: 09-26-101-021		
PROPOSED ZONE: PLANNED UNIT DEVELOPMENT (PUD)		
UNDERLYING ZONE: SINGLE-FAMILY (R-3)		
PROPOSED USE		
MULTIPLE-FAMILY RESIDENTIAL		
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT SIZE	10,000 SF (0.230 AC)	11,220 SF (0.253 AC)
MINIMUM LOT WIDTH	80 FT	91 FT (LOT #4)
MAXIMUM LOT COVERAGE	25%	11.5% (LOT #4)
MAXIMUM BUILDING HEIGHT	30 FT	4.30 FT
MAXIMUM DENSITY	4 UNITS / ACRE	3 UNITS / ACRE
MINIMUM FRONT YARD SETBACK	35 FT	PROVIDED
MINIMUM SIDE YARD SETBACK	10 FT	PROVIDED
MINIMUM REAR YARD SETBACK	35 FT	PROVIDED
MINIMUM BUILDING CLEAR SPACE	20 FT	PROVIDED
MINIMUM FLOOR AREA / UNIT	1,080 SF	1,192 SF
MINIMUM OPEN SPACE	10%	PROVIDED

OFF-STREET PARKING REQUIREMENTS		
CODE SECTION	REQUIRED	PROPOSED
1145.0.C	RESTAURANT (50' DOWN): 1 SPACE PER 100 SF * (7,000 SF) SPACE / 100 SF = 70 SPACES CLASSIC CAR CLUB: 1 SPACE PER 200 SF OF GEA * (13,985 SF) SPACE / 200 SF = 70 SPACES TOTAL: 70 + 70 SPACES = 140 SPACES	178 SPACES
	SINGLE-FAMILY: N/A	3 SPACES PER DWELLING
1370.A	30' PARKING: 9 FT X 19 FT WITH 20 FT AISLE	9 FT X 19 FT WITH 22 FT AISLE
1370.A	50' STREET LOADING: 10 FT X 50 FT	10 FT X 50 FT

* OFF-STREET PARKING DETERMINED USING GENERAL BUSINESS DISTRICT REQUIREMENTS

SYMBOL	DESCRIPTION
---	PROPERTY LINE
---	SETBACK LINE
---	PROPOSED CURB & GUTTER
---	PROPOSED FLUSH CURB
---	PROPOSED BUILDING
---	PROPOSED CONCRETE PAVEMENT
---	PROPOSED BUILDING DOORS



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- THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC PRIOR TO THE START OF CONSTRUCTION.
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DATE	ISSUE	DESCRIPTION
10/18/2023	1	FOR PUD APPROVAL

NOT APPROVED FOR CONSTRUCTION

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Phone: 248.247.1115

SITE DEVELOPMENT PLAN

HUDSON SQUARE

3030 S. LAPEER ROAD

PROPOSED MULTI-USE PLANNED UNIT DEVELOPMENT

PUD: 09-26-101-021
3030 S. LAPEER ROAD
OAKLAND COUNTY, MICHIGAN

MEHDI ESKANDARI, P.E.
MICHIGAN REG. NO. 401024928
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design

SCALE: 1" = 40' PROJECT ID: DET-201913-01

TITLE: DENSITY PLAN

DRAWING: C-4

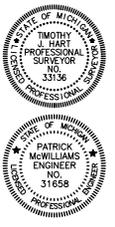


LEGEND

EXISTING	STORM SEWER
EXISTING	SANITARY SEWER
EXISTING	WATERMAIN
EXISTING	GAS MAIN
EXISTING	ELEC. TELE. CABLE
EXISTING	OVERHEAD
WETLAND LIMITS	WETLAND LIMITS
25' NATURAL FEATURES SETBACK	STORM MANHOLE
	CATCH BASIN
	REARVARD CATCH BASIN
	END SECTION
	SANITARY MANHOLE
	GATE VALVE AND WELL
	HYDRANT
	CONDUITS
	POWER POLE
	LIGHT POLE
	GRADE
	SOL BORING
	CALCULATED
	STREAM CHANNEL
	DEMOLITION LIMITS

- Benchmarks: NAVD '88**
- BM #1 - RIM OF EXISTING SANITARY MANHOLE LOCATED NEAR THE SW CORNER OF PROPERTY. ELEVATION = 989.46
 - BM #2 - RIM OF EXISTING SANITARY MANHOLE LOCATED ON THE WEST SIDE OF LAPEER ROAD, 140 FT +/- NORTH OF WALDON ROAD. ELEVATION = 973.80
 - BM #3 - ARROW OF EXISTING HYDRANT LOCATED NEAR THE NE PROPERTY CORNER. ELEVATION = 978.21
 - BM #4 - MAG NAIL SET IN NORTH FACE OF POWER POLE LOCATED ON THE SOUTH SIDE OF THE DOUBLE GREENHOUSES. ELEVATION = 972.52

Note:
ALL EXISTING UTILITIES SHOWN ON THIS TOPOGRAPHIC SURVEY HAVE BEEN TAKEN FROM FIELD OBSERVATION AND RECORD MAPPING, WHERE AVAILABLE. NO GUARANTEE IS MADE, OR SHOULD BE ASSUMED, AS TO THE COMPLETENESS OR ACCURACY OF THE UTILITIES SHOWN ON THIS DRAWING. PARTIES UTILIZING THIS INFORMATION SHALL FIELD VERIFY THE ACCURACY AND COMPLETENESS OF OVERHEAD AND UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION ACTIVITIES.



DATE	ISSUE

PROPRIETOR:
CONSTRUCTION DESIGN SERVICE
2867 GLENWOOD COURT
LAKE ORION, MICHIGAN 48360
(586) 216-5953

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KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 100, WARREN, MICHIGAN 48093
PHONE (248) 625-5251 www.kieft.com FAX (248) 625-7110

DATE	6-17-2020	CKD. BY	DATE
DESIGN	TJH/PCM	DESIGN	TJH/PCM
SECTION	26	SCALE	1" = 30'

Existing Conditions Plan
Orion Classic Car Club
PART OF THE E 1/2 OF THE NW 1/4 OF SECTION 26, T4N, R10E,
ORION TOWNSHIP, OKLAHOMA COUNTY, MICHIGAN

SCALE 1" = 30'
SHEET 2 OF 21
KE 2019.139

Hudson Square

3030 S Lapeer Rd.

Orion Township, MI 48360



3400 AUBURN RD., SUITE 200
AUBURN HILLS, MI 48326
T: 248.601.4422 F: 248.453.5854
WWW.DESIGNHAUS.COM
INFO@DESIGNHAUS.COM

PROJECT TEAM

OWNER
DETROIT RIVERSIDE CAPITAL, LLC
1251 INDEPENDENCE RD.
BLOOMFIELD TOWNSHIP, MI 48301
MICHAEL WAYNE
ALEX HARRIS

ARCHITECT
DESIGNHAUS ARCHITECTURE
3304 AUBURN RD.
AUBURN HILLS, MI 48326
T: 248.601.4422
F: 248.453.5854
PROJECT MANAGER: JRE LATOOS
PROJECT ARCHITECT:
PETER STUHLMEYER, AIA

CIVIL ENGINEER
STANFIELD
605 CHERRY ST., SUITE 200
DETROIT, MI 48226
T: 313.247.1115
C: 734.546.4941
CONTACT: EHC WILLIAMS

INDEX OF DRAWINGS

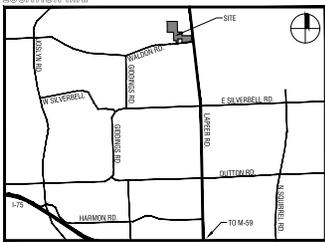
SHEET NO.	DRAWING NAME
01-1	Title Sheet and Index
ARCHITECTURAL	
A1-00	Floor Plan
A2-00	Building Elevations
A-001	First Floor Plan
A-002	Second Floor Plan
A-003	Elevations
A-004	Elevations
A-004	Right Elevation Reference

STATEMENT OF SELECTED DESIGN PROFESSIONAL

THESE CONSTRUCTION DOCUMENTS WERE PREPARED FOR COMPLIANCE WITH THE MICHIGAN CONSTRUCTION CODES IN EFFECT AT THE TIME OF PERMIT SUBMITTAL. ALL ENGINEERS, CONTRACTORS AND SUPPLIERS INVOLVED WITH THIS PROJECT SHALL COMPLY WITH THE SAME. CODES, ISSUES AND APPROVED CODES, INSPECTIONS AND/OR MUNICIPAL CONSTRUCTION BOARDS OF APPEALS RULINGS AND WHENEVER REQUIRED SHALL PROVIDE SHOP DRAWINGS AND SUBMITTALS CLEARLY IDENTIFYING COMPLIANCE TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE FOR REVIEW AND APPROVAL.

REGISTERED DESIGN PROFESSIONAL IN CHARGE:
PETER STUHLMEYER, AIA
MICHIGAN IDENTIFICATION # 44668
DESIGNHAUS ARCHITECTURE

LOCATION MAP



P.U.D. SUBMITTAL 10.20.22

Revision/Issue Date

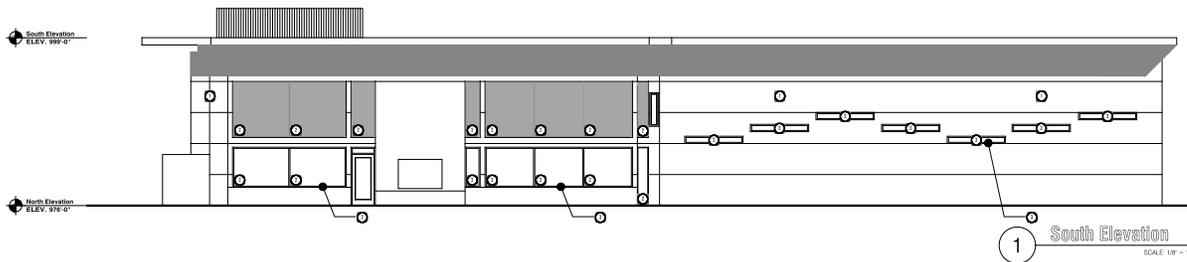
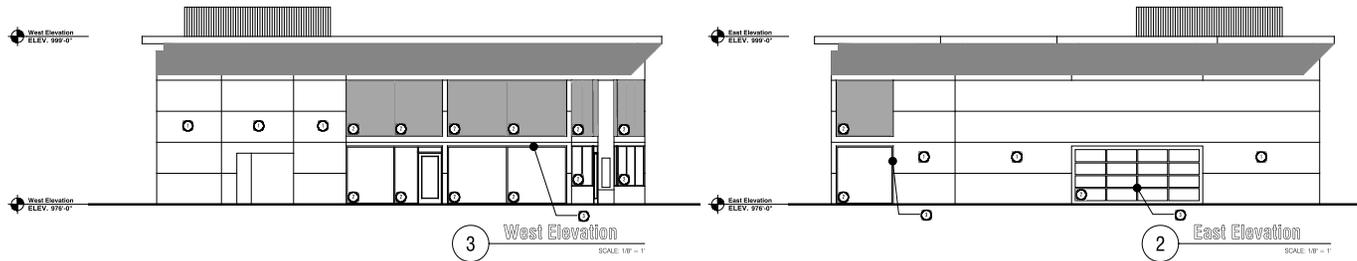
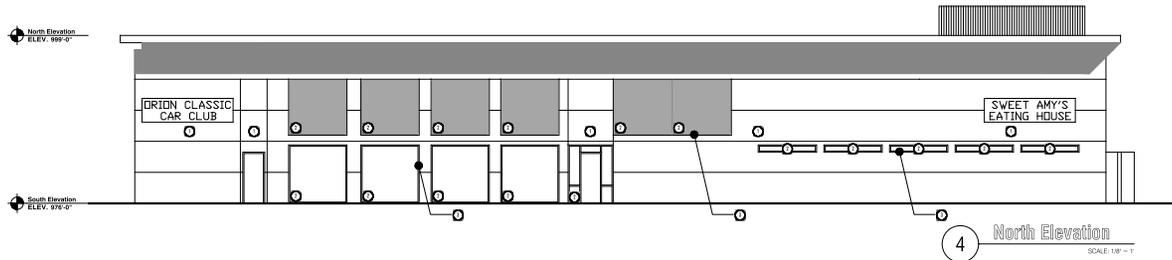
Hudson Square
3030 S Lapeer Rd.
Orion Township, MI 48360

Cover Sheet & Index

022165

GO.01

MATERIAL LEGEND	
IMAGE MARK	DESCRIPTION
	STUCCO
	CLEAR GLASS
	DARK BRONZE FRAMING



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1998
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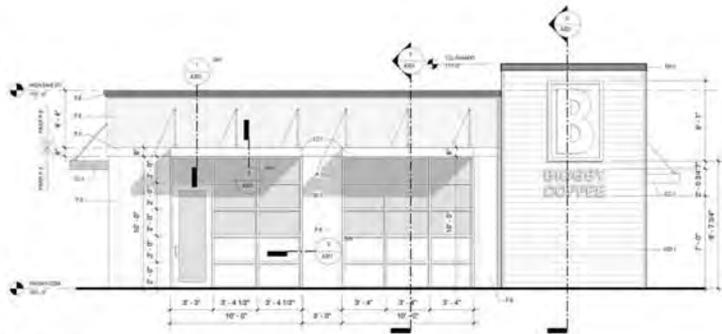
Revision/Issue	Date
P.U.D. SUBMITTAL	10.20.22

Hudson Square
3030 S Lapeer Rd.
Orion Township, MI 48360

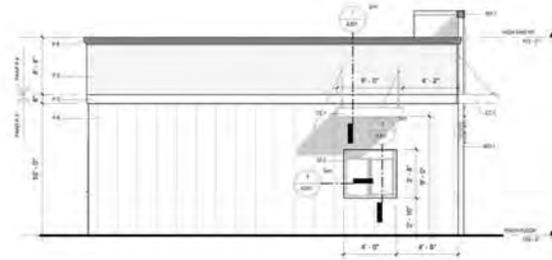
Building Elevations

022165

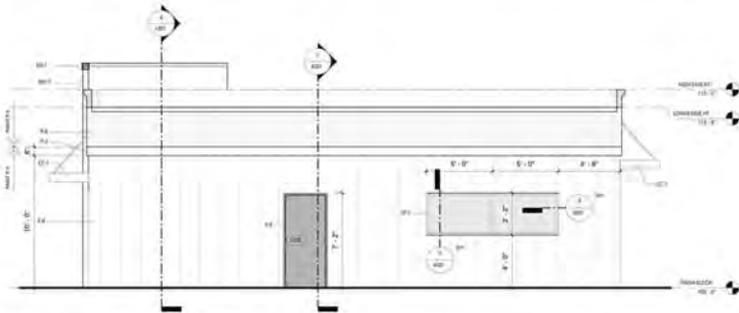
A2.00



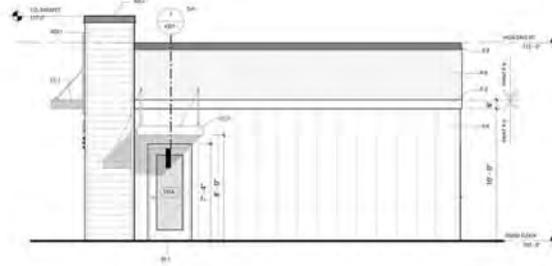
1 WEST ELEVATION



2 NORTH ELEVATION



3 EAST ELEVATION



4 SOUTH ELEVATION

Note: The pictured elevations are from an existing Bigby Coffee location and provided to serve as a reference for the general character of the proposed Bigby Coffee location. The proposed building size is roughly 500 SF larger than the reference. The dimensions of the proposed are 25' (w) x 68' (L), as provided on the PUD site plan. The proposed will contain similar façade design and materials.

EXTERIOR FINISH SCHEDULE

TAG	DESCRIPTION	SPEC SECTION	FINISH / COLOR	MANUFACTURER	ASSEMBLY
PAINT					
P-8	PAINT	09 91 13	DARK GREY	SHERWIN WILLIAMS SW 6006 BLACK BEAN	N/A
CANOPY					
CC-1	METAL CANOPY	10 73 16	RAL 2003 49/24540	MASA ARCHITECTURAL CANOPIES OR EQUAL	N/A
METAL SIDING					
MS-1	METAL CAP	13 34 19	MATCH P-8		N/A
STORE FRONT					
SF-1	ALUMINUM STORE FRONT WINDOWS	08 51 13	DARK BRONZE	TUBELITE	N/A
SF-2	DRIVE THROUGH WINDOW	08 56 53	DARK BRONZE	READY ACCESS OR EQUAL	N/A
WOOD					
WD-1	CEDAR RENDITIONS ALUMINUM SIDING	07 46 33	TBD	ROYAL BUILDING PRODUCTS	P4



Note: This is a photo of an existing Bigby Coffee location provided to serve as a reference for the general character of the proposed Bigby Coffee.

DESIGNHAUS
EST 1998
ARCHITECTURE

3300 AUBURN RD., SUITE 300
AUBURN HILLS, MI 48326
T:248.601.4422 F:248.453.9854
WWW.DESIGNHAUS.COM
INFO@DESIGNHAUS.COM

Revision/Issue	Date
Reference Material	22.10.18
---	---
---	---
---	---
---	---
---	---
---	---

Bigby Coffee
Lapeer & Waldon
Orion Twp, MI 48359

22.10.18



1 ELEVATION 1
6" = 10"



2 ELEVATION 2
6" = 10"

GENERAL NOTES: THIS SET OF DRAWINGS IS INTENDED AS A GUIDE. THE CONTRACTOR IS RESPONSIBLE FOR UNDERSTANDING AND FOLLOWING ALL APPLICABLE BUILDING CODES, LAWS, AND REGULATIONS WHICH ARE TO SUPPLEMENT ANY INFORMATION IN THESE DRAWINGS. ALL CONSTRUCTION IS TO MEET CURRENT STANDARDS OF CRAFTSMANSHIP AND CARE. ALL PRODUCTS ARE TO BE INSTALLED PER MANUFACTURER'S WRITTEN INSTRUCTIONS. STRUCTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING SYSTEMS ARE TO BE DESIGNED AND INSTALLED BY OTHERS AND ARE OUTSIDE THE SCOPE OF THESE DRAWINGS.

SEAL:

SIGNATURE:

CONTENT:

SHEET TITLE:

DATE:

SHEET NO.:



3 ELEVATION 3
6" = 10"



4 ELEVATION 4
6" = 10"

GENERAL NOTES: THIS SET OF DRAWINGS IS INTENDED AS A GUIDE. THE CONTRACTOR IS RESPONSIBLE FOR UNDERSTANDING AND FOLLOWING ALL APPLICABLE BUILDING CODES, LAWS, AND REGULATIONS WHICH ARE TO SUPPLEMENT ANY INFORMATION IN THESE DRAWINGS. ALL CONSTRUCTION IS TO MEET CURRENT STANDARDS OF CRAFTSMANSHIP AND CARE. ALL PRODUCTS ARE TO BE INSTALLED PER MANUFACTURER'S WRITTEN INSTRUCTIONS. STRUCTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING SYSTEMS ARE TO BE DESIGNED AND INSTALLED BY OTHERS AND ARE OUTSIDE THE SCOPE OF THESE DRAWINGS.

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1 FIRST FLOOR PLAN
6" = 10"

GENERAL NOTES: THIS SET OF DRAWINGS IS INTENDED AS A GUIDE. THE CONTRACTOR IS RESPONSIBLE FOR UNDERSTANDING AND FOLLOWING ALL APPLICABLE BUILDING CODES, LAWS, AND REGULATIONS WHICH ARE TO SUPERSEDE ANY INFORMATION IN THESE DRAWINGS. ALL CONSTRUCTION IS TO MEET CURRENT STANDARDS OF CRAFTSMANSHIP AND CARE. ALL PRODUCTS ARE TO BE INSTALLED PER MANUFACTURER'S WRITTEN INSTRUCTIONS. STRUCTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING SYSTEMS ARE TO BE DESIGNED AND INSTALLED BY OTHERS AND ARE OUTSIDE THE SCOPE OF THESE DRAWINGS.

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SHEET NO.:



1 SECOND FLOOR PLAN
6" = 10"

GENERAL NOTES: THIS SET OF DRAWINGS IS INTENDED AS A GUIDE. THE CONTRACTOR IS RESPONSIBLE FOR UNDERSTANDING AND FOLLOWING ALL APPLICABLE BUILDING CODES, LAWS, AND REGULATIONS WHICH ARE TO SUPERSEDE ANY INFORMATION IN THESE DRAWINGS. ALL CONSTRUCTION IS TO MEET CURRENT STANDARDS OF CRAFTSMANSHIP AND CARE. ALL PRODUCTS ARE TO BE INSTALLED PER MANUFACTURER'S WRITTEN INSTRUCTIONS. STRUCTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING SYSTEMS ARE TO BE DESIGNED AND INSTALLED BY OTHERS AND ARE OUTSIDE THE SCOPE OF THESE DRAWINGS.

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MEMO

VIA EMAIL michael.wayne@detroitriversidecapital.com

To: John and Nancy, LLC.

From: Jacob Swanson, PE
Fleis & VandenBrink

Date: November 9, 2022

Re: Hudson Square Planned Unit Development (PUD)
Orion Township, Michigan
Traffic Impact Study

1 INTRODUCTION

This memorandum presents the results of a Traffic Impact Study (TIS) for the proposed Hudson Square Planned Unit Development (PUD) located in Orion Township, Michigan. The project site is located at 3030 S. Lapeer Road (M-24) on approximately 7 acres, in the northwest quadrant of the SB Lapeer Road (M-24) & Waldon Road intersection, as shown on the attached **Figure 1**. The project includes a mixed-use development, with the construction of restaurant and residential land uses. Site access is proposed via one (1) driveway on SB Lapeer Road (M-24), which is under the jurisdiction of the Michigan Department of Transportation (MDOT).

The lane use and traffic control at the study intersections are shown on the attached **Figure 2** and the study roadways characteristics are summarized in **Table 1**. For the purposes of this study, site driveways, median U-turns (crossovers), and residential streets were assumed to have an operating speed of 25 miles per hour (mph), unless otherwise noted.

Table 1: Roadway Information

Roadway	Lapeer Road (M-24)	Waldon Road
Number of Lanes	4 lanes (2 lanes each direction, median divided)	2 lanes (1 lanes each direction)
National Functional Classification	Other Principal Arterial	Major Collector
Speed Limit	55 mph	40 mph
AADT	43,400 vpd (SEMCOG 2016)	4,300 (SEMCOG 2018)

The scope of the study was developed based on Fleis & VandenBrink's (F&V) understanding of the development program, accepted traffic engineering practice, and methodologies published by the Institute of Transportation Engineers (ITE). In addition, Orion Township and MDOT provided input regarding the scope of work for this traffic impact study. The study analyses were completed using Synchro/SimTraffic (Version 11) traffic analysis software. Sources of data for this study include F&V subconsultant Quality Counts, LLC. (QC), information published by the Institute of Transportation Engineers (ITE), RCOC, and MDOT.

2 DATA COLLECTION

F&V subconsultant Quality Counts, LLC. (QC) collected existing Turning Movement Count (TMC) data on Thursday October 13th, 2022, and Tuesday October 18th, 2022, while school was in session. Eight hours of existing TMC data was collected during the AM (7:00 AM to 9:00 AM), MD (11:00 AM to 1:00 PM), and PM (2:00 PM to 6:00 PM) peak periods, at the following study intersections:

- SB Lapeer Road (M-24) & NB-to-SB Crossover, North of Waldon Road
- SB Lapeer Road (M-24) & Waldon Road
- NB Lapeer Road (M-24) & SB-to-NB Crossover, South of Waldon Road / Eagle Ridge Road

During collection of the turning movement counts, Peak Hour Factors (PHFs), pedestrian and bike volumes, and commercial truck percentages were recorded and used in the traffic analysis. The AM and PM peak hours for the adjacent roadway network were generally observed to occur on weekdays between 7:45 AM to 8:45 AM and 5:00 PM to 6:00 PM, respectively. F&V collected an inventory of existing lane use and traffic controls, as shown on the attached **Figure 2**.

Additionally, F&V obtained the current signal timing permits from MDOT for the upstream signalized intersections and included these signalized intersections within the Synchro Model to appropriately reflect the platooning and progression of vehicles along Lapeer Road (M-24). Data collection previously performed by F&V subconsultant Traffic Data Collection, Inc. (TDC) at the Silverbell intersection was utilized in the model and traffic volumes were balanced upward through the network at the study intersections. Therefore, the raw traffic volumes shown on the attached data collection summaries may not match the traffic volumes utilized in the study. The existing 2022 peak hour traffic volumes used in the analysis are shown on the attached **Figure 3**. All applicable background data referenced in this memorandum is attached.

3 EXISTING CONDITIONS

Existing peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersections using Synchro (Version 11) traffic analysis software. The study analyses were based on the existing lane use and traffic control shown on the attached **Figure 2**, the existing peak hour traffic volumes shown on the attached **Figure 3**, and the methodologies presented in the *Highway Capacity Manual 6th, Edition* (HCM).

Descriptions of LOS “A” through “F” as defined in the HCM6, are attached. Typically, LOS D is considered acceptable, with LOS A representing minimal delay, and LOS F indicating failing conditions. Additionally, SimTraffic network simulations were reviewed to evaluate network operations and vehicle queues. The results for the existing conditions analysis are attached and shown in **Table 2**.

Table 2: Existing Intersection Operations

	Intersection	Control	Approach	Existing Conditions			
				AM Peak		PM Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS
10	SB Lapeer Road (M-24) & NB-to-SB Crossover, North of Waldon Road	Stop (Minor)	WBL	54.3	F	23.8	C
			SB	Free			
20	SB Lapeer Road (M-24) & Waldon Road	Stop (Minor)	EBR	54.3	F	23.3	C
			SB	Free			
30	NB Lapeer Road (M-24) & SB-to-NB Crossover, South of Waldon Road	Stop (Minor)	EBTL	22.9	C	580.1	F
			WBR	13.3	B	26.3	D
			NB	Free			

The result of the existing conditions analysis indicates that all approaches and movements and the study intersections are currently operating acceptably, at LOS D or better, during both the AM and the PM peak hours, with the exception of the following:

(INT #10) – SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon Road

- During the AM peak hour: The northbound to southbound U-turn movement is currently operating at LOS F.

(INT #20) – SB Lapeer Road (M-24) & Waldon Road

- During the AM peak hour: The eastbound right-turn movement currently operates at LOS F.

(INT #30) – NB Lapeer Road (M-24) & SB-to-NB X/O, S. of Waldon Road / Eagle Ridge Road

- During the PM peak hour: The southbound to northbound U-turn movement is currently operating at LOS F.

Review of SimTraffic network simulations during the AM peak hour indicates generally acceptable operations. Occasional periods of vehicle queues were observed along the eastbound Waldon Road approach and the northbound to southbound U-turn movement at the crossover (INT #10); however, these vehicle queues were observed to dissipate and were not present throughout the AM peak hour.

Review of SimTraffic microsimulations indicates long vehicle queues for the southbound to northbound U-turn movement at the crossover (INT #30) during the PM peak hour; these queues were occasionally observed to exceed the available storage area and block the southbound through traffic. Review of the data collection videos confirms periods of long vehicle queues resulting from vehicles struggling to find adequate gaps within the NB Lapeer Road (M-24) through traffic. Additionally, when the available SB-to-NB crossover storage area becomes blocked, vehicles along eastbound Waldon Road desiring to travel north on Lapeer Road (M-24) were observed to not progress through the intersection of SB Lapeer Road (M-24) & Waldon Road, even when adequate gaps were present within the southbound traffic flow. This issue was observed to create increased delays and longer vehicle queues for all traffic along eastbound Waldon Road, especially vehicles attempting to travel south.

3.1 EXISTING CONDITIONS WITH IMPROVEMENTS

In order to improve the existing traffic operations to a LOS D or better, during all peak periods, for all intersection approaches and movements, mitigation measures were investigated. These mitigation measures include geometric improvements and traffic control modifications. The proposed improvements and their impact on intersection operations are discussed below.

3.1.1 TRAFFIC SIGNAL WARRANT ANALYSIS

A signal warrant analysis was conducted at each of the stop-controlled study intersections. The *2011 Michigan Manual on Uniform Traffic Control Devices* (MMUTCD) documents the guidelines by which traffic signal control may or should be considered. F&V collected 8 hours of turning movement traffic volume data for use in the study. F&V evaluated Warrant 1 (8-Hour Vehicular Volume), Warrant 2 (4-Hour Vehicular Volume), and Warrant 3 (Peak-Hour) for this study. The existing MMUTCD signal warrant chart outputs are attached and summarized below in **Table 3**.

Warrant 1

According to the MMUTCD, Warrant 1, Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. Condition B is intended for application where Condition A is not satisfied, and where the traffic volume on the major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. It is intended that Warrant 1 be treated as a single warrant, where Warrant 1 is satisfied if either Conditions A or B are met.

Warrant 2

The Four-Hour signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The need for a traffic signal shall be considered if, for each of any four hours of an average day, the intersection approach volumes fall above the applicable curve on Figure 4C-1.

Warrant 3

The Peak Hour signal warrant conditions is intended for use at a location where traffic conditions are such that, for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. The need for a signal shall be considered if on any hour of an average day, the approach volumes fall above the applicable curve line shown on Figure 4C-3.

Table 3: Existing Signal Warrant Analysis Summary

Warrant		SB Lapeer Road (M-24) & NB-to-SB X/O	SB Lapeer Road (M-24) & Waldon Road	NB Lapeer Road (M-24) & SB-to-NB X/O
Warrant 1: Eight-Hour		YES	YES	YES
Condition A	Hours Met	3	8	8
	Warrant Met	NO	YES	YES
Condition B	Hours Met	8	8	8
	Warrant Met	YES	YES	YES
Warrant 2: Four-Hour	Hours Met	8	8	8
	Warrant Met	YES	YES	YES
Warrant 3: Peak-Hour	Hours Met	5	8	8
	Warrant Met	YES	YES	YES

The results of the signal warrant analyses indicate that traffic signals are warranted at all study intersections, based on the existing traffic volumes. The study intersections currently meet all of the volume thresholds for Warrant 1A, Warrant 1B, Warrant 2, and Warrant 3; with the exception of the intersection of SB Lapper Road (M-24) & NB-to-SB Crossover, which does not meet Warrant 1A. Additionally, a review of SimTraffic network simulations for the intersection of SB Lapper Road (M-24) & NB-to-SB Crossover does not indicate that the minor-street (median crossover) traffic suffers undue delay and during the field review, any vehicle queues present were observed to quickly dissipate within the peak periods.

3.1.2 SUMMARY

Traffic signals are warranted at all of the study intersections; however, field reviews indicate that traffic at the SB Lapeer Road (M-24) & NB-to-SB Crossover intersection does not experience undue delay. Therefore, in order to improve the existing intersection operations, the following mitigation measures are recommended:

Recommendations

Install a fully actuated/coordinated (SCATS) traffic signal at the following intersection to accommodate the existing traffic volumes:

- SB Lapeer Road (M-24) & Waldon Road (INT #20)
- NB Lapeer Road (M-24) & SB-to-NB Crossover, South of Waldon Road (INT #30)

The results of the existing improvements analysis are attached and summarized in **Table 4**. With the implementation of the recommended mitigation measures, all approaches and movements at the study intersections are expected to operate acceptably, at LOS D or better during both peak periods, with the exception of the following:

(INT #20) – SB Lapeer Road (M-24) & Waldon Road

- During the AM peak hour: The eastbound right-turn movement is expected to *improve* to LOS E.
- During the PM peak hour: The eastbound right-turn movement is expected to operate at LOS E.

(INT #30) – NB Lapeer Road (M-24) & SB-to-NB X/O, S. of Waldon Road / Eagle Ridge Road

- During the AM peak hour: The westbound right-turn movement is expected to operate at LOS E.

The LOS and delay at these intersections are due to moderately low volumes of vehicles on the minor street approaches and the random arrival of vehicles, in conjunction with the long cycle length (130 seconds) along the Lapeer Road (M-24) corridor. The consequence of this is that vehicles will often arrive at the intersection on a red signal and have to wait throughout the majority of the cycle length to receive a green signal. A reduction in cycle length at these intersections would improve operations for the minor street approaches and movements; however, this would impact the major street movements at this intersection, as well as the adjacent signalized intersections that are coordinated along the Lapeer Road (M-24) corridor.

Table 4: Existing Intersection Operations with Improvements

Intersection	Approach	Existing Conditions (STOP Control)				Existing IMP Conditions (Signalized)				Difference			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
20 SB Lapeer Road (M-24) & Waldon Road	EBR	54.3	F	23.3	C	63.0	E	62.8	E	8.7	F→E	39.5	C→E
	SBT	Free				6.0	A	4.9	A	N/A			
	SBR	Free				1.2	A	8.3	A	N/A			
	Overall	N/A				8.8	A	11.3	B	N/A			
30 NB Lapeer Road (M-24) & SB-to-NB X/O, S. of Waldon Rd.	EBTL	22.9	C	580.1	F	45.8	D	54.8	D	22.9	C→D	-525.3	F→D
	WBR	13.3	B	26.3	D	55.8	E	49.0	D	42.5	B→E	22.7	-
	NBT	Free				2.8	A	10.4	B	N/A			
	NBR	Free				1.7	A	3.1	A	N/A			
	Overall	N/A				9.5	A	13.6	B	N/A			

The eastbound right-turn movement at the SB Lapeer Road (M-24) & Waldon Road intersection is expected to experience an increased delay; however, the LOS is expected to improve. This is the result of the different range of delays that equate to the LOS descriptions for unsignalized and signalized intersection. Motorists at a signalized intersection are more comfortable waiting longer for a green light indication, as opposed to having to be constantly watching for gaps within the through traffic at a stop-controlled intersection.

Additionally, although the Synchro LOS analysis indicates poor operations for the eastbound right-turn movement at Waldon Road and the westbound right-turn movement at Eagle Ridge Road, a review of SimTraffic network simulations indicates acceptable operations; all vehicle queueing was observed to be processed through the signalized intersections within each cycle length, leaving no residual vehicle queueing.

4 BACKGROUND (2025) CONDITIONS

Population and economic growth profile data was obtained for Orion Township from the Southeast Michigan Council of Governments (SEMCOG) database to calculate a background growth rate for the 2022 peak hour traffic volumes in order to calculate the 2025 site buildout year traffic volumes. Population and employment projections from 2015 to 2045 were reviewed and showed an average annual growth of 0.19% and 0.08%, respectively. Therefore, a conservative annual background growth rate of **0.5%** per year was applied to the existing peak hour traffic volumes to forecast the background 2025 peak hour traffic volumes **without the proposed development**, as shown on the attached **Figure 4**. Additionally, it is important to account for developments within the study network, which will be constructed prior to the site buildout year of 2025; however, no planned background developments were identified within the study network.

The background peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersection based on the existing lane use and traffic control shown on the attached **Figure 2**, the background peak hour traffic volumes shown on the attached **Figure 4**, and the methodologies presented in the HCM 6th Edition. The results of the background conditions analysis are attached and summarized in **Table 5**.

The results of the background conditions analysis indicates that all study intersection approaches and movements are expected to continue operating in a manner similar to the existing conditions analysis. Review of SimTraffic microsimulations also indicates operations similar to those observed under existing conditions.

Table 5: Background Intersection Operations

Intersection	Control	Approach	Existing Conditions				Background Conditions				Difference			
			AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
10 SB Lapeer Road & NB-to-SB X/O, N. of Waldon Rd.	Stop (Minor)	WBL	54.3	F	23.8	C	58.7	F	24.4	C	4.4	-	0.6	-
		SB	Free				Free				N/A			
20 SB Lapeer Road & Waldon Road	Stop (Minor)	EBR	54.3	F	23.3	C	59.4	F	24.1	C	5.1	-	0.8	-
		SB	Free				Free				N/A			
30 NB Lapeer Road & SB-to-NB X/O, S. of Waldon Rd.	Stop (Minor)	EBTL	22.9	C	580.1	F	23.5	C	616.1	F	0.6	-	36.0	-
		WBR	13.3	B	26.3	D	13.4	B	26.8	D	0.1	-	0.5	-
		NB	Free				Free				N/A			

4.1 BACKGROUND CONDITIONS WITH IMPROVEMENTS

In order to improve the background traffic operations at the study intersections, the mitigation measures evaluated to improve existing conditions were re-evaluated:

4.1.1 TRAFFIC SIGNAL WARRANT ANALYSIS

A signal warrant analysis was again conducted at each of the stop-controlled study intersections, after applying the background growth rate to the buildout year of 2025, in order to reflect the background traffic volumes. The background signal warrant charts are summarized in **Table 6** below and are attached for reference.

Table 6: Background Signal Warrant Analysis Summary

Warrant		SB Lapeer Road (M-24) & NB-to-SB X/O	SB Lapeer Road (M-24) & Waldon Road	NB Lapeer Road (M-24) & SB-to-NB X/O
Warrant 1: Eight-Hour		YES	YES	YES
Condition A	Hours Met	4	8	8
	Warrant Met	NO	YES	YES
Condition B	Hours Met	8	8	8
	Warrant Met	YES	YES	YES
Warrant 2: Four-Hour	Hours Met	8	8	8
	Warrant Met	YES	YES	YES
Warrant 3: Peak-Hour	Hours Met	5	8	8
	Warrant Met	YES	YES	YES

The results of the signal warrant analyses indicates that traffic signals are warranted at all study intersections, based on the background traffic volumes. The study intersections are expected to meet all of the volume thresholds for Warrant 1A, Warrant 1B, Warrant 2, and Warrant 3; with the exception of the intersection of SB Lapper Road (M-24) & NB-to-SB Crossover, which does not meet Warrant 1A. Additionally, a review of SimTraffic network simulations for the intersection of SB Lapper Road (M-24) & NB-to-SB Crossover does not indicate that the minor-street (median crossover) traffic suffers undue delay and during the field review, any vehicle queues present were observed to quickly dissipate within the peak periods.

4.1.2 SUMMARY

Traffic signals are warranted at all of the study intersections; however, reviews indicate that traffic at the SB Lapeer Road (M-24) & NB-to-SB Crossover intersection does not experience undue delay. Therefore, in order to improve the background intersection operations, the following mitigation measures are recommended:

Recommendations

Install a fully actuated/coordinated (SCATS) traffic signal at the following intersection to accommodate the existing and background traffic volumes:

- SB Lapeer Road (M-24) & Waldon Road (INT #20)
- NB Lapeer Road (M-24) & SB-to-NB Crossover, South of Waldon Road (INT #30)

The results of the background improvements analysis are attached and summarized in **Table 7**. With the implementation of the recommended mitigation measures, all approaches and movements at the study intersections are expected to operate acceptably, at LOS D or better during both peak periods, with the exception of the following:

(INT #20) – SB Lapeer Road (M-24) & Waldon Road

- During the AM peak hour: The eastbound right-turn movement is expected to *improve* to LOS E.
- During the PM peak hour: The eastbound right-turn movement is expected to operate at LOS E.

(INT #30) – NB Lapeer Road (M-24) & SB-to-NB X/O, S. of Waldon Road / Eagle Ridge Road

- During the AM peak hour: The westbound right-turn movement is expected to operate at LOS E.

Table 7: Background Intersection Operations with Improvements

Intersection	Approach	Background Conditions (STOP Control)				Background IMP Conditions (Signalized)				Difference			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
20 SB Lapeer Road (M-24) & Waldon Road	EBR	59.4	F	24.1	C	62.8	E	63.0	E	3.4	F→E	38.9	C→E
	SBT	Free				6.3	A	5.1	A	N/A			
	SBR	Free				1.2	A	8.5	A	N/A			
	Overall	N/A				9.0	A	11.6	B	N/A			
30 NB Lapeer Road (M-24) & SB-to-NB X/O, S. of Waldon Rd.	EBTL	23.5	C	616.1	F	46.1	D	54.5	D	22.6	C→D	-561.6	F→D
	WBR	13.4	B	26.8	D	55.4	E	48.9	D	42.0	B→E	22.1	-
	NBT	Free				2.9	A	10.8	B	N/A			
	NBR	Free				1.7	A	3.1	A	N/A			
	Overall	N/A				9.6	A	13.9	B	N/A			

Although the Synchro LOS analysis indicates poor operations for the minor street movements, due to the long cycle length, a review of SimTraffic network simulations indicates acceptable operations. All vehicle queueing was observed to be processed through the signalized intersections within each cycle length, leaving no residual vehicle queueing during either peak period.

5 SITE TRIP GENERATION

The number of weekday peak hour (AM and PM) and daily vehicle trips that would be generated by the proposed development were forecast based on data published by ITE in the *Trip Generation Manual, 11th Edition*. Through discussion with the Township Engineer, the ITE standard methods of evaluation were utilized in this study. The proposed development includes the construction of a coffee shop with drive-through, a sit-down restaurant, a car storage club, and 24 multi-family units. The trip generation utilized for this study is summarized in **Table 8**.

Table 8: Site Trip Generation

Land Use	ITE Code	Amount	Units	Average Daily Traffic (vpd)	AM Peak Hour (vph)			PM Peak Hour (vph)		
					In	Out	Total	In	Out	Total
Mini-Storage	151	3,026	SF	4	1	0	1	1	0	1
Multi-Family Housing (Low-Rise)	220	24	DU	229	7	23	30	20	11	31
High Turnover (Sit-down) Restaurant	932	4,008	SF	430	21	17	38	22	14	36
Coffee Shop with Drive-Through	937	1,720	SF	918	75	73	148	34	33	67
<i>Pass-By (50% AM, 55% PM)</i>				482	37	37	74	18	18	36
Total Trips				1,581	104	113	217	77	58	135
<i>Total Pass-By</i>				482	37	37	74	18	18	36
Total New Trips				1,099	67	76	143	59	40	99

As is typical of commercial developments, a portion of the trips generated by the development are from vehicles already on the adjacent roadway network that will pass the site on their way from an origin to their ultimate destination. Therefore, not all traffic at the site driveways is necessarily new traffic added to the street system. This percentage of the trips generated by the development are considered “pass-by” trips and do not add new traffic to the adjacent street system. Through discussion with the Township engineer pass-by trips were only considered for the coffee-shop land use. These trips are reduced from the total external trips generated by a study site. The percentage of pass-by trips used in this analysis was determined based on the rates published by ITE in the *Trip Generation Manual, 11th Edition*. However, ITE does not provide pass-by data for LUC 937: Coffee Shop with Drive-Through; therefore, the pass-by data for LUC 934: Fast-Food Restaurant with Drive-Through was conservatively utilized for this analysis.

6 SITE TRIP DISTRIBUTION

The vehicular trips that would be generated by the proposed development were assigned to the study roadway network based on the proposed site access plan and driveway configurations, the existing peak hour traffic patterns in the adjacent roadway network, and the methodologies published by ITE. The ITE trip distribution methodology assumes that new trips will enter the network and access the development, then leave the development and return to their direction of origin, whereas pass-by trips will enter and exit the development, then continue on their original direction of travel. The site trip distributions utilized in this analysis are summarized in **Table 9**.

Table 9: Site Trip Distribution

To/From	Via	New Commercial		Pass-By		Residential	
		AM	PM	AM	PM	AM	PM
North	Lapeer Road (M-24)	65%	36%	31% (NB)	61% (NB)	31%	36%
South	Lapeer Road (M-24)	31%	60%	69% (SB)	39% (SB)	65%	60%
West	Waldon Road	4%	4%			4%	4%
Total		100%	100%		100%	100%	100%

The vehicular traffic volumes shown in **Table 8** were distributed to the study network according to the distribution shown in **Table 9**. The site-generated trips shown on the attached **Figure 5** were added to the background peak hour traffic volumes shown on the attached **Figure 4**, in order to calculate the future peak hour traffic volumes with the addition of the proposed development. Future peak hour traffic volumes are shown on the attached **Figure 6**.

7 FUTURE (2025) CONDITIONS

The future peak hour vehicle delays and LOS *with the proposed development* were calculated based on the future lane use and traffic control shown on the attached **Figure 2**, the proposed site access, the future traffic volumes shown on the attached **Figure 6**, and the methodologies presented in the HCM 6th Edition. The results of the future conditions analysis are attached and summarized in **Table 10**.

Table 10: FUTURE INTERSECTION OPERATIONS

Intersection	Control	Approach	Background Conditions				Future Conditions				Difference			
			AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
10 SB Lapeer Road & NB-to-SB X/O, N. of Waldon Rd.	Stop (Minor)	WBL	58.7	F	24.4	C	102.8	F	36.2	E	44.1	-	11.8	C→E
		SB	Free				Free				N/A			
20 SB Lapeer Road & Waldon Road	Stop (Minor)	EBR	59.4	F	24.1	C	71.6	F	26.3	D	12.2	-	2.2	C→D
		SB	Free				Free				N/A			
30 NB Lapeer Road & SB-to-NB X/O, S. of Waldon Rd.	Stop (Minor)	EBTL	23.5	C	616.1	F	33.4	D	780.4	F	9.9	C→D	164.3	-
		WBR	13.4	B	26.8	D	13.6	B	27.5	D	0.2	-	0.7	-
		NB	Free				Free				N/A			
40 SB Lapeer Road & Site Driveway	Stop (Minor)	EBR	N/A				100.3	F	25.3	D	N/A			
		SB	N/A				Free				N/A			

The results of the future conditions analysis indicates that the study intersections are expected to continue operating in a manner similar to the background conditions analysis, with the following additional impacts anticipated to intersection LOS:

(INT #10) – SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon Road

- During the PM peak hour: The northbound to southbound U-turn movement is expected to operate at LOS E.

(INT #40) – SB Lapeer Road (M-24) & Site Driveway

- During the AM peak hour: The eastbound right-turn movement is expected to operate at LOS F.

Review of SimTraffic network simulations during the AM peak hour indicates generally acceptable operations, similar to those observed during the background conditions analysis. Occasional periods of vehicle queues were observed along the eastbound Waldon Road approach (INT #20) and the northbound to southbound U-turn movement at the crossover (INT #10); however, these vehicle queues were typically observed to dissipate and were not present throughout the AM peak hour. Additionally, although the LOS analysis indicates poor operations at the proposed site driveway, review of SimTraffic network simulations indicates a 95th percentile queue length of approximately 95-feet (3-4 vehicles), which is not significant.

Review of SimTraffic network simulations during the PM peak hour indicates long vehicle queues for the southbound to northbound U-turn movement at the crossover (INT #30). These vehicle queues were often observed to exceed the available storage area, resulting in southbound traffic spilling back into and blocking the other study intersections along SB Lapeer Road (M-24). As a result, when the available SB-to-NB crossover storage area becomes blocked, increased delays and longer vehicle queues are experienced for all traffic on the eastbound Waldon Road approach and on the eastbound site driveway approach, especially for vehicles attempting to travel south.

7.1 FUTURE CONDITIONS WITH IMPROVEMENTS

In order to improve the future traffic operations at the study intersections, the mitigation measures evaluated to improve existing conditions were re-evaluated.

7.1.1 TRAFFIC SIGNAL WARRANT ANALYSIS

A signal warrant analysis was again conducted at all the stop-controlled study intersections. The site generated hourly traffic volumes utilized in this analysis were determined based on hourly variations in daily traffic data published by the ITE in *Trip Generation, 11th Edition*. The corresponding hourly traffic volumes generated by the proposed development were projected for the eight hours of TMC data collected and combined with the background traffic volumes to provide eight-hour traffic volume data for the signal warrant evaluation. The future signal warrant charts are summarized in **Table 11** below and are attached for reference.

The results of the signal warrant analyses indicate that the study intersections are expected to meet all of the warrant volume thresholds, based on the future traffic volumes. However, a review of SimTraffic network simulations for the intersection of SB Lapeer Road (M-24) & NB-to-SB Crossover does not indicate that the minor-street (median crossover) traffic suffers undue delay and during the field review, any vehicle queues present were observed to quickly dissipate within the peak periods.

Table 11: Future Signal Warrant Analysis Summary

Warrant		SB Lapeer Road (M-24) & NB-to-SB X/O	SB Lapeer Road (M-24) & Waldon Road	NB Lapeer Road (M-24) & SB-to-NB X/O
Warrant 1: Eight-Hour		YES	YES	YES
Condition A	Hours Met	8	8	8
	Warrant Met	YES	YES	YES
Condition B	Hours Met	8	8	8
	Warrant Met	YES	YES	YES
Warrant 2: Four-Hour	Hours Met	8	8	8
	Warrant Met	YES	YES	YES
Warrant 3: Peak-Hour	Hours Met	8	8	8
	Warrant Met	YES	YES	YES

7.1.2 SUMMARY

Traffic signals are warranted at all of the study intersections; however, reviews indicate that traffic at the SB Lapeer Road (M-24) & NB-to-SB Crossover intersection does not experience undue delay. Therefore, in order to improve the future intersection operations, the following mitigation measures are recommended:

Recommendations

Install a fully actuated/coordinated (SCATS) traffic signal at the following intersection to accommodate the existing, background, and future traffic volumes:

- SB Lapeer Road (M-24) & Waldon Road (INT #20)
- NB Lapeer Road (M-24) & SB-to-NB Crossover, South of Waldon Road (INT #30)

The results of the future improvements analysis are attached and summarized in **Table 12**. With the implementation of the recommended mitigation measures, all approaches and movements at the study intersections are expected to operate acceptably, at LOS D or better during both peak periods, with the exception of the following:

(INT #20) – SB Lapeer Road (M-24) & Waldon Road

- During the AM peak hour: The eastbound right-turn movement is expected to *improve* to LOS E.
- During the PM peak hour: The eastbound right-turn movement is expected to operate at LOS E.

Although the Synchro LOS analysis indicates poor operations for the minor street movements, due to the long cycle length, a review of SimTraffic network simulations indicates acceptable operations. All vehicle queueing was observed to be processed through the signalized intersections within each cycle length, leaving no residual vehicle queueing during either peak period.

Table 12: Future Intersection Operations with Improvements

Intersection	Approach	Future Conditions (STOP Control)				Future IMP Conditions (Signalized)				Difference			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
20 SB Lapeer Road (M-24) & Waldon Road	EBR	71.6	F	26.3	D	63.0	E	63.1	E	-8.6	F→E	36.8	D→E
	SBT	Free				7.4	A	5.5	A	N/A			
	SBR	Free				1.1	A	8.0	A	N/A			
	Overall	N/A				10.0	A	11.7	B	N/A			
30 NB Lapeer Road (M-24) & SB-to-NB X/O, S. of Waldon Rd.	EBTL	33.4	D	780.4	F	45.7	D	54.3	D	12.3	-	-726.1	F→D
	WBR	13.6	B	27.5	D	51.0	D	46.9	D	37.4	B→D	19.4	-
	NBT	Free				4.4	A	13.1	B	N/A			
	NBR	Free				2.6	A	3.7	A	N/A			
	Overall	N/A				12.3	B	16.4	B	N/A			

8 CRASH ANALYSIS

A crash analysis was conducted at the study intersections. F&V obtained the crash data used in the analysis from the Michigan Traffic Crash Facts (MTCF) historical crash database, for the most recent **three years** (January 1, 2019, to December 31, 2021) of available data at the study intersections. The results of the crash analysis are summarized in **Table 13**.

Table 13: Crash Analysis Summary

Crash Type	Description	SB Lapeer (M-24) Road & NB-to-SB Crossover		SB Lapeer (M-24) Road & Waldon Road		NB Lapeer (M-24) Road & SB-to-NB Crossover	
		Total Crashes	Percentage	Total Crashes	Percentage	Total Crashes	Percentage
1	Single Motor Vehicle Crash	0	0%	1	3%	0	0%
2	Head On	0	0%	0	0%	0	0%
3	Head On Left-Turn	0	0%	0	0%	0	0%
4	Angle	0	0%	2	5%	0	0%
5	Rear-End (Straight)	0	0%	0	0%	0	0%
6	Rear-End (Left-Turn)	0	0%	0	0%	0	0%
7	Rear-End (Right-Turn)	0	0%	32	87%	0	0%
8	Sideswipe-Same	0	0%	2	5%	0	0%
9	Sideswipe-Opposite	0	0%	0	0%	0	0%
10	Other/Unknown	0	0%	0	0%	0	0%
Total		0	0%	37	100%	0	0%

SB Lapeer Road (M-24) & NB-to-SB Crossover, N. of Waldon Road: Zero (0) crashes reported at this intersection between 2019 and 2021.

NB Lapeer Road (M-24) & SB-to-NB Crossover, S. of Waldon Road / Eagle Ridge Road: Zero (0) crashes reported at this intersection between 2019 and 2021.

SB Lapeer Road (M-24) & Waldon Road: There were 37 crashes reported between 2019 and 2021. The majority of crashes (32 reports) at the study intersection were Rear-End Right-Turn (86%) crashes; the remaining five (5) crashes (14%) were Sideswipe (5%), Angle (5%), and Single Motor Vehicle (3%) crash types.

The majority of crashes at this intersection are a result of vehicles traversing from Waldon Road to the southbound-to-northbound crossover. Drivers are looking north for gaps in southbound traffic and are not paying attention to the vehicle in front of them, are misjudging the available gap, or are not aware of backups in the crossover lane. Further details of the existing crash patterns are summarized below.

- Detailed review of the crash reports (UD-10s) indicates that the rear-end crashes were primarily resulting from motorist on the stop-controlled Waldon Road approach watching for gaps within the through traffic along SB Lapeer Road (M-24) traffic. These drivers were noted to rear-end the vehicle in front of them on Waldon Road, thinking the vehicle had already turned onto SB Lapeer Road (M-24). Therefore, creating controlled gaps in traffic with intersection signalization would mitigate the existing rear-end crashes associated with the existing conditions.
- Similar to the rear-end crashes, the sideswipe crashes occurred as a result of inattentive drivers believing the vehicle in front of them had already made their turn from Waldon Road onto SB Lapeer Road (M-24). The angle crashes occurred as a result of vehicles turning out onto SB Lapeer Road (M-24) without having an adequate gap within the southbound through traffic.
- The Single Motor Vehicle crash occurred when a vehicle was driving too fast for conditions, due to ice on the roadway, and lost control, striking the stop sign on Waldon Road.
- Three (3) Type-C injury crashes were reported; no fatal or Type-A injury crashes were reported within the most recent three years of available data.

The SEMCOG Crash Analysis Process Regional Critical Intersection Crash Rates, Frequencies, and Casualty Ratios: By Presence or Absence of Signalization was used to compare the actual crash rates and frequencies to the regional rates for similar intersection operations. Using methodology from the SEMCOG Crash Analysis Process, the intersections were further analyzed and compared to the SEMCOG regional crash frequency for signalized and unsignalized intersections. The results of this analysis are summarized in **Table 14**. The results of the SEMCOG analysis indicates that the crash rates and frequencies for the study intersection of SB Lapeer Road (M-24) & Waldon Road are greater than the SEMCOG averages for similar types of intersections.

Table 14: Study Network Intersection Crash Analysis Summary

Intersection	Average ADT (Entering Volume vpd)	Crash Frequency (crashes/year)			Crash Rate (crashes per MEV)		
		Intersection Annual Crash Frequency	SEMCOG Average Annual Crash Frequency	Difference	Intersection Annual Crash Rate	SEMCOG Average Annual Crash Rate	Difference
SB Lapeer Road (M-24) & Waldon Road	24,335	12.33	3.32	9.01	1.39	0.37	1.02
SB Lapeer Rd. (M-24) & NB-to-SB X/O, N. of Waldon	23,735	0	3.32	-3.32	0	0.37	-0.37
NB Lapeer Road (M-24) & SB-to-NB X/O, S. of Waldon	24,955	0	3.32	-3.32	0	0.37	-0.37

9 ACCESS MANAGEMENT

9.1 AUXILIARY LANES

The MDOT auxiliary turn lane treatment warrants were evaluated at the proposed site driveway; Lapeer Road (M-24) is a median divided roadway; therefore, the left-turn warrants were not evaluated. This analysis was based on the future peak hour traffic volumes shown on the attached **Figure 6**. The results of the analysis are shown on the attached MDOT warranting charts and summarized in **Table 15**.

Table 15: Auxiliary Turn Lane Summary

Intersection	AM Peak	PM Peak	Recommendation
SB Lapeer Road (M-24) & Site Drive	Right-Turn Lane	Right-Turn Lane	Right-Turn Lane

The results of the MDOT auxiliary turn lane evaluation indicates that a full-width southbound right-turn deceleration lane is warranted on SB Lapeer Road (M-45) at the proposed site driveway. However, the proposed driveway will be located within the existing right-turn lane at Waldon Road; therefore, no changes are recommended to the existing roadway configuration.

9.2 DRIVEWAY SPACING

The MDOT Geometric Design Guidance (section 1.2.2) was utilized to evaluate the location of the proposed site driveways in relation to nearby intersections and driveways within close proximity to the project site. The AASHTO desirable unsignalized access spacing and intersection corner clearance criteria were evaluated for the 55-mph section of SB Lapeer Road (M-24). The distance of the proposed site driveways from nearby access points and the warranting criteria are summarized in **Table 15** and displayed in **Exhibit 1**.

Table 16: Desirable Corner Clearance Summary

Adjacent Driveways & Intersections			Distance	Criteria (45 mph)	Meets
Site Driveway	To	Waldon Road	300 feet	230 feet	YES
Site Driveway	To	Church Driveway	140 feet	455 feet	NO
Site Driveway	To	NB-to-SB Crossover	600 feet	150 feet	YES

Exhibit 1: Driveway Spacing



The results of the driveway spacing analysis indicates that the proposed site driveway location is expected to meet the desirable corner clearance criteria, in relation to the nearby roadway and median crossover. The proposed access point will be located within close proximity (~140-ft) to the existing Divine Grace Lutheran Church and School driveway; however, the proposed driveway is located on the northern portion of the site in order to provide sufficient spacing from Waldon Road. Additionally, the existing church driveway is not expected to be a high trip generator; therefore, the potential conflicts between the adjacent access points is minimal.

10 SITE CIRCULATION

The projected drive-through vehicle queuing was reviewed to determine if the proposed on-site queue length for the drive-through is adequate to accommodate the projected operations. Hourly drive-through market average data for similar Biggby restaurants indicates an average service rate of approximately 60 vehicles/hour. Additionally, the dataset indicates that approximately 67% of customers at Biggby will utilize a drive-through. Therefore, based on these averages, assumptions and the conservative ITE trip generation projections, it is estimated that approximately 50 vehicles per hour will use the proposed Biggby drive-through facility during the AM peak hour. The evaluation of the queue length included two criteria:

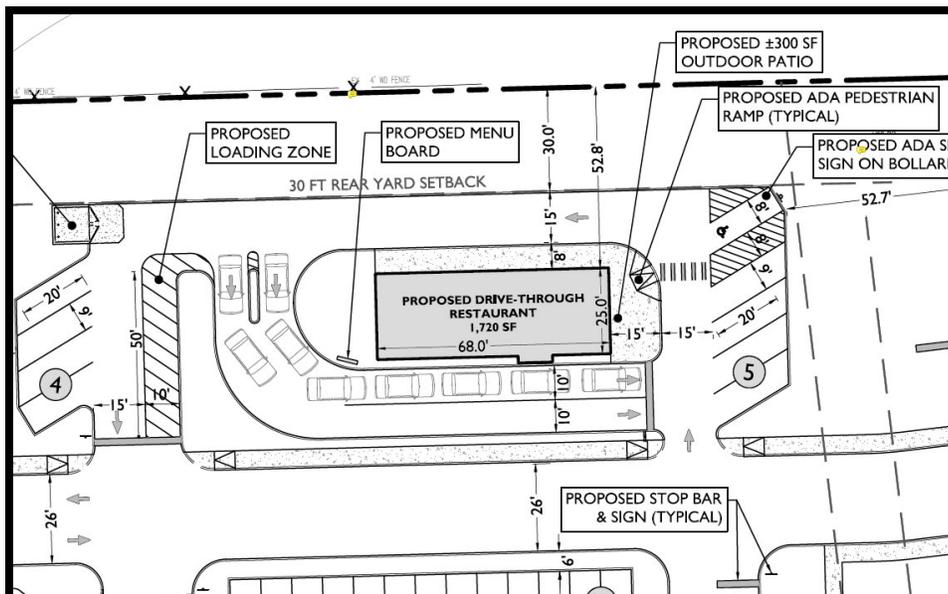
- 1) A queuing analysis was performed to determine if the projected demand exceeds the service rate and calculate the projected queuing.
- 2) Since the peak demand for the proposed drive-through is less than the available capacity, a Poisson Distribution was performed to determine the probability of random arrivals; the results indicate a maximum potential of 5 vehicles arriving at one time.

Therefore, providing queueing on site for 5 random arrival vehicles (125 feet) past the order board will adequately accommodate the peak demands for this site. The projected maximum vehicle queueing is summarized in **Table 17** and is shown on **Exhibit 2**; showing that the projected maximum vehicle queueing will not impact internal traffic operations and/or the site driveway connection to SB Lapeer Road (M-24).

Table 17: Vehicle Queuing Analysis

Biggby Drive-Through Stacking Space	
Number of Arrivals	50
Time per Vehicle (s)	60
Service Rate (veh/hr)	60
Drive-through Queue (veh)	0
Random Arrival (veh)	5
Vehicle Length	25
TOTAL QUEUE LENGTH (ft)	125

Exhibit 2: Vehicle Queueing



11 CONCLUSIONS

The conclusions of this TIS are as follows:

11.1 EXISTING CONDITIONS (2022)

The results of the existing conditions analysis indicates that all approaches and movements at the study intersections are currently operate acceptably, at LOS D or better during both peak periods, with the exception of the following:

- **(INT #10) – SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon Road:** During the AM peak hour, the northbound to southbound U-turn movement currently operates at LOS F.
- **(INT #20) – SB Lapeer Road (M-24) & Waldon Road:** During the AM peak hour, the eastbound right-turn movement currently operates at LOS F.
- **(INT #30) – NB Lapeer Road (M-24) & SB-to-NB X/O, S. of Waldon Road / Eagle Ridge Road:** During the PM peak hour, the southbound to northbound U-turn movement is currently operating at LOS F. Review of SimTraffic network indicates long vehicle queues which were observed to exceed the available storage area and block the southbound through traffic. Review of the data collection videos confirms periods of long vehicle queues resulting from vehicles struggling to find adequate gaps within the NB Lapeer Road (M-24) through traffic.

11.2 BACKGROUND CONDITIONS (2025)

- The results of the background conditions analysis indicate that all study intersections are expected to continue to operate in a manner similar to the existing conditions analysis. Review of SimTraffic network simulations indicates operations similar to those observed under existing conditions.

11.3 FUTURE CONDITIONS (2025)

The results of the future conditions analysis indicates that the study intersections are expected to continue operating in a manner similar to the background conditions analysis, with the following additional impacts to LOS:

- **(INT #10) – SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon Road:** During the PM peak hour, the northbound to southbound U-turn movement is expected to operate at LOS E.
- **(INT #40) – SB Lapeer Road (M-24) & Site Driveway:** During the AM peak hour, the eastbound right-turn movement is expected to operate at LOS F. Although the LOS analysis indicates poor operations at the proposed site driveway, review of SimTraffic network simulations indicates a 95th percentile queue length of approximately 95-feet (3-4 vehicles), which is not significant.

11.4 SIGNAL WARRANT ANALYSIS

- Traffic signals are currently warranted at all of the study intersections as summarized in the table below and shown on the attached tables.

Existing Conditions Signal Warrant Analysis Summary

Warrant		SB Lapeer Road (M-24) & NB-to-SB X/O	SB Lapeer Road (M-24) & Waldon Road	NB Lapeer Road (M-24) & SB-to-NB X/O
Warrant 1: Eight-Hour		YES	YES	YES
Condition A	Hours Met	3	8	8
	Warrant Met	NO	YES	YES
Condition B	Hours Met	8	8	8
	Warrant Met	YES	YES	YES
Warrant 2: Four-Hour	Hours Met	8	8	8
	Warrant Met	YES	YES	YES
Warrant 3: Peak-Hour	Hours Met	5	8	8
	Warrant Met	YES	YES	YES

11.5 CRASH ANALYSIS

- SB Lapeer Road (M-24) & NB-to-SB Crossover:** Zero (0) crashes reported at this intersection between 2019 and 2021.
- NB Lapeer Road (M-24) & SB-to-NB Crossover:** Zero (0) crashes reported at this intersection between 2019 and 2021.
- SB Lapeer Road (M-24) & Waldon Road:** There were 37 crashes reported between 2019 and 2021. The majority of crashes (32 reports) at the study intersection were Rear-End Right-Turn (86%) crashes; the remaining five (5) crashes (14%) were Sideswipe (5%), Angle (5%), and Single Motor Vehicle (3%) crash types.

The majority of crashes at this intersection are a result of vehicles traversing from Waldon Road to the southbound-to-northbound crossover. Drivers are looking north for gaps in southbound traffic and are not paying attention to the vehicle in front or misjudge the available gap, or backups in the crossover lane. Therefore, creating controlled gaps in traffic with intersection signalization would mitigate the existing rear-end crashes associated with the existing conditions.

11.6 ACCESS MANAGEMENT

- The results of the driveway spacing evaluation indicates that the location of the proposed site driveway is expected to meet the desirable MDOT spacing criteria, in relation to nearby roadway intersection and median crossover.
- The proposed site driveway is within close proximity (~140-feet) from an existing church driveway; however, the proposed driveway is located on the northern portion of the site in order to provide sufficient spacing from Waldon Road. Additionally, the church driveway is not expected to be a high trip generator; therefore, the potential conflicts between the adjacent access points is minimal.

11.7 SITE CIRCULATION REVIEW

- The results of the drive-through queueing evaluation indicates that the proposed site plan can adequately accommodate the projected vehicle queueing generated by the drive-through operations without impacting the internal site circulation or the adjacent roadway network.

12 RECOMMENDATIONS

The recommendations of this TIS are summarized as follows:

Recommended Improvements	Existing	Background	Future
(INT #20) – SB Lapeer Road (M-24) & Waldon Road			
Install a fully actuated/coordinated (SCATS) traffic signal at the following intersection to accommodate the existing traffic volumes.	✓		
(INT #30) – NB Lapeer Road (M-24) & SB-to-NB X/O, S. of Waldon Road / Eagle Ridge Road			
Install a fully actuated/coordinated (SCATS) traffic signal at the following intersection to accommodate the existing traffic volumes	✓		

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



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Michigan.

Attached: Figures 1-6
 Proposed Site Plan
 Traffic Volume Data
 SEMCOG Data
 Synchro / SimTraffic Results
 MDOT Auxiliary Turn Lane Warrants
 MMUTCD Signal Warrants
 Drive-Through Poisson Distribution

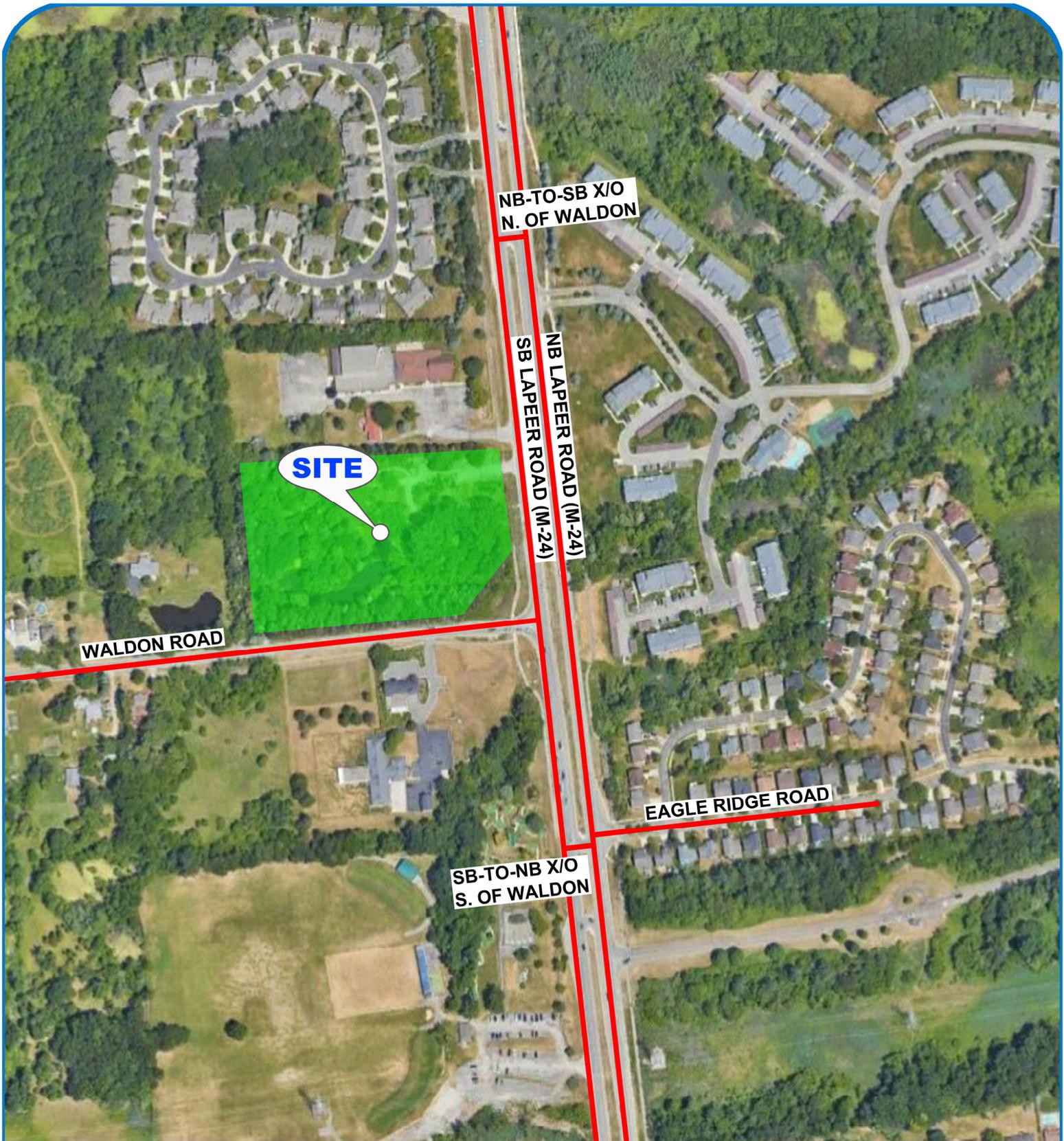


FIGURE 1
SITE LOCATION MAP
 273
 HUDSON SQUARE TIS - ORION TOWNSHIP, MI

LEGEND

SITE SITE LOCATION



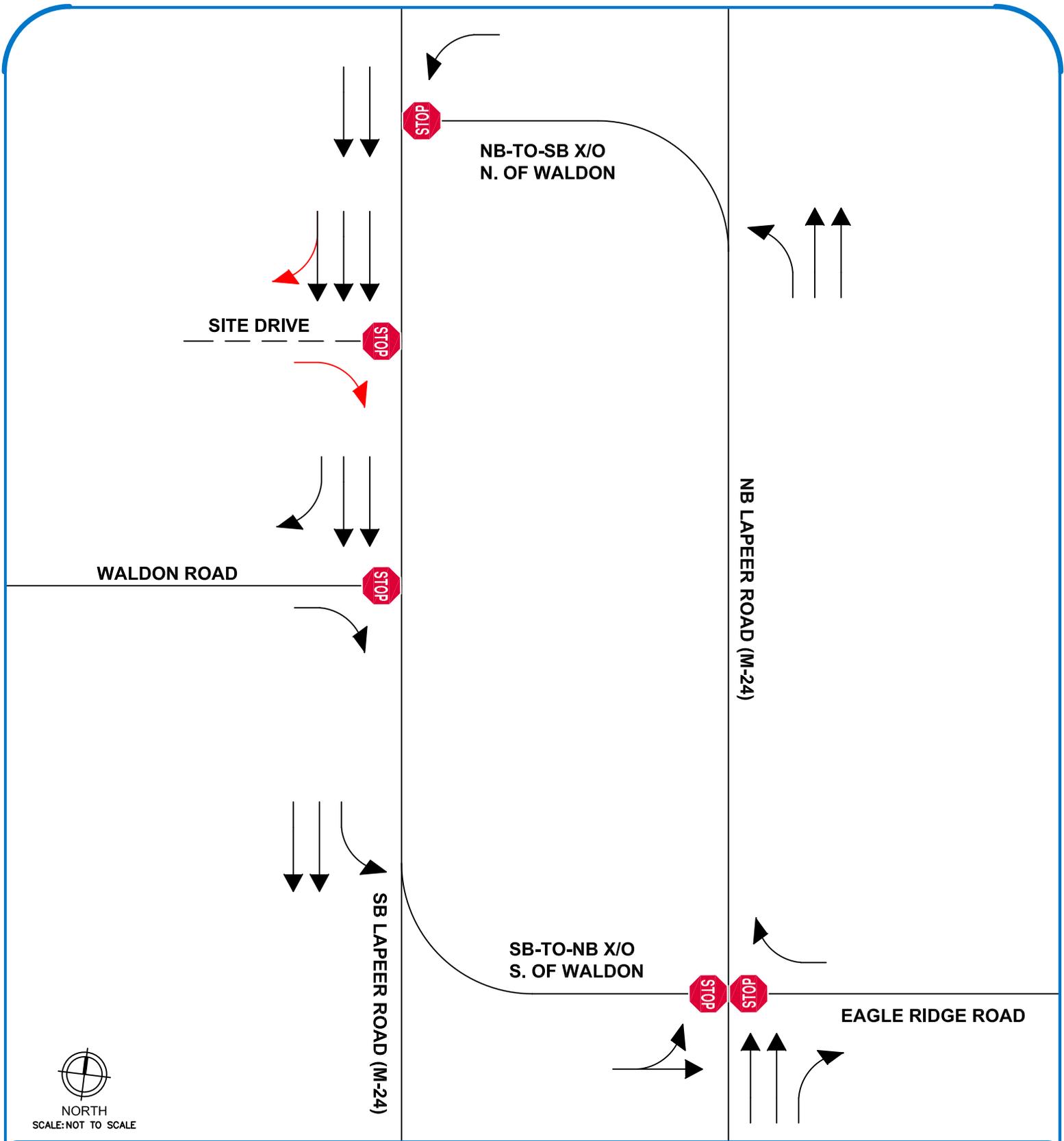


FIGURE 2
LANE USE AND TRAFFIC CONTROL
 274



LEGEND

- ROADS
- PROPOSED ROADS
- ↔ LANE USE
- ↔ PROPOSED LANE USE
- 🚦 SIGNALIZED INTERSECTION
- 🛑 UNSIGNALIZED INTERSECTION

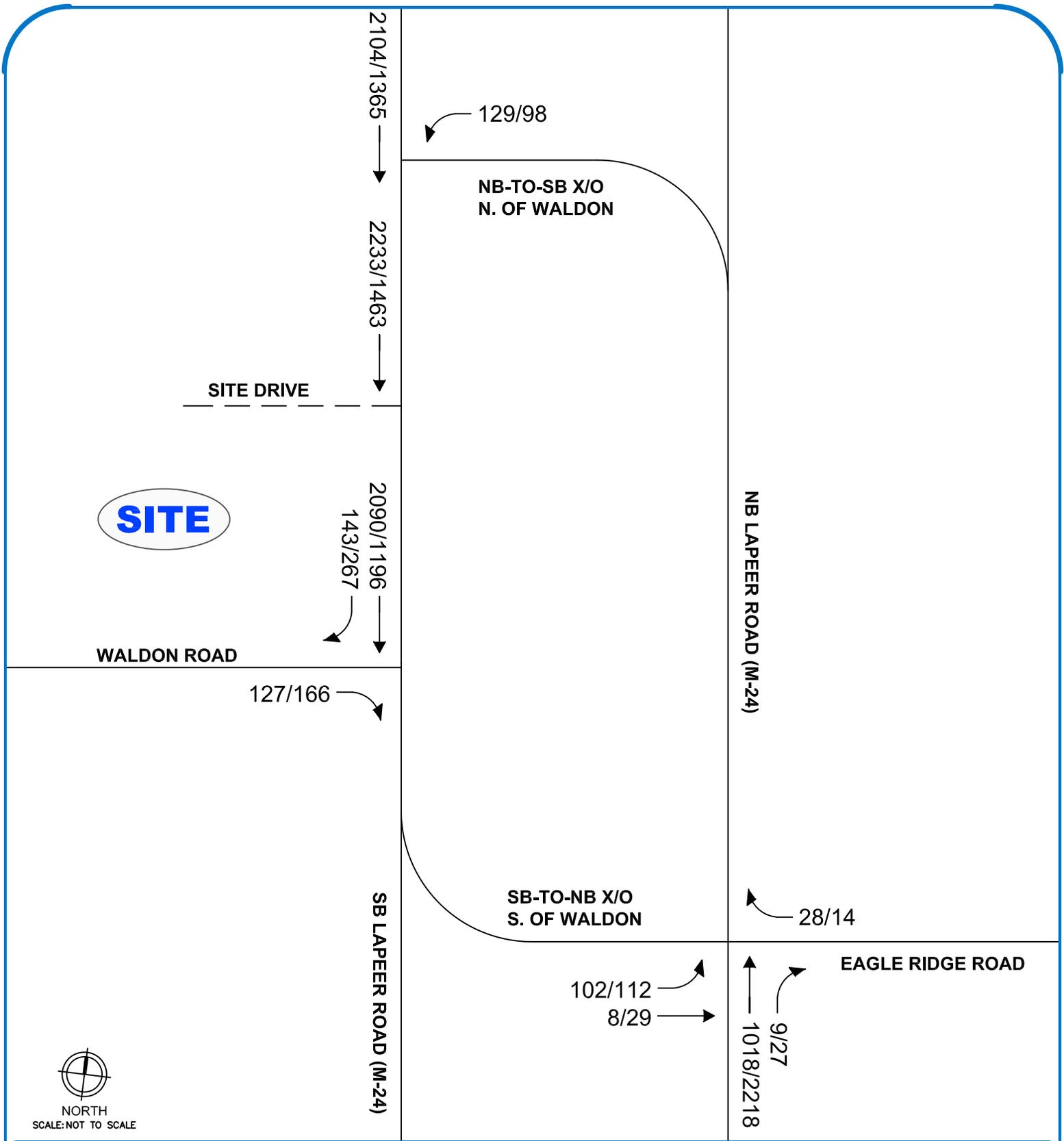


FIGURE 3
EXISTING TRAFFIC
VOLUMES

275

HUDSON SQUARE TIS - ORION TOWNSHIP, MI



LEGEND

- ROADS
- PROPOSED ROADS
- TRAFFIC VOLUMES (AM/PM)

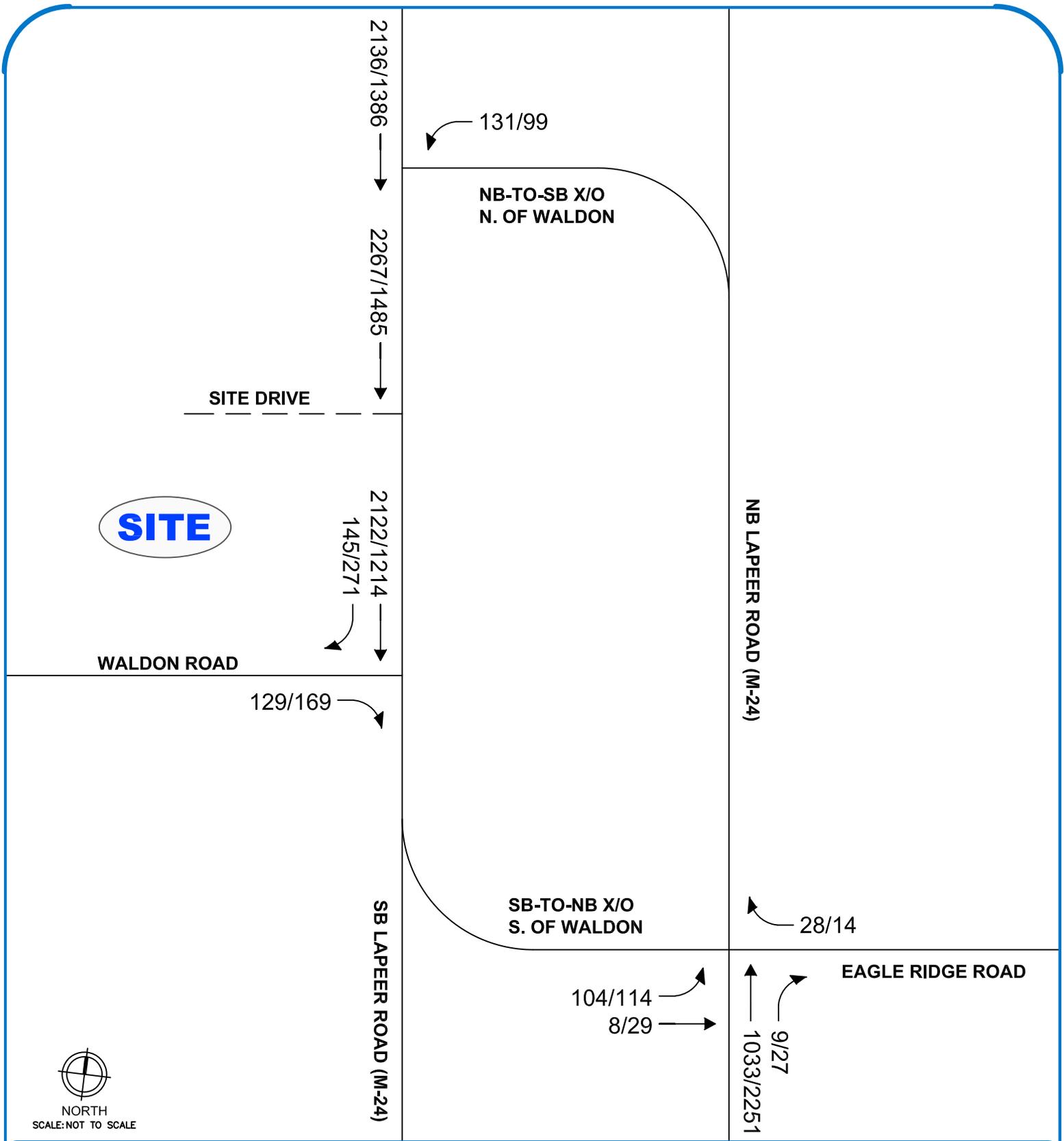


FIGURE 4
BACKGROUND
TRAFFIC VOLUMES
 276



HUDSON SQUARE TIS - ORION TOWNSHIP, MI

LEGEND

- ROADS
- - - PROPOSED ROADS
- ↑↓ TRAFFIC VOLUMES (AM/PM)

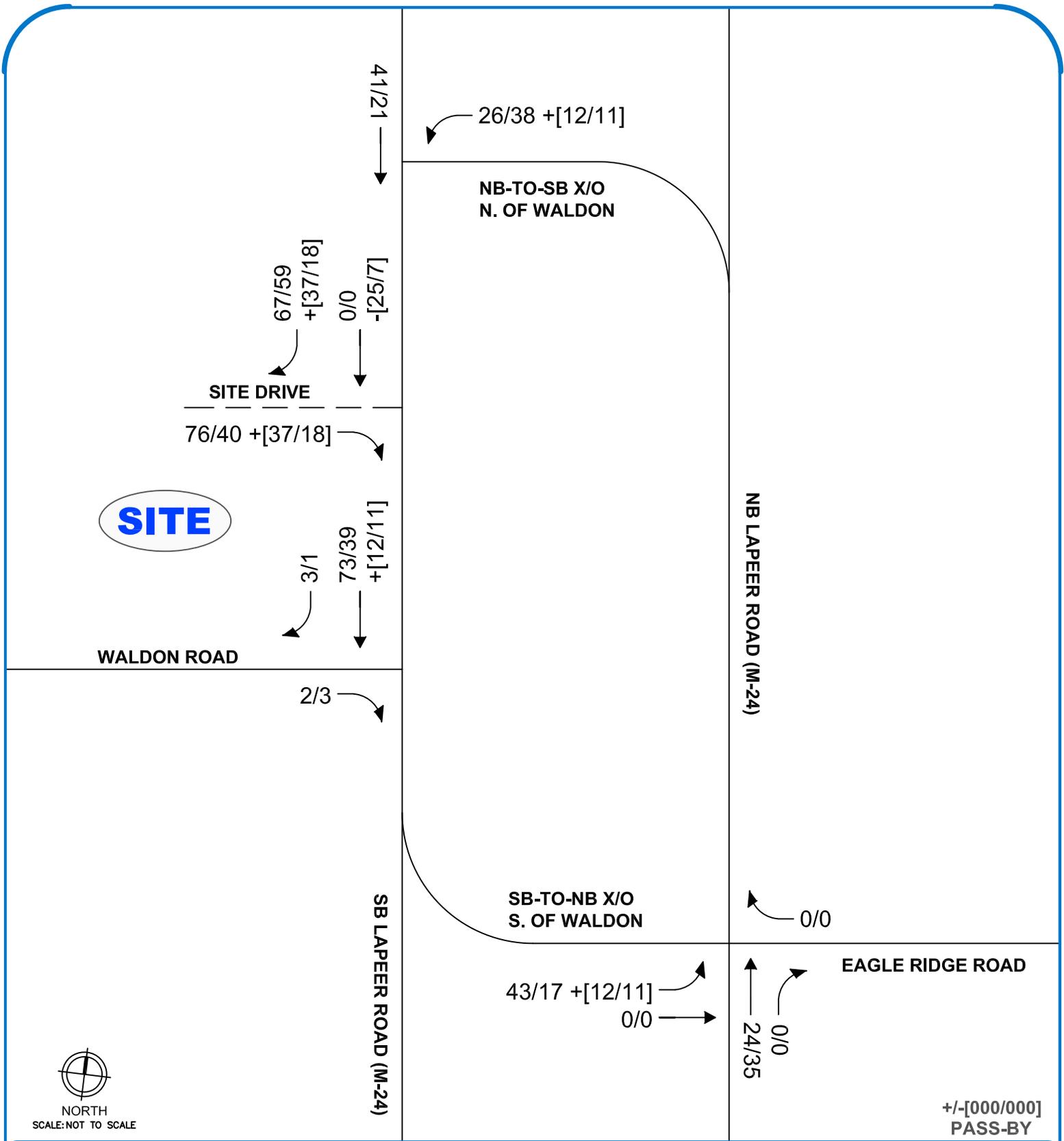


FIGURE 5
SITE-GENERATED
TRAFFIC VOLUMES



LEGEND

- ROADS
- - - PROPOSED ROADS
- ↑ ↓ TRAFFIC VOLUMES (AM/PM)

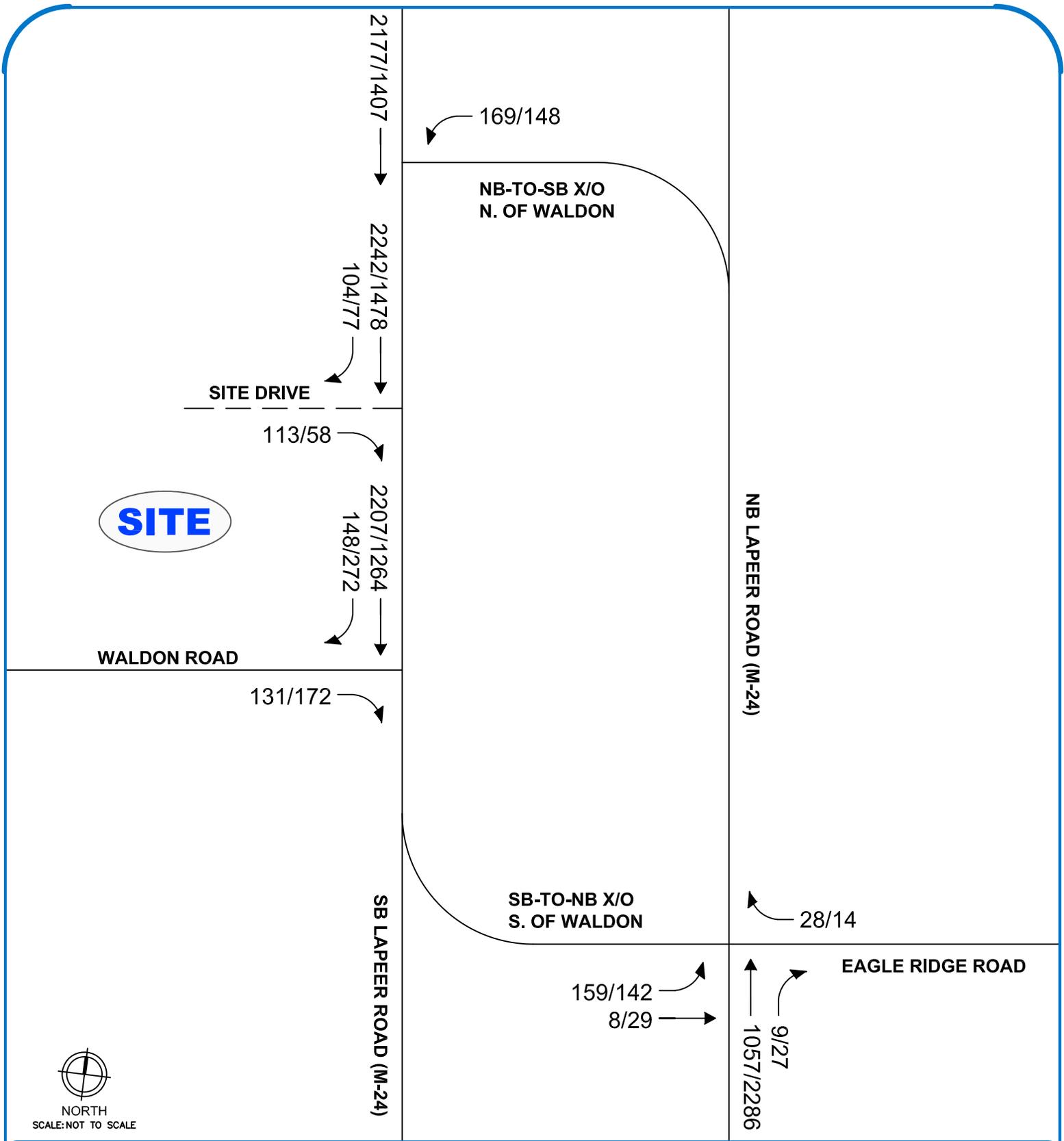


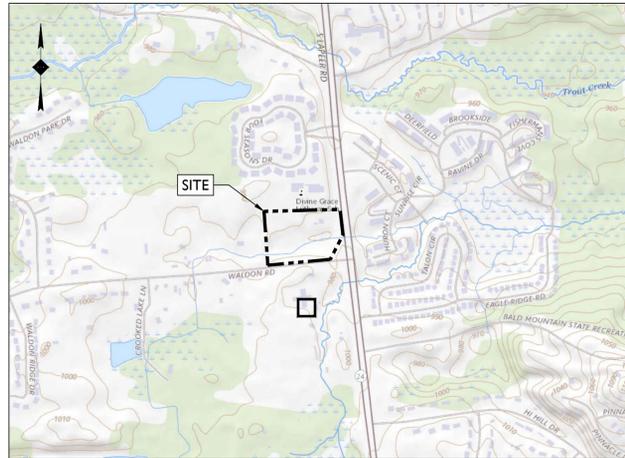
FIGURE 6 FUTURE TRAFFIC VOLUMES

278

HUDSON SQUARE TIS - ORION TOWNSHIP, MI

LEGEND

-  ROADS
-  PROPOSED ROADS
-  TRAFFIC VOLUMES (AM/PM)



SOURCE: USGS MAPS, DATE RETRIEVED 10/11/2022

LOCATION MAP

SCALE: 1" = 800'±

SITE DEVELOPMENT PLAN FOR HUDSON SQUARE 3030 SOUTH LAPEER ROAD PROPOSED MULTI-USE PLANNED UNIT DEVELOPMENT

PID: 09-26-101-021

3030 SOUTH LAPEER ROAD
ORION TOWNSHIP, OAKLAND COUNTY, MICHIGAN

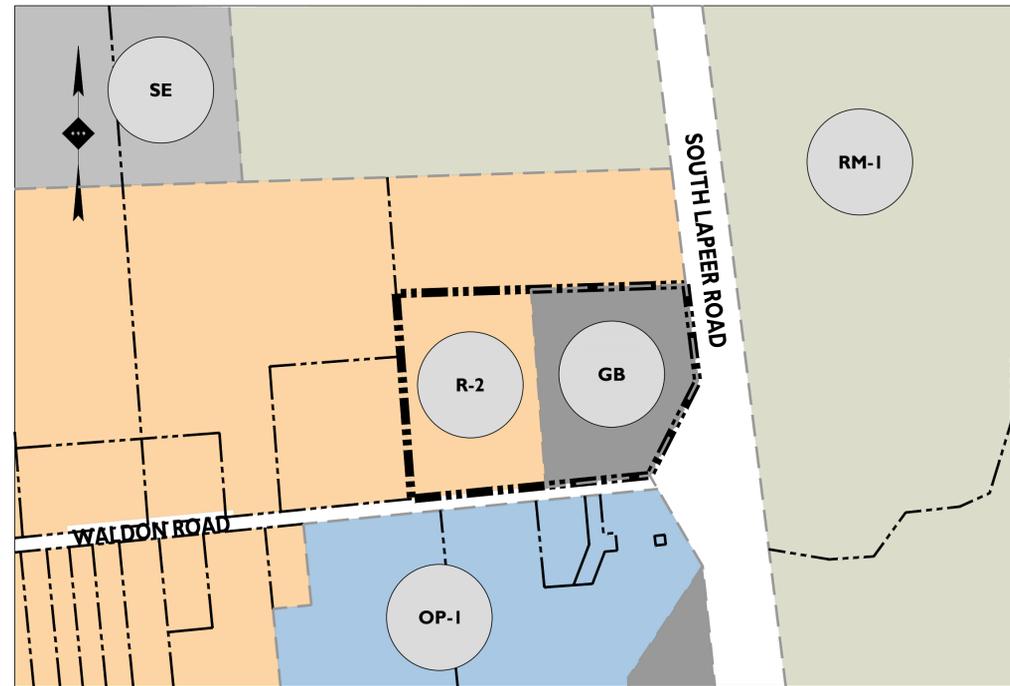
APPLICANT
DETROIT RIVERSIDE CAPITAL
3300 AUBURN ROAD
AUBURN HILLS, MI 48326
313-964-5552
MICHAEL.WAYNE@DETROITRIVERSIDECAPITAL.COM



SOURCE: NEARMAP DATE RETRIEVED, 10/11/2022

AERIAL MAP

SCALE: 1" = 200'±



SOURCE: OAKLAND COUNTY PROPERTY GATEWAY & ORION TOWNSHIP ZONING MAP, DATE RETRIEVED 10/11/2022

ZONING MAP

SCALE: 1" = 200'±

PLANS PREPARED BY:



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PLAN REFERENCE MATERIALS:

- THIS PLAN SET REFERENCES THE FOLLOWING DOCUMENTS INCLUDING, BUT NOT LIMITED TO:
 - SURVEY PROVIDED BY KEIFT ENGINEERING, INC.
 - ARCHITECTURAL PLANS PROVIDED BY DEISNGHAUS ARCHITECTURE
 - AERIAL MAP FROM NEARMAPS ONLINE MAPPING SYSTEM, DATE RETRIEVED 10/11/2022
 - LOCATION MAP FROM USGS ONLINE MAPPING SYSTEM, DATE RETRIEVED 10/11/2022
- ALL REFERENCE MATERIAL LISTED ABOVE SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THESE MATERIALS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF EACH REFERENCE AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.

SHEET INDEX

DRAWING TITLE	SHEET #
COVER SHEET	C-1
SITE PLAN	C-2
AERIAL OVERLAY PLAN	C-3
DENSITY PLAN	C-4
GRADING PLAN	C-5

ADDITIONAL SHEETS

DRAWING TITLE	SHEET #
EXISTING CONDITIONS PLAN	1 OF 1

ISSUE	DATE	BY	DESCRIPTION
1	10/18/2023	KTH	FOR PID APPROVAL

NOT APPROVED FOR CONSTRUCTION



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SITE DEVELOPMENT PLAN
HUDSON SQUARE
3030 S. LAPEER ROAD
PROPOSED MULTI-USE
PLANNED UNIT DEVELOPMENT
PID: 09-26-101-021
3030 SOUTH LAPEER ROAD
ORION TOWNSHIP
OAKLAND COUNTY, MICHIGAN



SCALE: AS SHOWN PROJECT ID: DET-210193.01

TITLE:
COVER SHEET

DRAWING:
C-1

TABLE OF LAND USE AND ZONING		
PIN: 09-26-101-021		
PROPOSED ZONE: PLANNED UNIT DEVELOPMENT (PUD)		
STORAGE		
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT AREA	435,600 SF (10 AC)	307,766 SF (7.07 AC) (M)
MAXIMUM LOT COVERAGE	30% (92,330 SF)	17.4% (53,460 SF)

(M) MODIFICATION

TABLE OF LAND USE AND ZONING		
PIN: 09-26-101-021		
PROPOSED ZONE: PLANNED UNIT DEVELOPMENT (PUD)		
UNDERLYING ZONE: GENERAL BUSINESS (GB)		
PROPOSED USE		
RESTAURANT WITH DRIVE-THRU SIT DOWN RESTAURANT CLASSIC CAR CLUB		
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT AREA	12,000 SF (0.275 AC)	163,195 SF (3.75 AC)
MAXIMUM LOT COVERAGE	30%	5.4% (8,754 SF)
MAXIMUM BUILDING HEIGHT	25 FT	< 25 FT
MINIMUM FRONT YARD SETBACK	30 FT	56.0 FT
MINIMUM SIDE YARD SETBACK	20 FT	N/A
MINIMUM REAR YARD SETBACK	30 FT	52.8 FT
MINIMUM BUILDING CLEAR SPACE	20 FT	PROVIDED
MINIMUM R.O.W. GREENBELT BUFFER	20 FT	52.7 FT
MINIMUM SINGLE-FAMILY GREENBELT BUFFER	30 FT	30.0 FT
MINIMUM OPEN SPACE	10%	PROVIDED
DRIVE-THRU / SINGLE FAMILY SETBACK	100 FT	52.8 FT (M)

(M) MODIFICATION

TABLE OF LAND USE AND ZONING		
PIN: 09-26-101-021		
PROPOSED ZONE: PLANNED UNIT DEVELOPMENT (PUD)		
UNDERLYING ZONE: SINGLE-FAMILY (R-2)		
PROPOSED USE		
MULTIPLE-FAMILY RESIDENTIAL		
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT SIZE	10,800 SF	N/A
MINIMUM LOT WIDTH	80 FT	N/A
MAXIMUM LOT COVERAGE	25%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	< 30 FT
MINIMUM FRONT YARD SETBACK	25 FT	248.0 FT
MINIMUM SIDE YARD SETBACK	35 FT	65.8 FT
MINIMUM REAR YARD SETBACK	35 FT	30.3 FT (M)
MINIMUM BUILDING CLEAR SPACE	20 FT	30.0 FT
MINIMUM FLOOR AREA / UNIT	1,080 SF	N/A
MINIMUM OPEN SPACE	15%	PROVIDED

(M) MODIFICATION

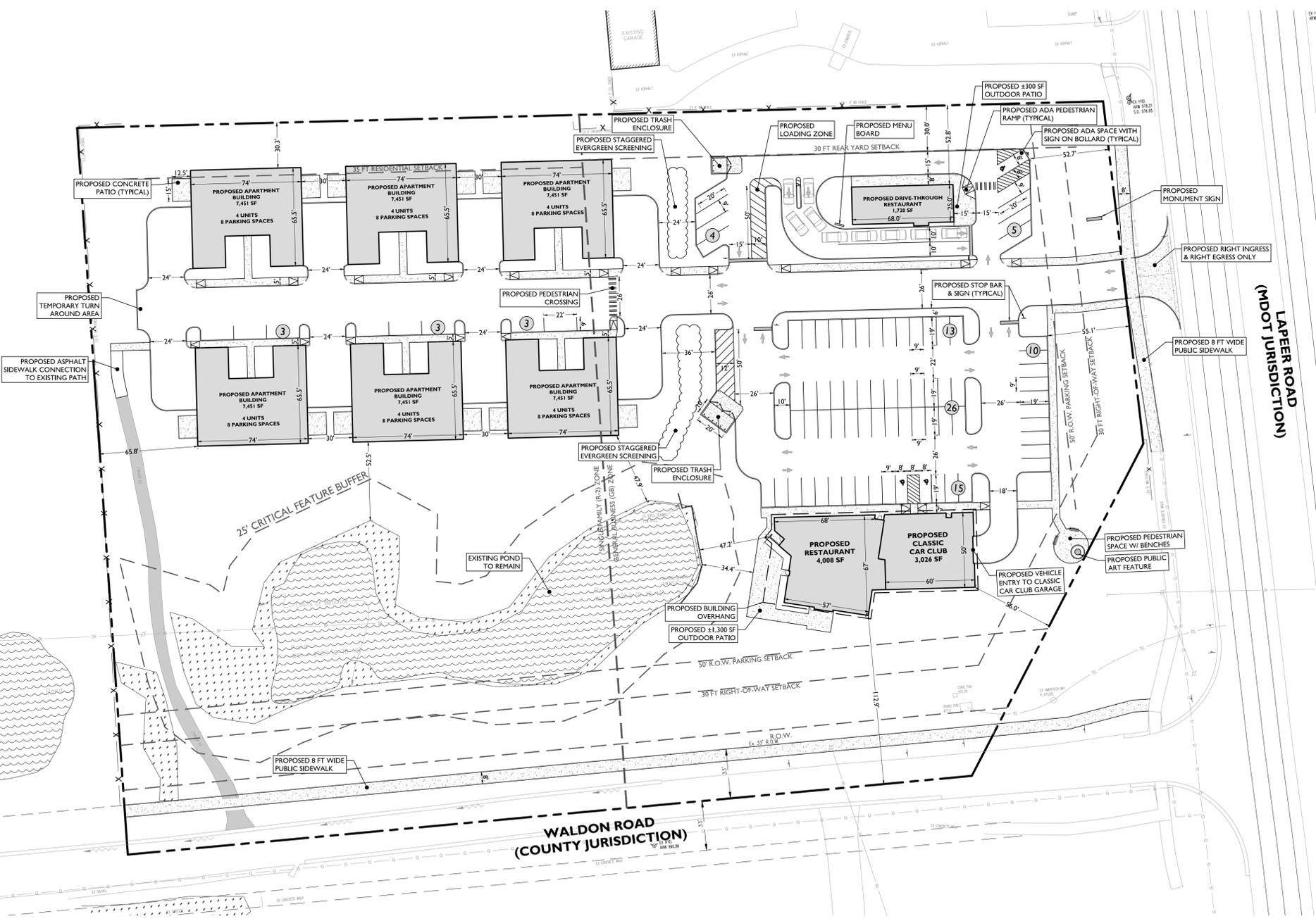
OFF-STREET PARKING REQUIREMENTS		
CODE SECTION	REQUIRED	PROPOSED
§ 14.03.C	DRIVE-THROUGH RESTAURANT: 1 SPACE PER 100 SF OF GFA * (1,720 SF) (1 SPACE/100 SF) = 17 SPACES RESTAURANT (SIT DOWN): 1 SPACE PER 100 SF * (4,008 SF) (1 SPACE / 100 SF) = 40 SPACES CLASSIC CAR CLUB: 1 SPACE PER 200 SF OF GFA * (3,026 SF) (1 SPACE / 200 SF) = 15 SPACES TOTAL: 17 + 40 + 15 SPACES = 72 SPACES	73 SPACES
§ 27.04.A	MULTI-FAMILY APARTMENT: 2 SPACES PER UNIT (24 UNITS) (2 SPACES/UNIT) = 48 SPACES	48 SPACES
§ 14.04.A	APARTMENT GUEST PARKING: 1 SPACE PER 3 UNITS (24 UNITS) (1 SPACE / 3 UNITS) = 8 SPACES	9 SPACES
§ 27.04.A	90° PARKING: 9 FT X 19 FT WITH 22 FT AISLE	9 FT X 19 FT WITH 22 FT AISLE
§ 14.04.A	PARALLEL PARKING: 9 FT X 22 FT	9 FT X 22 FT
§ 27.04.A	OFF STREET LOADING: 10 FT X 50 FT	10 FT X 50 FT

* OFF-STREET PARKING DETERMINED USING GENERAL BUSINESS DISTRICT REQUIREMENTS

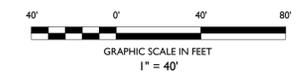
N

S

SYMBOL	DESCRIPTION
---	PROPERTY LINE
- - - - -	SETBACK LINE
=====	PROPOSED CURB & GUTTER
=====	PROPOSED FLUSH CURB
○ ○ ○	PROPOSED SIGNS / BOLLARDS
■	PROPOSED BUILDING
▨	PROPOSED CONCRETE PAVEMENT
▩	PROPOSED WALL
⌒	PROPOSED BUILDING DOORS
⬢	PROPOSED EVERGREEN LANDSCAPING SCREEN



- GENERAL NOTES**
- THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC PRIOR TO THE START OF CONSTRUCTION.
 - THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ENSURE THAT ALL REQUIRED APPROVALS HAVE BEEN OBTAINED PRIOR TO THE START OF CONSTRUCTION. COPIES OF ALL REQUIRED PERMITS AND APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
 - ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC, AND ITS SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEES ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
 - THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC.
 - THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
 - THE CONTRACTOR SHALL NOT PERFORM ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PERSON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
 - THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURE OR SITE FEATURE THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTOR'S EXPENSE.
 - CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW. STONEFIELD ENGINEERING & DESIGN, LLC WILL REVIEW THE SUBMITTALS IN ACCORDANCE WITH THE DESIGN INTENT AS REFLECTED WITHIN THE PLAN SET.
 - THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
 - THE CONTRACTOR IS REQUIRED TO PERFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE PROCUREMENT OF STREET OPENING PERMITS.
 - THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION & DEMOLITION ACTIVITIES.
 - SHOULD AN EMPLOYEE OF STONEFIELD ENGINEERING & DESIGN, LLC, BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.



NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design

Detroit, MI • New York, NY • Boston, MA
Princeton, NJ • Tampa, FL • Rutherford, NJ
www.stonefielddesign.com

607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLAN

HUDSON SQUARE

3030 S. LAPEER ROAD

PROPOSED MULTI-USE

PLANNED UNIT DEVELOPMENT

RD. 3030 S. LAPEER ROAD
ORION TOWNSHIP
OAKLAND COUNTY, MICHIGAN



STONEFIELD
engineering & design

SCALE: 1" = 40' PROJECT ID: DET-210193.01

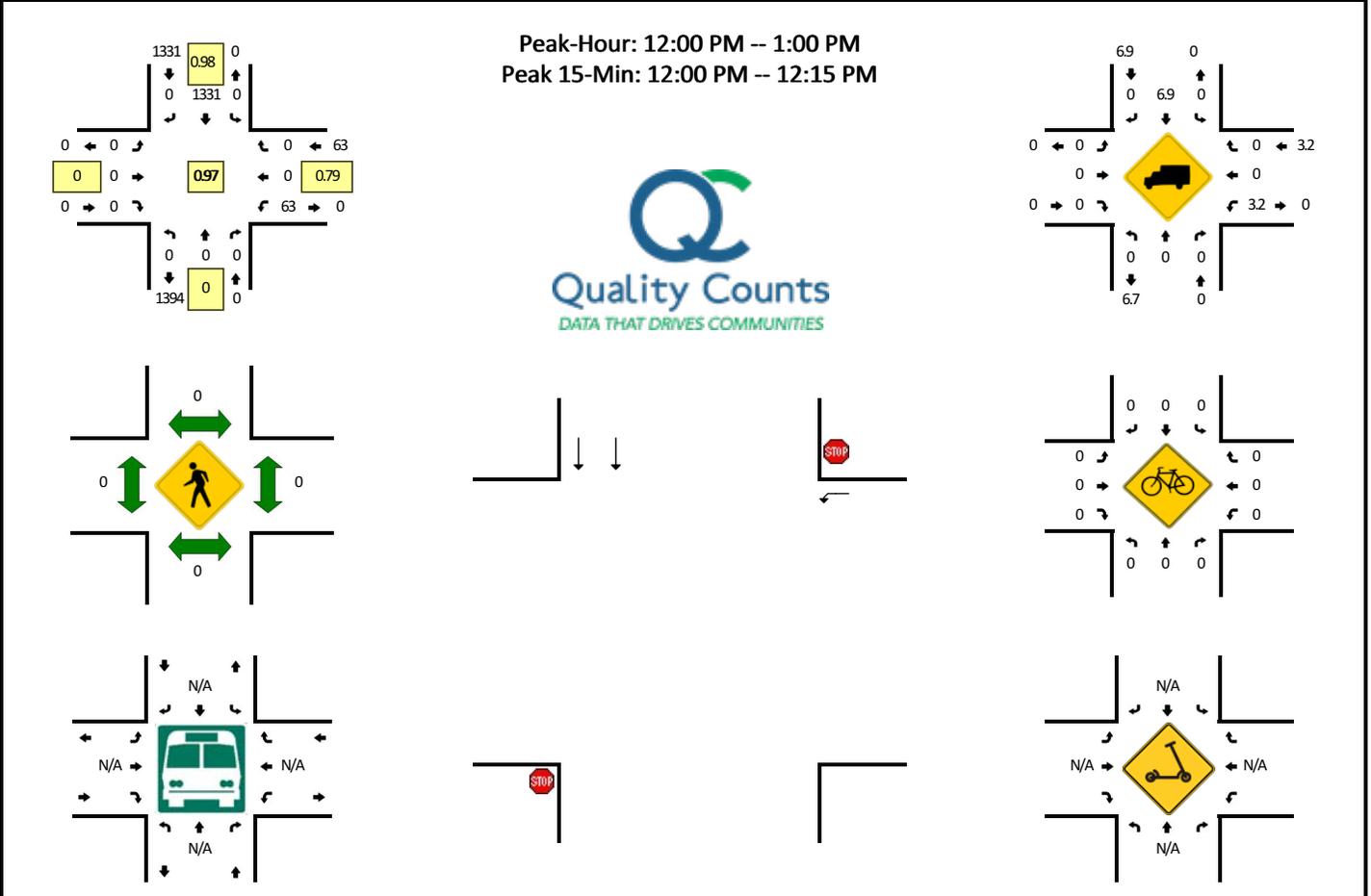
TITLE: **SITE PLAN**

DRAWING: **C-2**

V:\PROJECTS\210193\210193.DWG AND "MAY" 11:36 AM CLARKSON ROAD, CLARKSTON, MICHIGAN 48348-1414 STONEFIELD

LOCATION: SB Lapeer Rd -- NB to SB X/O North of Waldon
CITY/STATE: Orion Township, MI

QC JOB #: 15971079
DATE: Thu, Oct 13 2022



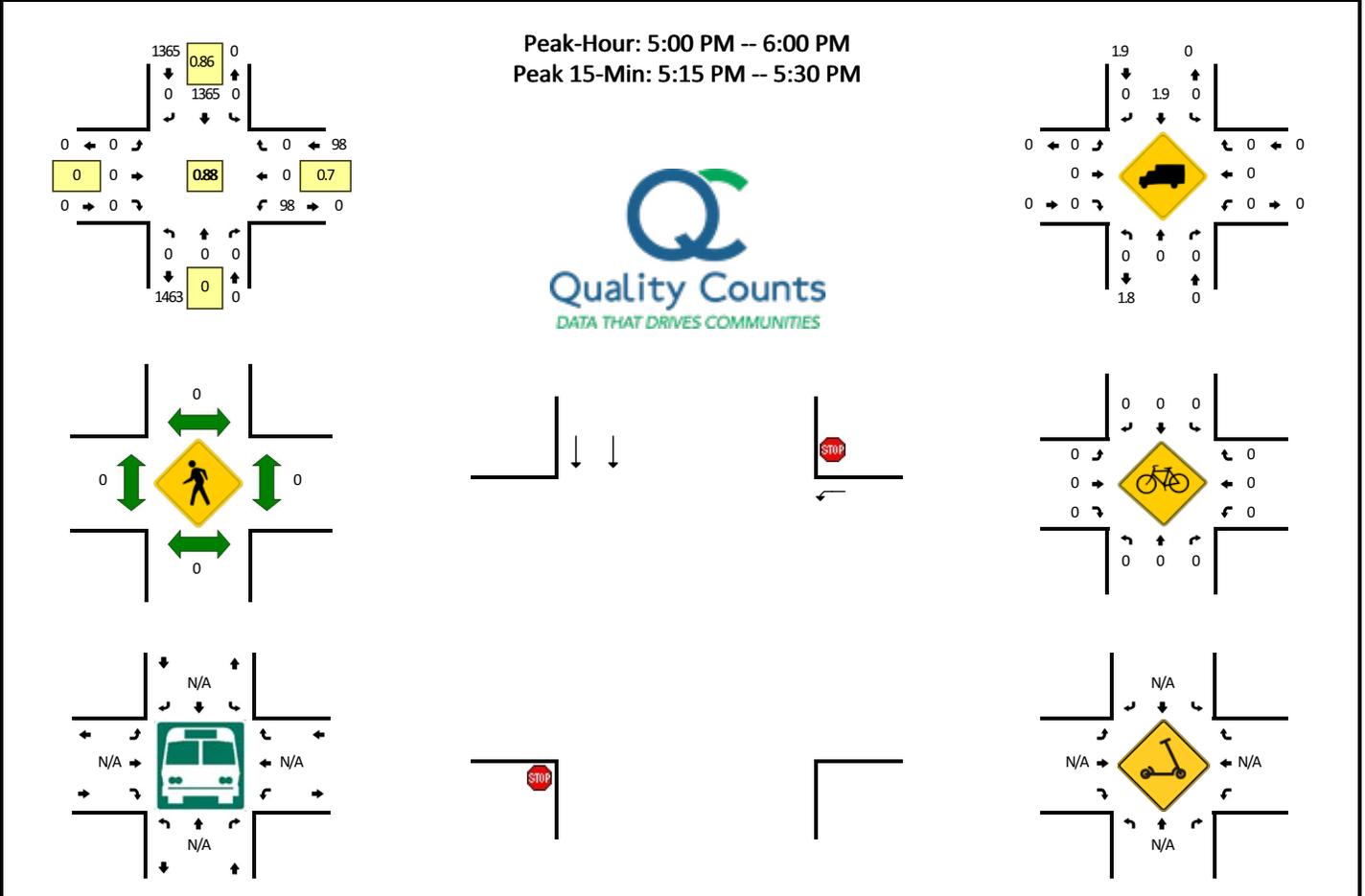
15-Min Count Period Beginning At	SB Lapeer Rd (Northbound)				SB Lapeer Rd (Southbound)				NB to SB X/O North of Waldon (Eastbound)				NB to SB X/O North of Waldon (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	0	0	0	0	318	0	0	0	0	0	0	10	0	0	0	328	
11:15 AM	0	0	0	0	0	288	0	0	0	0	0	0	13	0	0	0	301	
11:30 AM	0	0	0	0	0	309	0	0	0	0	0	0	16	0	0	0	325	
11:45 AM	0	0	0	0	0	311	0	0	0	0	0	0	24	0	0	0	335	1289
12:00 PM	0	0	0	0	0	340	0	0	0	0	0	0	20	0	0	0	360	1321
12:15 PM	0	0	0	0	0	336	0	0	0	0	0	0	17	0	0	0	353	1373
12:30 PM	0	0	0	0	0	330	0	0	0	0	0	0	13	0	0	0	343	1391
12:45 PM	0	0	0	0	0	325	0	0	0	0	0	0	13	0	0	0	338	1394

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	1360	0	0	0	0	0	0	80	0	0	0	1440
Heavy Trucks	0	0	0	0	0	76	0	0	0	0	0	0	4	0	0	0	80
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scoters																	

Comments:

LOCATION: SB Lapeer Rd -- NB to SB X/O North of Waldon
CITY/STATE: Orion Township, MI

QC JOB #: 15971080
DATE: Tue, Oct 18 2022

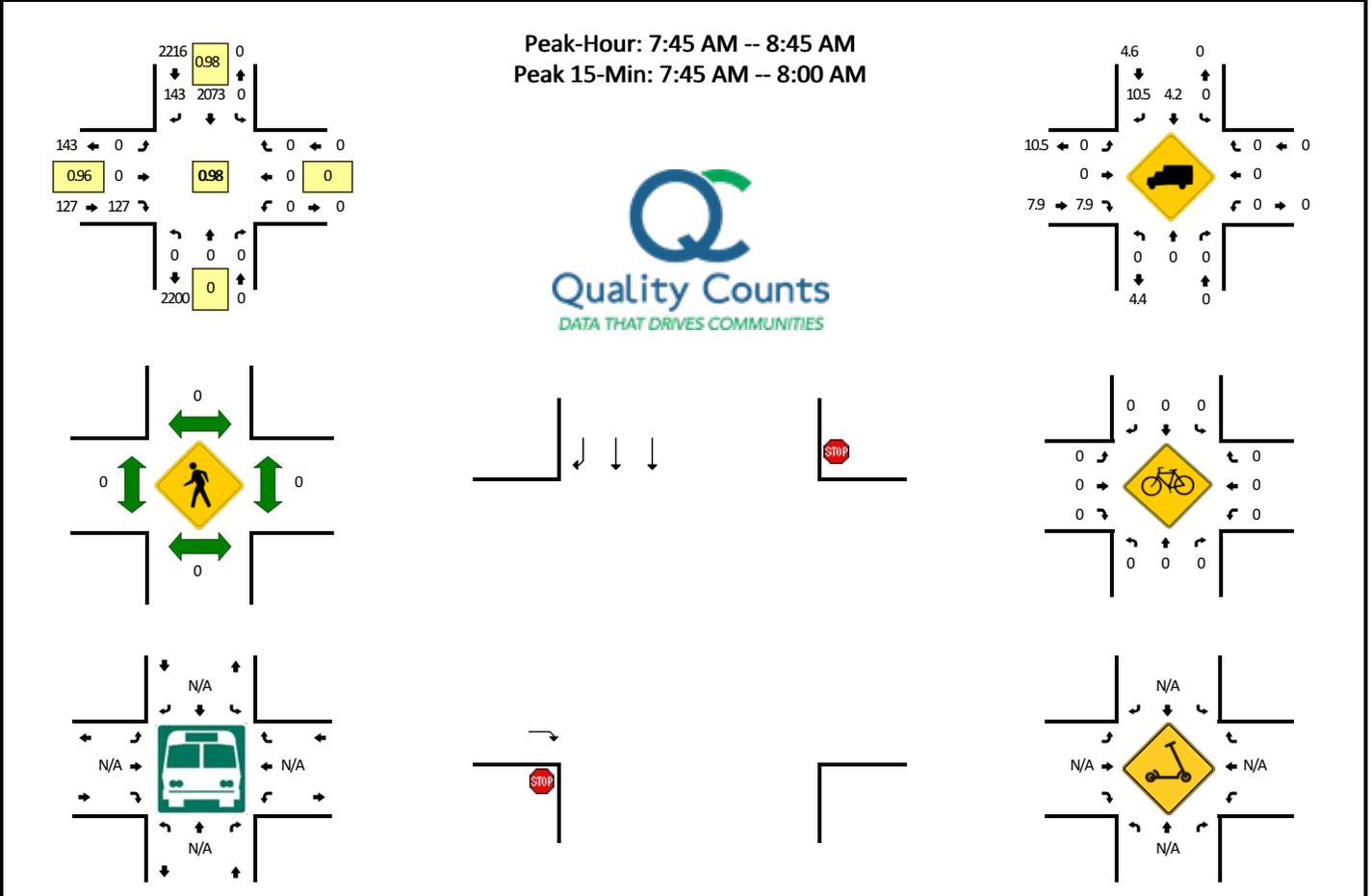


15-Min Count Period Beginning At	SB Lapeer Rd (Northbound)				SB Lapeer Rd (Southbound)				NB to SB X/O North of Waldon (Eastbound)				NB to SB X/O North of Waldon (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	0	0	0	0	297	0	0	0	0	0	0	20	0	0	0	317	
2:15 PM	0	0	0	0	0	287	0	0	0	0	0	0	14	0	0	0	301	
2:30 PM	0	0	0	0	0	347	0	0	0	0	0	0	15	0	0	0	362	
2:45 PM	0	0	0	0	0	472	0	0	0	0	0	0	25	0	0	0	497	1477
3:00 PM	0	0	0	0	0	364	0	0	0	0	0	0	33	0	0	0	397	1557
3:15 PM	0	0	0	0	0	369	0	0	0	0	0	0	24	0	0	0	393	1649
3:30 PM	0	0	0	0	0	363	0	0	0	0	0	0	29	0	0	0	392	1679
3:45 PM	0	0	0	0	0	369	0	0	0	0	0	0	22	0	0	0	391	1573
4:00 PM	0	0	0	0	0	342	0	0	0	0	0	0	25	0	0	0	367	1543
4:15 PM	0	0	0	0	0	384	0	0	0	0	0	0	30	0	0	0	414	1564
4:30 PM	0	0	0	0	0	357	0	0	0	0	0	0	32	0	0	0	389	1561
4:45 PM	0	0	0	0	0	287	0	0	0	0	0	0	29	0	0	0	316	1486
5:00 PM	0	0	0	0	0	322	0	0	0	0	0	0	35	0	0	0	357	1476
5:15 PM	0	0	0	0	0	396	0	0	0	0	0	0	20	0	0	0	416	1478
5:30 PM	0	0	0	0	0	343	0	0	0	0	0	0	18	0	0	0	361	1450
5:45 PM	0	0	0	0	0	304	0	0	0	0	0	0	25	0	0	0	329	1463
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	1584	0	0	0	0	0	0	80	0	0	0	1664	
Heavy Trucks	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	20	
Buses																		
Pedestrians		0				0					0			0			0	
Bicycles	0	0	0		0	0	0			0	0	0	0	0	0		0	
Scoters																		

Comments:

LOCATION: SB Lapeer Rd -- Waldon Road
CITY/STATE: Orion Township, MI

QC JOB #: 15971069
DATE: Thu, Oct 13 2022



15-Min Count Period Beginning At	SB Lapeer Rd (Northbound)				SB Lapeer Rd (Southbound)				Waldon Road (Eastbound)				Waldon Road (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	423	32	0	0	0	64	0	0	0	0	0	519	
7:15 AM	0	0	0	0	0	482	37	0	0	0	34	0	0	0	0	0	553	
7:30 AM	0	0	0	0	0	495	36	0	0	0	32	0	0	0	0	0	563	
7:45 AM	0	0	0	0	0	534	30	0	0	0	32	0	0	0	0	0	596	2231
8:00 AM	0	0	0	0	0	529	30	0	0	0	29	0	0	0	0	0	588	2300
8:15 AM	0	0	0	0	0	514	37	0	0	0	33	0	0	0	0	0	584	2331
8:30 AM	0	0	0	0	0	496	46	0	0	0	33	0	0	0	0	0	575	2343
8:45 AM	0	0	0	0	0	432	51	0	0	0	36	0	0	0	0	0	519	2266

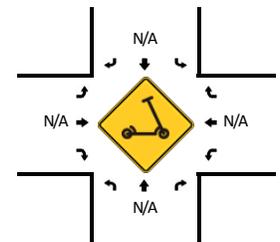
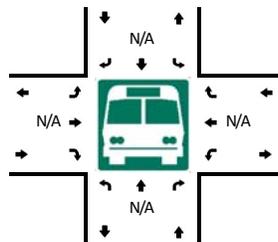
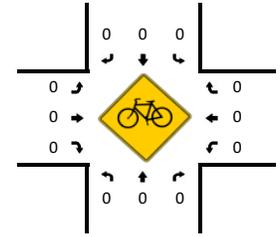
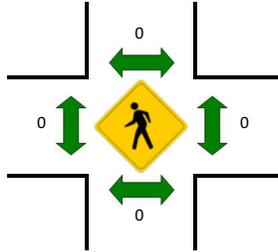
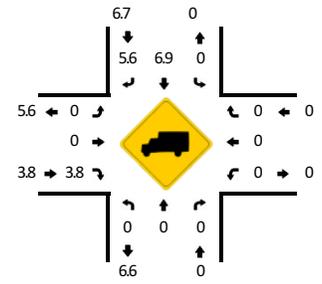
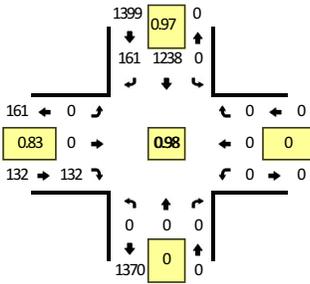
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	2136	120	0	0	0	128	0	0	0	0	0	2384
Heavy Trucks	0	0	0	0	0	80	4	0	0	0	12	0	0	0	0	0	96
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scoters																	

Comments:

LOCATION: SB Lapeer Rd -- Waldon Road
CITY/STATE: Orion Township, MI

QC JOB #: 15971071
DATE: Thu, Oct 13 2022

Peak-Hour: 12:00 PM -- 1:00 PM
 Peak 15-Min: 12:15 PM -- 12:30 PM



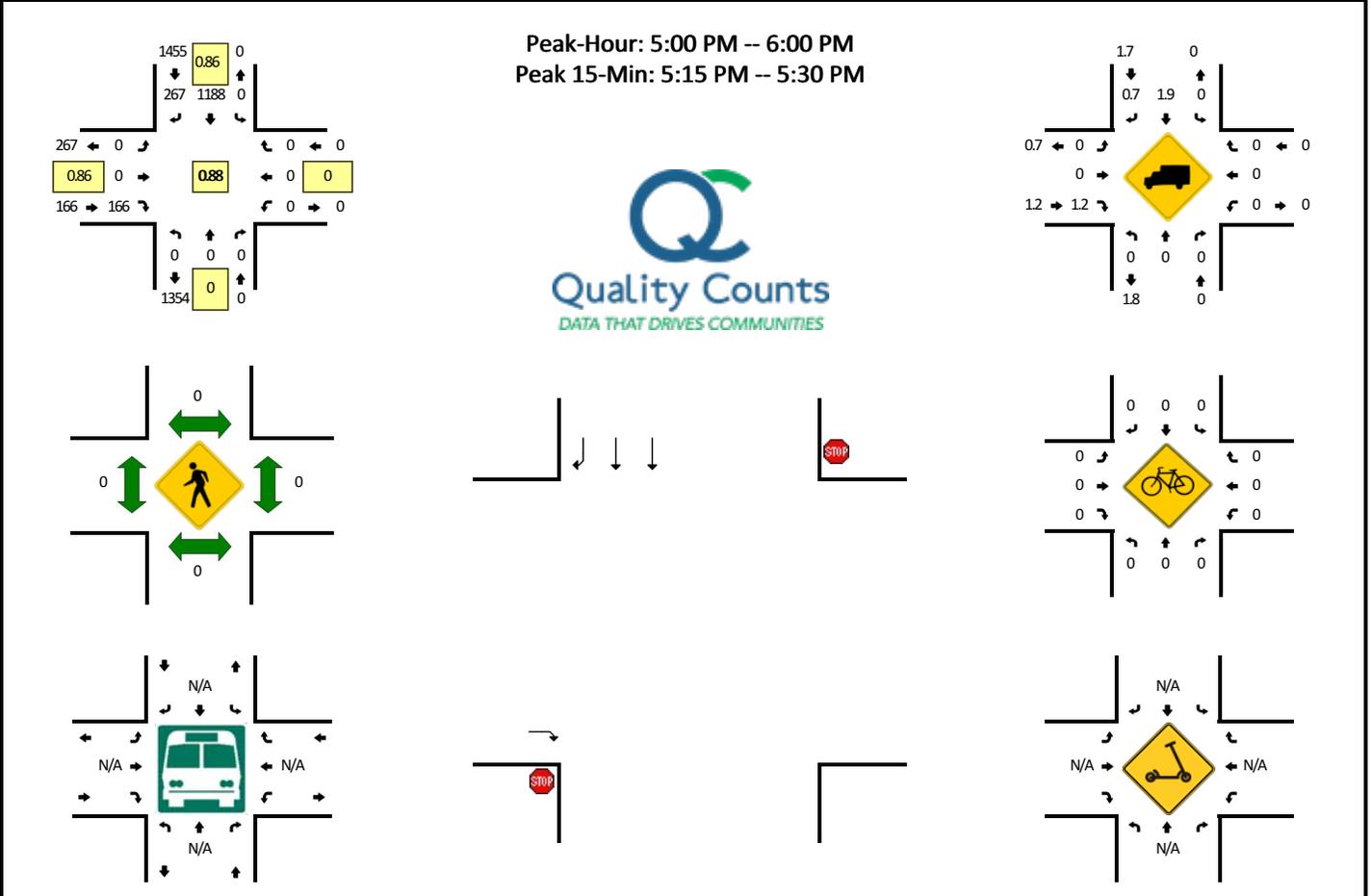
15-Min Count Period Beginning At	SB Lapeer Rd (Northbound)				SB Lapeer Rd (Southbound)				Waldon Road (Eastbound)				Waldon Road (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	0	0	0	0	297	30	0	0	0	25	0	0	0	0	0	352	
11:15 AM	0	0	0	0	0	273	29	0	0	0	24	0	0	0	0	0	326	
11:30 AM	0	0	0	0	0	281	44	0	0	0	45	0	0	0	0	0	370	
11:45 AM	0	0	0	0	0	289	43	0	0	0	22	0	0	0	0	0	354	1402
12:00 PM	0	0	0	0	0	302	58	0	0	0	27	0	0	0	0	0	387	1437
12:15 PM	0	0	0	0	0	323	34	0	0	0	34	0	0	0	0	0	391	1502
12:30 PM	0	0	0	0	0	307	31	0	0	0	40	0	0	0	0	0	378	1510
12:45 PM	0	0	0	0	0	306	38	0	0	0	31	0	0	0	0	0	375	1531

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	1292	136	0	0	0	136	0	0	0	0	0	1564
Heavy Trucks	0	0	0	0	0	104	12	0	0	0	4	0	0	0	0	0	120
Buses																	0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scoters																	0

Comments:

LOCATION: SB Lapeer Rd -- Waldon Road
CITY/STATE: Orion Township, MI

QC JOB #: 15971072
DATE: Tue, Oct 18 2022

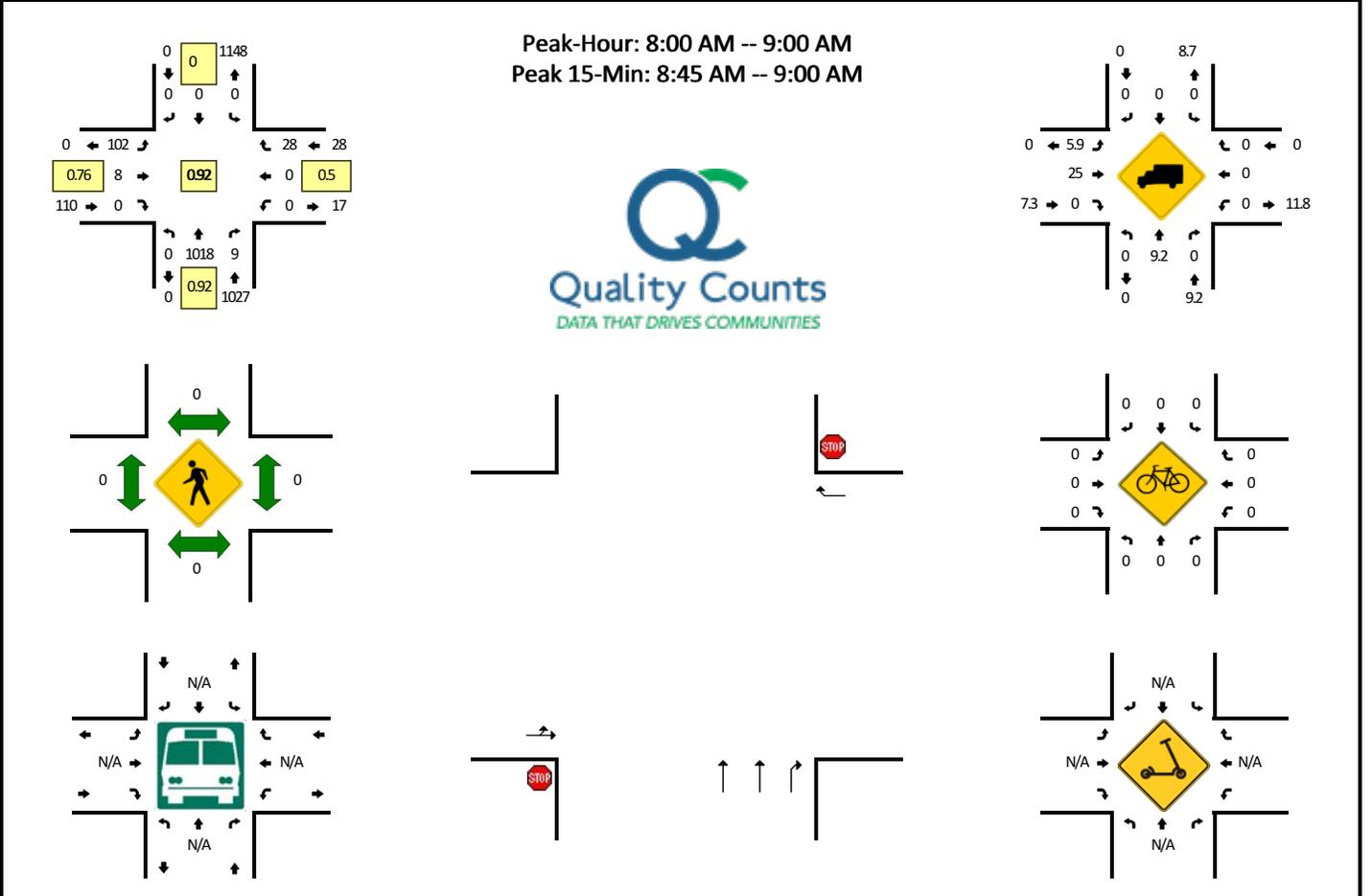


15-Min Count Period Beginning At	SB Lapeer Rd (Northbound)				SB Lapeer Rd (Southbound)				Waldon Road (Eastbound)				Waldon Road (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	0	0	0	0	270	40	0	0	0	42	0	0	0	0	0	352	
2:15 PM	0	0	0	0	0	261	37	0	0	0	34	0	0	0	0	0	332	
2:30 PM	0	0	0	0	0	306	50	0	0	0	30	0	0	0	0	0	386	
2:45 PM	0	0	0	0	0	361	128	0	0	0	38	0	0	0	0	0	527	1597
3:00 PM	0	0	0	0	0	342	77	0	0	0	35	0	0	0	0	0	454	1699
3:15 PM	0	0	0	0	0	314	57	0	0	0	29	0	0	0	0	0	400	1767
3:30 PM	0	0	0	0	0	334	73	0	0	0	33	0	0	0	0	0	440	1821
3:45 PM	0	0	0	0	0	328	63	0	0	0	31	0	0	0	0	0	422	1716
4:00 PM	0	0	0	0	0	309	58	0	0	0	53	0	0	0	0	0	420	1682
4:15 PM	0	0	0	0	0	331	89	0	0	0	37	0	0	0	0	0	457	1739
4:30 PM	0	0	0	0	0	308	77	0	0	0	29	0	0	0	0	0	414	1713
4:45 PM	0	0	0	0	0	266	60	0	0	0	40	0	0	0	0	0	366	1657
5:00 PM	0	0	0	0	0	269	76	0	0	0	48	0	0	0	0	0	393	1630
5:15 PM	0	0	0	0	0	345	76	0	0	0	42	0	0	0	0	0	463	1636
5:30 PM	0	0	0	0	0	298	61	0	0	0	40	0	0	0	0	0	399	1621
5:45 PM	0	0	0	0	0	276	54	0	0	0	36	0	0	0	0	0	366	1621
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	1380	304	0	0	0	168	0	0	0	0	0	1852	
Heavy Trucks	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	12	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

Comments:

LOCATION: NB Lapeer Rd -- Eagle Ridge Rd
CITY/STATE: Orion Township, MI

QC JOB #: 15971073
DATE: Thu, Oct 13 2022



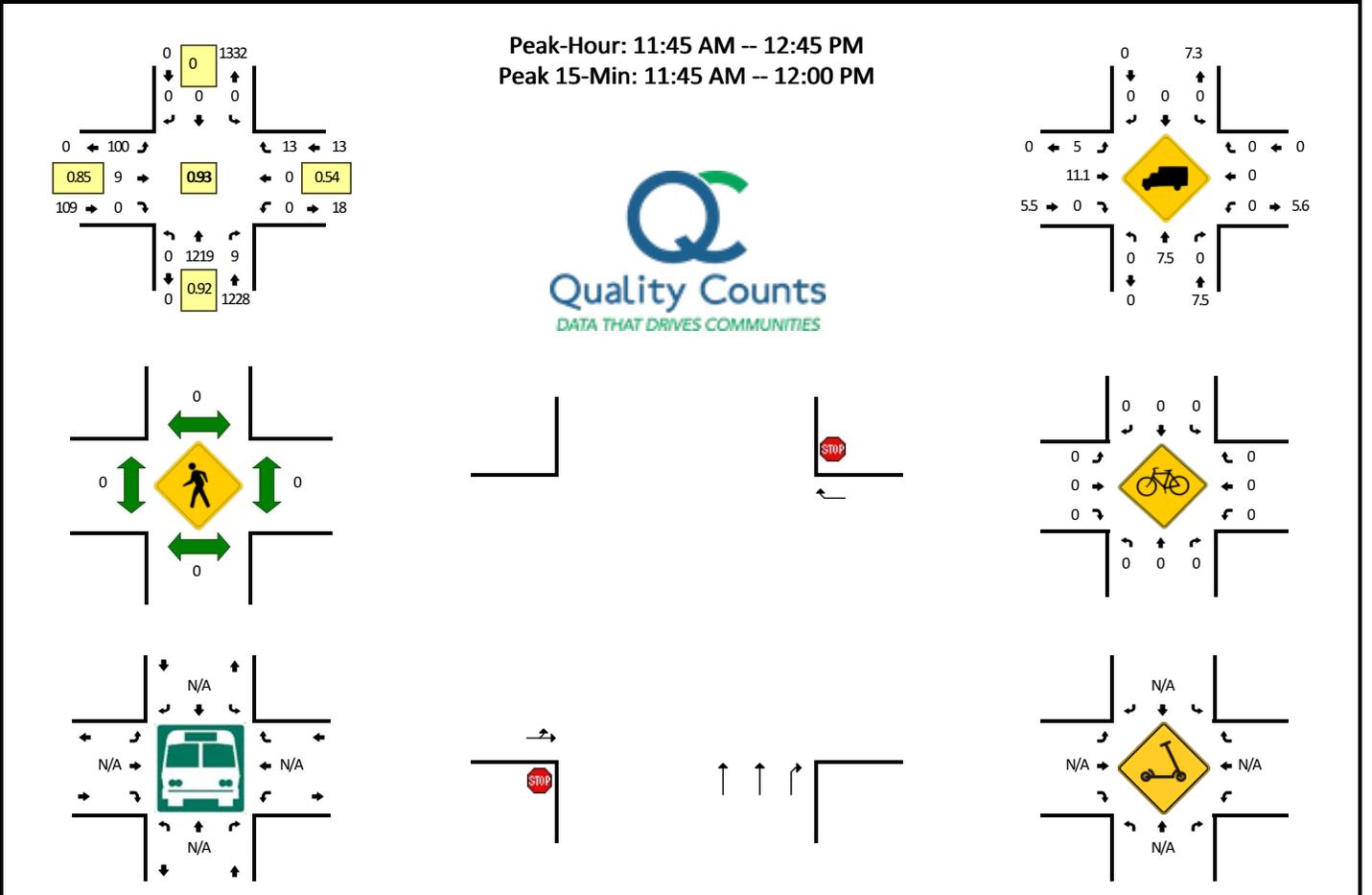
15-Min Count Period Beginning At	NB Lapeer Rd (Northbound)				NB Lapeer Rd (Southbound)				Eagle Ridge Rd (Eastbound)				Eagle Ridge Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	312	0	0	0	0	0	0	52	0	0	0	0	0	12	0	376	
7:15 AM	0	243	0	0	0	0	0	0	24	4	0	0	0	0	4	0	275	
7:30 AM	0	183	0	0	0	0	0	0	22	2	0	0	0	0	8	0	215	
7:45 AM	0	267	1	0	0	0	0	0	18	0	0	0	0	0	8	0	294	1160
8:00 AM	0	278	2	0	0	0	0	0	23	1	0	0	0	0	8	0	312	1096
8:15 AM	0	210	3	0	0	0	0	0	21	3	0	0	0	0	14	0	251	1072
8:30 AM	0	258	1	0	0	0	0	0	22	4	0	0	0	0	2	0	287	1144
8:45 AM	0	272	3	0	0	0	0	0	36	0	0	0	0	0	4	0	315	1165

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1088	12	0	0	0	0	0	144	0	0	0	0	0	16	0	1260
Heavy Trucks	0	100	0		0	0	0		8	0	0		0	0	0		108
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

LOCATION: NB Lapeer Rd -- Eagle Ridge Rd
CITY/STATE: Orion Township, MI

QC JOB #: 15971075
DATE: Thu, Oct 13 2022

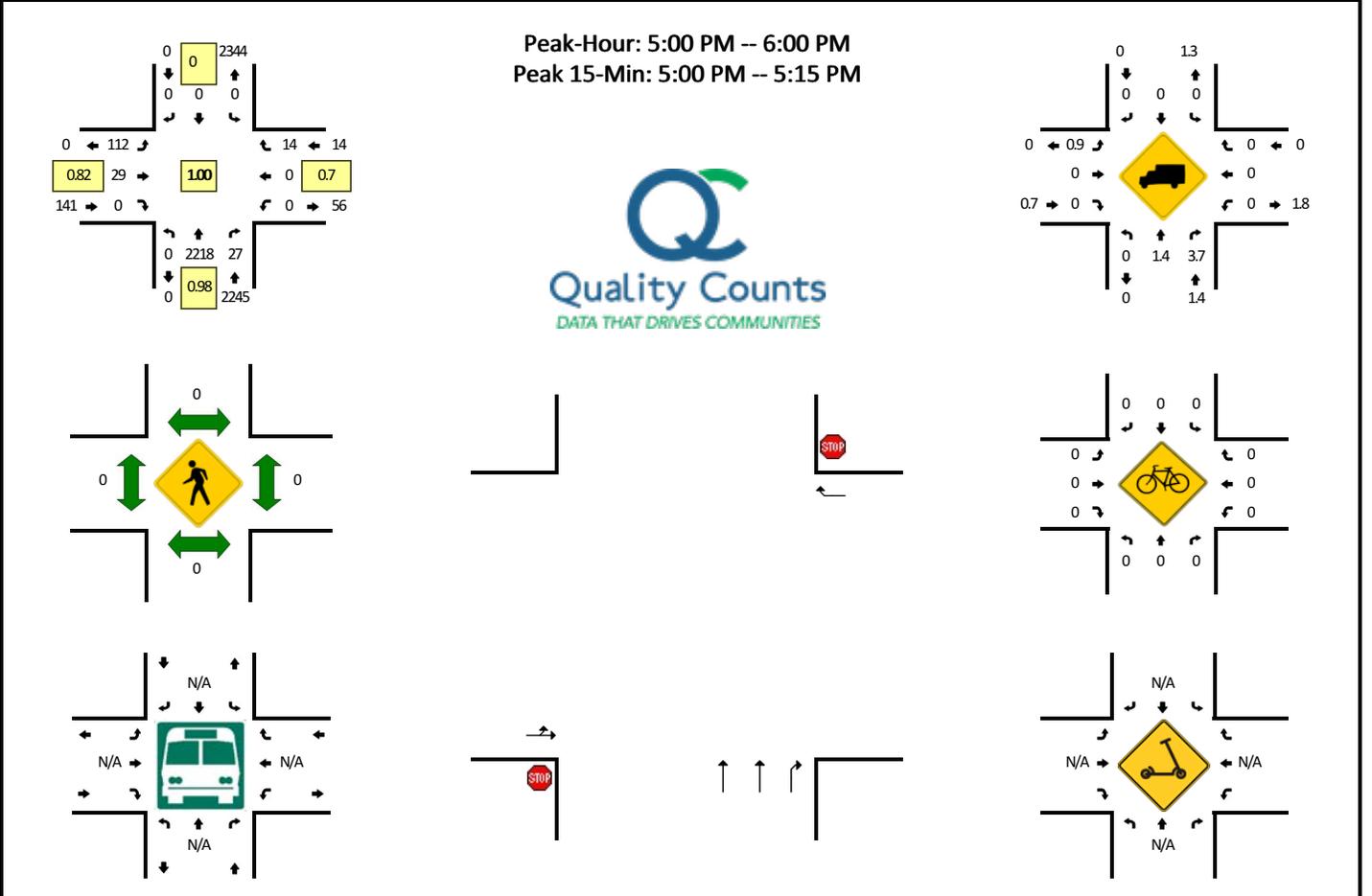


15-Min Count Period Beginning At	NB Lapeer Rd (Northbound)				NB Lapeer Rd (Southbound)				Eagle Ridge Rd (Eastbound)				Eagle Ridge Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	267	2	0	0	0	0	0	19	5	0	0	0	0	2	0	295	
11:15 AM	0	271	1	0	0	0	0	0	26	3	0	0	0	0	3	0	304	
11:30 AM	0	295	1	0	0	0	0	0	21	2	0	0	0	0	4	0	323	
11:45 AM	0	332	2	0	0	0	0	0	28	2	0	0	0	0	0	0	364	1286
12:00 PM	0	310	3	0	0	0	0	0	18	2	0	0	0	0	3	0	336	1327
12:15 PM	0	286	3	0	0	0	0	0	27	0	0	0	0	0	6	0	322	1345
12:30 PM	0	291	1	0	0	0	0	0	27	5	0	0	0	0	4	0	328	1350
12:45 PM	0	304	1	0	0	0	0	0	29	3	0	0	0	0	2	0	339	1325
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	1328	8	0	0	0	0	0	112	8	0	0	0	0	0	0	1456	
Heavy Trucks	0	104	0		0	0	0		12	0	0		0	0	0		116	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

Comments:

LOCATION: NB Lapeer Rd -- Eagle Ridge Rd
CITY/STATE: Orion Township, MI

QC JOB #: 15971076
DATE: Tue, Oct 18 2022



15-Min Count Period Beginning At	NB Lapeer Rd (Northbound)				NB Lapeer Rd (Southbound)				Eagle Ridge Rd (Eastbound)				Eagle Ridge Rd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
2:00 PM	0	358	2	0	0	0	0	0	30	0	0	0	0	0	0	6	0	396	
2:15 PM	0	416	0	0	0	0	0	0	26	1	0	0	0	0	0	3	0	446	
2:30 PM	0	446	2	0	0	0	0	0	25	1	0	0	0	0	0	3	0	477	
2:45 PM	0	465	1	0	0	0	0	0	29	7	0	0	0	0	0	3	0	505	1824
3:00 PM	0	456	5	0	0	0	0	0	19	7	0	0	0	0	0	7	0	494	1922
3:15 PM	0	455	6	0	0	0	0	0	17	4	0	0	0	0	0	4	0	486	1962
3:30 PM	0	550	9	0	0	0	0	0	33	2	0	0	0	0	0	7	0	601	2086
3:45 PM	0	572	8	0	0	0	0	0	22	7	0	0	0	0	0	6	0	615	2196
4:00 PM	0	528	7	0	0	0	0	0	33	4	0	0	0	0	0	4	0	576	2278
4:15 PM	0	474	4	0	0	0	0	0	32	6	0	0	0	0	0	4	0	520	2312
4:30 PM	0	536	4	0	0	0	0	0	28	2	0	0	0	0	0	7	0	577	2288
4:45 PM	0	537	3	0	0	0	0	0	30	3	0	0	0	0	0	10	0	583	2256
5:00 PM	0	567	5	0	0	0	0	0	21	5	0	0	0	0	0	5	0	603	2283
5:15 PM	0	558	7	0	0	0	0	0	27	8	0	0	0	0	0	3	0	603	2366
5:30 PM	0	547	9	0	0	0	0	0	28	9	0	0	0	0	0	3	0	596	2385
5:45 PM	0	546	6	0	0	0	0	0	36	7	0	0	0	0	0	3	0	598	2400
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	0	2268	20	0	0	0	0	0	84	20	0	0	0	0	0	20	0	2412	
Heavy Trucks	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	
Buses																		0	
Pedestrians		0				0				0				0				0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0			0	
Scoters																		0	

Comments:

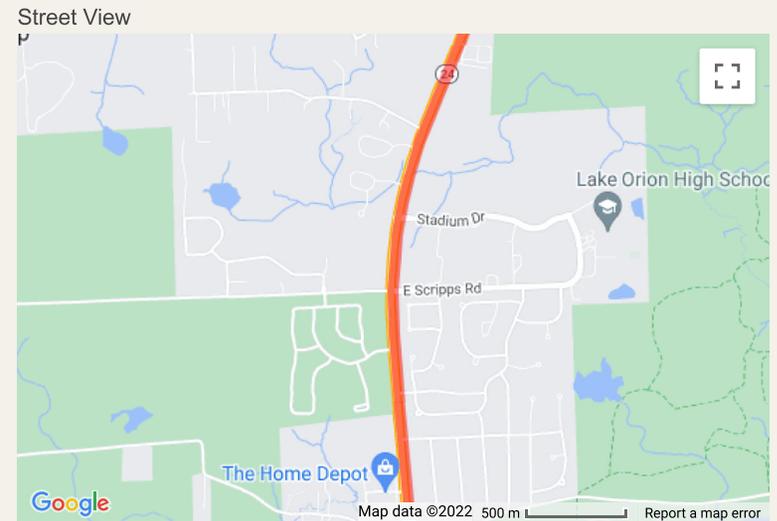
Crash and Road Data

Road Segment Report

Lapeer Rd, (PR Number 616604)

From:	Waldon Rd 3.933 BMP
To:	Clarkston Rd W 6.206 EMP
Jurisdiction:	State
FALINK ID:	323
Community:	Orion Township
County:	Oakland
Functional Class:	3 - Other Principal Arterial
Direction:	1 Way
Length:	2.273 miles
Number of Lanes:	2
Posted Speed:	55 (source: TCO)
Route Classification:	Not a route
Annual Crash Average 2017-2021:	<u>43</u>
Traffic Volume (2016)*:	20,800 (Observed AADT)
Pavement Type (2021):	Asphalt
Pavement Rating (2021):	Fair
Short Range (TIP) Projects:	No TIP projects for this segment.
Long Range (RTP) Projects:	No long-range projects for this segment.

* AADT values are derived from **Traffic Counts**



Crash and Road Data

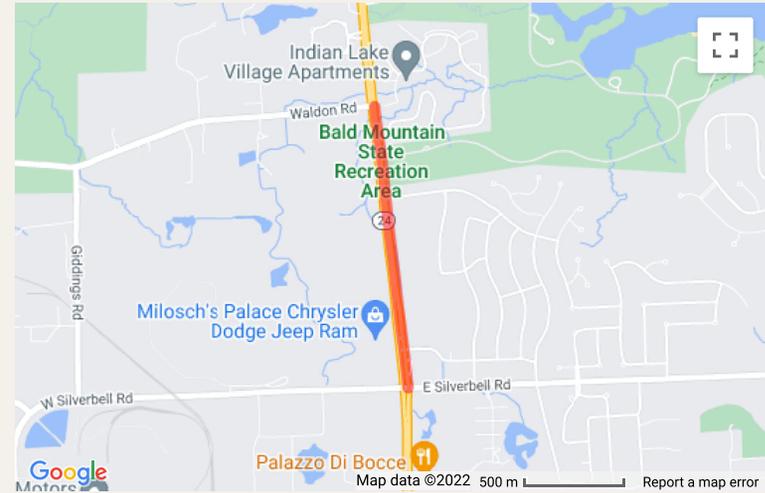
Road Segment Report

Lapeer Rd, (PR Number 616604)

From:	Silver Bell Rd E 3.050 BMP
To:	Waldon Rd 3.933 EMP
Jurisdiction:	State
FALINK ID:	322
Community:	Orion Township
County:	Oakland
Functional Class:	3 - Other Principal Arterial
Direction:	1 Way
Length:	0.883 miles
Number of Lanes:	2
Posted Speed:	55 (source: TCO)
Route Classification:	Not a route
Annual Crash Average 2017-2021:	<u>19</u>
Traffic Volume (2019)*:	23,700 (Observed AADT)
Pavement Type (2021):	Asphalt
Pavement Rating (2021):	Fair
Short Range (TIP) Projects:	No TIP projects for this segment.
Long Range (RTP) Projects:	No long-range projects for this segment.

* AADT values are derived from **Traffic Counts**

Street View



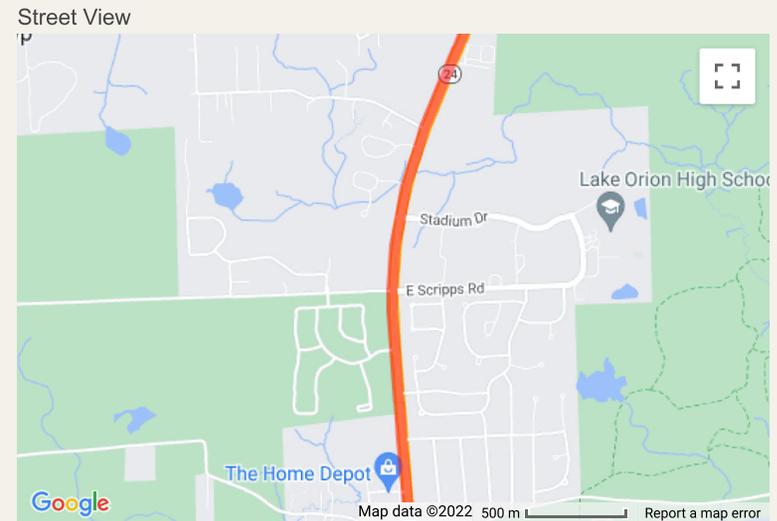
Crash and Road Data

Road Segment Report

Lapeer Rd, (PR Number 616605)

From:	Waldon Rd 3.920 BMP
To:	Clarkston Rd W 6.193 EMP
Jurisdiction:	State
FALINK ID:	349
Community:	Orion Township
County:	Oakland
Functional Class:	3 - Other Principal Arterial
Direction:	1 Way
Length:	2.273 miles
Number of Lanes:	2
Posted Speed:	55 (source: TCO)
Route Classification:	BL-75
Annual Crash Average 2017-2021:	<u>43</u>
Traffic Volume (2016)*:	22,600 (Observed AADT)
Pavement Type (2021):	Asphalt
Pavement Rating (2021):	Good
Short Range (TIP) Projects:	(10867) Rehabilitate Roadway
Long Range (RTP) Projects:	No long-range projects for this segment.

* AADT values are derived from **Traffic Counts**



Crash and Road Data

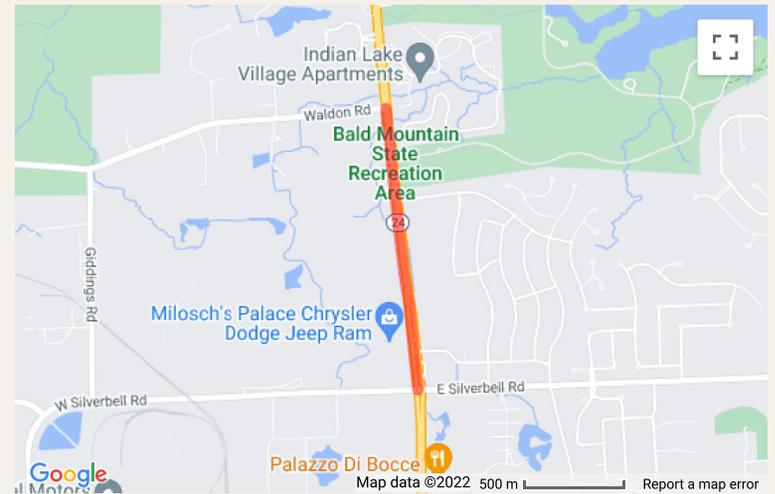
Road Segment Report

Lapeer Rd, (PR Number 616605)

From:	Silver Bell Rd E 3.037 BMP
To:	Waldon Rd 3.920 EMP
Jurisdiction:	State
FALINK ID:	348
Community:	Orion Township
County:	Oakland
Functional Class:	3 - Other Principal Arterial
Direction:	1 Way
Length:	0.883 miles
Number of Lanes:	2
Posted Speed:	55 (source: TCO)
Route Classification:	BL-75
Annual Crash Average 2017-2021:	<u>19</u>
Traffic Volume (2016)*:	21,900 (Observed AADT)
Pavement Type (2021):	Asphalt
Pavement Rating (2021):	Good
Short Range (TIP) Projects:	(10867) Rehabilitate Roadway
Long Range (RTP) Projects:	No long-range projects for this segment.

* AADT values are derived from **Traffic Counts**

Street View



Crash and Road Data

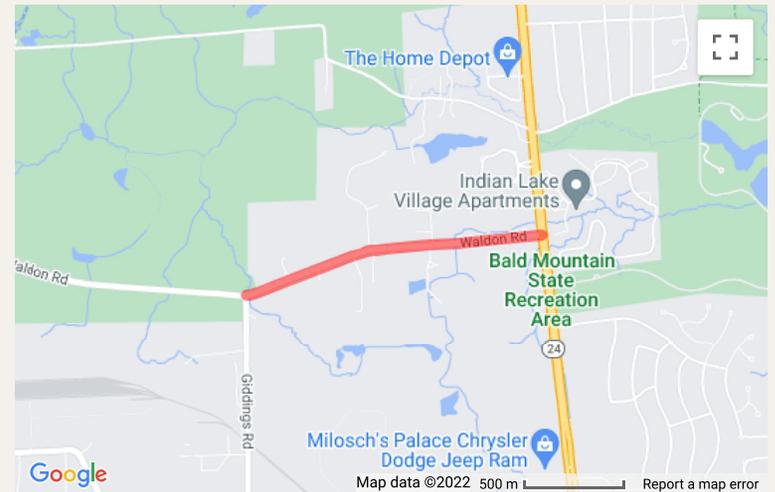
Road Segment Report

Waldon Rd, (PR Number 627303)

From:	Giddings Rd 8.038 BMP
To:	Lapeer Rd 8.990 EMP
Jurisdiction:	County
FALINK ID:	661
Community:	Orion Township
County:	Oakland
Functional Class:	5 - Major Collector
Direction:	1 Way
Length:	0.952 miles
Number of Lanes:	2
Posted Speed:	40 (source: TCO)
Route Classification:	BL-75
Annual Crash Average 2017-2021:	<u>16</u>
Traffic Volume (2018)*:	4,300 (Observed AADT)
Pavement Type (2021):	Asphalt
Pavement Rating (2021):	Fair
Short Range (TIP) Projects:	No TIP projects for this segment.
Long Range (RTP) Projects:	No long-range projects for this segment.

* AADT values are derived from **Traffic Counts**

Street View



Community Profiles

YOU ARE VIEWING DATA FOR:

Orion Township

2323 Joslyn Road
Lake Orion, MI 48360
<http://www.oriontownship.org>



Census 2020 Population:
35,330

Area: 34.6 square miles

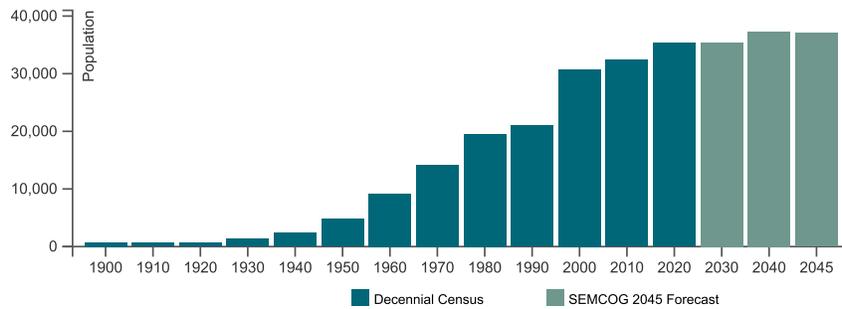
[VIEW COMMUNITY EXPLORER MAP](#)

[VIEW 2020 CENSUS MAP](#)

Population and Households

Link to American Community Survey (ACS) Profiles: **Select a Year** **Social | Demographic**
Population and Household Estimates for Southeast Michigan, 2021

Population Forecast



Population and Households

Population and Households	Census 2020	Census 2010	Change 2010-2020	Pct Change 2010-2020	SEMCOG Jul 2021	SEMCOG 2045
Total Population	35,330	32,421	2,909	9.0%	35,541	37,032
Group Quarters Population	121	140	-19	-13.6%	121	212
Household Population	35,209	32,281	2,928	9.1%	35,420	36,820
Housing Units	13,885	12,515	1,370	10.9%	14,018	-
Households (Occupied Units)	13,219	11,673	1,546	13.2%	13,361	14,652
Residential Vacancy Rate	4.8%	6.7%	-1.9%	-	4.7%	-
Average Household Size	2.66	2.77	-0.10	-	2.65	2.51

Source: U.S. Census Bureau and SEMCOG 2045 Regional Development Forecast

Components of Population Change

Components of Population Change	2000-2005 Avg.	2006-2010 Avg.	2011-2018 Avg.
Natural Increase (Births - Deaths)	132	50	94
Births	275	172	260
Deaths	143	122	166
Net Migration (Movement In - Movement Out)	78	75	349
Population Change (Natural Increase + Net Migration)	210	125	443

Source: Michigan Department of Community Health Vital Statistics, U.S. Census Bureau, and SEMCOG

Community Profiles

YOU ARE VIEWING DATA FOR:

Orion Township

2323 Joslyn Road
Lake Orion, MI 48360
<http://www.oriontownship.org>



Census 2020 Population:
35,330

Area: 34.6 square miles

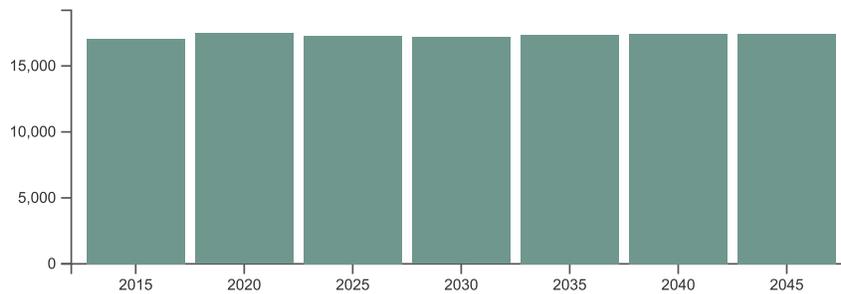
[VIEW COMMUNITY EXPLORER MAP](#)

[VIEW 2020 CENSUS MAP](#)

Economy & Jobs

Link to American Community Survey (ACS) Profiles: **Select a Year** **Economic**

Forecasted Jobs



Source: SEMCOG 2045 Regional Development Forecast

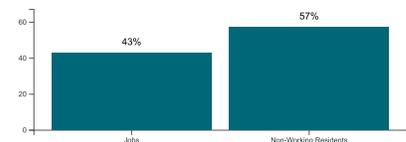
Forecasted Jobs by Industry Sector

Forecasted Jobs By Industry Sector	2015	2020	2025	2030	2035	2040	2045	Change 2015-2045	Pct Change 2015-2045
Natural Resources, Mining, & Construction	975	1,126	1,072	1,057	1,068	1,079	1,091	116	11.9%
Manufacturing	2,885	2,576	2,415	2,224	2,102	1,995	1,880	-1,005	-34.8%
Wholesale Trade	904	925	923	913	913	912	905	1	0.1%
Retail Trade	2,458	2,600	2,613	2,586	2,575	2,552	2,493	35	1.4%
Transportation, Warehousing, & Utilities	576	595	589	587	598	611	618	42	7.3%
Information & Financial Activities	1,611	1,692	1,691	1,712	1,752	1,759	1,779	168	10.4%
Professional and Technical Services & Corporate HQ	1,175	1,233	1,159	1,253	1,349	1,332	1,346	171	14.6%
Administrative, Support, & Waste Services	1,690	1,745	1,768	1,778	1,817	1,859	1,884	194	11.5%
Education Services	1,020	992	993	992	1,004	1,009	1,023	3	0.3%
Healthcare Services	1,014	1,095	1,147	1,184	1,274	1,365	1,450	436	43%
Leisure & Hospitality	1,368	1,499	1,539	1,558	1,592	1,664	1,659	291	21.3%
Other Services	1,219	1,253	1,223	1,200	1,194	1,184	1,168	-51	-4.2%
Public Administration	138	138	137	135	135	135	135	-3	-2.2%
Total Employment Numbers	17,033	17,469	17,269	17,179	17,373	17,456	17,431	398	2.3%

Source: SEMCOG 2045 Regional Development Forecast

Daytime Population

Daytime Population	ACS 2016
Jobs	12,576
Non-Working Residents	16,770
Age 15 and under	8,051
Not in labor force	7,657
Unemployed	1,062
Daytime Population	29,346



Source: 2012-2016 American Community Survey 5-Year Estimates and 2012-2016 Census Transportation Planning Products Program (CTPP). For additional information, visit SEMCOG's [Interactive Commuting Patterns Map](#)

Note: The number of residents attending school outside Southeast Michigan is not available. Likewise, the number of students commuting into Southeast Michigan to attend school is also not known.

Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. LOS can be characterized for the entire intersection, each intersection approach, and each lane group. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle. The criteria are given in Exhibit 19-8. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group in question.

LOS A describes operations with a control delay of 10 s/veh or less. This level is typically assigned when the volume-to-capacity ratio is low and either progression is extremely favorable or the cycle length is very short. If LOS A is the result of favorable progression, most vehicles arrive during a green indication and travel through the intersection without stopping.

LOS B describes operations with control delay between 10 and 20 s/veh. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

Exhibit 19.8. Level-of-Service Criteria for Signalized Intersections (Motorized Vehicles)

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤ 10.0
B	> 10.0 and ≤ 20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	> 80.0

1. If the v/c ratio for a lane group exceeds 1.0, a LOS F is assigned to the individual lane group. LOS for approach-based and intersection-wide assessments are determined solely by the control delay.

LOS C describes operations with control delay between 20 and 35 s/veh. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e. one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicle stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D describes operations with control delay between 35 and 55 s/veh. This level is typically assigned when when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E describes operations with control delay between 55 and 80 s/veh. This level is typically assigned when when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level, considered to be unacceptable to most drivers, often occurs with over-saturation, that is, when arrival flow rates exceed the capacity of the intersection. This level is typically assigned when the volume-to-capacity ratio is high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: Highway Capacity Manual, 6th Edition. Transportation Research Board, National Research Council

Intersection						
Int Delay, s/veh	3.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵					↑↑
Traffic Vol, veh/h	129	0	0	0	0	2104
Future Vol, veh/h	129	0	0	0	0	2104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	95	95
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	140	0	0	0	0	2215

Major/Minor	Minor1	Major2	
Conflicting Flow All	1108	-	-
Stage 1	0	-	-
Stage 2	1108	-	-
Critical Hdwy	6.84	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	-	-
Pot Cap-1 Maneuver	204	0	0
Stage 1	-	0	-
Stage 2	278	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	204	-	-
Mov Cap-2 Maneuver	204	-	-
Stage 1	-	-	-
Stage 2	278	-	-

Approach	WB	SB
HCM Control Delay, s	54.3	0
HCM LOS	F	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	204	-
HCM Lane V/C Ratio	0.687	-
HCM Control Delay (s)	54.3	-
HCM Lane LOS	F	-
HCM 95th %tile Q(veh)	4.3	-

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕↕	↗
Traffic Vol, veh/h	0	127	0	0	2090	143
Future Vol, veh/h	0	127	0	0	2090	143
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	500
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	92	92	95	95
Heavy Vehicles, %	8	8	2	2	5	5
Mvmt Flow	0	134	0	0	2200	151

Major/Minor	Minor2		Major2	
Conflicting Flow All	-	1100	-	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	7.06	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.38	-	-
Pot Cap-1 Maneuver	0	198	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	198	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	54.3	0
HCM LOS	F	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	198	-	-
HCM Lane V/C Ratio	0.675	-	-
HCM Control Delay (s)	54.3	-	-
HCM Lane LOS	F	-	-
HCM 95th %tile Q(veh)	4.1	-	-

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔				↔		↕↕	↔			
Traffic Vol, veh/h	102	8	0	0	0	28	0	1018	9	0	0	0
Future Vol, veh/h	102	8	0	0	0	28	0	1018	9	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	475	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1085325568	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	60	60	60	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	0	0	0	9	9	9	2	2	2
Mvmt Flow	134	11	0	0	0	47	0	1107	10	0	0	0

Major/Minor	Minor2		Minor1			Major1		
Conflicting Flow All	554	1117	-	-	-	554	-	0
Stage 1	0	0	-	-	-	-	-	-
Stage 2	554	1117	-	-	-	-	-	-
Critical Hdwy	7.64	6.64	-	-	-	6.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.64	5.64	-	-	-	-	-	-
Follow-up Hdwy	3.57	4.07	-	-	-	3.3	-	-
Pot Cap-1 Maneuver	404	198	0	0	0	481	0	-
Stage 1	-	-	0	0	0	-	0	-
Stage 2	472	271	0	0	0	-	0	-
Platoon blocked, %								-
Mov Cap-1 Maneuver	365	198	-	-	-	481	-	-
Mov Cap-2 Maneuver	365	198	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	426	271	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	22.9	13.3	0
HCM LOS	C	B	

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	344	481
HCM Lane V/C Ratio	-	-	0.421	0.097
HCM Control Delay (s)	-	-	22.9	13.3
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	2	0.3

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵					↑↑
Traffic Vol, veh/h	98	0	0	0	0	1365
Future Vol, veh/h	98	0	0	0	0	1365
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	92	92	86	86
Heavy Vehicles, %	0	0	2	2	2	2
Mvmt Flow	140	0	0	0	0	1587

Major/Minor	Minor1	Major2	
Conflicting Flow All	794	-	-
Stage 1	0	-	-
Stage 2	794	-	-
Critical Hdwy	6.8	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	-	-
Pot Cap-1 Maneuver	329	0	0
Stage 1	-	0	-
Stage 2	411	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	329	-	-
Mov Cap-2 Maneuver	329	-	-
Stage 1	-	-	-
Stage 2	411	-	-

Approach	WB	SB
HCM Control Delay, s	23.8	0
HCM LOS	C	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	329	-
HCM Lane V/C Ratio	0.426	-
HCM Control Delay (s)	23.8	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	2	-

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕↕	↗
Traffic Vol, veh/h	0	166	0	0	1196	267
Future Vol, veh/h	0	166	0	0	1196	267
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	500
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	92	92	86	86
Heavy Vehicles, %	1	1	2	2	2	2
Mvmt Flow	0	193	0	0	1391	310

Major/Minor	Minor2		Major2	
Conflicting Flow All	-	696	-	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.92	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.31	-	-
Pot Cap-1 Maneuver	0	386	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	386	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	23.3	0
HCM LOS	C	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	386	-	-
HCM Lane V/C Ratio	0.5	-	-
HCM Control Delay (s)	23.3	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	2.7	-	-

Intersection												
Int Delay, s/veh	39.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↕		↕↕	↕			
Traffic Vol, veh/h	112	29	0	0	0	14	0	2218	27	0	0	0
Future Vol, veh/h	112	29	0	0	0	14	0	2218	27	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	475	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1085325568	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	70	70	70	95	95	95	92	92	92
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	2	2	2
Mvmt Flow	137	35	0	0	0	20	0	2335	28	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	1168	2363	-	-	-	1168	-	0	0
Stage 1	0	0	-	-	-	-	-	-	-
Stage 2	1168	2363	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	-	-	-	6.9	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	-	-	-	3.3	-	-	-
Pot Cap-1 Maneuver	150	~ 35	0	0	0	189	0	-	-
Stage 1	-	-	0	0	0	-	0	-	-
Stage 2	207	68	0	0	0	-	0	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	~ 134	~ 35	-	-	-	189	-	-	-
Mov Cap-2 Maneuver	~ 134	~ 35	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	185	68	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	580.1	26.3	0
HCM LOS	F	D	

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	85	189
HCM Lane V/C Ratio	-	-	2.023	0.106
HCM Control Delay (s)	-	-	580.1	26.3
HCM Lane LOS	-	-	F	D
HCM 95th %tile Q(veh)	-	-	15.1	0.3

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

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB
Directions Served	L
Maximum Queue (ft)	66
Average Queue (ft)	46
95th Queue (ft)	60
Link Distance (ft)	12
Upstream Blk Time (%)	64
Queuing Penalty (veh)	82
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB	NB
Directions Served	L	T
Maximum Queue (ft)	196	61
Average Queue (ft)	60	2
95th Queue (ft)	154	44
Link Distance (ft)		1471
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	250	
Storage Blk Time (%)	1	
Queuing Penalty (veh)	4	

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB
Directions Served	R
Maximum Queue (ft)	203
Average Queue (ft)	82
95th Queue (ft)	188
Link Distance (ft)	2710
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB
Directions Served	LT	R
Maximum Queue (ft)	69	38
Average Queue (ft)	38	13
95th Queue (ft)	60	32
Link Distance (ft)	4	354
Upstream Blk Time (%)	13	
Queuing Penalty (veh)	15	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB
Directions Served	L
Maximum Queue (ft)	73
Average Queue (ft)	13
95th Queue (ft)	48
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 101

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	36
95th Queue (ft)	54
Link Distance (ft)	12
Upstream Blk Time (%)	25
Queuing Penalty (veh)	26
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB
Directions Served	L
Maximum Queue (ft)	66
Average Queue (ft)	11
95th Queue (ft)	43
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB
Directions Served	R
Maximum Queue (ft)	108
Average Queue (ft)	46
95th Queue (ft)	87
Link Distance (ft)	2710
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB	NB
Directions Served	LT	R	T
Maximum Queue (ft)	57	43	514
Average Queue (ft)	40	10	18
95th Queue (ft)	51	32	368
Link Distance (ft)	4	354	2497
Upstream Blk Time (%)	87		0
Queuing Penalty (veh)	123		0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	389	355	346
Average Queue (ft)	194	64	53
95th Queue (ft)	372	274	249
Link Distance (ft)		529	529
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	300		
Storage Blk Time (%)	12	3	
Queuing Penalty (veh)	74	4	

Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 227

HCM Signalized Intersection Capacity Analysis
 20: SB Lapeer Road (M-24) & Waldon Road

Existing Conditions w/ IMP
 AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕↕	↘
Traffic Volume (vph)	0	127	0	0	2090	143
Future Volume (vph)	0	127	0	0	2090	143
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8			6.1	6.1
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1602			3619	1619
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1602			3619	1619
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.95	0.95
Adj. Flow (vph)	0	134	0	0	2200	151
RTOR Reduction (vph)	0	0	0	0	0	26
Lane Group Flow (vph)	0	134	0	0	2200	125
Heavy Vehicles (%)	8%	8%	2%	2%	5%	5%
Turn Type		Perm			NA	Perm
Protected Phases					6	
Permitted Phases		4				6
Actuated Green, G (s)		16.2			102.9	102.9
Effective Green, g (s)		16.2			102.9	102.9
Actuated g/C Ratio		0.12			0.79	0.79
Clearance Time (s)		4.8			6.1	6.1
Vehicle Extension (s)		3.0			3.0	3.0
Lane Grp Cap (vph)		199			2864	1281
v/s Ratio Prot					0.61	
v/s Ratio Perm		0.08				0.08
v/c Ratio		0.67			0.77	0.10
Uniform Delay, d1		54.4			7.2	3.1
Progression Factor		1.00			0.62	0.35
Incremental Delay, d2		8.7			1.5	0.1
Delay (s)		63.0			6.0	1.2
Level of Service		E			A	A
Approach Delay (s)	63.0			0.0	5.7	
Approach LOS	E			A	A	

Intersection Summary

HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Existing Conditions w/ IMP
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	8	0	0	0	28	0	1018	9	0	0	0
Future Volume (vph)	102	8	0	0	0	28	0	1018	9	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8				4.8		6.1	6.1			
Lane Util. Factor		1.00				1.00		0.95	1.00			
Frt		1.00				0.86		1.00	0.85			
Flt Protected		0.96				1.00		1.00	1.00			
Satd. Flow (prot)		1787				1730		3486	1560			
Flt Permitted		0.96				1.00		1.00	1.00			
Satd. Flow (perm)		1787				1730		3486	1560			
Peak-hour factor, PHF	0.76	0.76	0.76	0.60	0.60	0.60	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	11	0	0	0	47	0	1107	10	0	0	0
RTOR Reduction (vph)	0	119	0	0	0	43	0	0	2	0	0	0
Lane Group Flow (vph)	0	26	0	0	0	4	0	1107	8	0	0	0
Heavy Vehicles (%)	7%	7%	7%	0%	0%	0%	9%	9%	9%	2%	2%	2%
Turn Type	Perm	NA				Perm		NA	Perm			
Protected Phases		4						2				
Permitted Phases	4					8			2			
Actuated Green, G (s)		9.9				9.9		109.2	109.2			
Effective Green, g (s)		9.9				9.9		109.2	109.2			
Actuated g/C Ratio		0.08				0.08		0.84	0.84			
Clearance Time (s)		4.8				4.8		6.1	6.1			
Vehicle Extension (s)		5.0				5.0		3.0	3.0			
Lane Grp Cap (vph)		136				131		2928	1310			
v/s Ratio Prot								c0.32				
v/s Ratio Perm		0.01				0.00			0.01			
v/c Ratio		0.19				0.03		0.38	0.01			
Uniform Delay, d1		56.3				55.6		2.4	1.7			
Progression Factor		0.80				1.00		1.00	1.00			
Incremental Delay, d2		1.0				0.2		0.4	0.0			
Delay (s)		45.8				55.8		2.8	1.7			
Level of Service		D				E		A	A			
Approach Delay (s)		45.8			55.8			2.8			0.0	
Approach LOS		D			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.5				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		10.9			
Intersection Capacity Utilization			51.5%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 20: SB Lapeer Road (M-24) & Waldon Road

Existing Conditions w/ IMP
 PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕	↗
Traffic Volume (vph)	0	166	0	0	1196	267
Future Volume (vph)	0	166	0	0	1196	267
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8			6.1	6.1
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1713			3725	1667
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1713			3725	1667
Peak-hour factor, PHF	0.86	0.86	0.92	0.92	0.86	0.86
Adj. Flow (vph)	0	193	0	0	1391	310
RTOR Reduction (vph)	0	0	0	0	0	73
Lane Group Flow (vph)	0	193	0	0	1391	237
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%
Turn Type		Perm			NA	Perm
Protected Phases					6	
Permitted Phases		4				6
Actuated Green, G (s)		19.9			99.2	99.2
Effective Green, g (s)		19.9			99.2	99.2
Actuated g/C Ratio		0.15			0.76	0.76
Clearance Time (s)		4.8			6.1	6.1
Vehicle Extension (s)		3.0			3.0	3.0
Lane Grp Cap (vph)		262			2842	1272
v/s Ratio Prot					c0.37	
v/s Ratio Perm		c0.11				0.14
v/c Ratio		0.74			0.49	0.19
Uniform Delay, d1		52.5			5.8	4.3
Progression Factor		1.00			0.74	1.87
Incremental Delay, d2		10.3			0.6	0.3
Delay (s)		62.8			4.9	8.3
Level of Service		E			A	A
Approach Delay (s)	62.8			0.0	5.5	
Approach LOS	E			A	A	

Intersection Summary

HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Existing Conditions w/ IMP
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 				
Traffic Volume (vph)	112	29	0	0	0	14	0	2218	27	0	0	0
Future Volume (vph)	112	29	0	0	0	14	0	2218	27	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8				4.8		6.1	6.1			
Lane Util. Factor		1.00				1.00		0.95	1.00			
Frt		1.00				0.86		1.00	0.85			
Flt Protected		0.96				1.00		1.00	1.00			
Satd. Flow (prot)		1904				1730		3762	1683			
Flt Permitted		0.96				1.00		1.00	1.00			
Satd. Flow (perm)		1904				1730		3762	1683			
Peak-hour factor, PHF	0.82	0.82	0.82	0.70	0.70	0.70	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	137	35	0	0	0	20	0	2335	28	0	0	0
RTOR Reduction (vph)	0	23	0	0	0	17	0	0	6	0	0	0
Lane Group Flow (vph)	0	149	0	0	0	3	0	2335	22	0	0	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA				Perm		NA	Perm			
Protected Phases		4						2				
Permitted Phases	4					8			2			
Actuated Green, G (s)		17.3				17.3		101.8	101.8			
Effective Green, g (s)		17.3				17.3		101.8	101.8			
Actuated g/C Ratio		0.13				0.13		0.78	0.78			
Clearance Time (s)		4.8				4.8		6.1	6.1			
Vehicle Extension (s)		5.0				5.0		3.0	3.0			
Lane Grp Cap (vph)		253				230		2945	1317			
v/s Ratio Prot								c0.62				
v/s Ratio Perm		0.08				0.00			0.01			
v/c Ratio		0.59				0.01		0.79	0.02			
Uniform Delay, d1		53.0				48.9		8.1	3.1			
Progression Factor		0.94				1.00		1.00	1.00			
Incremental Delay, d2		4.9				0.0		2.3	0.0			
Delay (s)		54.8				49.0		10.4	3.1			
Level of Service		D				D		B	A			
Approach Delay (s)		54.8			49.0			10.3			0.0	
Approach LOS		D			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			13.6				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		10.9			
Intersection Capacity Utilization			84.5%				ICU Level of Service		E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB
Directions Served	L
Maximum Queue (ft)	79
Average Queue (ft)	48
95th Queue (ft)	65
Link Distance (ft)	12
Upstream Blk Time (%)	70
Queuing Penalty (veh)	90
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB	NB
Directions Served	L	T
Maximum Queue (ft)	181	37
Average Queue (ft)	75	1
95th Queue (ft)	169	27
Link Distance (ft)		1471
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	250	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB	SB	SB	SB
Directions Served	R	T	T	R
Maximum Queue (ft)	224	209	169	49
Average Queue (ft)	114	73	66	12
95th Queue (ft)	195	150	139	38
Link Distance (ft)	2693	279	279	279
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	66	35	111	131	15
Average Queue (ft)	33	13	18	21	1
95th Queue (ft)	55	31	69	77	8
Link Distance (ft)	4	354	2482	2482	
Upstream Blk Time (%)	23				
Queuing Penalty (veh)	26				
Storage Bay Dist (ft)				475	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB
Directions Served	L
Maximum Queue (ft)	178
Average Queue (ft)	34
95th Queue (ft)	117
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 116

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	37
95th Queue (ft)	54
Link Distance (ft)	12
Upstream Blk Time (%)	26
Queuing Penalty (veh)	28
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB
Directions Served	L
Maximum Queue (ft)	70
Average Queue (ft)	12
95th Queue (ft)	43
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB	SB	SB	SB
Directions Served	R	T	T	R
Maximum Queue (ft)	235	121	113	66
Average Queue (ft)	125	44	37	23
95th Queue (ft)	209	95	92	54
Link Distance (ft)	2693	279	279	279
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	50	43	285	731	30
Average Queue (ft)	39	8	108	135	3
95th Queue (ft)	48	27	242	494	18
Link Distance (ft)	4	354	2482	2482	
Upstream Blk Time (%)	60			0	
Queuing Penalty (veh)	85			0	
Storage Bay Dist (ft)					475
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB	SB
Directions Served	L	T
Maximum Queue (ft)	169	19
Average Queue (ft)	81	1
95th Queue (ft)	158	10
Link Distance (ft)		529
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 113

Intersection						
Int Delay, s/veh	3.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘					↑↑
Traffic Vol, veh/h	131	0	0	0	0	2136
Future Vol, veh/h	131	0	0	0	0	2136
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	95	95
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	142	0	0	0	0	2248

Major/Minor	Minor1	Major2	
Conflicting Flow All	1124	-	-
Stage 1	0	-	-
Stage 2	1124	-	-
Critical Hdwy	6.84	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	-	-
Pot Cap-1 Maneuver	199	0	0
Stage 1	-	0	-
Stage 2	272	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	199	-	-
Mov Cap-2 Maneuver	199	-	-
Stage 1	-	-	-
Stage 2	272	-	-

Approach	WB	SB
HCM Control Delay, s	58.7	0
HCM LOS	F	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	199	-
HCM Lane V/C Ratio	0.716	-
HCM Control Delay (s)	58.7	-
HCM Lane LOS	F	-
HCM 95th %tile Q(veh)	4.6	-

Intersection						
Int Delay, s/veh	3.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕↕	↗
Traffic Vol, veh/h	0	129	0	0	2122	145
Future Vol, veh/h	0	129	0	0	2122	145
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	92	92	95	95
Heavy Vehicles, %	8	8	2	2	5	5
Mvmt Flow	0	136	0	0	2234	153

Major/Minor	Minor2		Major2	
Conflicting Flow All	-	1117	-	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	7.06	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.38	-	-
Pot Cap-1 Maneuver	0	192	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	192	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	59.4	0
HCM LOS	F	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	192	-	-
HCM Lane V/C Ratio	0.707	-	-
HCM Control Delay (s)	59.4	-	-
HCM Lane LOS	F	-	-
HCM 95th %tile Q(veh)	4.4	-	-

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↗		↕↕	↗			
Traffic Vol, veh/h	104	8	0	0	0	28	0	1033	9	0	0	0
Future Vol, veh/h	104	8	0	0	0	28	0	1033	9	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	475	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1085325568	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	60	60	60	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	0	0	0	9	9	9	2	2	2
Mvmt Flow	137	11	0	0	0	47	0	1123	10	0	0	0

Major/Minor	Minor2		Minor1			Major1		
Conflicting Flow All	562	1133	-	-	-	562	-	0
Stage 1	0	0	-	-	-	-	-	-
Stage 2	562	1133	-	-	-	-	-	-
Critical Hdwy	7.64	6.64	-	-	-	6.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.64	5.64	-	-	-	-	-	-
Follow-up Hdwy	3.57	4.07	-	-	-	3.3	-	-
Pot Cap-1 Maneuver	399	194	0	0	0	475	0	-
Stage 1	-	-	0	0	0	-	0	-
Stage 2	467	266	0	0	0	-	0	-
Platoon blocked, %								-
Mov Cap-1 Maneuver	360	194	-	-	-	475	-	-
Mov Cap-2 Maneuver	360	194	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	421	266	-	-	-	-	-	-

Approach	EB		WB		NB	
HCM Control Delay, s	23.5		13.4		0	
HCM LOS	C		B			

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	339	475
HCM Lane V/C Ratio	-	-	0.435	0.098
HCM Control Delay (s)	-	-	23.5	13.4
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	2.1	0.3

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘					↑↑
Traffic Vol, veh/h	99	0	0	0	0	1386
Future Vol, veh/h	99	0	0	0	0	1386
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	92	92	86	86
Heavy Vehicles, %	0	0	2	2	2	2
Mvmt Flow	141	0	0	0	0	1612

Major/Minor	Minor1	Major2	
Conflicting Flow All	806	-	-
Stage 1	0	-	-
Stage 2	806	-	-
Critical Hdwy	6.8	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	-	-
Pot Cap-1 Maneuver	324	0	0
Stage 1	-	0	-
Stage 2	405	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	324	-	-
Mov Cap-2 Maneuver	324	-	-
Stage 1	-	-	-
Stage 2	405	-	-

Approach	WB	SB
HCM Control Delay, s	24.4	0
HCM LOS	C	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	324	-
HCM Lane V/C Ratio	0.437	-
HCM Control Delay (s)	24.4	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	2.1	-

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕↕	↗
Traffic Vol, veh/h	0	169	0	0	1214	271
Future Vol, veh/h	0	169	0	0	1214	271
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	92	92	86	86
Heavy Vehicles, %	1	1	2	2	2	2
Mvmt Flow	0	197	0	0	1412	315

Major/Minor	Minor2		Major2	
Conflicting Flow All	-	706	-	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.92	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.31	-	-
Pot Cap-1 Maneuver	0	381	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	381	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	24.1	0
HCM LOS	C	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	381	-	-
HCM Lane V/C Ratio	0.516	-	-
HCM Control Delay (s)	24.1	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	2.8	-	-

Intersection												
Int Delay, s/veh	41.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↗		↕↕	↗			
Traffic Vol, veh/h	114	29	0	0	0	14	0	2251	27	0	0	0
Future Vol, veh/h	114	29	0	0	0	14	0	2251	27	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	475	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1085325568	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	70	70	70	95	95	95	92	92	92
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	2	2	2
Mvmt Flow	139	35	0	0	0	20	0	2369	28	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	1185	2397	-	-	-	1185	-	0	0
Stage 1	0	0	-	-	-	-	-	-	-
Stage 2	1185	2397	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	-	-	-	6.9	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	-	-	-	3.3	-	-	-
Pot Cap-1 Maneuver	146	~ 34	0	0	0	185	0	-	-
Stage 1	-	-	0	0	0	-	0	-	-
Stage 2	202	65	0	0	0	-	0	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	~ 130	~ 34	-	-	-	185	-	-	-
Mov Cap-2 Maneuver	~ 130	~ 34	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	180	65	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	616.1	26.8	0
HCM LOS	F	D	

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	83	185
HCM Lane V/C Ratio	-	-	2.101	0.108
HCM Control Delay (s)	-	-	616.1	26.8
HCM Lane LOS	-	-	F	D
HCM 95th %tile Q(veh)	-	-	15.6	0.4

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

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB
Directions Served	L
Maximum Queue (ft)	79
Average Queue (ft)	47
95th Queue (ft)	63
Link Distance (ft)	12
Upstream Blk Time (%)	66
Queuing Penalty (veh)	87
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB	NB
Directions Served	L	T
Maximum Queue (ft)	224	44
Average Queue (ft)	69	2
95th Queue (ft)	170	32
Link Distance (ft)		1471
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	250	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	1	

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB	SB
Directions Served	R	T
Maximum Queue (ft)	188	4
Average Queue (ft)	84	0
95th Queue (ft)	163	3
Link Distance (ft)	2710	294
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB
Directions Served	LT	R
Maximum Queue (ft)	68	47
Average Queue (ft)	36	12
95th Queue (ft)	56	34
Link Distance (ft)	4	354
Upstream Blk Time (%)	15	
Queuing Penalty (veh)	17	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB
Directions Served	L
Maximum Queue (ft)	80
Average Queue (ft)	14
95th Queue (ft)	52
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 105

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	36
95th Queue (ft)	54
Link Distance (ft)	12
Upstream Blk Time (%)	23
Queuing Penalty (veh)	24
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB
Directions Served	L
Maximum Queue (ft)	43
Average Queue (ft)	9
95th Queue (ft)	32
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	596	104	100
Average Queue (ft)	196	36	32
95th Queue (ft)	848	173	159
Link Distance (ft)	2710	294	294
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		1	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB	NB
Directions Served	LT	R	T
Maximum Queue (ft)	54	39	513
Average Queue (ft)	40	11	35
95th Queue (ft)	50	34	528
Link Distance (ft)	4	354	2497
Upstream Blk Time (%)	87		0
Queuing Penalty (veh)	125		0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	377	350	325
Average Queue (ft)	248	154	79
95th Queue (ft)	526	527	351
Link Distance (ft)		529	529
Upstream Blk Time (%)		14	0
Queuing Penalty (veh)		98	1
Storage Bay Dist (ft)	300		
Storage Blk Time (%)	30	1	
Queuing Penalty (veh)	189	1	

Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement	SB	SB
Directions Served	T	T
Maximum Queue (ft)	10	12
Average Queue (ft)	1	1
95th Queue (ft)	10	9
Link Distance (ft)	614	614
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 439

HCM Signalized Intersection Capacity Analysis
 20: SB Lapeer Road (M-24) & Waldon Road

Background Conditions w/ IMP
 AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕	↗
Traffic Volume (vph)	0	129	0	0	2122	145
Future Volume (vph)	0	129	0	0	2122	145
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8			6.1	6.1
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1602			3619	1619
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1602			3619	1619
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.95	0.95
Adj. Flow (vph)	0	136	0	0	2234	153
RTOR Reduction (vph)	0	0	0	0	0	26
Lane Group Flow (vph)	0	136	0	0	2234	127
Heavy Vehicles (%)	8%	8%	2%	2%	5%	5%
Turn Type		Perm			NA	Perm
Protected Phases					6	
Permitted Phases		4				6
Actuated Green, G (s)		16.4			102.7	102.7
Effective Green, g (s)		16.4			102.7	102.7
Actuated g/C Ratio		0.13			0.79	0.79
Clearance Time (s)		4.8			6.1	6.1
Vehicle Extension (s)		3.0			3.0	3.0
Lane Grp Cap (vph)		202			2859	1279
v/s Ratio Prot					c0.62	
v/s Ratio Perm		c0.08				0.08
v/c Ratio		0.67			0.78	0.10
Uniform Delay, d1		54.2			7.5	3.1
Progression Factor		1.00			0.63	0.35
Incremental Delay, d2		8.5			1.6	0.1
Delay (s)		62.8			6.3	1.2
Level of Service		E			A	A
Approach Delay (s)	62.8			0.0	6.0	
Approach LOS	E			A	A	

Intersection Summary

HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Background Conditions w/ IMP
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	8	0	0	0	28	0	1033	9	0	0	0
Future Volume (vph)	104	8	0	0	0	28	0	1033	9	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8				4.8		6.1	6.1			
Lane Util. Factor		1.00				1.00		0.95	1.00			
Frt		1.00				0.86		1.00	0.85			
Flt Protected		0.96				1.00		1.00	1.00			
Satd. Flow (prot)		1786				1730		3486	1560			
Flt Permitted		0.96				1.00		1.00	1.00			
Satd. Flow (perm)		1786				1730		3486	1560			
Peak-hour factor, PHF	0.76	0.76	0.76	0.60	0.60	0.60	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	11	0	0	0	47	0	1123	10	0	0	0
RTOR Reduction (vph)	0	115	0	0	0	43	0	0	2	0	0	0
Lane Group Flow (vph)	0	33	0	0	0	4	0	1123	8	0	0	0
Heavy Vehicles (%)	7%	7%	7%	0%	0%	0%	9%	9%	9%	2%	2%	2%
Turn Type	Perm	NA				Perm		NA	Perm			
Protected Phases		4						2				
Permitted Phases	4					8			2			
Actuated Green, G (s)		10.3				10.3		108.8	108.8			
Effective Green, g (s)		10.3				10.3		108.8	108.8			
Actuated g/C Ratio		0.08				0.08		0.84	0.84			
Clearance Time (s)		4.8				4.8		6.1	6.1			
Vehicle Extension (s)		5.0				5.0		3.0	3.0			
Lane Grp Cap (vph)		141				137		2917	1305			
v/s Ratio Prot								c0.32				
v/s Ratio Perm		0.02				0.00			0.01			
v/c Ratio		0.23				0.03		0.38	0.01			
Uniform Delay, d1		56.1				55.2		2.6	1.7			
Progression Factor		0.80				1.00		1.00	1.00			
Incremental Delay, d2		1.2				0.2		0.4	0.0			
Delay (s)		46.1				55.4		2.9	1.7			
Level of Service		D				E		A	A			
Approach Delay (s)		46.1			55.4			2.9			0.0	
Approach LOS		D			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.6				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		10.9			
Intersection Capacity Utilization			51.9%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 20: SB Lapeer Road (M-24) & Waldon Road

Background Conditions w/ IMP
 PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕↕	↗
Traffic Volume (vph)	0	169	0	0	1214	271
Future Volume (vph)	0	169	0	0	1214	271
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8			6.1	6.1
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1713			3725	1667
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1713			3725	1667
Peak-hour factor, PHF	0.86	0.86	0.92	0.92	0.86	0.86
Adj. Flow (vph)	0	197	0	0	1412	315
RTOR Reduction (vph)	0	0	0	0	0	75
Lane Group Flow (vph)	0	197	0	0	1412	240
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%
Turn Type		Perm			NA	Perm
Protected Phases					6	
Permitted Phases		4				6
Actuated Green, G (s)		20.2			98.9	98.9
Effective Green, g (s)		20.2			98.9	98.9
Actuated g/C Ratio		0.16			0.76	0.76
Clearance Time (s)		4.8			6.1	6.1
Vehicle Extension (s)		3.0			3.0	3.0
Lane Grp Cap (vph)		266			2833	1268
v/s Ratio Prot					c0.38	
v/s Ratio Perm		c0.12				0.14
v/c Ratio		0.74			0.50	0.19
Uniform Delay, d1		52.4			6.0	4.3
Progression Factor		1.00			0.75	1.89
Incremental Delay, d2		10.6			0.6	0.3
Delay (s)		63.0			5.1	8.5
Level of Service		E			A	A
Approach Delay (s)	63.0			0.0	5.7	
Approach LOS	E			A	A	
Intersection Summary						
HCM 2000 Control Delay			11.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	10.9
Intersection Capacity Utilization			50.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Background Conditions w/ IMP
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 				
Traffic Volume (vph)	114	29	0	0	0	14	0	2251	27	0	0	0
Future Volume (vph)	114	29	0	0	0	14	0	2251	27	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8				4.8		6.1	6.1			
Lane Util. Factor		1.00				1.00		0.95	1.00			
Frt		1.00				0.86		1.00	0.85			
Flt Protected		0.96				1.00		1.00	1.00			
Satd. Flow (prot)		1904				1730		3762	1683			
Flt Permitted		0.96				1.00		1.00	1.00			
Satd. Flow (perm)		1904				1730		3762	1683			
Peak-hour factor, PHF	0.82	0.82	0.82	0.70	0.70	0.70	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	139	35	0	0	0	20	0	2369	28	0	0	0
RTOR Reduction (vph)	0	23	0	0	0	17	0	0	6	0	0	0
Lane Group Flow (vph)	0	151	0	0	0	3	0	2369	22	0	0	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA				Perm		NA	Perm			
Protected Phases		4						2				
Permitted Phases	4					8			2			
Actuated Green, G (s)		17.4				17.4		101.7	101.7			
Effective Green, g (s)		17.4				17.4		101.7	101.7			
Actuated g/C Ratio		0.13				0.13		0.78	0.78			
Clearance Time (s)		4.8				4.8		6.1	6.1			
Vehicle Extension (s)		5.0				5.0		3.0	3.0			
Lane Grp Cap (vph)		254				231		2943	1316			
v/s Ratio Prot								c0.63				
v/s Ratio Perm		0.08				0.00			0.01			
v/c Ratio		0.60				0.01		0.80	0.02			
Uniform Delay, d1		53.0				48.8		8.3	3.1			
Progression Factor		0.93				1.00		1.00	1.00			
Incremental Delay, d2		4.9				0.0		2.5	0.0			
Delay (s)		54.5				48.9		10.8	3.1			
Level of Service		D				D		B	A			
Approach Delay (s)		54.5			48.9			10.7			0.0	
Approach LOS		D			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			13.9				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		10.9			
Intersection Capacity Utilization			85.5%				ICU Level of Service		E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB	SB
Directions Served	L	T
Maximum Queue (ft)	75	141
Average Queue (ft)	47	5
95th Queue (ft)	65	101
Link Distance (ft)	12	1466
Upstream Blk Time (%)	68	
Queuing Penalty (veh)	89	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB	NB
Directions Served	L	T
Maximum Queue (ft)	147	11
Average Queue (ft)	56	0
95th Queue (ft)	127	8
Link Distance (ft)		1471
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	250	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB	SB	SB	SB
Directions Served	R	T	T	R
Maximum Queue (ft)	216	165	161	51
Average Queue (ft)	106	69	64	13
95th Queue (ft)	185	135	134	39
Link Distance (ft)	2693	279	279	279
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	68	39	96	132	5
Average Queue (ft)	34	12	11	19	0
95th Queue (ft)	57	32	52	79	4
Link Distance (ft)	4	354	2482	2482	
Upstream Blk Time (%)	21				
Queuing Penalty (veh)	24				
Storage Bay Dist (ft)				475	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB
Directions Served	L
Maximum Queue (ft)	182
Average Queue (ft)	32
95th Queue (ft)	109
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 113

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	36
95th Queue (ft)	55
Link Distance (ft)	12
Upstream Blk Time (%)	25
Queuing Penalty (veh)	27
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB
Directions Served	L
Maximum Queue (ft)	59
Average Queue (ft)	10
95th Queue (ft)	38
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB	SB	SB	SB
Directions Served	R	T	T	R
Maximum Queue (ft)	237	120	116	60
Average Queue (ft)	126	43	38	21
95th Queue (ft)	215	93	90	51
Link Distance (ft)	2693	279	279	279
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	48	39	253	259	20
Average Queue (ft)	39	8	100	113	2
95th Queue (ft)	47	29	206	222	13
Link Distance (ft)	4	354	2482	2482	
Upstream Blk Time (%)	57				
Queuing Penalty (veh)	83				
Storage Bay Dist (ft)				475	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB	SB
Directions Served	L	T
Maximum Queue (ft)	164	31
Average Queue (ft)	75	1
95th Queue (ft)	146	23
Link Distance (ft)		529
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 109

Intersection						
Int Delay, s/veh	7.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵					↑↑
Traffic Vol, veh/h	169	0	0	0	0	2177
Future Vol, veh/h	169	0	0	0	0	2177
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	95	95
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	184	0	0	0	0	2292

Major/Minor	Minor1	Major2	
Conflicting Flow All	1146	-	-
Stage 1	0	-	-
Stage 2	1146	-	-
Critical Hdwy	6.84	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	-	-
Pot Cap-1 Maneuver	193	0	0
Stage 1	-	0	-
Stage 2	265	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	193	-	-
Mov Cap-2 Maneuver	193	-	-
Stage 1	-	-	-
Stage 2	265	-	-

Approach	WB	SB
HCM Control Delay, s	102.8	0
HCM LOS	F	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	193	-
HCM Lane V/C Ratio	0.952	-
HCM Control Delay (s)	102.8	-
HCM Lane LOS	F	-
HCM 95th %tile Q(veh)	7.7	-

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕↕	↗
Traffic Vol, veh/h	0	131	0	0	2207	148
Future Vol, veh/h	0	131	0	0	2207	148
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	92	92	95	95
Heavy Vehicles, %	8	8	2	2	5	5
Mvmt Flow	0	138	0	0	2323	156

Major/Minor	Minor2		Major2	
Conflicting Flow All	-	1162	-	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	7.06	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.38	-	-
Pot Cap-1 Maneuver	0	179	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	179	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	71.6	0
HCM LOS	F	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	179	-	-
HCM Lane V/C Ratio	0.77	-	-
HCM Control Delay (s)	71.6	-	-
HCM Lane LOS	F	-	-
HCM 95th %tile Q(veh)	5.1	-	-

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↗		↕↕	↗			
Traffic Vol, veh/h	159	8	0	0	0	28	0	1057	9	0	0	0
Future Vol, veh/h	159	8	0	0	0	28	0	1057	9	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	475	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1085325568	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	60	60	60	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	0	0	0	9	9	9	2	2	2
Mvmt Flow	209	11	0	0	0	47	0	1149	10	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	575	1159	-	-	-	575	-	0	0
Stage 1	0	0	-	-	-	-	-	-	-
Stage 2	575	1159	-	-	-	-	-	-	-
Critical Hdwy	7.64	6.64	-	-	-	6.9	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.64	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.57	4.07	-	-	-	3.3	-	-	-
Pot Cap-1 Maneuver	391	187	0	0	0	466	0	-	-
Stage 1	-	-	0	0	0	-	0	-	-
Stage 2	458	258	0	0	0	-	0	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	352	187	-	-	-	466	-	-	-
Mov Cap-2 Maneuver	352	187	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	412	258	-	-	-	-	-	-	-

Approach	EB		WB		NB	
HCM Control Delay, s	33.4		13.6		0	
HCM LOS	D		B			

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	338	466
HCM Lane V/C Ratio	-	-	0.65	0.1
HCM Control Delay (s)	-	-	33.4	13.6
HCM Lane LOS	-	-	D	B
HCM 95th %tile Q(veh)	-	-	4.3	0.3

Intersection						
Int Delay, s/veh	4.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↑↑↑	
Traffic Vol, veh/h	0	113	0	0	2242	104
Future Vol, veh/h	0	113	0	0	2242	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	95	95
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	0	123	0	0	2360	109

Major/Minor	Minor2	Major2
Conflicting Flow All	- 1235	- 0
Stage 1	- -	- -
Stage 2	- -	- -
Critical Hdwy	- 7.14	- -
Critical Hdwy Stg 1	- -	- -
Critical Hdwy Stg 2	- -	- -
Follow-up Hdwy	- 3.92	- -
Pot Cap-1 Maneuver	0 144	- -
Stage 1	0 -	- -
Stage 2	0 -	- -
Platoon blocked, %		- -
Mov Cap-1 Maneuver	- 144	- -
Mov Cap-2 Maneuver	- -	- -
Stage 1	- -	- -
Stage 2	- -	- -

Approach	EB	SB
HCM Control Delay, s	100.3	0
HCM LOS	F	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	144	-	-
HCM Lane V/C Ratio	0.853	-	-
HCM Control Delay (s)	100.3	-	-
HCM Lane LOS	F	-	-
HCM 95th %tile Q(veh)	5.6	-	-

Intersection						
Int Delay, s/veh	4.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘					↗↗
Traffic Vol, veh/h	148	0	0	0	0	1407
Future Vol, veh/h	148	0	0	0	0	1407
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	92	92	86	86
Heavy Vehicles, %	0	0	2	2	2	2
Mvmt Flow	211	0	0	0	0	1636

Major/Minor	Minor1	Major2	
Conflicting Flow All	818	-	-
Stage 1	0	-	-
Stage 2	818	-	-
Critical Hdwy	6.8	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	-	-
Pot Cap-1 Maneuver	318	0	0
Stage 1	-	0	-
Stage 2	399	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	318	-	-
Mov Cap-2 Maneuver	318	-	-
Stage 1	-	-	-
Stage 2	399	-	-

Approach	WB	SB
HCM Control Delay, s	36.2	0
HCM LOS	E	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	318	-
HCM Lane V/C Ratio	0.665	-
HCM Control Delay (s)	36.2	-
HCM Lane LOS	E	-
HCM 95th %tile Q(veh)	4.5	-

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕↕	↗
Traffic Vol, veh/h	0	172	0	0	1264	272
Future Vol, veh/h	0	172	0	0	1264	272
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	92	92	86	86
Heavy Vehicles, %	1	1	2	2	2	2
Mvmt Flow	0	200	0	0	1470	316

Major/Minor	Minor2	Major2
Conflicting Flow All	- 735	- 0
Stage 1	- -	- -
Stage 2	- -	- -
Critical Hdwy	- 6.92	- -
Critical Hdwy Stg 1	- -	- -
Critical Hdwy Stg 2	- -	- -
Follow-up Hdwy	- 3.31	- -
Pot Cap-1 Maneuver	0 364	- -
Stage 1	0 -	- -
Stage 2	0 -	- -
Platoon blocked, %		- -
Mov Cap-1 Maneuver	- 364	- -
Mov Cap-2 Maneuver	- -	- -
Stage 1	- -	- -
Stage 2	- -	- -

Approach	EB	SB
HCM Control Delay, s	26.3	0
HCM LOS	D	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	364	-	-
HCM Lane V/C Ratio	0.549	-	-
HCM Control Delay (s)	26.3	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	3.2	-	-

HCM 6th TWSC
30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Future Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	61.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↗		↗↗	↗			
Traffic Vol, veh/h	142	29	0	0	0	14	0	2286	27	0	0	0
Future Vol, veh/h	142	29	0	0	0	14	0	2286	27	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	475	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1085325568	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	70	70	70	95	95	95	92	92	92
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	2	2	2
Mvmt Flow	173	35	0	0	0	20	0	2406	28	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	1203	2434	-	-	-	1203	-	0	0
Stage 1	0	0	-	-	-	-	-	-	-
Stage 2	1203	2434	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	-	-	-	6.9	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	-	-	-	3.3	-	-	-
Pot Cap-1 Maneuver	~ 141	~ 32	0	0	0	180	0	-	-
Stage 1	-	-	0	0	0	-	0	-	-
Stage 2	197	62	0	0	0	-	0	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	~ 125	~ 32	-	-	-	180	-	-	-
Mov Cap-2 Maneuver	~ 125	~ 32	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	175	62	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	780.4	27.5	0
HCM LOS	F	D	

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	84	180
HCM Lane V/C Ratio	-	-	2.483	0.111
HCM Control Delay (s)	-	-	780.4	27.5
HCM Lane LOS	-	-	F	D
HCM 95th %tile Q(veh)	-	-	19.6	0.4

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

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↑↑↑	
Traffic Vol, veh/h	0	58	0	0	1478	77
Future Vol, veh/h	0	58	0	0	1478	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	63	0	0	1719	90

Major/Minor	Minor2		Major2	
Conflicting Flow All	-	905	-	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	7.14	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.92	-	-
Pot Cap-1 Maneuver	0	240	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	240	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	25.3	0
HCM LOS	D	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	240	-	-
HCM Lane V/C Ratio	0.263	-	-
HCM Control Delay (s)	25.3	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	1	-	-

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB
Directions Served	L
Maximum Queue (ft)	78
Average Queue (ft)	50
95th Queue (ft)	64
Link Distance (ft)	12
Upstream Blk Time (%)	82
Queuing Penalty (veh)	139
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB	NB
Directions Served	L	T
Maximum Queue (ft)	287	169
Average Queue (ft)	137	10
95th Queue (ft)	277	85
Link Distance (ft)		1471
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	250	
Storage Blk Time (%)	5	0
Queuing Penalty (veh)	29	0

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB
Directions Served	R
Maximum Queue (ft)	377
Average Queue (ft)	133
95th Queue (ft)	375
Link Distance (ft)	2710
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB
Directions Served	LT	R
Maximum Queue (ft)	73	51
Average Queue (ft)	39	15
95th Queue (ft)	58	37
Link Distance (ft)	4	354
Upstream Blk Time (%)	20	
Queuing Penalty (veh)	34	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB
Directions Served	L
Maximum Queue (ft)	111
Average Queue (ft)	24
95th Queue (ft)	71
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement	EB
Directions Served	R
Maximum Queue (ft)	128
Average Queue (ft)	50
95th Queue (ft)	97
Link Distance (ft)	249
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 202

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	42
95th Queue (ft)	57
Link Distance (ft)	12
Upstream Blk Time (%)	45
Queuing Penalty (veh)	71
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB	NB
Directions Served	L	T
Maximum Queue (ft)	160	46
Average Queue (ft)	37	4
95th Queue (ft)	118	52
Link Distance (ft)		1471
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	250	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	1694	292	307
Average Queue (ft)	627	136	77
95th Queue (ft)	1952	359	273
Link Distance (ft)	2710	294	294
Upstream Blk Time (%)		23	0
Queuing Penalty (veh)		116	2
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB	NB
Directions Served	LT	R	T
Maximum Queue (ft)	62	39	4
Average Queue (ft)	41	9	0
95th Queue (ft)	53	28	3
Link Distance (ft)	4	354	2497
Upstream Blk Time (%)	93		
Queuing Penalty (veh)	159		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	500	576	542
Average Queue (ft)	400	390	135
95th Queue (ft)	648	775	482
Link Distance (ft)		529	529
Upstream Blk Time (%)		44	0
Queuing Penalty (veh)		314	2
Storage Bay Dist (ft)	300		
Storage Blk Time (%)	74	3	
Queuing Penalty (veh)	471	5	

Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement	EB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	178	248	238
Average Queue (ft)	72	74	66
95th Queue (ft)	200	278	257
Link Distance (ft)	249	614	614
Upstream Blk Time (%)	8		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			1
Queuing Penalty (veh)			3

Zone Summary

Zone wide Queuing Penalty: 1144

HCM Signalized Intersection Capacity Analysis
 20: SB Lapeer Road (M-24) & Waldon Road

Future Conditions w/ IMP
 AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕↕	↗
Traffic Volume (vph)	0	131	0	0	2207	148
Future Volume (vph)	0	131	0	0	2207	148
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8			6.1	6.1
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1602			3619	1619
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1602			3619	1619
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.95	0.95
Adj. Flow (vph)	0	138	0	0	2323	156
RTOR Reduction (vph)	0	0	0	0	0	26
Lane Group Flow (vph)	0	138	0	0	2323	130
Heavy Vehicles (%)	8%	8%	2%	2%	5%	5%
Turn Type		Perm			NA	Perm
Protected Phases					6	
Permitted Phases		4				6
Actuated Green, G (s)		16.5			102.6	102.6
Effective Green, g (s)		16.5			102.6	102.6
Actuated g/C Ratio		0.13			0.79	0.79
Clearance Time (s)		4.8			6.1	6.1
Vehicle Extension (s)		3.0			3.0	3.0
Lane Grp Cap (vph)		203			2856	1277
v/s Ratio Prot					c0.64	
v/s Ratio Perm		c0.09				0.08
v/c Ratio		0.68			0.81	0.10
Uniform Delay, d1		54.2			8.1	3.1
Progression Factor		1.00			0.67	0.32
Incremental Delay, d2		8.7			2.0	0.1
Delay (s)		63.0			7.4	1.1
Level of Service		E			A	A
Approach Delay (s)	63.0			0.0	7.0	
Approach LOS	E			A	A	

Intersection Summary

HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Future Conditions w/ IMP
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 				
Traffic Volume (vph)	159	8	0	0	0	28	0	1057	9	0	0	0
Future Volume (vph)	159	8	0	0	0	28	0	1057	9	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8				4.8		6.1	6.1			
Lane Util. Factor		1.00				1.00		0.95	1.00			
Frt		1.00				0.86		1.00	0.85			
Flt Protected		0.95				1.00		1.00	1.00			
Satd. Flow (prot)		1784				1730		3486	1560			
Flt Permitted		0.95				1.00		1.00	1.00			
Satd. Flow (perm)		1784				1730		3486	1560			
Peak-hour factor, PHF	0.76	0.76	0.76	0.60	0.60	0.60	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	11	0	0	0	47	0	1149	10	0	0	0
RTOR Reduction (vph)	0	104	0	0	0	42	0	0	2	0	0	0
Lane Group Flow (vph)	0	116	0	0	0	5	0	1149	8	0	0	0
Heavy Vehicles (%)	7%	7%	7%	0%	0%	0%	9%	9%	9%	2%	2%	2%
Turn Type	Perm	NA				Perm		NA	Perm			
Protected Phases		4						2				
Permitted Phases	4					8			2			
Actuated Green, G (s)		15.2				15.2		103.9	103.9			
Effective Green, g (s)		15.2				15.2		103.9	103.9			
Actuated g/C Ratio		0.12				0.12		0.80	0.80			
Clearance Time (s)		4.8				4.8		6.1	6.1			
Vehicle Extension (s)		5.0				5.0		3.0	3.0			
Lane Grp Cap (vph)		208				202		2786	1246			
v/s Ratio Prot								c0.33				
v/s Ratio Perm		0.06				0.00			0.01			
v/c Ratio		0.56				0.03		0.41	0.01			
Uniform Delay, d1		54.2				50.9		3.9	2.6			
Progression Factor		0.78				1.00		1.00	1.00			
Incremental Delay, d2		3.5				0.1		0.5	0.0			
Delay (s)		45.7				51.0		4.4	2.6			
Level of Service		D				D		A	A			
Approach Delay (s)		45.7			51.0			4.3			0.0	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			12.3				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		10.9			
Intersection Capacity Utilization			55.4%				ICU Level of Service		B			
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
 20: SB Lapeer Road (M-24) & Waldon Road

Future Conditions w/ IMP
 PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↕↕	↗
Traffic Volume (vph)	0	172	0	0	1264	272
Future Volume (vph)	0	172	0	0	1264	272
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8			6.1	6.1
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1713			3725	1667
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1713			3725	1667
Peak-hour factor, PHF	0.86	0.86	0.92	0.92	0.86	0.86
Adj. Flow (vph)	0	200	0	0	1470	316
RTOR Reduction (vph)	0	0	0	0	0	76
Lane Group Flow (vph)	0	200	0	0	1470	240
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%
Turn Type		Perm			NA	Perm
Protected Phases					6	
Permitted Phases		4				6
Actuated Green, G (s)		20.4			98.7	98.7
Effective Green, g (s)		20.4			98.7	98.7
Actuated g/C Ratio		0.16			0.76	0.76
Clearance Time (s)		4.8			6.1	6.1
Vehicle Extension (s)		3.0			3.0	3.0
Lane Grp Cap (vph)		268			2828	1265
v/s Ratio Prot					0.39	
v/s Ratio Perm		0.12				0.14
v/c Ratio		0.75			0.52	0.19
Uniform Delay, d1		52.3			6.2	4.4
Progression Factor		1.00			0.77	1.76
Incremental Delay, d2		10.8			0.7	0.3
Delay (s)		63.1			5.5	8.0
Level of Service		E			A	A
Approach Delay (s)	63.1			0.0	5.9	
Approach LOS	E			A	A	

Intersection Summary

HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Future Conditions w/ IMP
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 				
Traffic Volume (vph)	142	29	0	0	0	14	0	2286	27	0	0	0
Future Volume (vph)	142	29	0	0	0	14	0	2286	27	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.8				4.8		6.1	6.1			
Lane Util. Factor		1.00				1.00		0.95	1.00			
Frt		1.00				0.86		1.00	0.85			
Flt Protected		0.96				1.00		1.00	1.00			
Satd. Flow (prot)		1901				1730		3762	1683			
Flt Permitted		0.96				1.00		1.00	1.00			
Satd. Flow (perm)		1901				1730		3762	1683			
Peak-hour factor, PHF	0.82	0.82	0.82	0.70	0.70	0.70	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	173	35	0	0	0	20	0	2406	28	0	0	0
RTOR Reduction (vph)	0	22	0	0	0	17	0	0	7	0	0	0
Lane Group Flow (vph)	0	186	0	0	0	3	0	2406	21	0	0	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA				Perm		NA	Perm			
Protected Phases		4						2				
Permitted Phases	4					8			2			
Actuated Green, G (s)		19.7				19.7		99.4	99.4			
Effective Green, g (s)		19.7				19.7		99.4	99.4			
Actuated g/C Ratio		0.15				0.15		0.76	0.76			
Clearance Time (s)		4.8				4.8		6.1	6.1			
Vehicle Extension (s)		5.0				5.0		3.0	3.0			
Lane Grp Cap (vph)		288				262		2876	1286			
v/s Ratio Prot								c0.64				
v/s Ratio Perm		0.10				0.00			0.01			
v/c Ratio		0.65				0.01		0.84	0.02			
Uniform Delay, d1		51.9				46.9		10.0	3.6			
Progression Factor		0.93				1.00		1.00	1.00			
Incremental Delay, d2		5.8				0.0		3.1	0.0			
Delay (s)		54.3				46.9		13.1	3.7			
Level of Service		D				D		B	A			
Approach Delay (s)		54.3			46.9			13.0			0.0	
Approach LOS		D			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			16.4				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		10.9			
Intersection Capacity Utilization			87.9%				ICU Level of Service		E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB
Directions Served	L
Maximum Queue (ft)	83
Average Queue (ft)	51
95th Queue (ft)	67
Link Distance (ft)	12
Upstream Blk Time (%)	83
Queuing Penalty (veh)	141
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB	NB	NB
Directions Served	L	T	T
Maximum Queue (ft)	326	302	134
Average Queue (ft)	170	51	15
95th Queue (ft)	375	272	147
Link Distance (ft)		1471	1471
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	250		
Storage Blk Time (%)	21		
Queuing Penalty (veh)	114		

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB	SB	SB	SB
Directions Served	R	T	T	R
Maximum Queue (ft)	216	192	198	48
Average Queue (ft)	109	101	96	16
95th Queue (ft)	193	172	174	43
Link Distance (ft)	2693	279	279	279
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	73	43	123	153	18
Average Queue (ft)	39	14	18	23	1
95th Queue (ft)	61	36	78	93	7
Link Distance (ft)	4	354	2482	2482	
Upstream Blk Time (%)	23				
Queuing Penalty (veh)	40				
Storage Bay Dist (ft)				475	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB	SB
Directions Served	L	T
Maximum Queue (ft)	186	47
Average Queue (ft)	40	2
95th Queue (ft)	119	30
Link Distance (ft)		529
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement	EB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	240	12	6
Average Queue (ft)	109	0	0
95th Queue (ft)	223	8	4
Link Distance (ft)	249	614	614
Upstream Blk Time (%)	3		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 295

Intersection: 10: SB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	WB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	41
95th Queue (ft)	56
Link Distance (ft)	12
Upstream Blk Time (%)	36
Queuing Penalty (veh)	58
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NB Lapeer Road (M-24) & NB-to-SB X/O, N. of Waldon

Movement	NB
Directions Served	L
Maximum Queue (ft)	118
Average Queue (ft)	24
95th Queue (ft)	76
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 20: SB Lapeer Road (M-24) & Waldon Road

Movement	EB	SB	SB	SB
Directions Served	R	T	T	R
Maximum Queue (ft)	242	149	138	75
Average Queue (ft)	130	52	49	23
95th Queue (ft)	210	112	110	54
Link Distance (ft)	2693	279	279	279
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: NB Lapeer Road (M-24) & SB-to-NB X/O/Eagle Ridge Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	53	47	315	362	28
Average Queue (ft)	40	9	128	147	3
95th Queue (ft)	48	32	271	293	17
Link Distance (ft)	4	354	2482	2482	
Upstream Blk Time (%)	61				
Queuing Penalty (veh)	105				
Storage Bay Dist (ft)				475	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 31: SB Lapeer Road (M-24) & SB-to-NB X/O

Movement	SB	SB
Directions Served	L	T
Maximum Queue (ft)	233	18
Average Queue (ft)	101	1
95th Queue (ft)	195	11
Link Distance (ft)		529
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

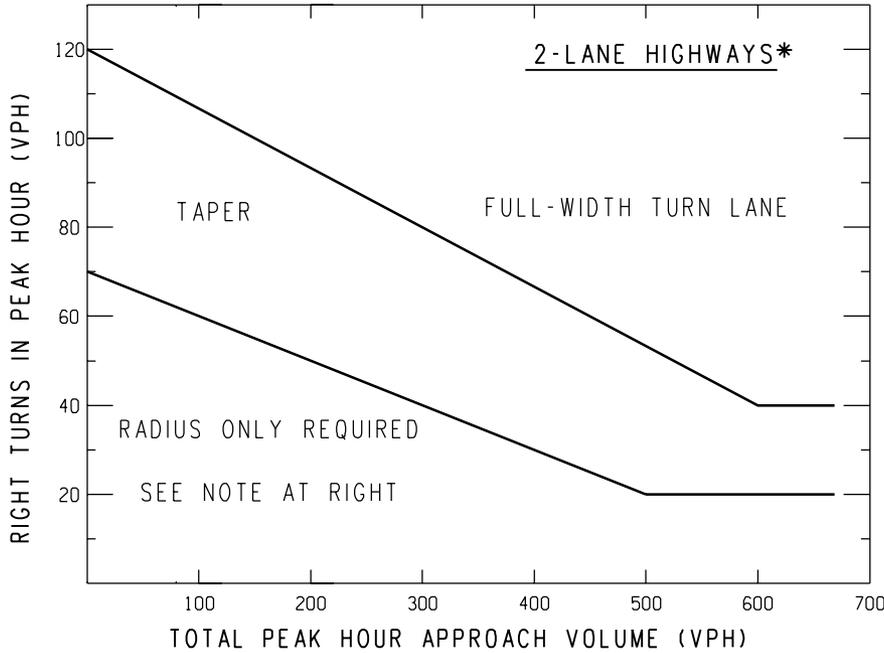
Intersection: 40: SB Lapeer Road (M-24) & Site Drive

Movement	EB
Directions Served	R
Maximum Queue (ft)	69
Average Queue (ft)	30
95th Queue (ft)	59
Link Distance (ft)	249
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

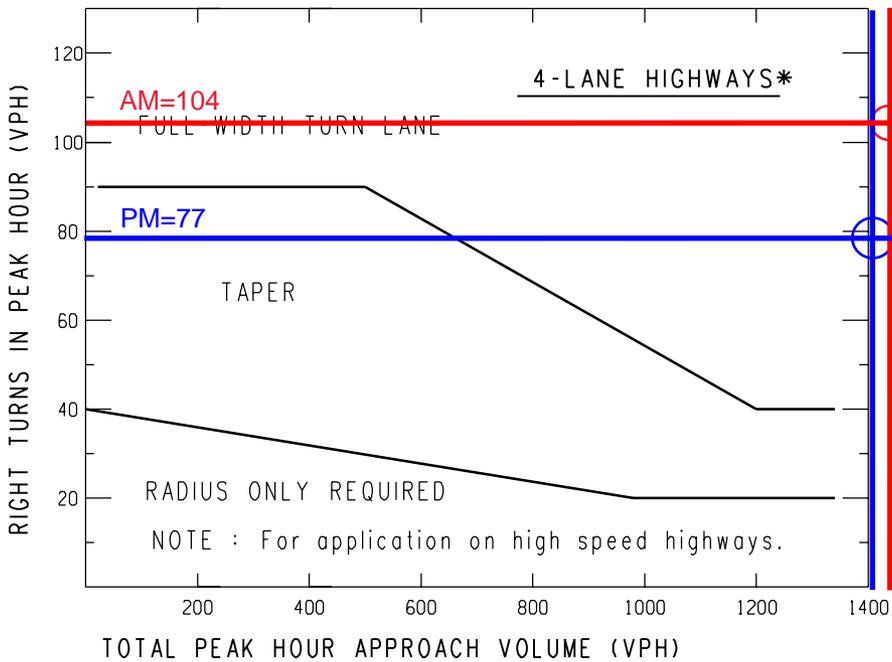
Zone wide Queuing Penalty: 163

SB Lapeer Road (M-24) & Site Drive



NOTE:
 For posted speeds at or under 45 mph, peak hour right turns greater than 40 vph, and total peak hour approach less than 300 vph, adjust right turn volumes.

Adjust peak hour right turns = Peak hour right turns - 20



If a center left-turn lane exists (i.e. 3 or 5 lane highway), subtract the number of left turns in approach volume from the total approach volume to get an adjusted total approach volume.

RT LANE Recommended

AM=2,346
 PM=1,555

Sample Problem:

The Design Speed is 55 mph. The Peak Hour Approach Volume is 300 vph. The Number of Right Turns in the Peak Hour is 100 vph. Determine if a right turn lane is recommended.

Solution:

Figure indicates that the intersection of 300 vph and 100 vph is located above the upper trend line; thus, a right-turn lane may be recommended.

 TRAFFIC AND SAFETY NOTE	TRAFFIC VOLUME GUIDELINES FOR RIGHT-TURN LANES AND TAPERS	
DRAWN BY: MTS	08/05/2004	604A
CHECKED BY: JAT	PLAN DATE:	
FILE: K:\DGN\ts notes\Note604A tsn.dgn		SHEET 2 OF 2 REV. 08/05/2004

Summary of Warrants

Spot Number:	Existing Conditions		
Major Street:	SB Lapeer Road (M-24)	Minor Street:	NB-to-SB X/O
Intersection:	SB Lapeer Road (M-24) at NB-to-SB X/O		
City/Twp:	Orion Township		
Date Performed:	11/4/2022	Performed By:	F&V
Date Volumes Collected:	10/13/2022		
Warrant	Condition	Is Warrant Met	
Data Validation Error		NO	
WARRANT 1: Eight-Hour Vehicular Volume		YES	
	Condition A	NO	
	Condition B	YES	
	Condition A&B	N/A	
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES	
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES	
	Condition A	N/A	
	Condition B	YES	
WARRANT 4: Pedestrian Volume	(70%)	NO	
	Four Hour	N/A	
	Peak Hour	N/A	
	(Threshold)	HAWK	NO
	(Threshold)	RRFB	NO
WARRANT 5: School Crossing		NO	
WARRANT 6: Coordinated Signal System		NO	
WARRANT 7: Crash Experience		NO	
	Condition A	NO	
	Condition B	NO	
WARRANT 8: Roadway Network		NO	
WARRANT 9: Intersection Near a Grade Crossing		#N/A	
Issue to Be Addressed by Signalization:			
0			

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume**

Intersection:	SB Lapeer Road (M-24) @ NB-to-SB X/O		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St?
1	: No. of Lanes on Minor St?
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: if answer 4 is Yes, then what is the of the population isolated community?
NO	: Have other remedial measures been tried?

USE 70% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B

Time	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?
00:01 - 01:00	0	E-W	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
01:00 - 02:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
02:00 - 03:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
03:00 - 04:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
04:00 - 05:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
05:00 - 06:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
06:00 - 07:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
07:00 - 08:00	1967	104	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
08:00 - 09:00	2027	119	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
09:00 - 10:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
10:00 - 11:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
11:00 - 12:00	1226	63	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
12:00 - 13:00	1331	63	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
13:00 - 14:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
14:00 - 15:00	1403	74	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
15:00 - 16:00	1465	108	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
16:00 - 17:00	1370	116	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
17:00 - 18:00	1365	98	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
18:00 - 19:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
19:00 - 20:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
20:00 - 21:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
21:00 - 22:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
22:00 - 23:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
23:00 - 00:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A

Number of Hours that met the warrant 1A =	3
Number of Hours that met the warrant 1B =	8
Number of Hours that met the warrant 1 A & B =	0

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	NO
B. Is the Interruption of Continuous Traffic Met? (Condition B)	YES
C. Combination of Warrants A and B Criteria Met?	N/A

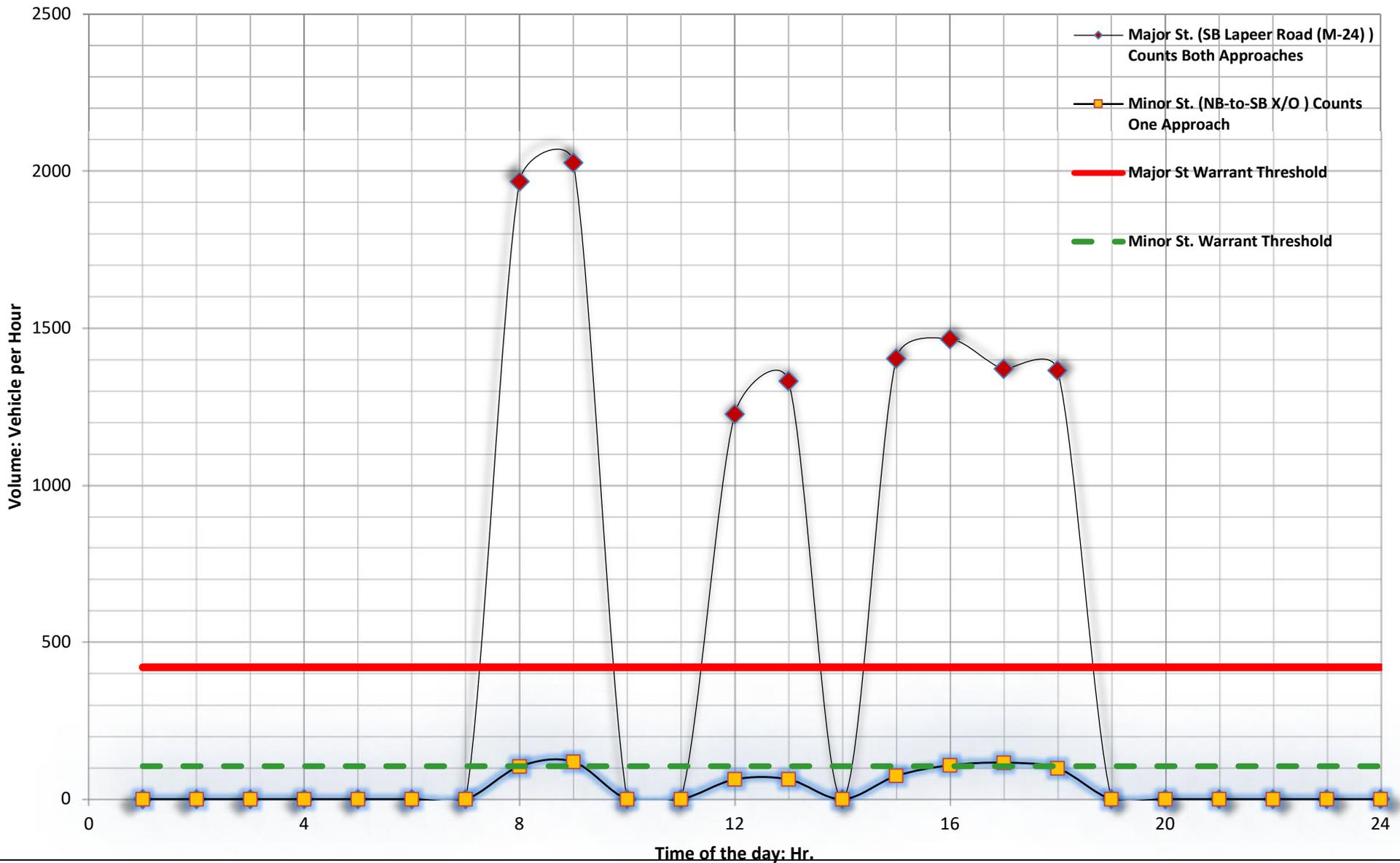


FIGURE 1: WARRANT 1A

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Existing
Conditions
SB Lapeer Road (M-24) @ NB-to-SB
X/O

NO. OF LANES ON MAJOR ST.? 2
 NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 3

Does this intersection meet Warrant 1A for signal installation? NO

Data Collection Date: 10/13/2022

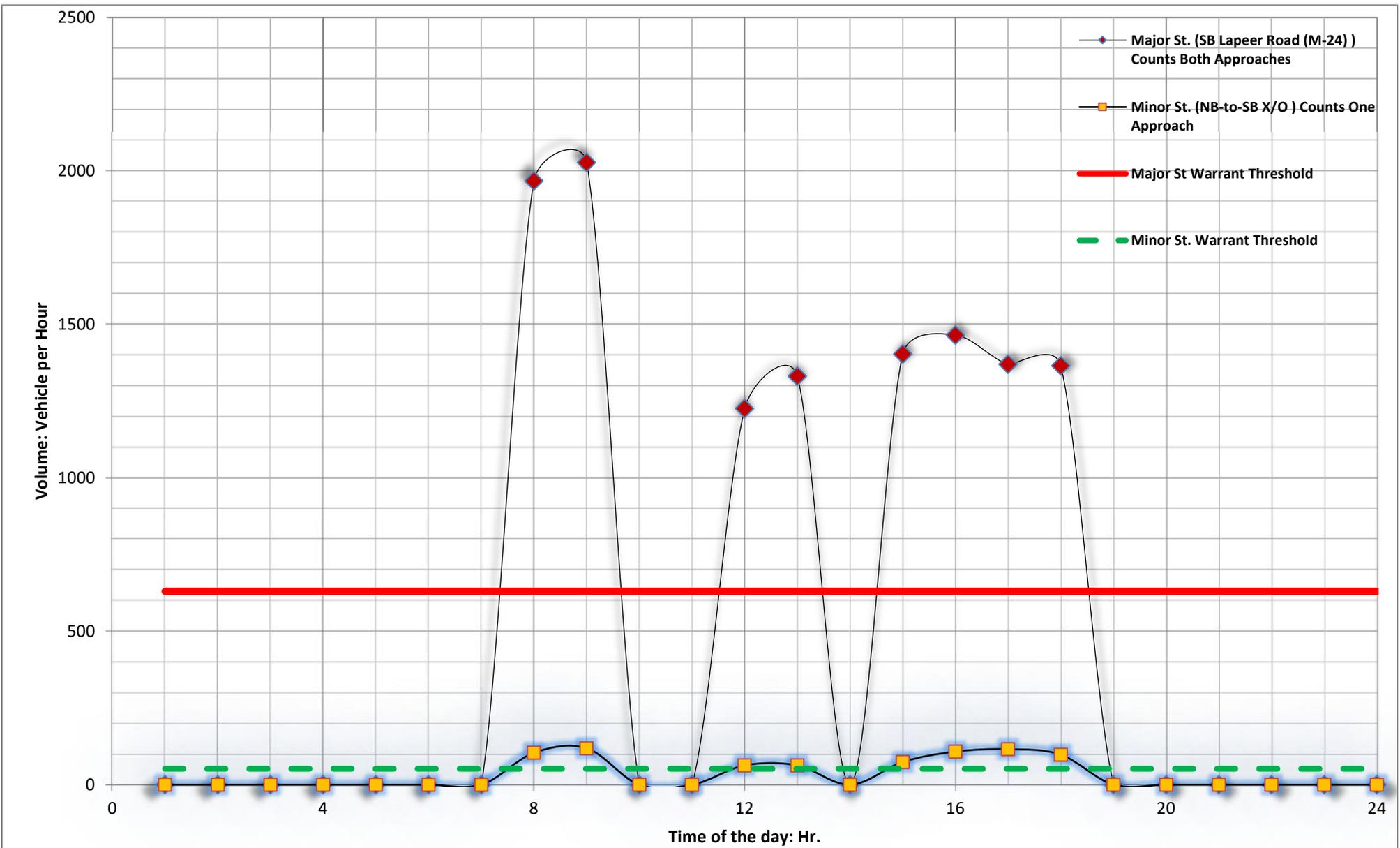


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Existing Conditions

SB Lapeer Road (M-24) @ NB-to-SB X/O

NO. OF LANES ON MAJOR ST.? ³⁶² 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

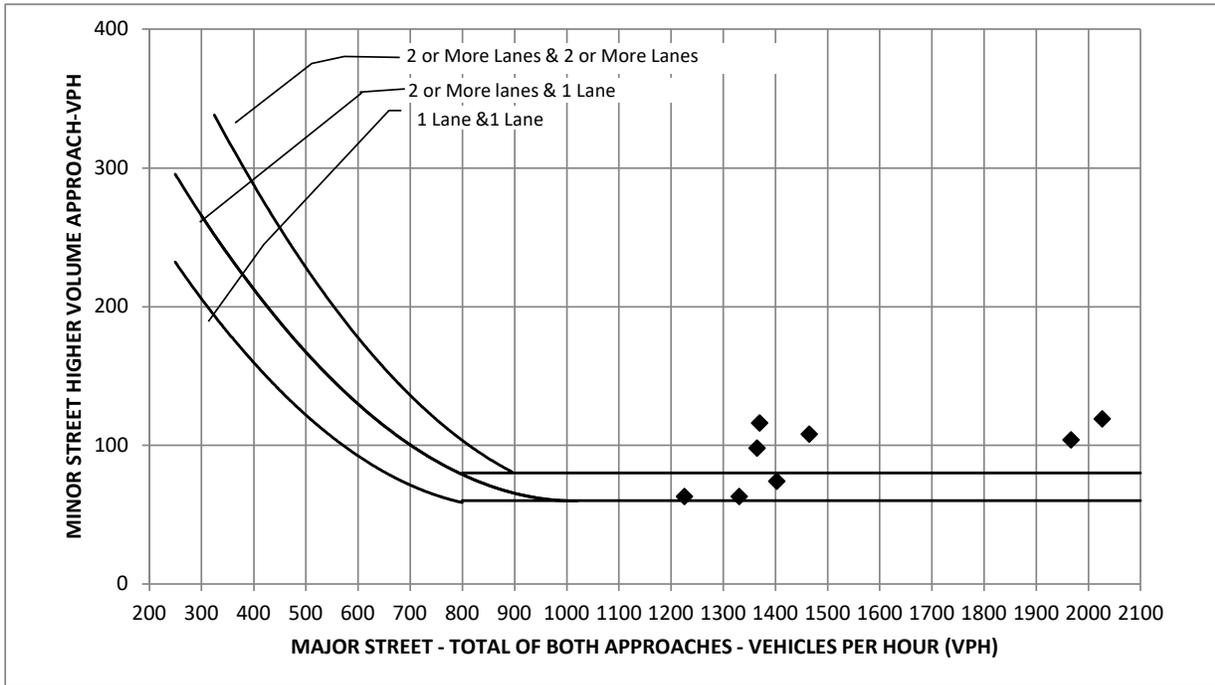
Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 10/13/2022

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	Existing Conditions		
Intersection:	SB Lapeer Road (M-24) @ NB-to-SB X/O		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met

8

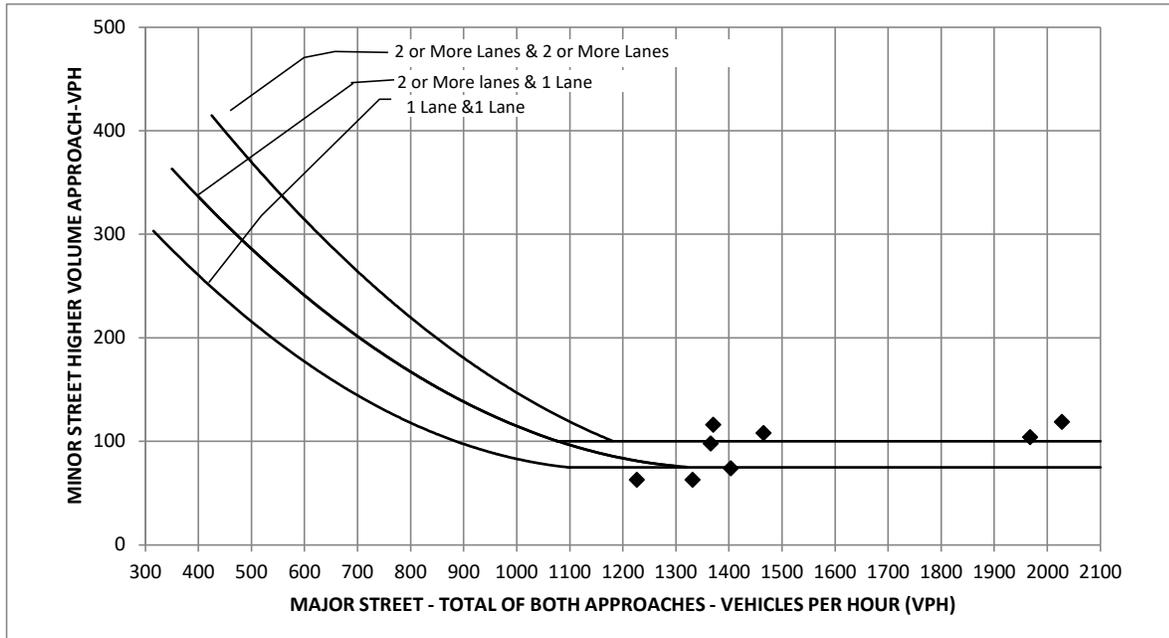
Is Warrant (70%) Met?

YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	Existing Conditions		
Intersection:	SB Lapeer Road (M-24) @ NB-to-SB X/O		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	5
Is Warrant (70%) Met?	YES

Summary of Warrants

Spot Number:	Existing Conditions		
Major Street:	SB Lapeer Road (M-24)	Minor Street:	Waldon Road
Intersection:	SB Lapeer Road (M-24) at Waldon Road		
City/Twp:	Orion Township		
Date Performed:	11/4/2022	Performed By:	F&V
Date Volumes Collected:	10/13/2022		

Warrant	Condition	Is Warrant Met
Data Validation Error		NO
WARRANT 1: Eight-Hour Vehicular Volume		YES
	Condition A	YES
	Condition B	YES
	Condition A&B	N/A
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES
	Condition A	N/A
	Condition B	YES
WARRANT 4: Pedestrian Volume	(70%)	NO
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold)	HAWK NO
	(Threshold)	RRFB NO
WARRANT 5: School Crossing		NO
WARRANT 6: Coordinated Signal System		NO
WARRANT 7: Crash Experience		NO
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		NO
WARRANT 9: Intersection Near a Grade Crossing		#N/A

Issue to Be Addressed by Signalization:

0

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume**

Intersection:	SB Lapeer Road (M-24) @ Waldon Road		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St?
1	: No. of Lanes on Minor St?
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: if answer 4 is Yes, then what is the of the population isolated community?
NO	: Have other remedial measures been tried?

USE 70% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B

Time	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?
00:01 - 01:00	0	E-W	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
01:00 - 02:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
02:00 - 03:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
03:00 - 04:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
04:00 - 05:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
05:00 - 06:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
06:00 - 07:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
07:00 - 08:00	2069	162	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
08:00 - 09:00	2135	131	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
09:00 - 10:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
10:00 - 11:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
11:00 - 12:00	1286	116	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
12:00 - 13:00	1399	132	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
13:00 - 14:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
14:00 - 15:00	1453	144	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
15:00 - 16:00	1588	128	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
16:00 - 17:00	1498	159	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
17:00 - 18:00	1455	166	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
18:00 - 19:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
19:00 - 20:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
20:00 - 21:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
21:00 - 22:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
22:00 - 23:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
23:00 - 00:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A

Number of Hours that met the warrant 1A =	8
Number of Hours that met the warrant 1B =	8
Number of Hours that met the warrant 1 A & B =	0

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	YES
B. Is the Interruption of Continuous Traffic Met? (Condition B)	YES
C. Combination of Warrants A and B Criteria Met?	N/A

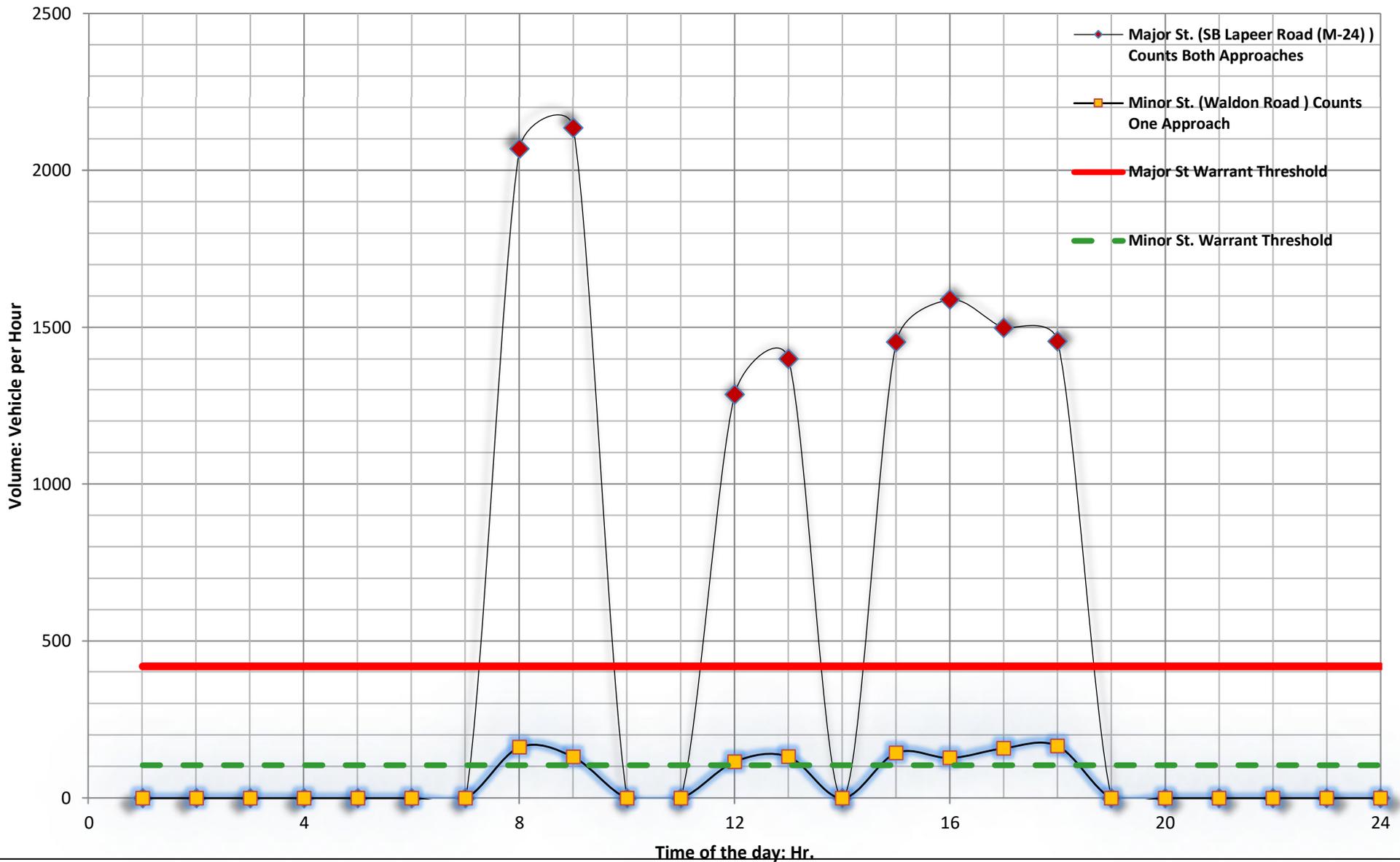


FIGURE 1: WARRANT 1A

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Existing
Conditions
SB Lapeer Road (M-24) @ Waldon Road

NO. OF LANES ON MAJOR ST.? 2
 NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

Does this intersection meet Warrant 1A for signal installation? YES

Data Collection Date: 10/13/2022

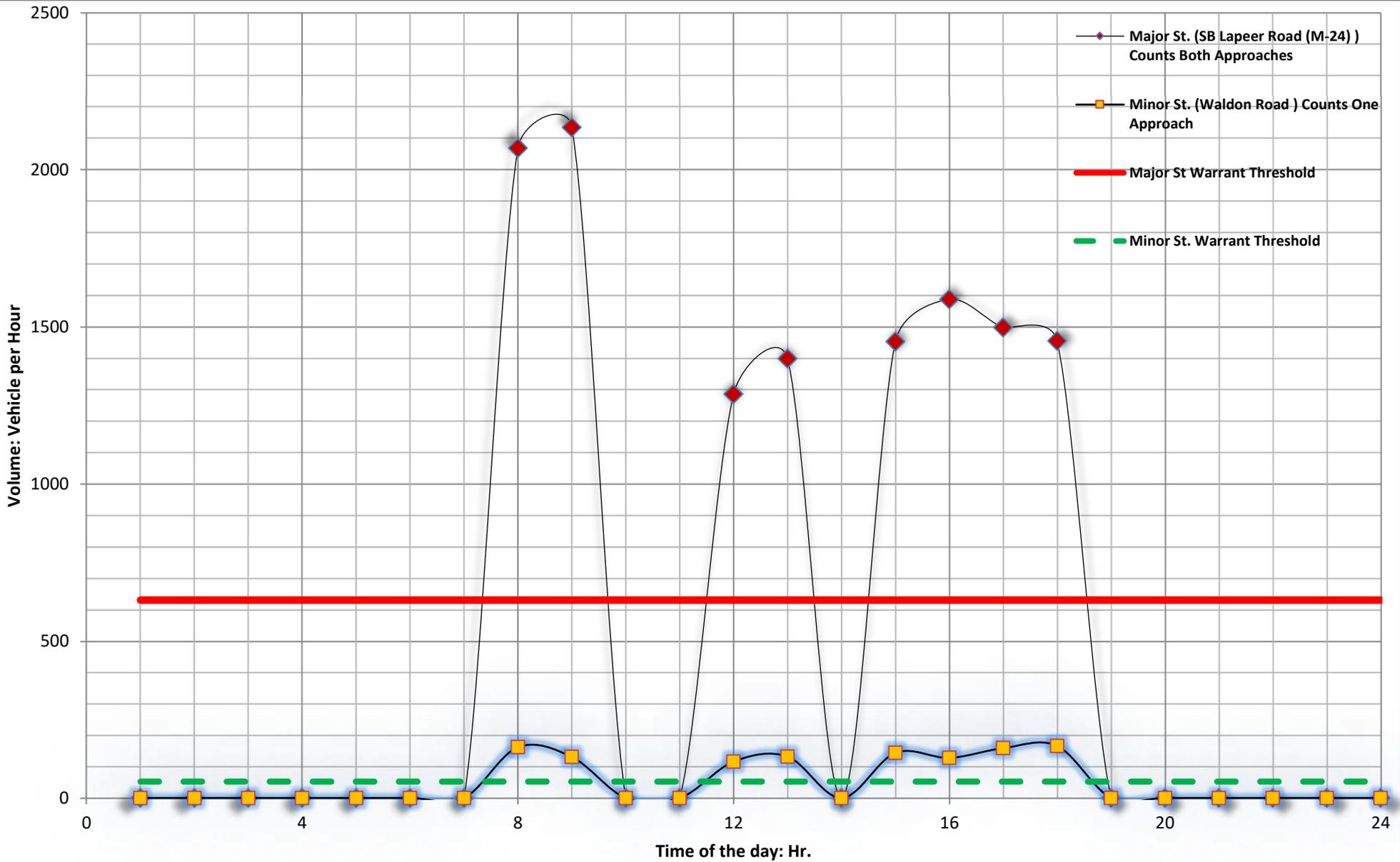


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Existing Conditions

SB Lapeer Road (M-24) @ Waldon Road

NO. OF LANES ON MAJOR ST.? 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

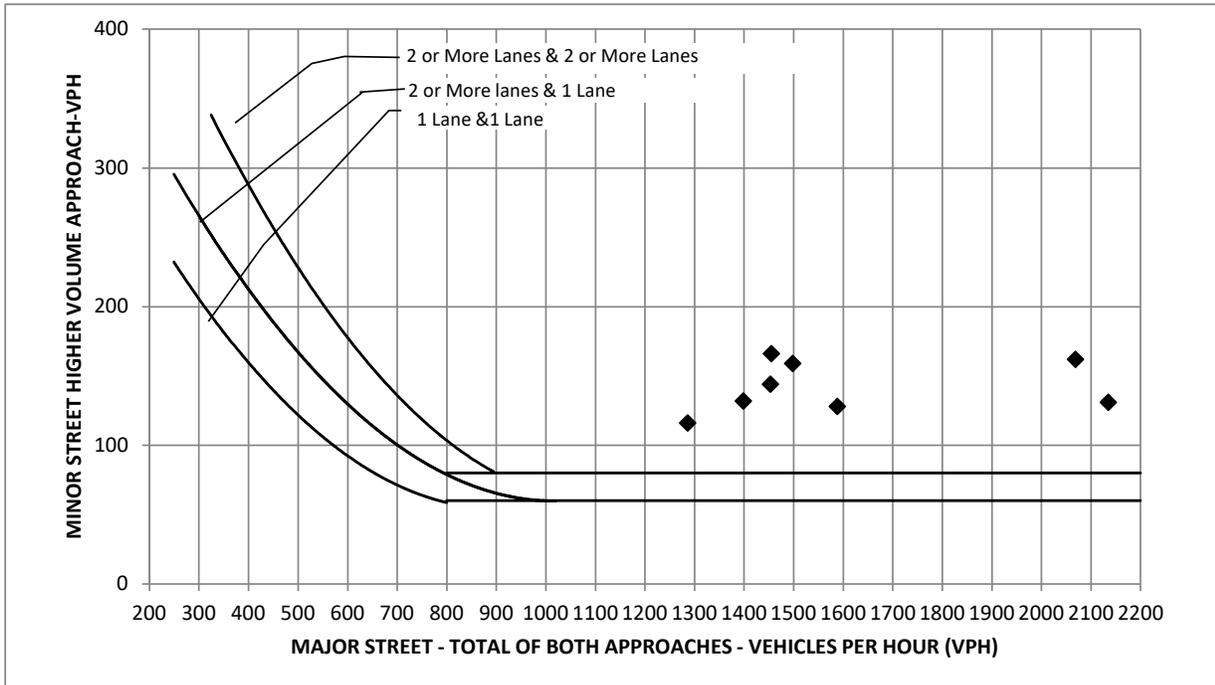
Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 10/13/2022

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	Existing Conditions		
Intersection:	SB Lapeer Road (M-24) @ Waldon Road		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?

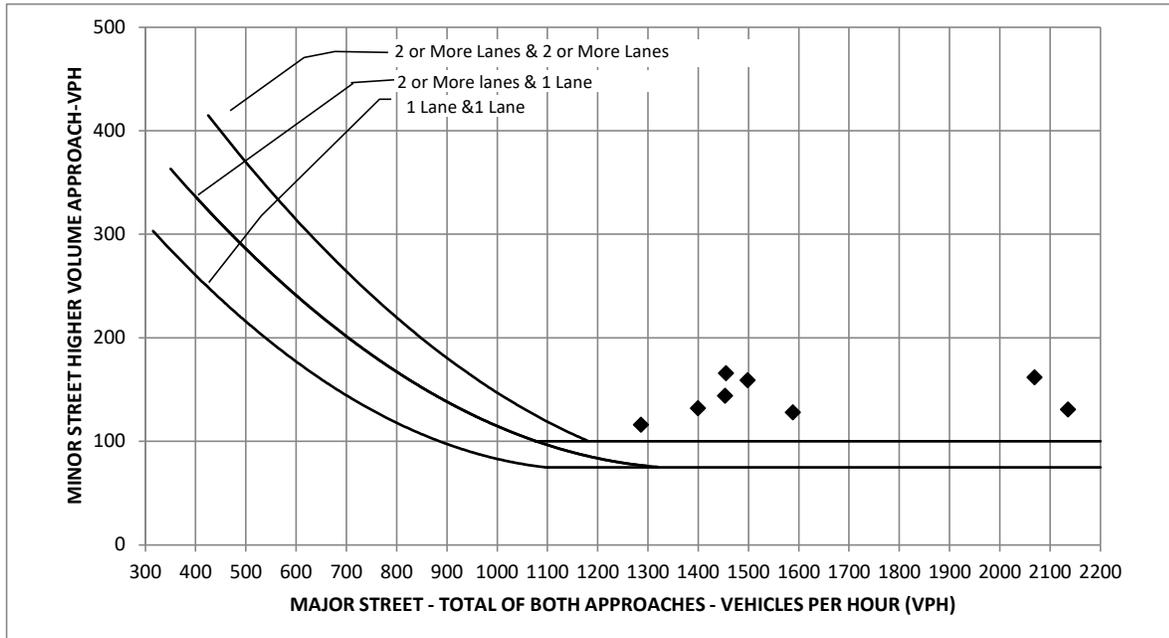


How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	Existing Conditions		
Intersection:	SB Lapeer Road (M-24) @ Waldon Road		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

Summary of Warrants

Spot Number:	Existing Conditions		
Major Street:	NB Lapeer Road (M-24)	Minor Street:	SB-to-NB XO
Intersection:	NB Lapeer Road (M-24) at SB-to-NB XO		
City/Twp:	Orion Township		
Date Performed:	11/4/2022	Performed By:	F&V
Date Volumes Collected:	10/13/2022		

Warrant	Condition	Is Warrant Met
Data Validation Error		NO
WARRANT 1: Eight-Hour Vehicular Volume		YES
	Condition A	YES
	Condition B	YES
	Condition A&B	N/A
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES
	Condition A	N/A
	Condition B	YES
WARRANT 4: Pedestrian Volume	(70%)	NO
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold)	HAWK NO
	(Threshold)	RRFB NO
WARRANT 5: School Crossing		NO
WARRANT 6: Coordinated Signal System		NO
WARRANT 7: Crash Experience		NO
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		NO
WARRANT 9: Intersection Near a Grade Crossing		#N/A

Issue to Be Addressed by Signalization:

0

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume**

Intersection:	NB Lapeer Road (M-24) @ SB-to-NB XO		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St?
1	: No. of Lanes on Minor St?
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: if answer 4 is Yes, then what is the of the population isolated community?
NO	: Have other remedial measures been tried?

USE 70% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B

Time	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?
00:01 - 01:00	0	E-W	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
01:00 - 02:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
02:00 - 03:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
03:00 - 04:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
04:00 - 05:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
05:00 - 06:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
06:00 - 07:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
07:00 - 08:00	1005	122	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
08:00 - 09:00	1018	110	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
09:00 - 10:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
10:00 - 11:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
11:00 - 12:00	1165	106	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
12:00 - 13:00	1191	111	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
13:00 - 14:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
14:00 - 15:00	1685	119	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
15:00 - 16:00	2033	111	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
16:00 - 17:00	2075	138	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
17:00 - 18:00	2218	141	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
18:00 - 19:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
19:00 - 20:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
20:00 - 21:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
21:00 - 22:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
22:00 - 23:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
23:00 - 00:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A

Number of Hours that met the warrant 1A =	8
Number of Hours that met the warrant 1B =	8
Number of Hours that met the warrant 1 A & B =	0

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	YES
B. Is the Interruption of Continuous Traffic Met? (Condition B)	YES
C. Combination of Warrants A and B Criteria Met?	N/A

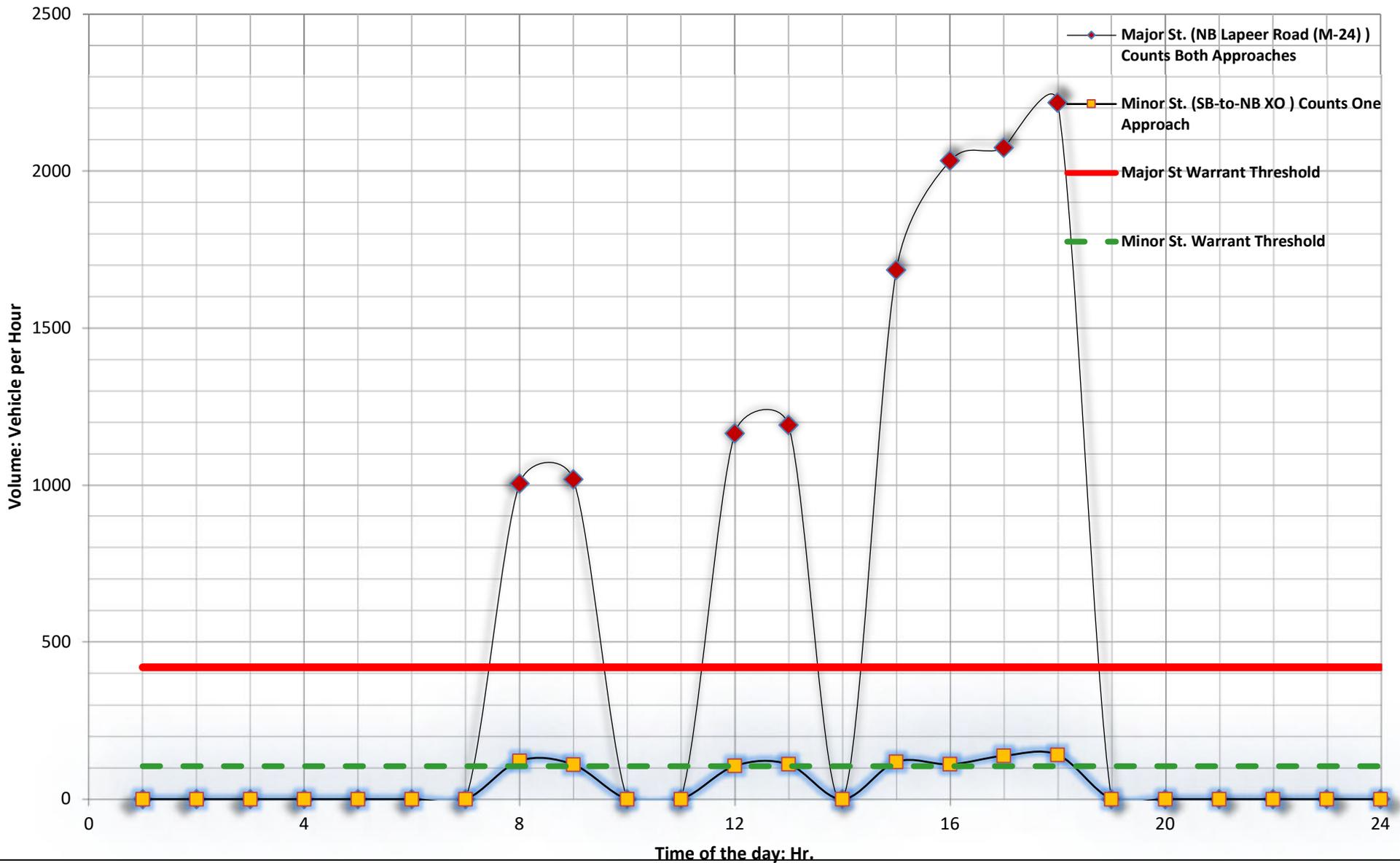


FIGURE 1: WARRANT 1A

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Existing
Conditions
NB Lapeer Road (M-24) @ SB-to-NB
XO

NO. OF LANES ON MAJOR ST.? 2
 NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

Does this intersection meet Warrant 1A for signal installation? YES

Data Collection Date: 10/13/2022

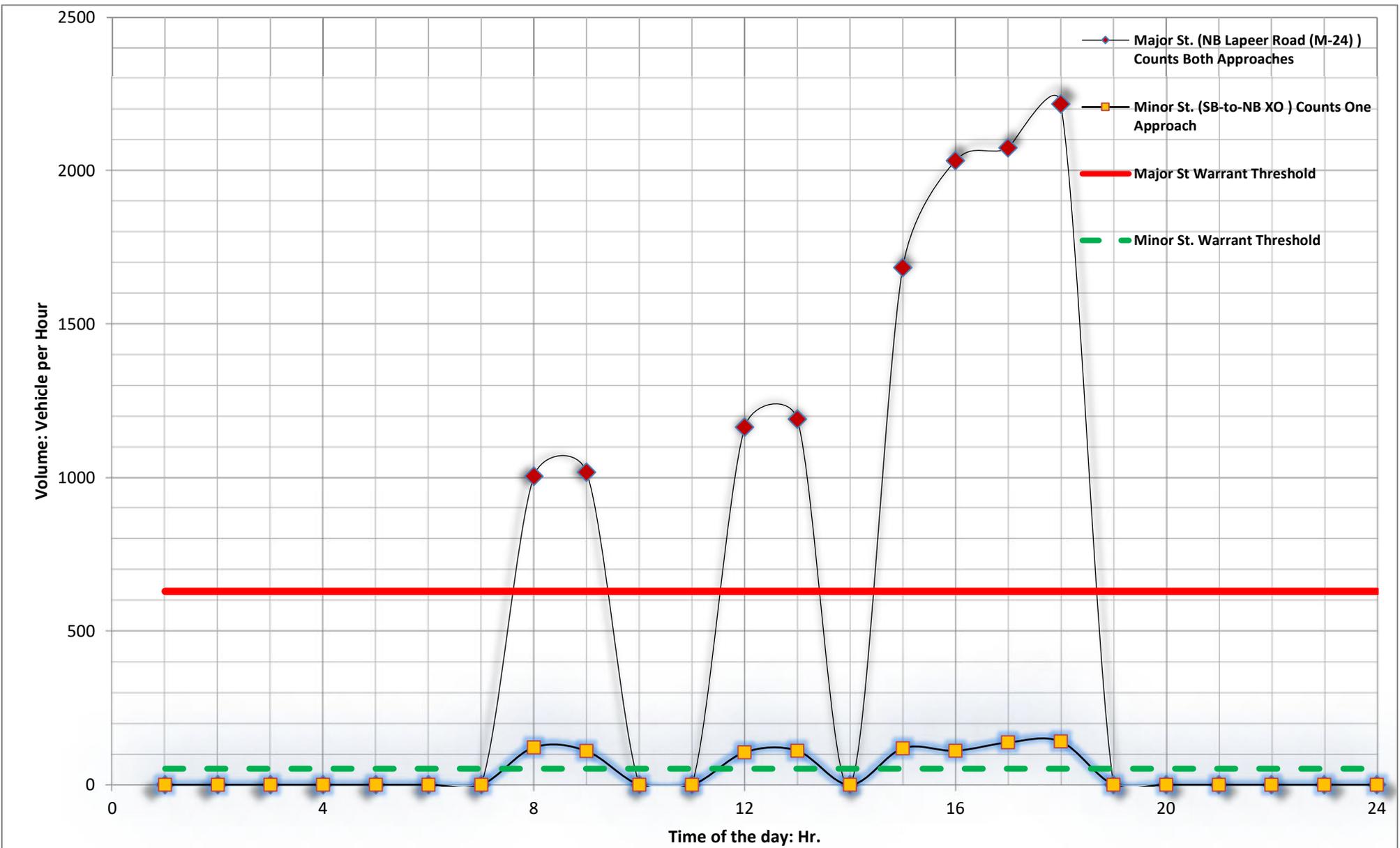


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Existing Conditions

NB Lapeer Road (M-24) @ SB-to-NB XO

NO. OF LANES ON MAJOR ST.? 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

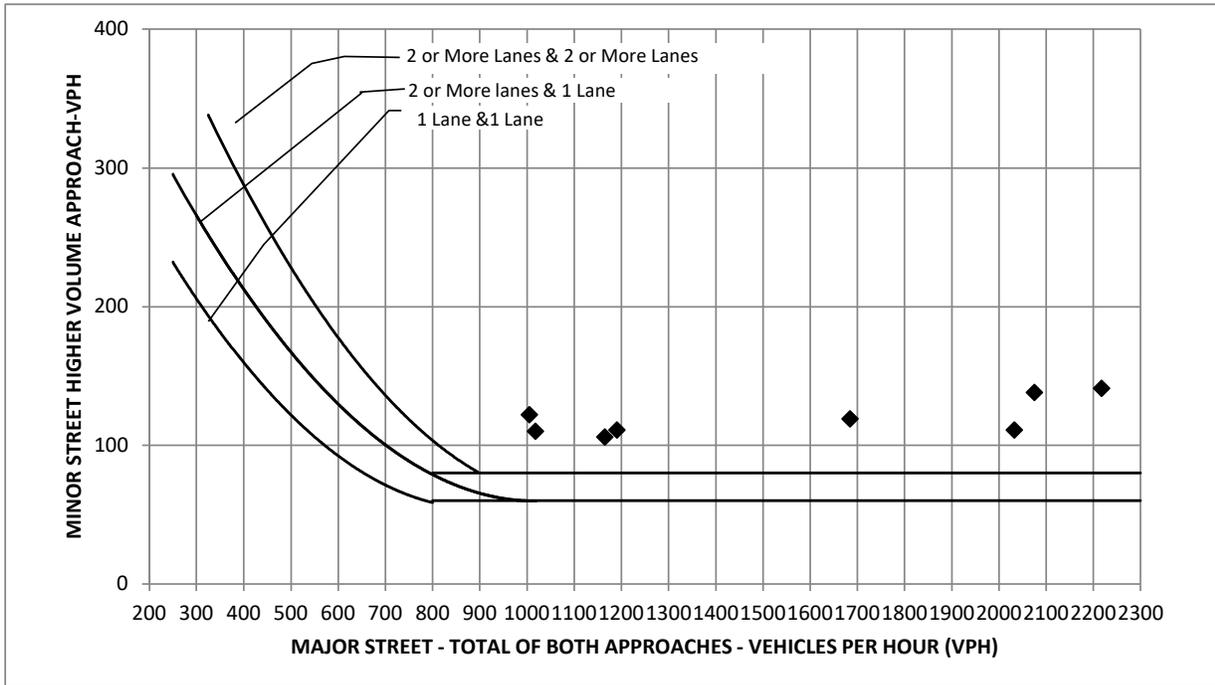
Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 10/13/2022

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	Existing Conditions		
Intersection:	NB Lapeer Road (M-24) @ SB-to-NB XO		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?

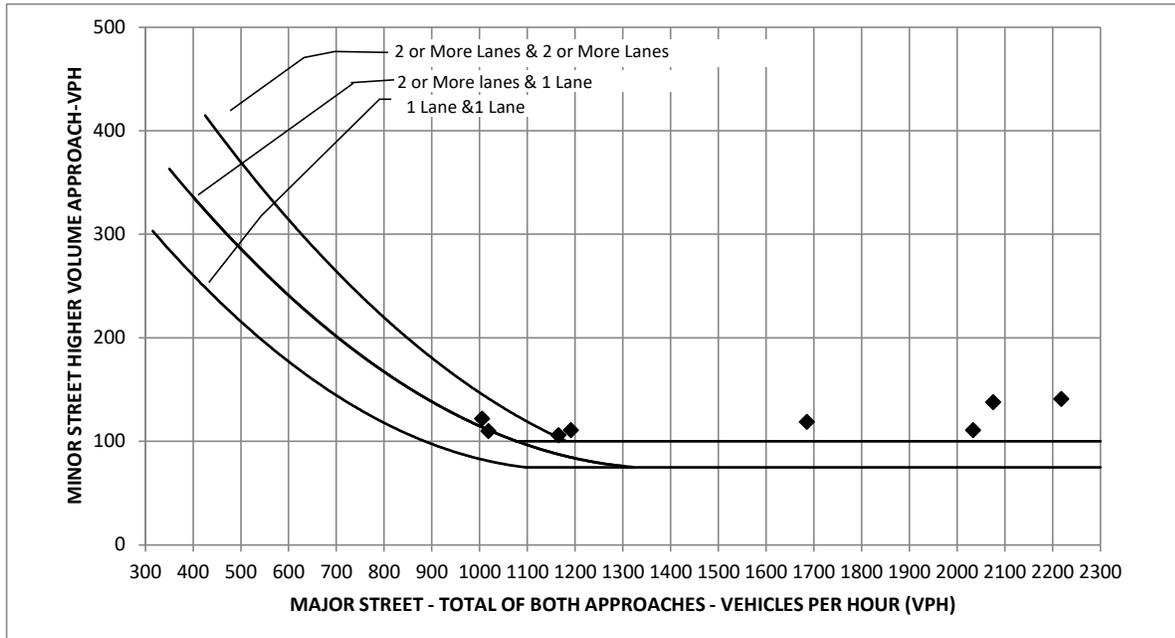


How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	Existing Conditions		
Intersection:	NB Lapeer Road (M-24) @ SB-to-NB XO		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

Summary of Warrants

Spot Number:	Background Conditions		
Major Street:	SB Lapeer Road (M-24)	Minor Street:	NB-to-SB X/O
Intersection:	SB Lapeer Road (M-24) at NB-to-SB X/O		
City/Twp:	Orion Township		
Date Performed:	11/4/2022	Performed By:	F&V
Date Volumes Collected:	10/13/2022		

Warrant	Condition	Is Warrant Met
Data Validation Error		NO
WARRANT 1: Eight-Hour Vehicular Volume		YES
	Condition A	NO
	Condition B	YES
	Condition A&B	N/A
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES
	Condition A	N/A
	Condition B	YES
WARRANT 4: Pedestrian Volume	(70%)	NO
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold)	HAWK
	(Threshold)	RRFB
		NO
		NO
WARRANT 5: School Crossing		NO
WARRANT 6: Coordinated Signal System		NO
WARRANT 7: Crash Experience		NO
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		NO
WARRANT 9: Intersection Near a Grade Crossing		#N/A

Issue to Be Addressed by Signalization:

0

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume**

Intersection:	SB Lapeer Road (M-24) @ NB-to-SB X/O		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St?
1	: No. of Lanes on Minor St?
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: if answer 4 is Yes, then what is the of the population isolated community?
NO	: Have other remedial measures been tried?

USE 70% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B

Time	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?
00:01 - 01:00	0	E-W	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
01:00 - 02:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
02:00 - 03:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
03:00 - 04:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
04:00 - 05:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
05:00 - 06:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
06:00 - 07:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
07:00 - 08:00	1997	106	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
08:00 - 09:00	2058	121	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
09:00 - 10:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
10:00 - 11:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
11:00 - 12:00	1244	64	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
12:00 - 13:00	1351	64	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
13:00 - 14:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
14:00 - 15:00	1424	75	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
15:00 - 16:00	1487	110	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
16:00 - 17:00	1391	118	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
17:00 - 18:00	1386	99	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
18:00 - 19:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
19:00 - 20:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
20:00 - 21:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
21:00 - 22:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
22:00 - 23:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
23:00 - 00:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A

Number of Hours that met the warrant 1A =	4
Number of Hours that met the warrant 1B =	8
Number of Hours that met the warrant 1 A & B =	0

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	NO
B. Is the Interruption of Continuous Traffic Met? (Condition B)	YES
C. Combination of Warrants A and B Criteria Met?	N/A

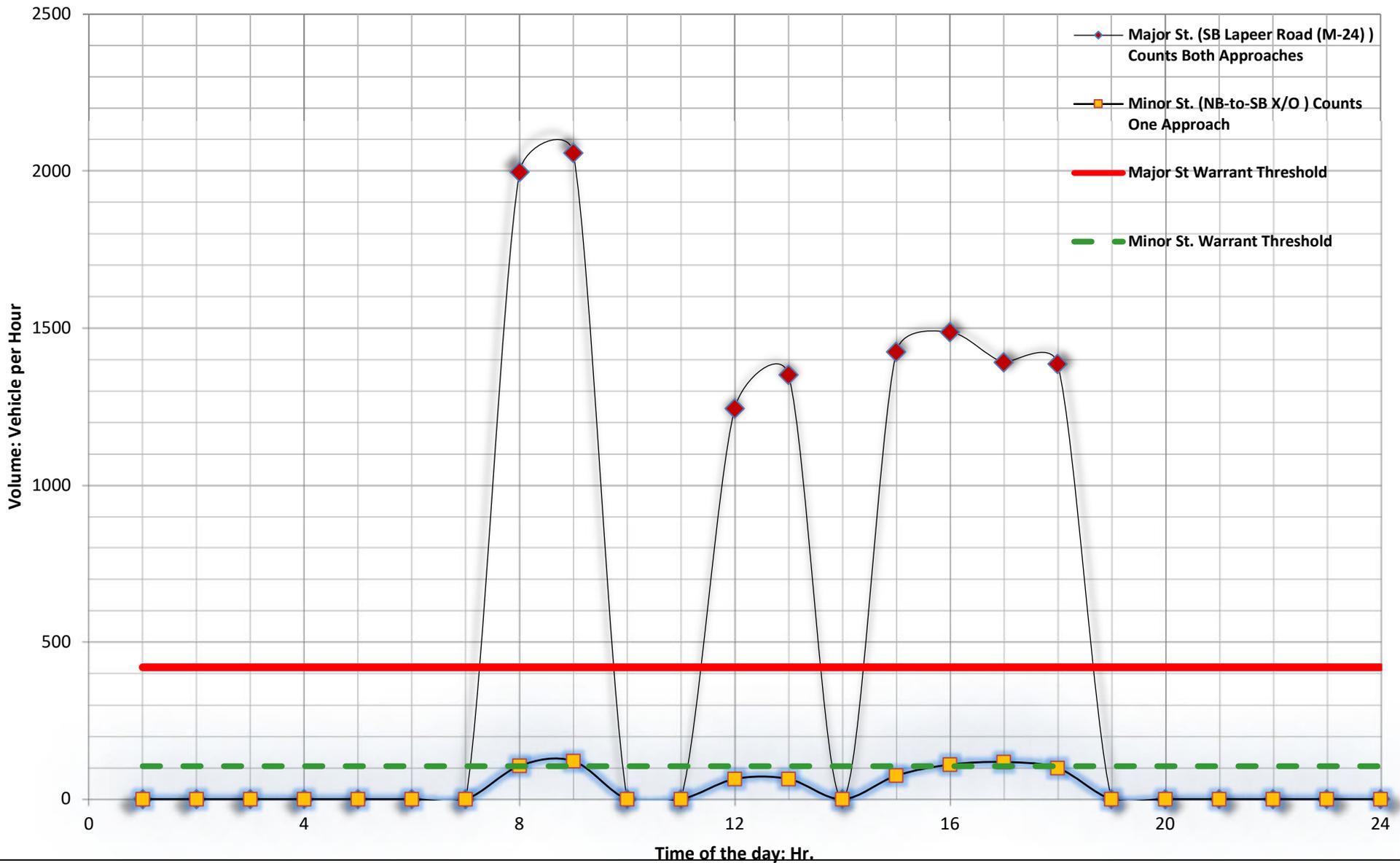


FIGURE 1: WARRANT 1A

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Background
Conditions
SB Lapeer Road (M-24) @ NB-to-SB
X/O

NO. OF LANES ON MAJOR ST.? 2
 NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 4

Does this intersection meet Warrant 1A for signal installation? NO

Data Collection Date: 10/13/2022

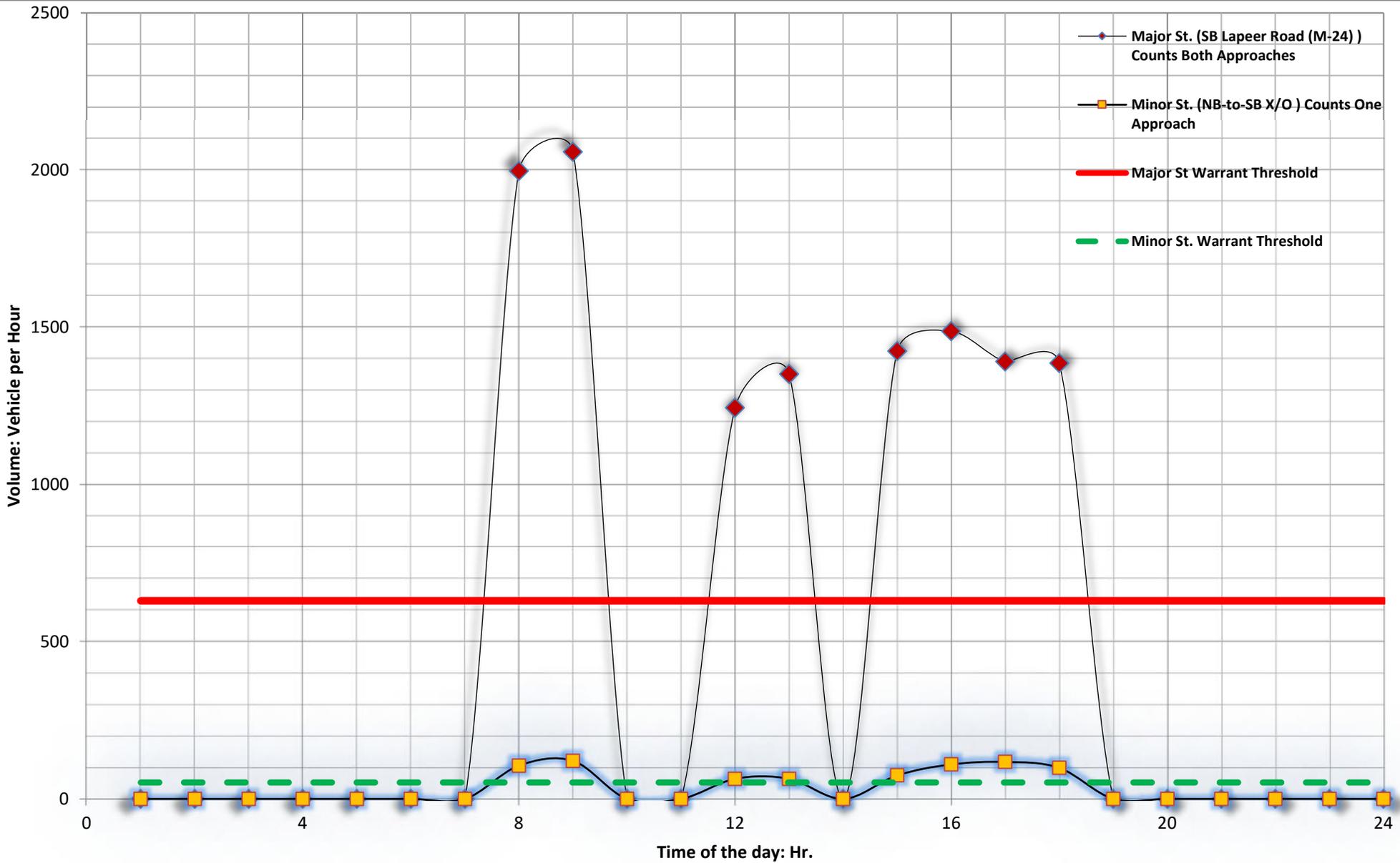


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Background Conditions

SB Lapeer Road (M-24) @ NB-to-SB X/O

NO. OF LANES ON MAJOR ST.? 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

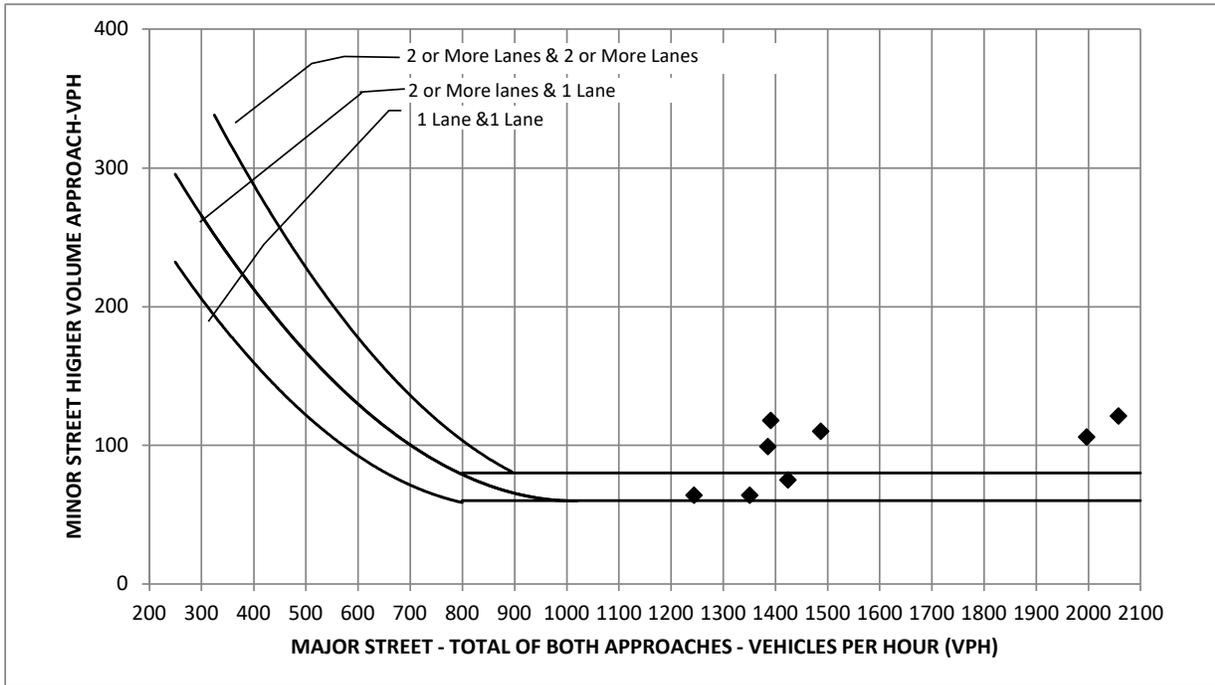
Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 10/13/2022

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	Background Conditions		
Intersection:	SB Lapeer Road (M-24) @ NB-to-SB X/O		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met

8

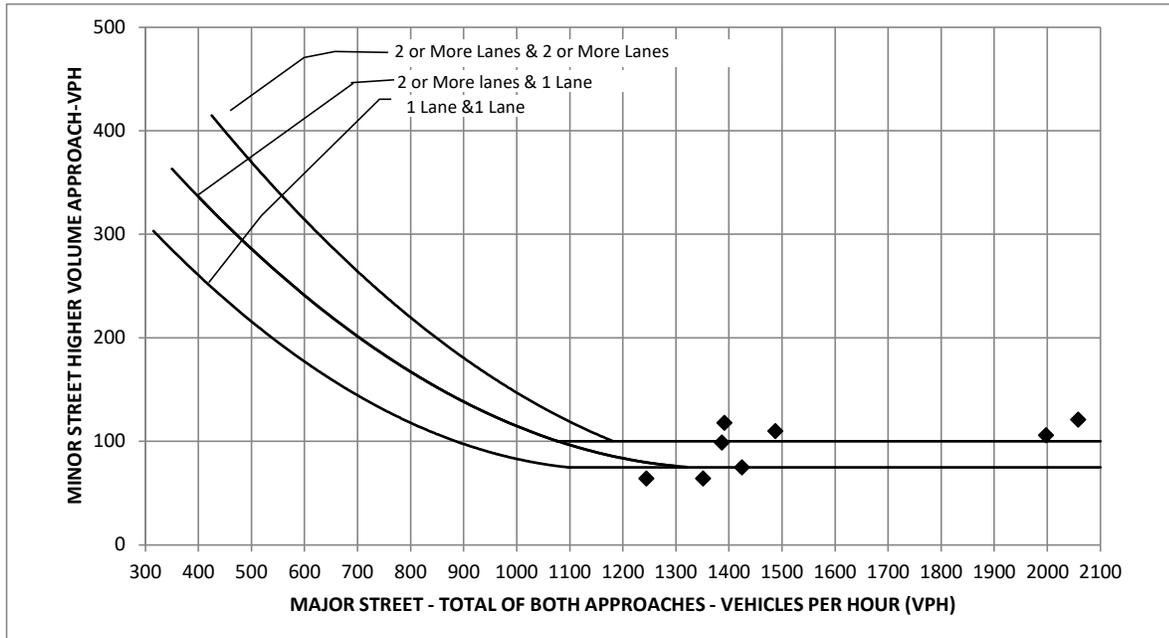
Is Warrant (70%) Met?

YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	Background Conditions		
Intersection:	SB Lapeer Road (M-24) @ NB-to-SB X/O		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	5
Is Warrant (70%) Met?	YES

Summary of Warrants

Spot Number:	Background Conditions		
Major Street:	SB Lapeer Road (M-24)	Minor Street:	Waldon Road
Intersection:	SB Lapeer Road (M-24) at Waldon Road		
City/Twp:	Orion Township		
Date Performed:	11/4/2022	Performed By:	F&V
Date Volumes Collected:	10/13/2022		

Warrant	Condition	Is Warrant Met
Data Validation Error		NO
WARRANT 1: Eight-Hour Vehicular Volume		YES
	Condition A	YES
	Condition B	YES
	Condition A&B	N/A
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES
	Condition A	N/A
	Condition B	YES
WARRANT 4: Pedestrian Volume	(70%)	NO
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold)	HAWK NO
	(Threshold)	RRFB NO
WARRANT 5: School Crossing		NO
WARRANT 6: Coordinated Signal System		NO
WARRANT 7: Crash Experience		NO
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		NO
WARRANT 9: Intersection Near a Grade Crossing		#N/A

Issue to Be Addressed by Signalization:

0

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume**

Intersection:	SB Lapeer Road (M-24) @ Waldon Road		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St?
1	: No. of Lanes on Minor St?
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: if answer 4 is Yes, then what is the of the population isolated community?
NO	: Have other remedial measures been tried?

USE 70% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B

Time	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?
00:01 - 01:00	0	E-W	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
01:00 - 02:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
02:00 - 03:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
03:00 - 04:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
04:00 - 05:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
05:00 - 06:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
06:00 - 07:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
07:00 - 08:00	2100	164	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
08:00 - 09:00	2167	133	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
09:00 - 10:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
10:00 - 11:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
11:00 - 12:00	1305	118	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
12:00 - 13:00	1420	134	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
13:00 - 14:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
14:00 - 15:00	1475	146	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
15:00 - 16:00	1612	130	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
16:00 - 17:00	1521	161	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
17:00 - 18:00	1477	169	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
18:00 - 19:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
19:00 - 20:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
20:00 - 21:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
21:00 - 22:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
22:00 - 23:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
23:00 - 00:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A

Number of Hours that met the warrant 1A =	8
Number of Hours that met the warrant 1B =	8
Number of Hours that met the warrant 1 A & B =	0

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	YES
B. Is the Interruption of Continuous Traffic Met? (Condition B)	YES
C. Combination of Warrants A and B Criteria Met?	N/A

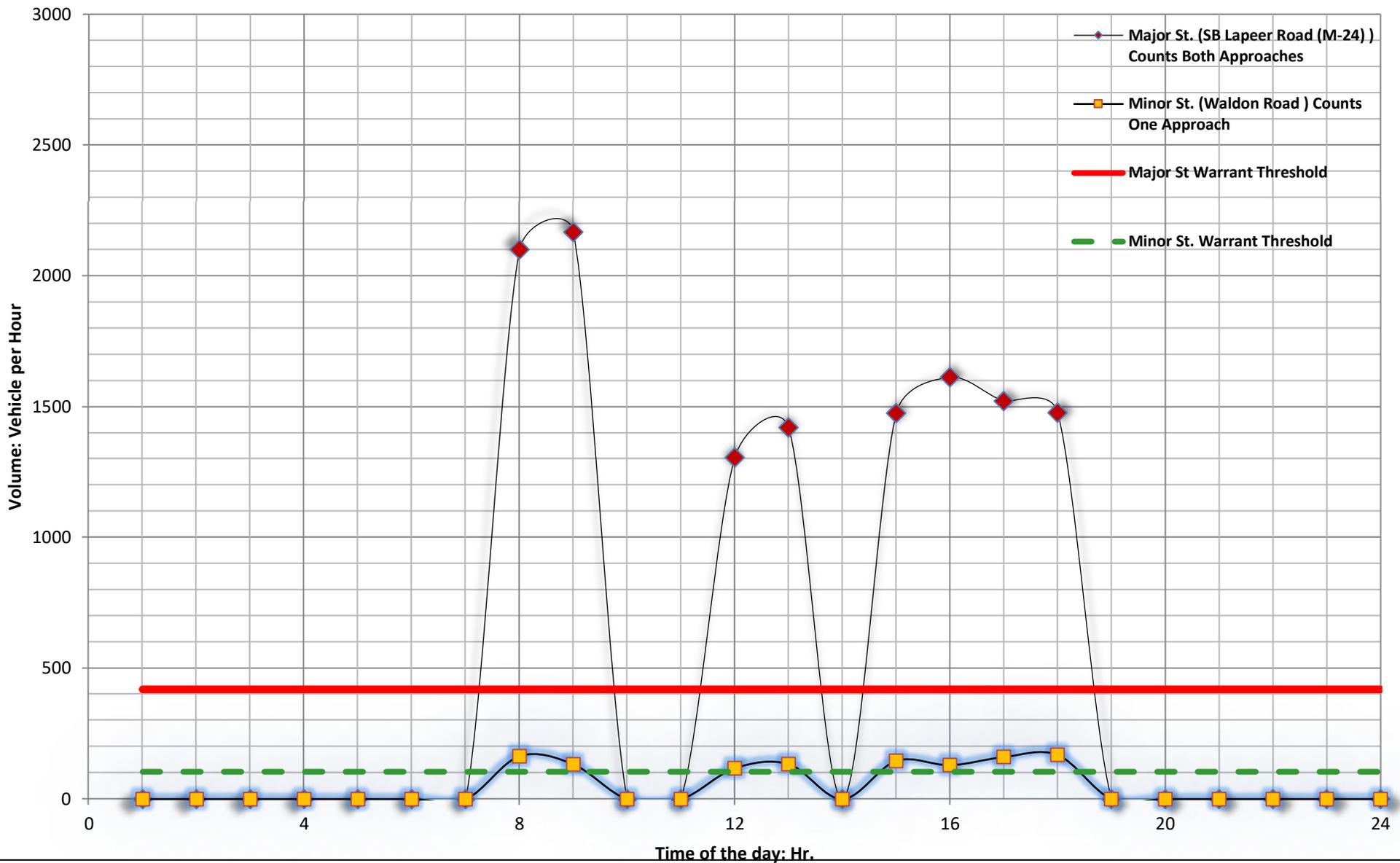


FIGURE 1: WARRANT 1A

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Background
Conditions
SB Lapeer Road (M-24) @ Waldon Road

NO. OF LANES ON MAJOR ST.? 2
 NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

Does this intersection meet Warrant 1A for signal installation? YES

Data Collection Date: 10/13/2022

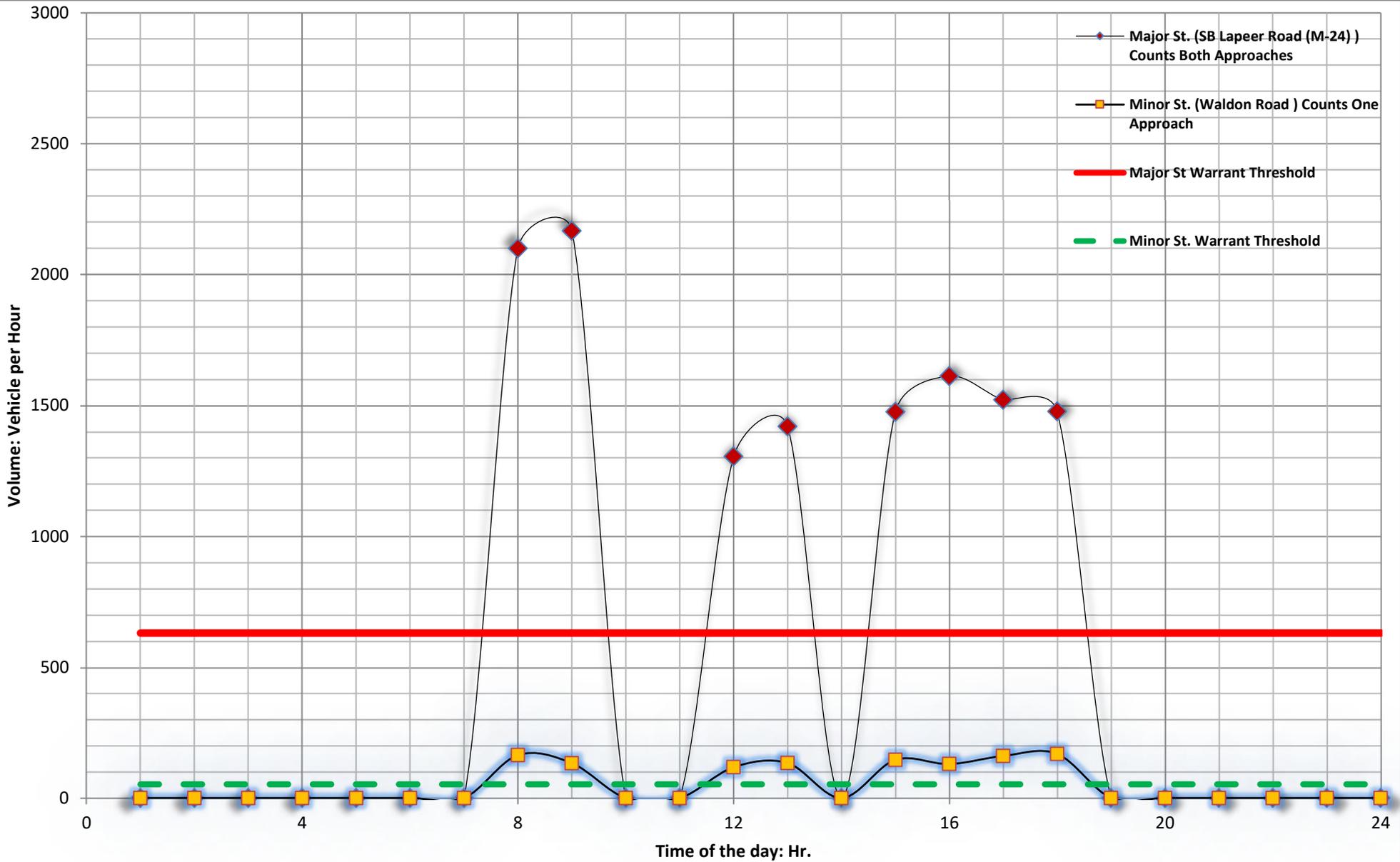


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Background Conditions
SB Lapeer Road (M-24) @ Waldon Road

NO. OF LANES ON MAJOR ST.? 2
 NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

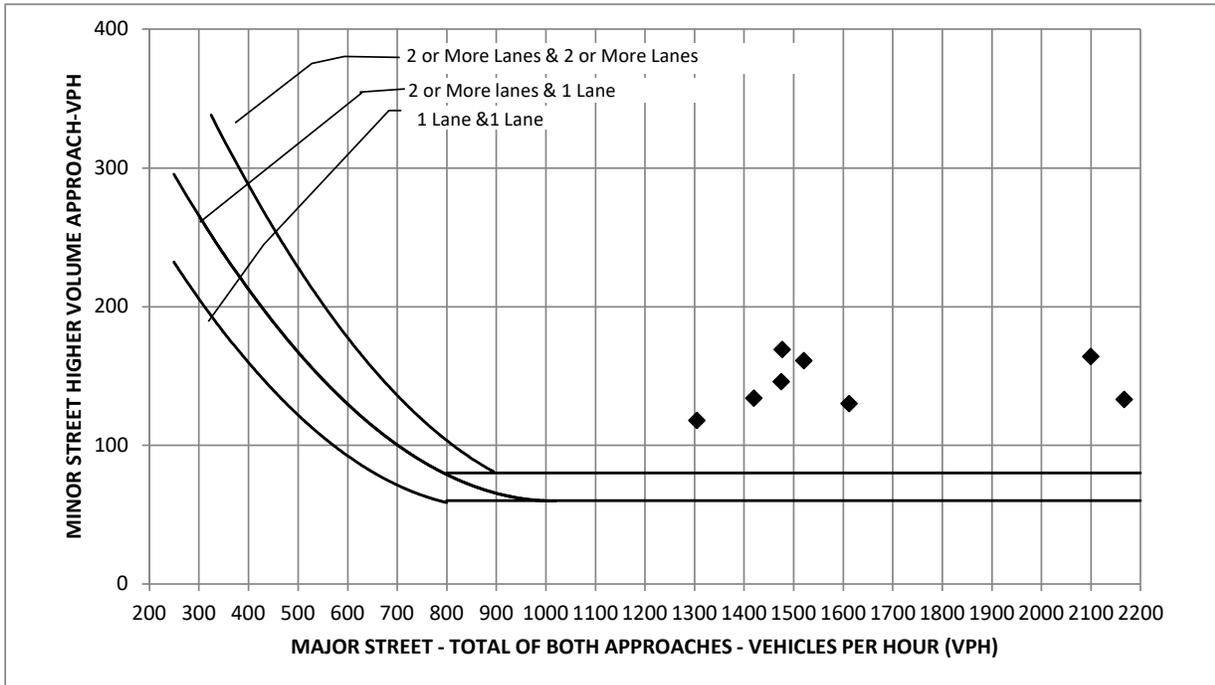
Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 10/13/2022

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	Background Conditions		
Intersection:	SB Lapeer Road (M-24) @ Waldon Road		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?

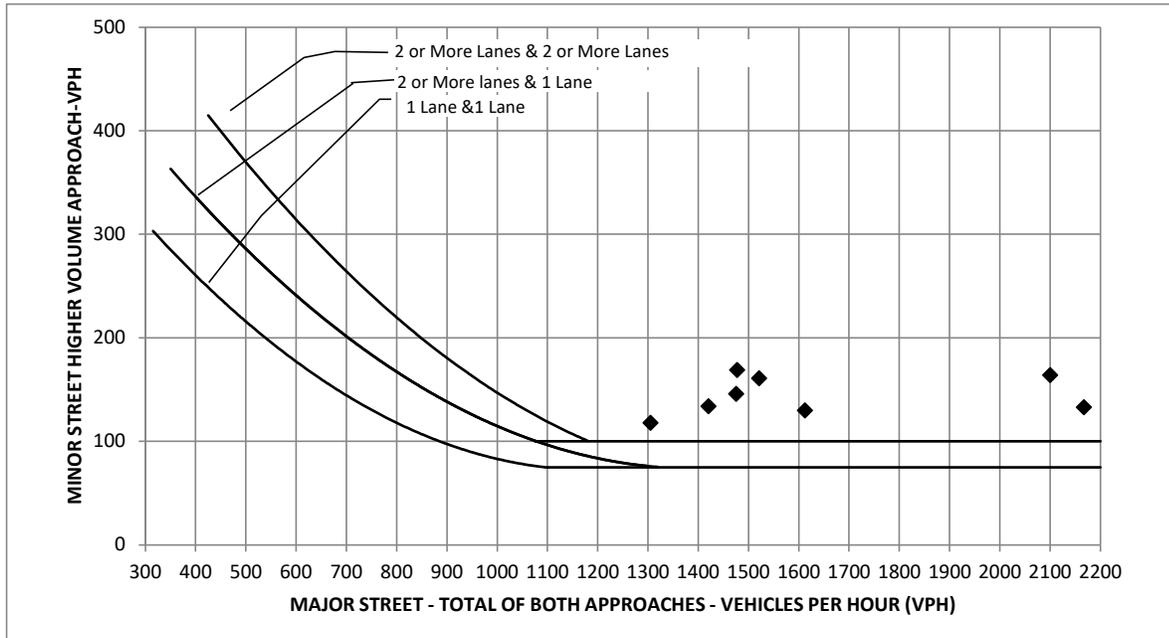


How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	Background Conditions		
Intersection:	SB Lapeer Road (M-24) @ Waldon Road		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

Summary of Warrants

Spot Number:	Background Conditions		
Major Street:	NB Lapeer Road (M-24)	Minor Street:	SB-to-NB XO
Intersection:	NB Lapeer Road (M-24) at SB-to-NB XO		
City/Twp:	Orion Township		
Date Performed:	11/4/2022	Performed By:	F&V
Date Volumes Collected:	10/13/2022		

Warrant	Condition	Is Warrant Met
Data Validation Error		NO
WARRANT 1: Eight-Hour Vehicular Volume		YES
	Condition A	YES
	Condition B	YES
	Condition A&B	N/A
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES
	Condition A	N/A
	Condition B	YES
WARRANT 4: Pedestrian Volume	(70%)	NO
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold)	HAWK NO
	(Threshold)	RRFB NO
WARRANT 5: School Crossing		NO
WARRANT 6: Coordinated Signal System		NO
WARRANT 7: Crash Experience		NO
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		NO
WARRANT 9: Intersection Near a Grade Crossing		#N/A

Issue to Be Addressed by Signalization:

0

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume**

Intersection:	NB Lapeer Road (M-24) @ SB-to-NB XO		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St?
1	: No. of Lanes on Minor St?
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: if answer 4 is Yes, then what is the of the population isolated community?
NO	: Have other remedial measures been tried?

USE 70% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B

Time	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?
00:01 - 01:00	0	E-W	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
01:00 - 02:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
02:00 - 03:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
03:00 - 04:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
04:00 - 05:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
05:00 - 06:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
06:00 - 07:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
07:00 - 08:00	1020	124	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
08:00 - 09:00	1033	112	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
09:00 - 10:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
10:00 - 11:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
11:00 - 12:00	1183	108	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
12:00 - 13:00	1209	113	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
13:00 - 14:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
14:00 - 15:00	1710	121	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
15:00 - 16:00	2064	113	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
16:00 - 17:00	2106	140	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
17:00 - 18:00	2251	143	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
18:00 - 19:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
19:00 - 20:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
20:00 - 21:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
21:00 - 22:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
22:00 - 23:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
23:00 - 00:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A

Number of Hours that met the warrant 1A =	8
Number of Hours that met the warrant 1B =	8
Number of Hours that met the warrant 1 A & B =	0

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	YES
B. Is the Interruption of Continuous Traffic Met? (Condition B)	YES
C. Combination of Warrants A and B Criteria Met?	N/A

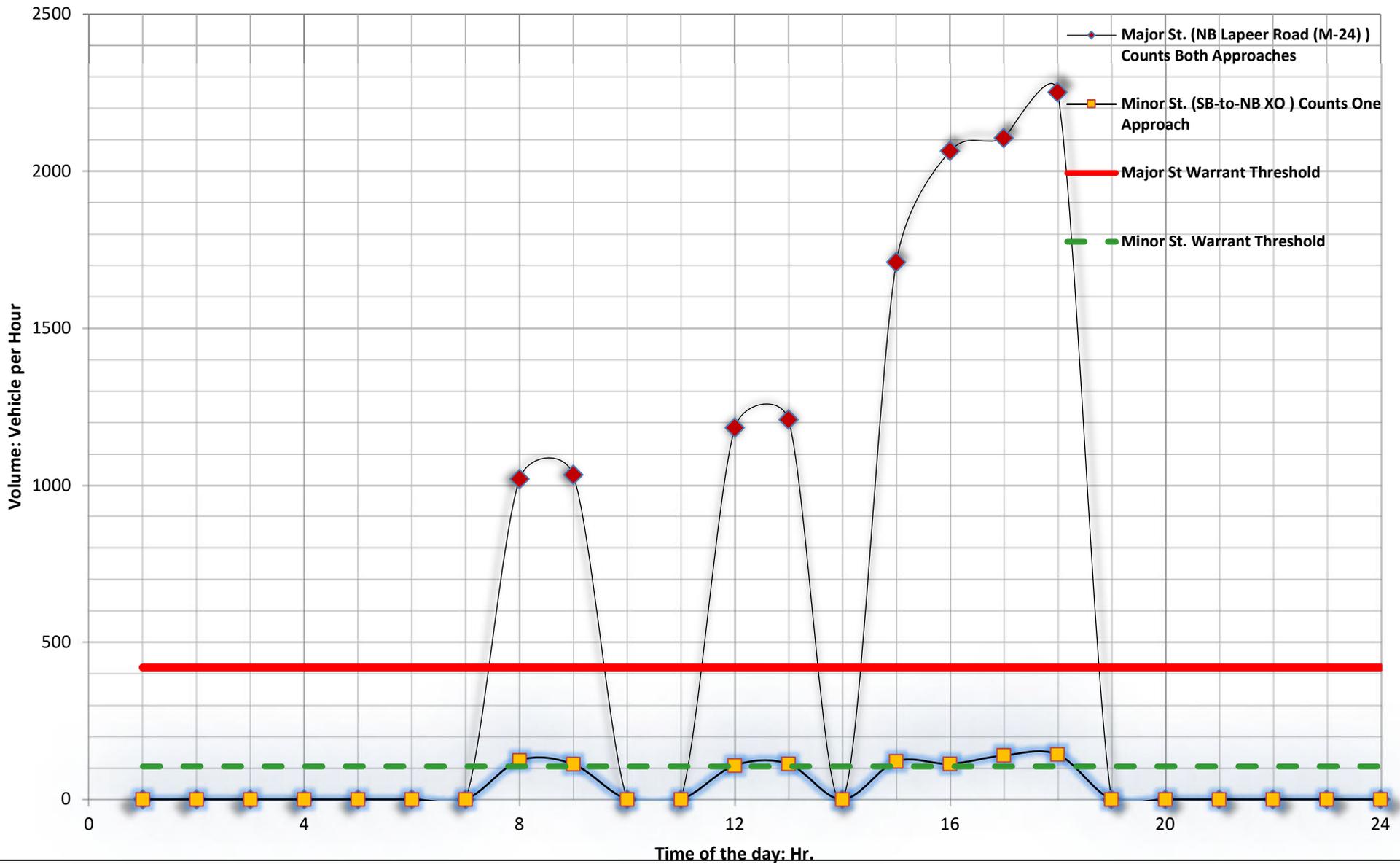


FIGURE 1: WARRANT 1A

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Background
Conditions
NB Lapeer Road (M-24) @ SB-to-NB
XO

NO. OF LANES ON MAJOR ST.? 2
 NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

Does this intersection meet Warrant 1A for signal installation? YES

Data Collection Date: 10/13/2022

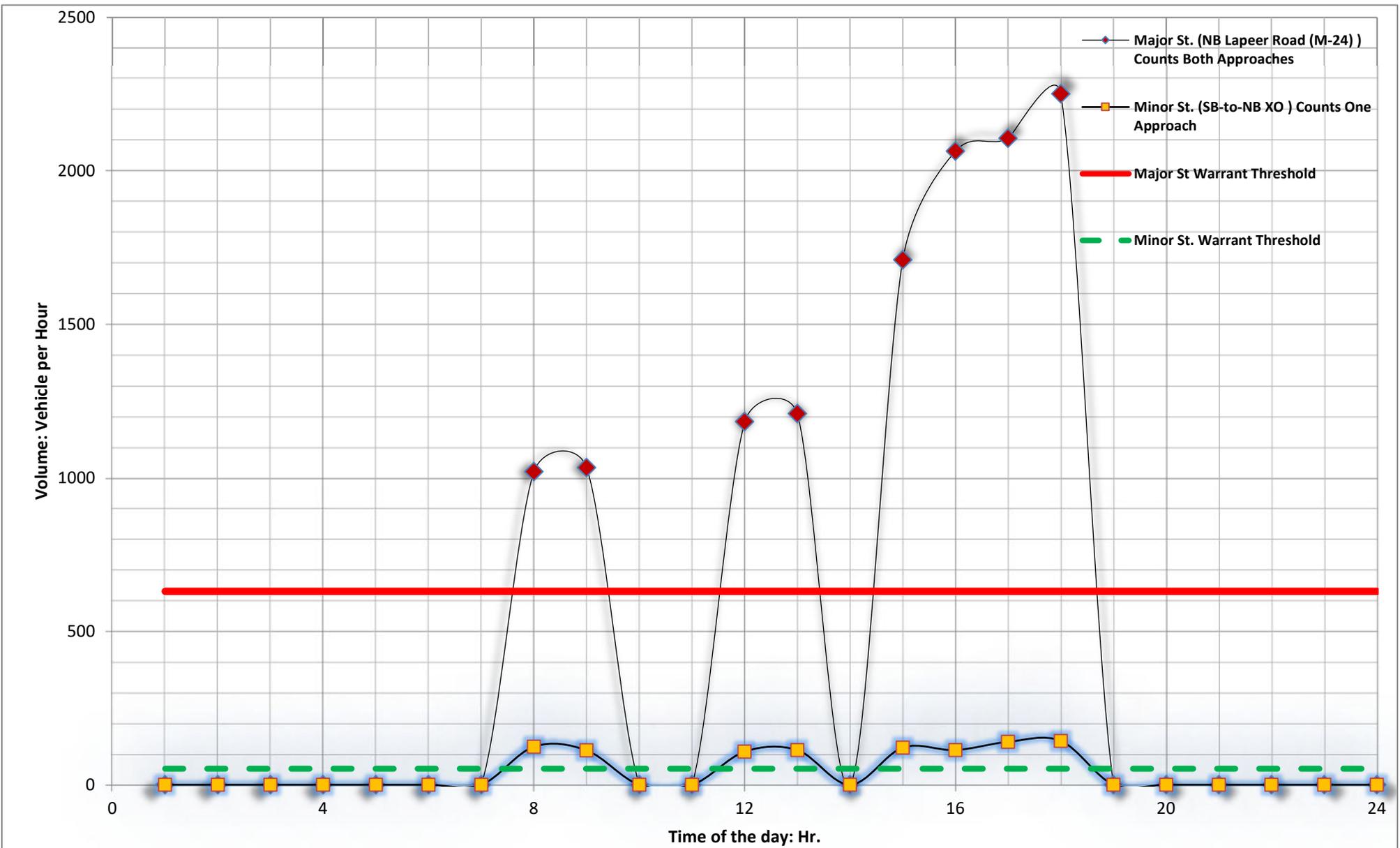


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Background Conditions

NB Lapeer Road (M-24) @ SB-to-NB XO

NO. OF LANES ON MAJOR ST.? 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

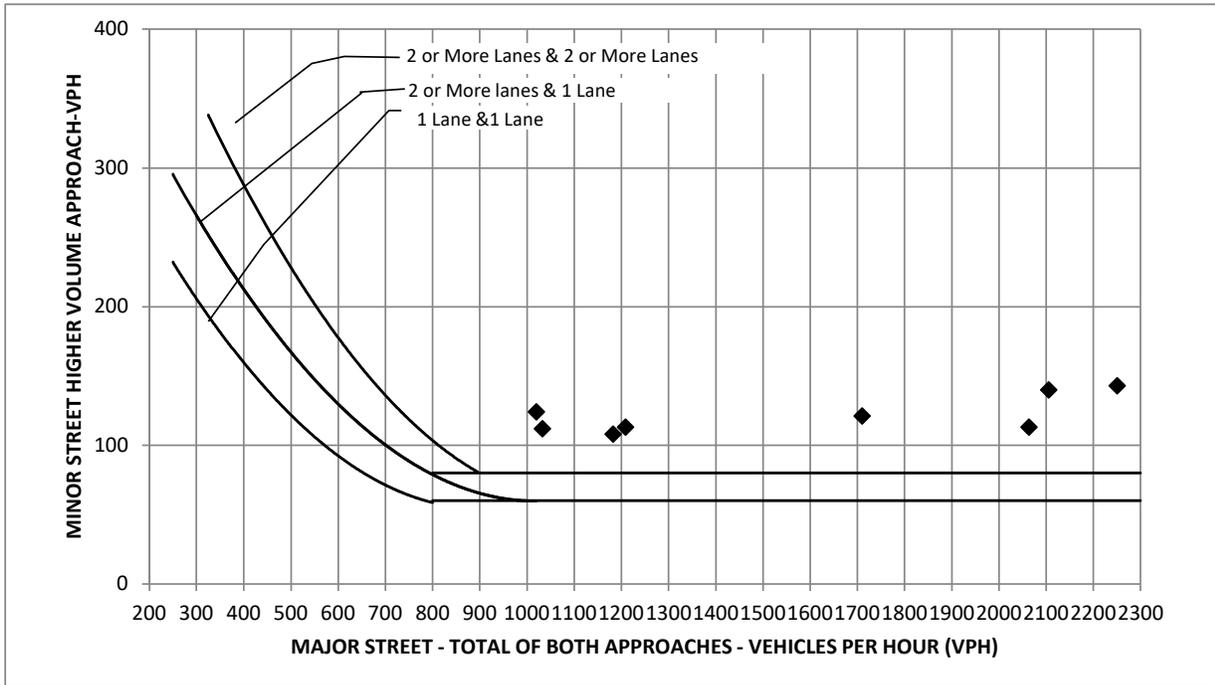
Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 10/13/2022

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	Background Conditions		
Intersection:	NB Lapeer Road (M-24) @ SB-to-NB XO		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?

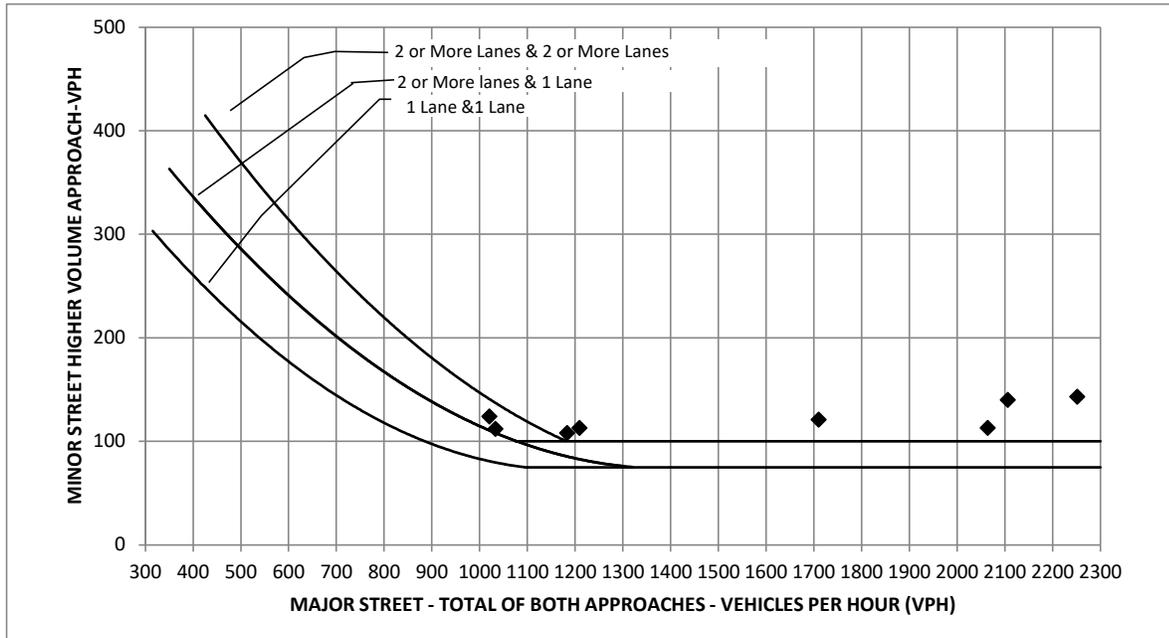


How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	Background Conditions		
Intersection:	NB Lapeer Road (M-24) @ SB-to-NB XO		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

Summary of Warrants

Spot Number:	Future Conditions		
Major Street:	SB Lapeer Road (M-24)	Minor Street:	NB-to-SB X/O
Intersection:	SB Lapeer Road (M-24) at NB-to-SB X/O		
City/Twp:	Orion Township		
Date Performed:	11/4/2022	Performed By:	F&V
Date Volumes Collected:	10/13/2022		

Warrant	Condition	Is Warrant Met
Data Validation Error		NO
WARRANT 1: Eight-Hour Vehicular Volume		YES
	Condition A	YES
	Condition B	YES
	Condition A&B	N/A
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES
	Condition A	N/A
	Condition B	YES
WARRANT 4: Pedestrian Volume	(70%)	NO
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold)	HAWK NO
	(Threshold)	RRFB NO
WARRANT 5: School Crossing		NO
WARRANT 6: Coordinated Signal System		NO
WARRANT 7: Crash Experience		NO
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		NO
WARRANT 9: Intersection Near a Grade Crossing		#N/A

Issue to Be Addressed by Signalization:

0

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume**

Intersection:	SB Lapeer Road (M-24) @ NB-to-SB X/O		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St?
1	: No. of Lanes on Minor St?
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: if answer 4 is Yes, then what is the of the population isolated community?
NO	: Have other remedial measures been tried?

USE 70% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B

Time	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?
00:01 - 01:00	0	E-W	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
01:00 - 02:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
02:00 - 03:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
03:00 - 04:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
04:00 - 05:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
05:00 - 06:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
06:00 - 07:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
07:00 - 08:00	2036	144	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
08:00 - 09:00	2100	162	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
09:00 - 10:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
10:00 - 11:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
11:00 - 12:00	1273	108	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
12:00 - 13:00	1383	107	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
13:00 - 14:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
14:00 - 15:00	1440	111	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
15:00 - 16:00	1503	149	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
16:00 - 17:00	1408	160	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
17:00 - 18:00	1404	139	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
18:00 - 19:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
19:00 - 20:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
20:00 - 21:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
21:00 - 22:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
22:00 - 23:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
23:00 - 00:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A

Number of Hours that met the warrant 1A =	8
Number of Hours that met the warrant 1B =	8
Number of Hours that met the warrant 1 A & B =	0

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	YES
B. Is the Interruption of Continuous Traffic Met? (Condition B)	YES
C. Combination of Warrants A and B Criteria Met?	N/A

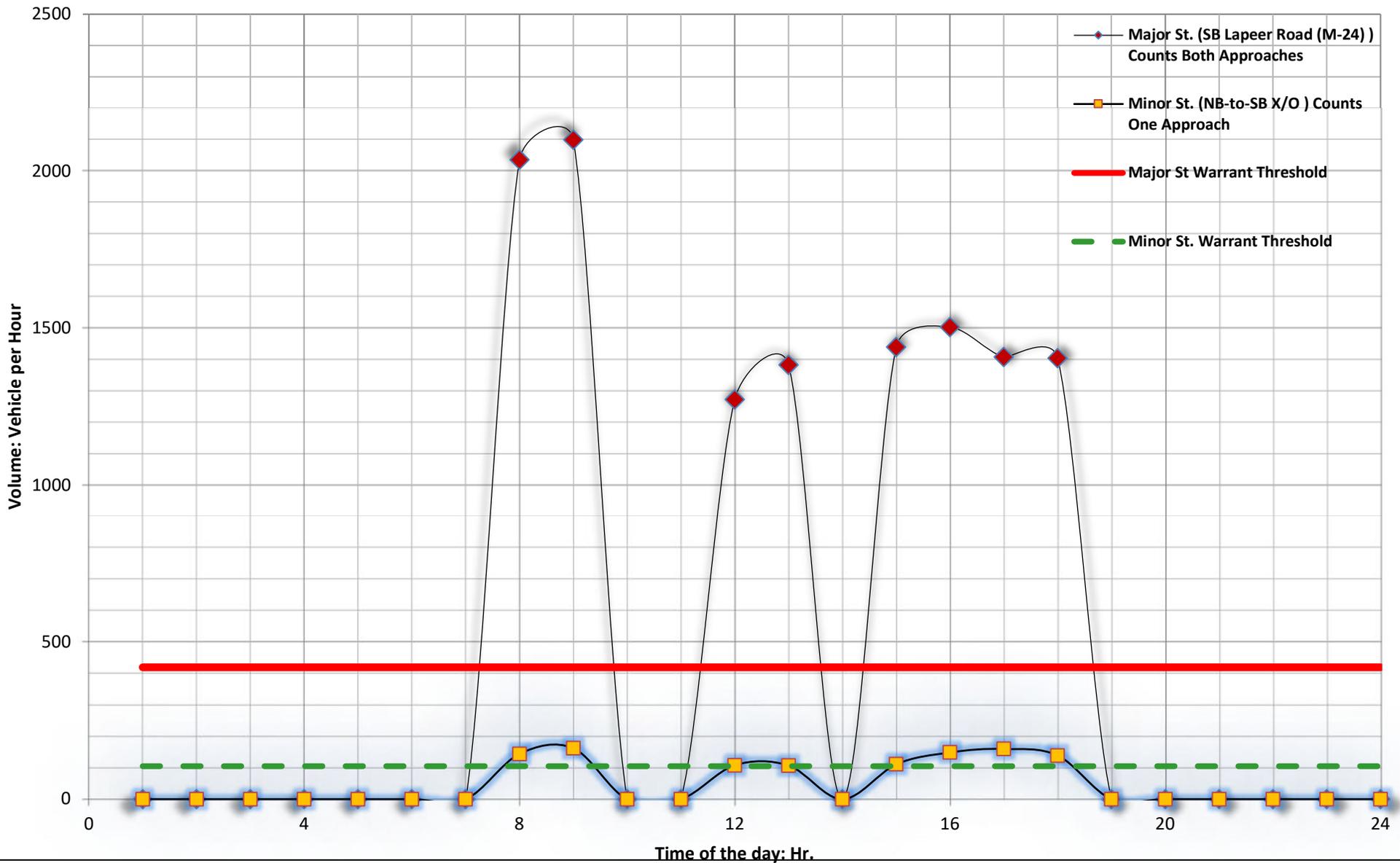


FIGURE 1: WARRANT 1A

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Future Conditions

SB Lapeer Road (M-24) @ NB-to-SB X/O

NO. OF LANES ON MAJOR ST.? 2
 NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

Does this intersection meet Warrant 1A for signal installation? YES

Data Collection Date: 10/13/2022

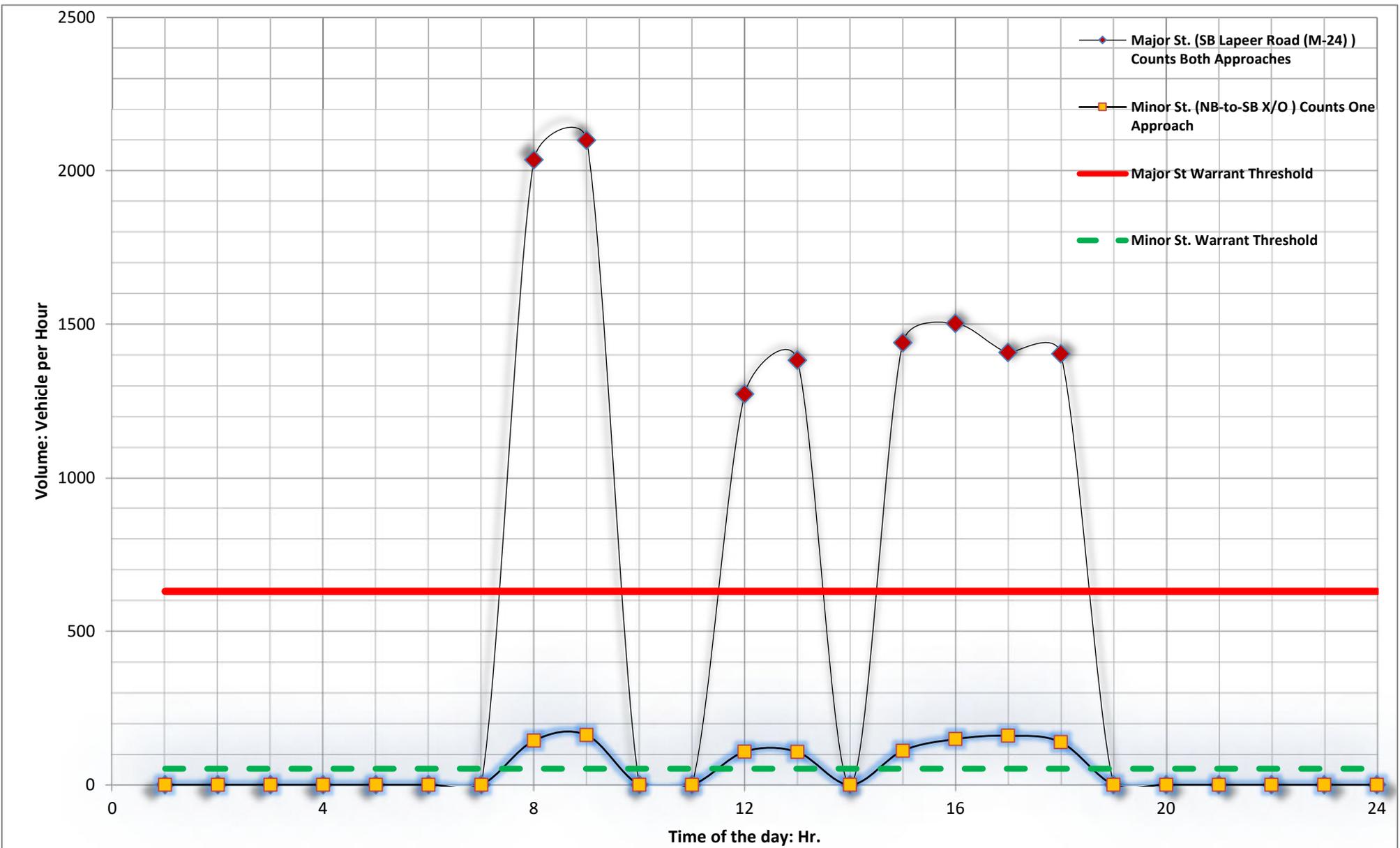


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Future Conditions

SB Lapeer Road (M-24) @ NB-to-SB X/O

NO. OF LANES ON MAJOR ST.? 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

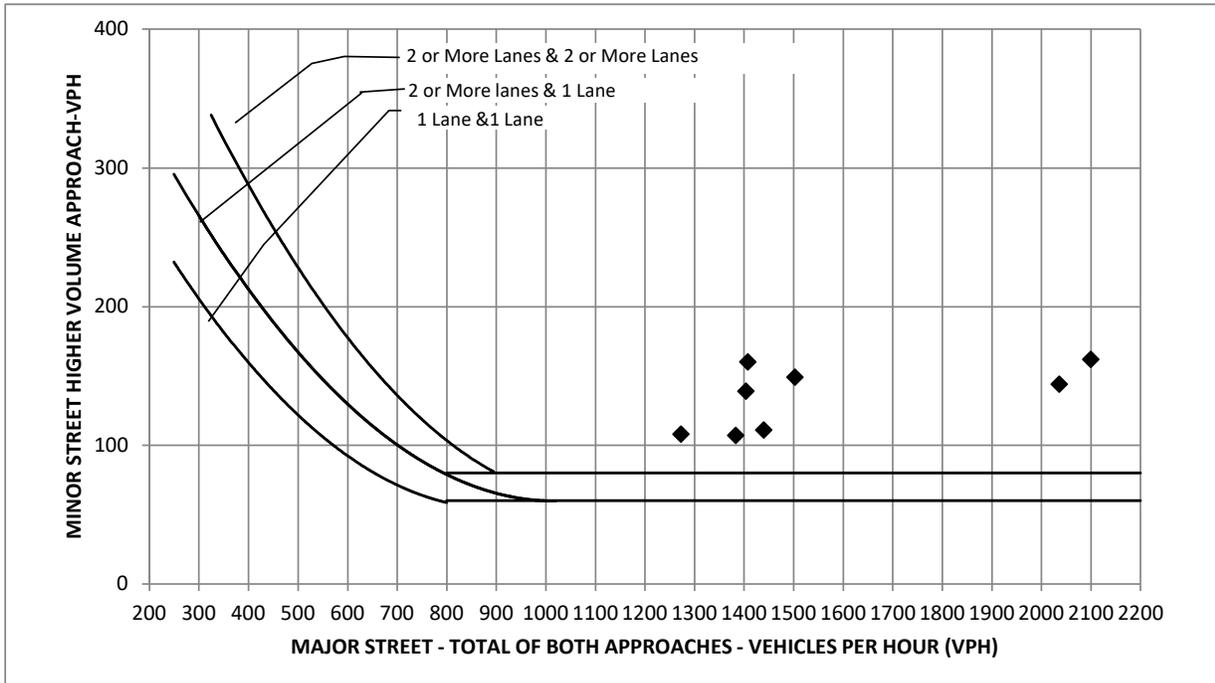
Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 10/13/2022

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	Future Conditions		
Intersection:	SB Lapeer Road (M-24) @ NB-to-SB X/O		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met

8

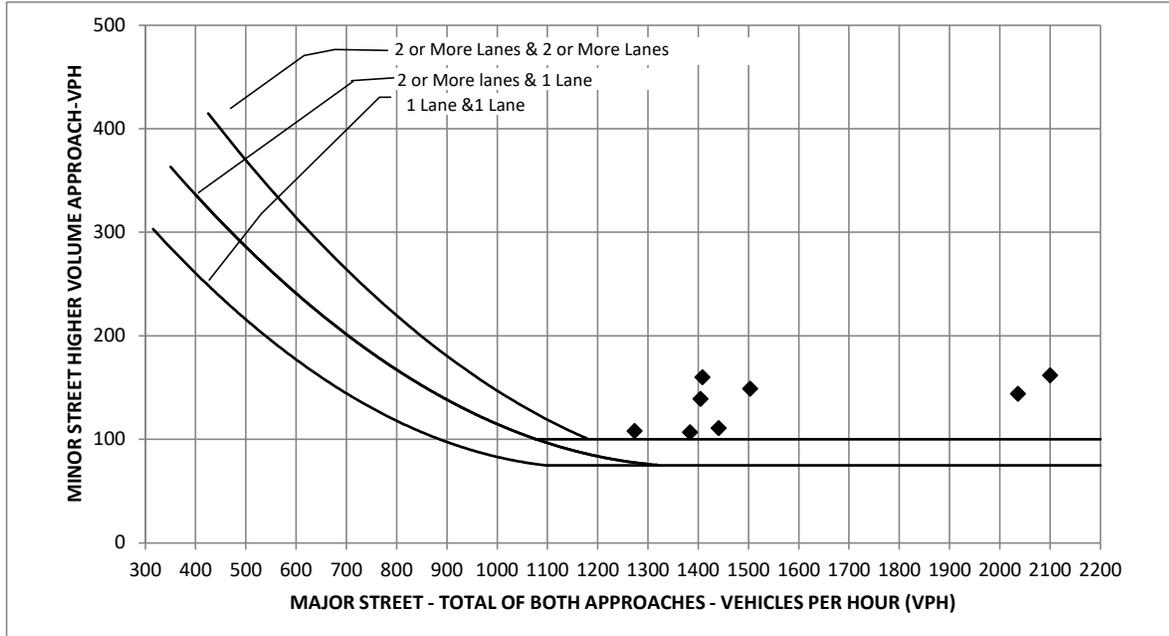
Is Warrant (70%) Met?

YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	Future Conditions		
Intersection:	SB Lapeer Road (M-24) @ NB-to-SB X/O		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

Summary of Warrants

Spot Number:	Future Conditions		
Major Street:	SB Lapeer Road (M-24)	Minor Street:	Waldon Road
Intersection:	SB Lapeer Road (M-24) at Waldon Road		
City/Twp:	Orion Township		
Date Performed:	11/4/2022	Performed By:	F&V
Date Volumes Collected:	10/13/2022		

Warrant	Condition	Is Warrant Met
Data Validation Error		NO
WARRANT 1: Eight-Hour Vehicular Volume		YES
	Condition A	YES
	Condition B	YES
	Condition A&B	N/A
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES
	Condition A	N/A
	Condition B	YES
WARRANT 4: Pedestrian Volume	(70%)	NO
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold)	HAWK NO
	(Threshold)	RRFB NO
WARRANT 5: School Crossing		NO
WARRANT 6: Coordinated Signal System		NO
WARRANT 7: Crash Experience		NO
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		NO
WARRANT 9: Intersection Near a Grade Crossing		#N/A

Issue to Be Addressed by Signalization:

0

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume**

Intersection:	SB Lapeer Road (M-24) @ Waldon Road		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St?
1	: No. of Lanes on Minor St?
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: if answer 4 is Yes, then what is the of the population isolated community?
NO	: Have other remedial measures been tried?

USE 70% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B

Time	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?
00:01 - 01:00	0	E-W 0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
01:00 - 02:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
02:00 - 03:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
03:00 - 04:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
04:00 - 05:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
05:00 - 06:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
06:00 - 07:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
07:00 - 08:00	2180	165	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
08:00 - 09:00	2250	134	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
09:00 - 10:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
10:00 - 11:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
11:00 - 12:00	1364	119	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
12:00 - 13:00	1482	135	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
13:00 - 14:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
14:00 - 15:00	1525	146	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
15:00 - 16:00	1660	131	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
16:00 - 17:00	1565	163	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
17:00 - 18:00	1524	171	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
18:00 - 19:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
19:00 - 20:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
20:00 - 21:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
21:00 - 22:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
22:00 - 23:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
23:00 - 00:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A

Number of Hours that met the warrant 1A =	8
Number of Hours that met the warrant 1B =	8
Number of Hours that met the warrant 1 A & B =	0

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	YES
B. Is the Interruption of Continuous Traffic Met? (Condition B)	YES
C. Combination of Warrants A and B Criteria Met?	N/A

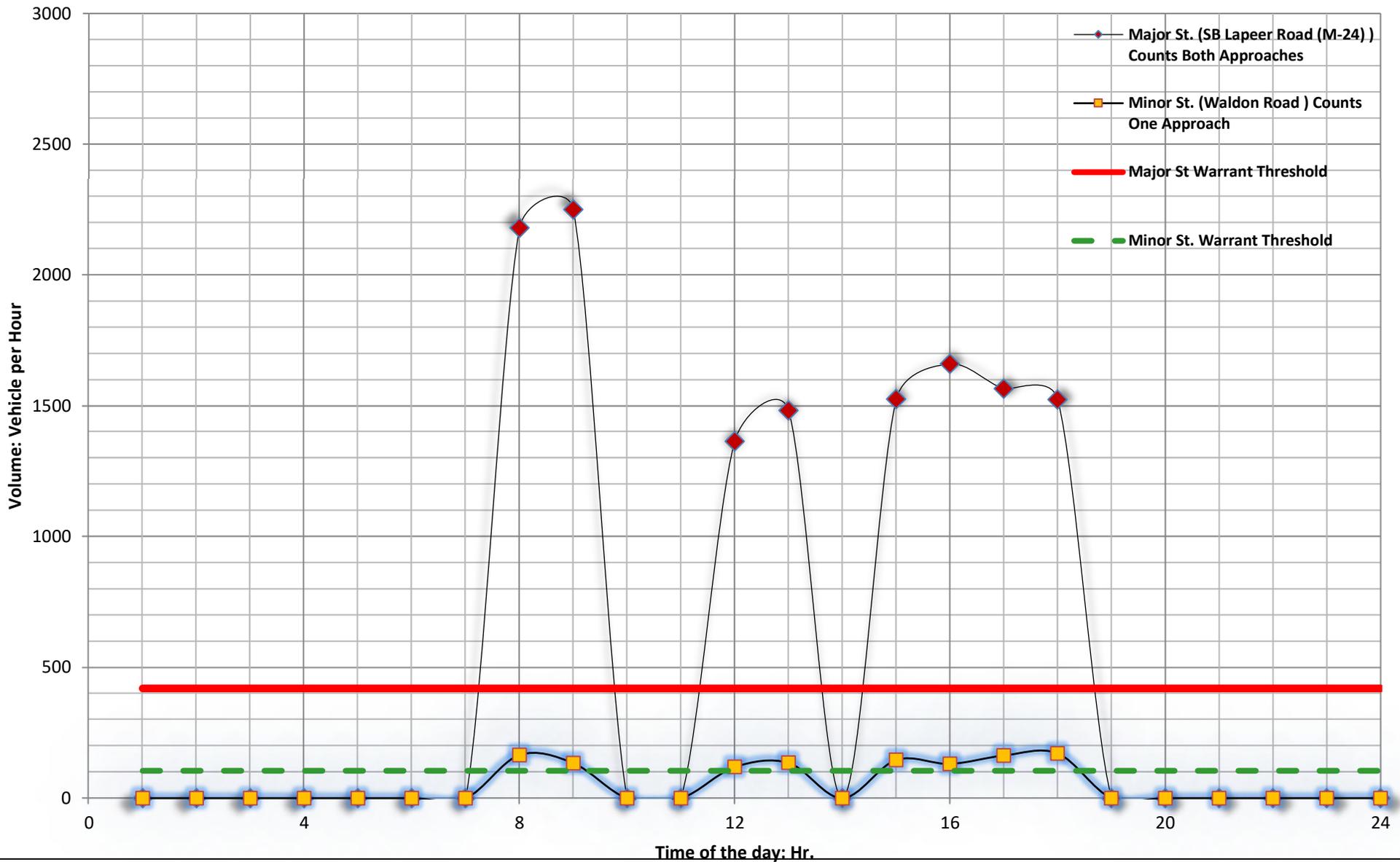


FIGURE 1: WARRANT 1A

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Future Conditions

SB Lapeer Road (M-24) @ Waldon Road

NO. OF LANES ON MAJOR ST.? 2
 NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

Does this intersection meet Warrant 1A for signal installation? YES

Data Collection Date: 10/13/2022

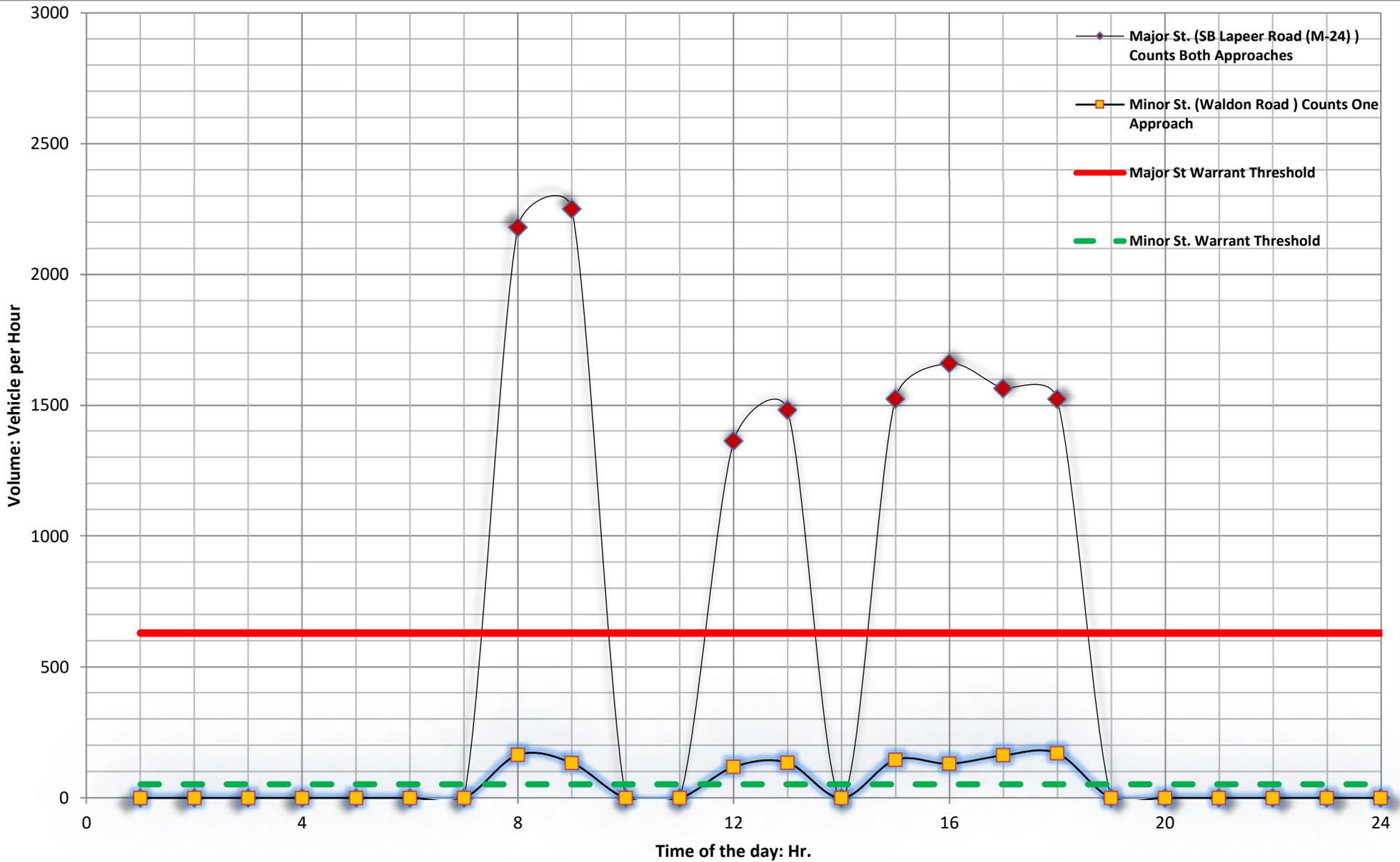


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Future Conditions

SB Lapeer Road (M-24) @ Waldon Road

NO. OF LANES ON MAJOR ST.? 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

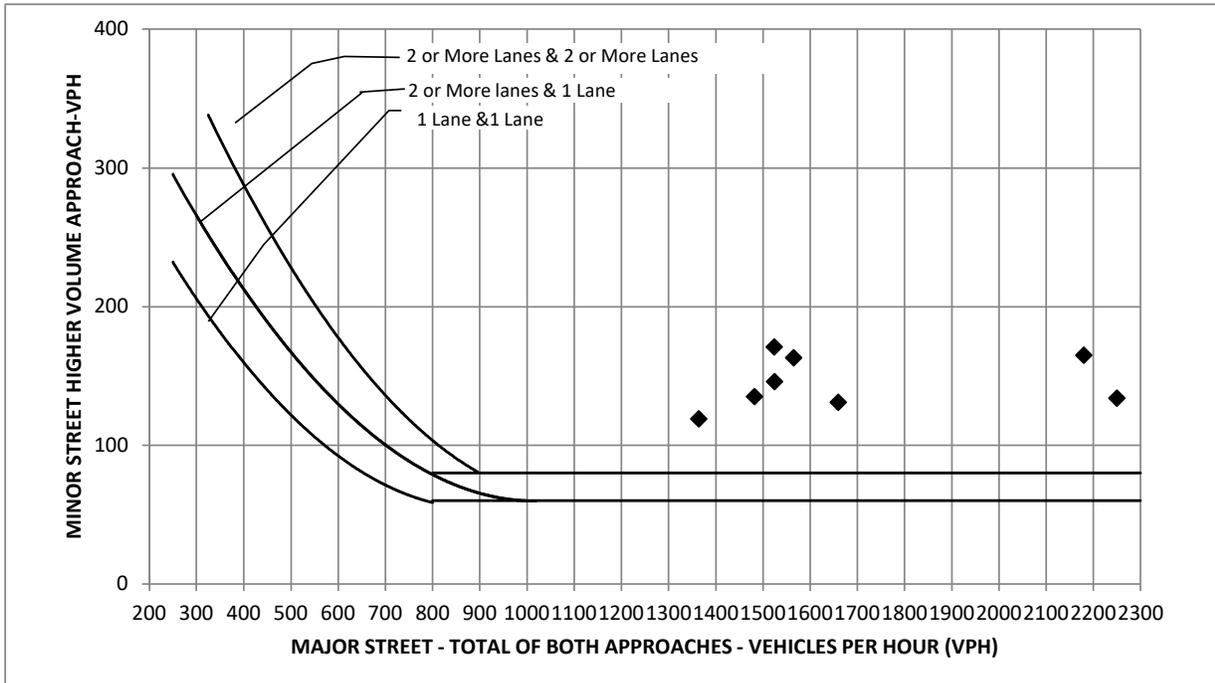
Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 10/13/2022

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	Future Conditions		
Intersection:	SB Lapeer Road (M-24) @ Waldon Road		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?

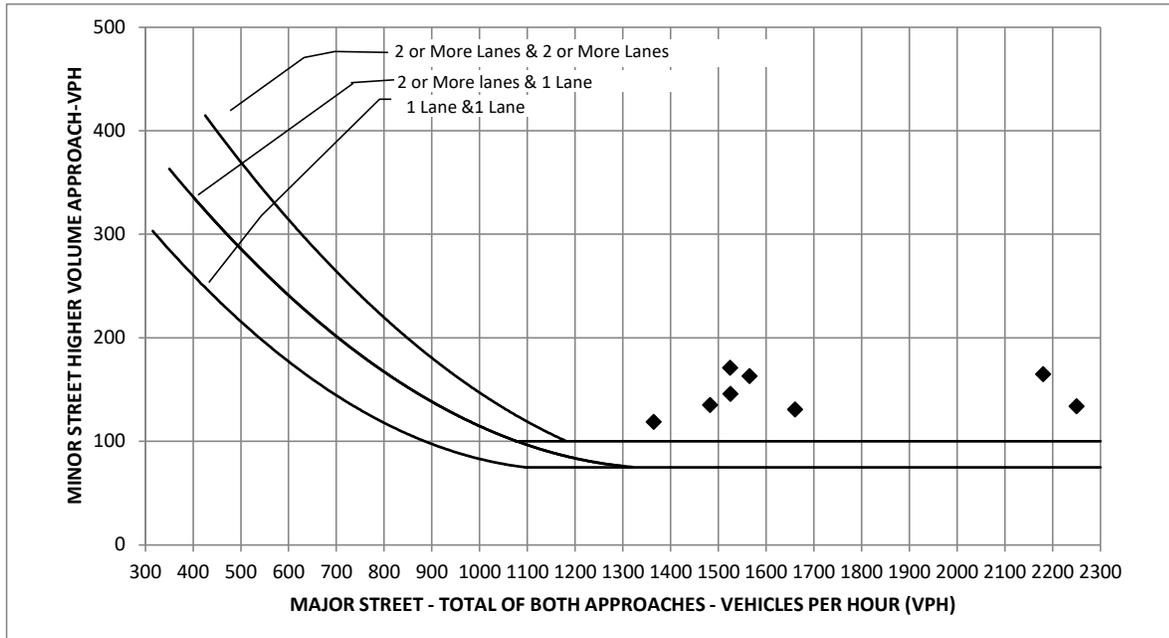


How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	Future Conditions		
Intersection:	SB Lapeer Road (M-24) @ Waldon Road		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

Summary of Warrants

Spot Number:	Future Conditions		
Major Street:	NB Lapeer Road (M-24)	Minor Street:	SB-to-NB XO
Intersection:	NB Lapeer Road (M-24) at SB-to-NB XO		
City/Twp:	Orion Township		
Date Performed:	11/4/2022	Performed By:	F&V
Date Volumes Collected:	10/13/2022		

Warrant	Condition	Is Warrant Met
Data Validation Error		NO
WARRANT 1: Eight-Hour Vehicular Volume		YES
	Condition A	YES
	Condition B	YES
	Condition A&B	N/A
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES
	Condition A	N/A
	Condition B	YES
WARRANT 4: Pedestrian Volume	(70%)	NO
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold)	HAWK NO
	(Threshold)	RRFB NO
WARRANT 5: School Crossing		NO
WARRANT 6: Coordinated Signal System		NO
WARRANT 7: Crash Experience		NO
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		NO
WARRANT 9: Intersection Near a Grade Crossing		#N/A

Issue to Be Addressed by Signalization:

0

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume**

Intersection:	NB Lapeer Road (M-24) @ SB-to-NB XO		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St?
1	: No. of Lanes on Minor St?
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: if answer 4 is Yes, then what is the of the population isolated community?
NO	: Have other remedial measures been tried?

USE 70% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B

Time	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?
00:01 - 01:00	0	E-W	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
01:00 - 02:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
02:00 - 03:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
03:00 - 04:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
04:00 - 05:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
05:00 - 06:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
06:00 - 07:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
07:00 - 08:00	1044	173	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
08:00 - 09:00	1069	165	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
09:00 - 10:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
10:00 - 11:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
11:00 - 12:00	1223	143	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
12:00 - 13:00	1251	149	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
13:00 - 14:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
14:00 - 15:00	1737	151	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
15:00 - 16:00	2115	142	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
16:00 - 17:00	2154	164	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
17:00 - 18:00	2310	168	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
18:00 - 19:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
19:00 - 20:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
20:00 - 21:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
21:00 - 22:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
22:00 - 23:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
23:00 - 00:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A

Number of Hours that met the warrant 1A =	8
Number of Hours that met the warrant 1B =	8
Number of Hours that met the warrant 1 A & B =	0

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	YES
B. Is the Interruption of Continuous Traffic Met? (Condition B)	YES
C. Combination of Warrants A and B Criteria Met?	N/A

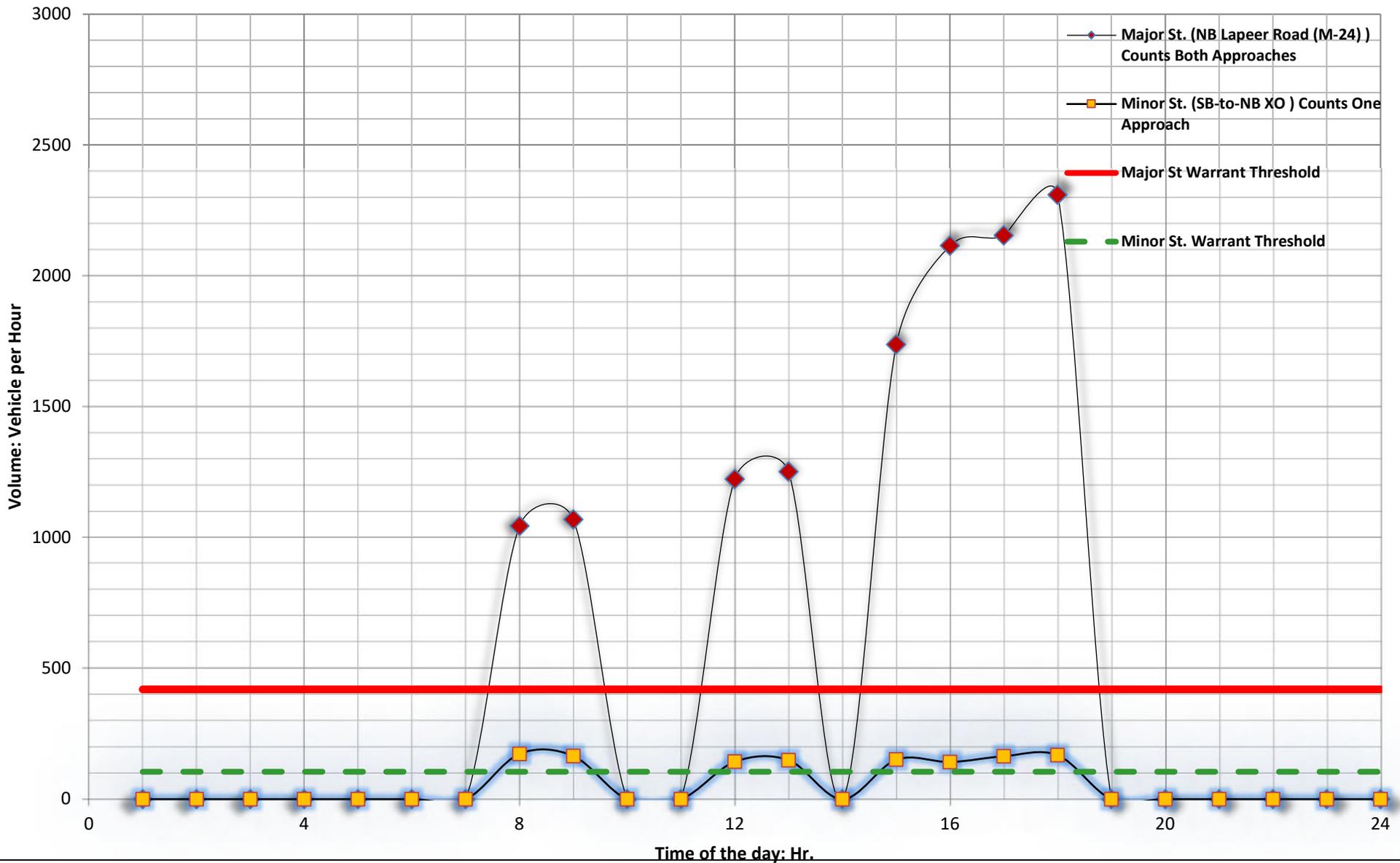


FIGURE 1: WARRANT 1A

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Future Conditions

NB Lapeer Road (M-24) @ SB-to-NB XO

NO. OF LANES ON MAJOR ST.? 2
NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

Does this intersection meet Warrant 1A for signal installation? YES

Data Collection Date: 10/13/2022

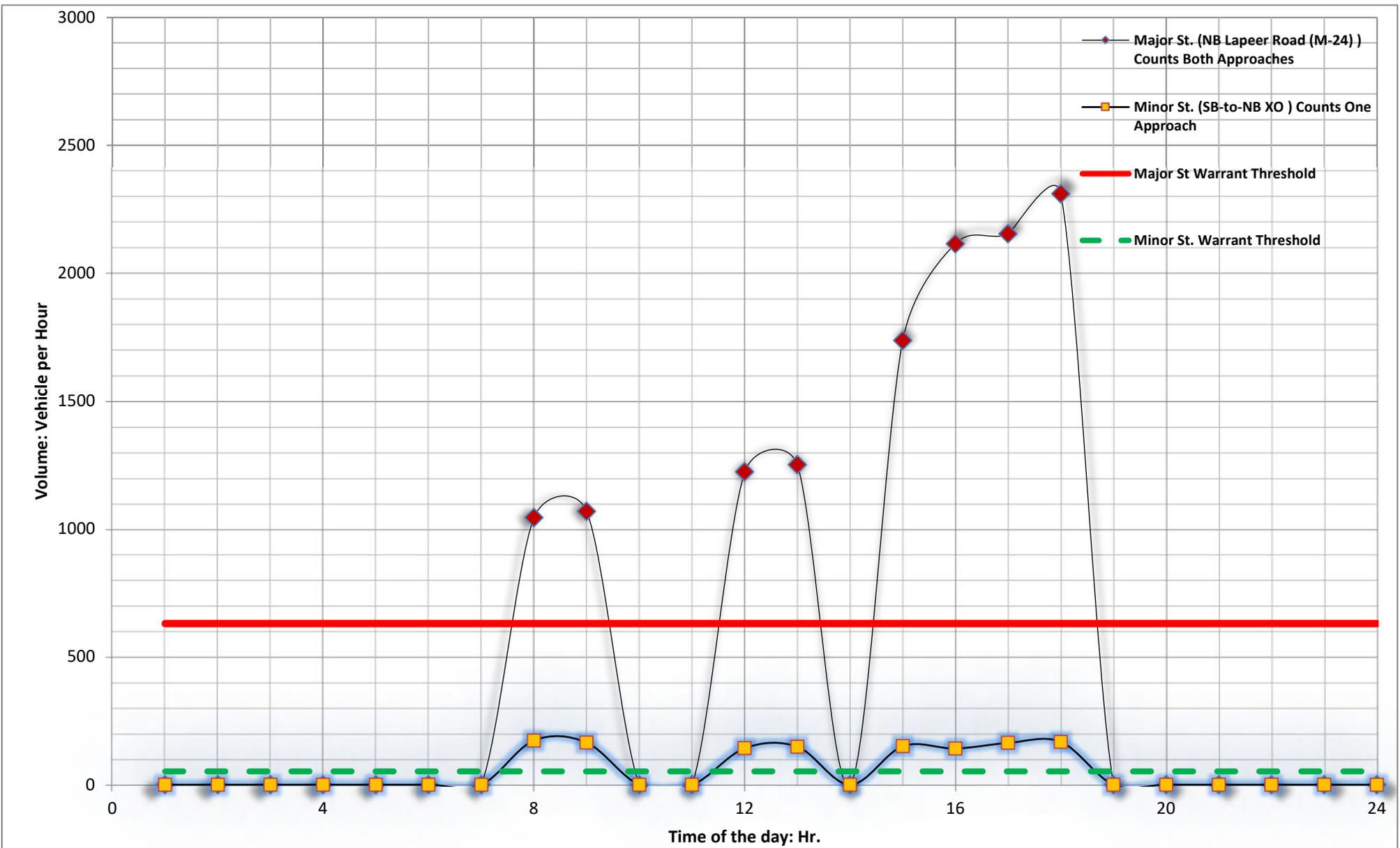


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: Future Conditions

NB Lapeer Road (M-24) @ SB-to-NB XO

NO. OF LANES ON MAJOR ST.? 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

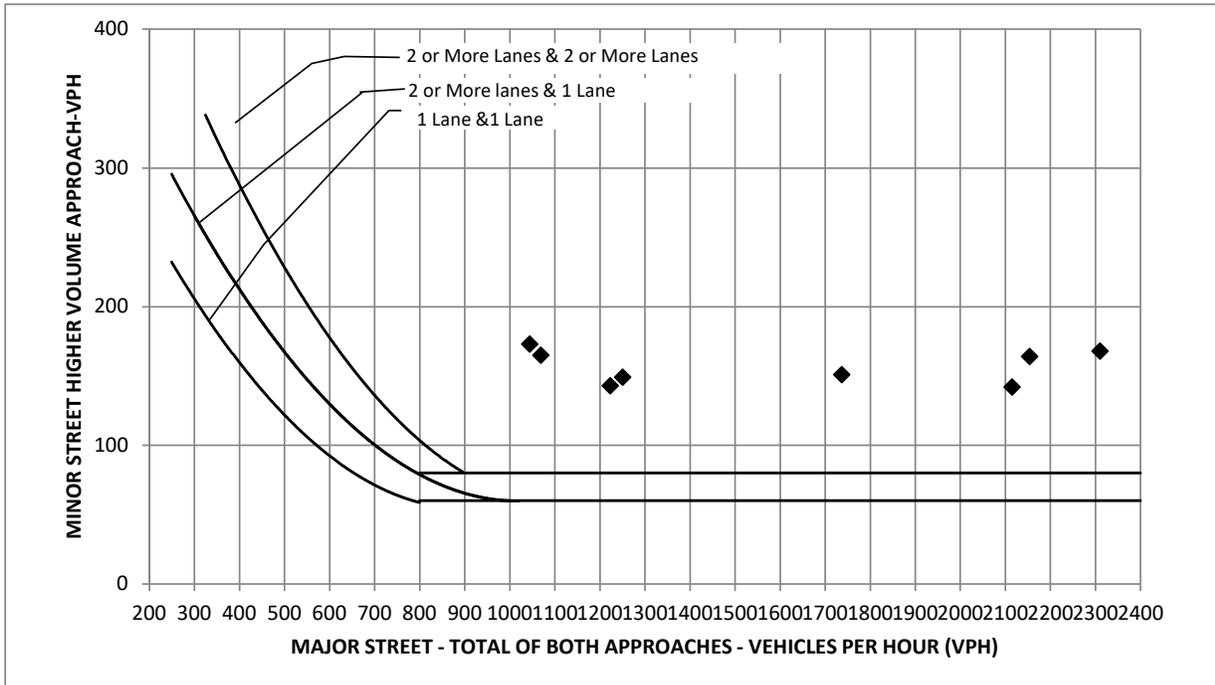
Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 10/13/2022

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	Future Conditions		
Intersection:	NB Lapeer Road (M-24) @ SB-to-NB XO		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met

8

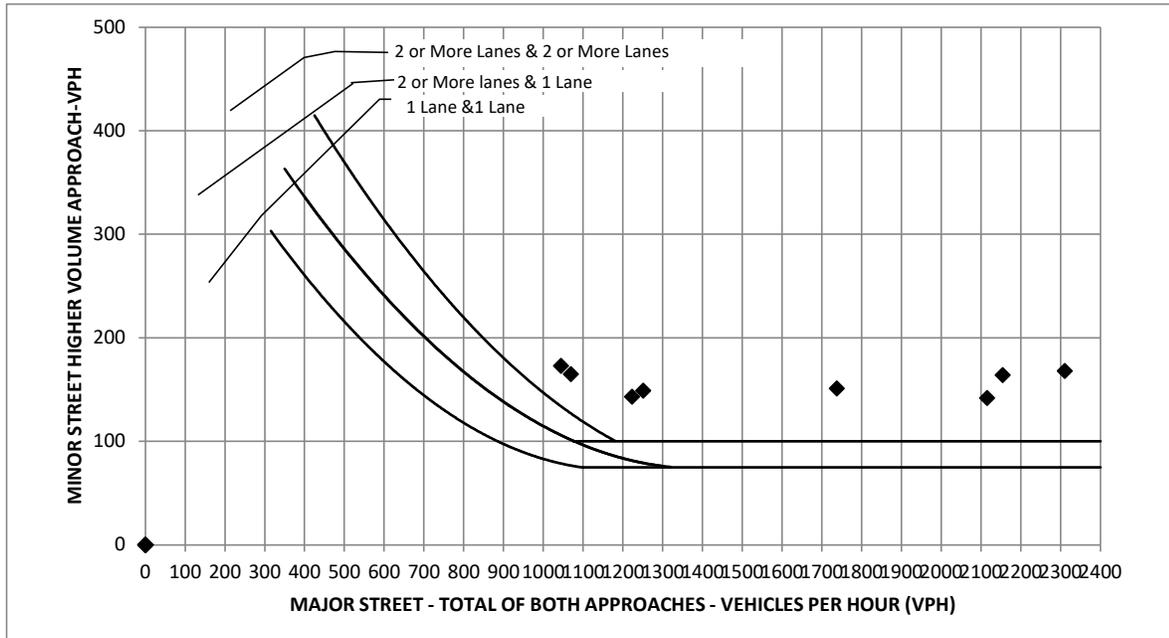
Is Warrant (70%) Met?

YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	Future Conditions		
Intersection:	NB Lapeer Road (M-24) @ SB-to-NB XO		
Date	11/4/2022	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

Bigby Drive-Thru Stacking Space

95th Percentile Probability - Drive Through Queue Length (# of Vehicles)

Volume = 50 vph
 service rate = 60 veh/hr
 $\lambda = 0.833333$

	1	2	3	4	5	6	7	8	9
λ^x	No Veh in Cycle	X	X!	$P = (e^{(-\lambda)})(\lambda^x)/X!$	ΣP	P* # Cycle containing Volume in 1	Σ Cycles in 6	Volume in Cycle (1*6)	Σ volume
1.0000	0	0	1	43.46%	43.46%	26	26	0	0
0.8333	1	1	1	36.22%	79.68%	22	48	22	22
0.6944	2	2	2	15.09%	94.77%	9	11	18	40
0.5787	3	3	6	4.19%	98.96%	3	14	8	47
0.4823	4	4	24	0.87%	99.83%	1	14	2	49
0.4019	5	5	120	0.15%	99.98%	0	14	0	50
0.3349	6	6	720	0.02%	100.00%	0	14	0	50
0.2791	7	7	5040	0.00%	100.00%	0	14	0	50
0.2326	8	8	40320	0.00%	100.00%	0	14	0	50
0.1938	9	9	362880	0.00%	100.00%	0	14	0	50
0.1615	10	10	3628800	0.00%	100.00%	0	14	0	50
0.1346	11	11	39916800	0.00%	100.00%	0	14	0	50

**CHARTER TOWNSHIP OF ORION PLANNING COMMISSION MINUTES
PC-22-39, HUDSON SQUARE PLANNED UNIT DEVELOPMENT (PUD) CONCEPT PLAN
JOINT PUBLIC HEARING – WEDNESDAY, NOVEMBER 16, 2022**

The Charter Township of Orion Planning Commission held a Public Hearing on Wednesday, November 16, 2022, at 7:05 p.m. at the Orion Township Municipal Complex Board Room 2323 Joslyn Road, Lake Orion, MI 48360.

PLANNING COMMISSION MEMBERS PRESENT:

Scott Reynolds, Chairman	Don Walker, PC Rep to ZBA
Derek Brackon, Commissioner	Joe St. Henry, Secretary
Kim Urbanowski, BOT Rep to PC	Jessica Gingell, Commissioner

PLANNING COMMISSION MEMBERS ABSENT:

Don Gross, Vice Chairman

CONSULTANTS PRESENT:

Jill Bahm, (Township Planner) of Giffels Webster
Eric Pietsch, (Township Planner) of Giffels Webster
Mark Landis (Township Engineer) of Orchard, Hiltz, and McCliment, Inc.
Lynn Harrison, Planning & Zoning Specialist

OTHERS PRESENT:

Amy Harris	Scott Harris	Matt Malenich
Ray Harris	Greg Moran	Amy Keyzer
Sherley Moran	Emily Glassford	David Steuer
John Slocombe	Elizabeth Glassford	Lorita Woznick
Diane Glassford	Sydnee Keucken	Mary Mansfield
Ari Geczi	Jen Geczi	Terry Clissold
Fred Glassford	Elizabeth Fenwick	Sharon McQueen
Susan Johnston	Marcie Ramsey	John Whitley
Alicia Lawson	Matt Lawson	Melissa Canelis
Giselle Graham	James Graham	Tracy Deuman
Kelly Mihelich	Ryan Soldan	Al Hassnan

PC-22-39, Hudson Square Planned Unit Development (PUD) Concept Plan, located at 3030 S. Lapeer Rd. (Sidwell #09-26-101-021).

Chairman Reynolds asked the petitioner to make a presentation.

Mr. Michael Wayne with Detroit Riverside Capital located at 3250 Auburn Rd., Auburn Hills, MI presented.

Mr. Wayne stated that they were there to share with them a proposal that cultivates the vision of the Orion Township Master Plan and practices responsible development on a currently underutilized parcel.

Mr. Wayne said that this project is not The Woodlands. This proposal has nothing to do with The Woodlands and it is a completely separate project. He added that the adjoining 20 acres that were previously part of The Woodlands proposal is not a part of this proposal, and they have no intention to combine this with the adjacent parcels.

Mr. Wayne stated that the history of this site is interesting because following The Woodlands proposal Dr. Canine was left with a choice of what to do with his land. He met with various members of the Township and through those meetings created some ideas, and the output of those ideas is what they have here tonight.

Mr. Wayne said the existing subject parcel is 7.07 acres. It is located on the northwest corner of Lapeer and Waldon, and the address is 3030 S. Lapeer Rd. The current zoning of the parcel is split between

General Business (GB), and (R-2) single-family. They are bordered to the south by (OP-1) to the east by (RM-1) and to the north, by (R-2) although the current land use is institutional a church being built there and then north of that is (RM-1), to the west is (R-2) residential.

Mr. Wayne said that as of today there is a project that is currently approved on this site. This project features 26,000 total square feet of office space as well as a 4,000 square foot free-standing restaurant. He added that the majority of the office space was being built on spec to complement the car club. But, in a post-pandemic environment, the demand for office space has completely fallen off a cliff. As an example, in Oakland County there are 54 million square feet of office space in total, currently, 24% of that office space is vacant. That leaves 12 million square feet of office space in Oakland County currently vacant. Not a good time to build spec office space.

Mr. Wayne stated that there was another challenge facing this site and that was the adjacent three acres that by building the subject parcel really limited the future development potential of the property to the west. When faced with the economic challenges of office space, as well as the underutilized land, Dr. Canine knew that he had to rethink his approach to this site. So, they collaborated with Dr. Canine and created Hudson Square. They feel that Hudson Square is a tremendous project that meets the relevant needs of the community today as compared to what is currently approved.

Mr. Wayne said that Hudson Square site plan has four main components. On the southeast is the restaurant which is also attached to the car club. The northeast is the drive-through Biggby Coffee and to the west is the for-lease residential. Now, of all of these uses, they need a total of 128 parking spaces of which they provide 130, so parking is not an issue.

Mr. Wayne stated that every (PUD) must bring along with it public benefits, and Hudson Square has numerous. Many of those were mentioned by the Giffels Webster review, which they will hear about later tonight. A couple of those benefits include the preservation of natural features. On the southwest portion of the site, they have a beautiful water feature and that was certainly key in their site design to preserve and not disturb that wetland area. Furthermore, Waldon Rd. features a beautiful tree line as they are driving toward Lapeer and it was really important to them to preserve that tree line, in doing so they did not create any access from the property to Waldon Rd.

Mr. Wayne said that Hudson Square also brings improvements in public safety through the additional construction of safety paths. Of course, this is beneficial just for their site alone, but when they look at the macro situation there is an existing safety path that runs about 3,000-ft. north to south just south of Summerfield Condo community all the way up to the Home Depot. That stretch of safety path doesn't currently connect with the existing three-mile path that is to the west along Waldon Rd. in between Lapeer Rd. and Baldwin. Hudson Square will provide for the connection of almost four miles worth of safety paths which currently are inaccessible to one another.

Mr. Wayne stated that open space and nature preservation were important to them so open space was another public benefit. They have been able to generate 40% of the site to remain as open space, and this is more than double what the ordinance requires.

Mr. Wayne noted that high-quality architectural design is another public benefit listed in the (PUD) application and it is certainly applicable to Hudson Square. Between the commercial and residential uses they have identified façade materials that are not only high quality and durable, but also very aesthetically pleasing and that is represented in some of the elevations and renderings that they will see tonight.

Mr. Wayne said that his favorite public benefit is the public art feature which is proposed at the southeast corner of the site. This is a 10-acre patio space that will be centered by public art piece. He will collaborate with some of the various art institutions, perhaps the DIA to come up with a sculpture design and then propose that for approval to the necessary township boards. They feel that this is a really great

way to accent a popular corner and display a cornerstone piece that can be representative of Orion Township.

Mr. Wayne stated that accessing (PUD) compliance with the Master Plan is critical. One of the ways to do that is to look at the Future Land Use designation. This site on the west portion is high-density residential in the Master Plan and on the east portion is General Business (GB). The Master Plan also calls for higher density residential near commercial thoroughfares, of course, that applies here. It looks like they are missing middle housing types that specifically name quadplexes as one of those and that is what they were presenting tonight.

Mr. Wayne said it calls for the clustering of residential units around natural features and open space, he explained how that was achieved by this site plan. Lastly, it mentions that commercial corridors should be placed along major thoroughfares, of course, they are the most major thoroughfare in the Township.

Mr. Wayne stated that the Giffels Webster review letter notes a number of these, and they stated that the project was generally consistent with the Master Plan and the Future Land Use, and they agreed.

Mr. Wayne said with this project there are four key components; the first is Sweet Amy's Eating House. This is a 4,000-square-foot upscale restaurant that has over 1,000 square feet of outdoor dining space. Then they have Biggby Coffee which is a 1,700-square-foot drive-through, quick-service restaurant. They have the Orion Classic Car Club, which is 3,000 square feet and again is connected to the restaurant. And lastly the 24 residential for lease units. They are going to break down each of these components. He asked Amy Harris the owner of Sweet Amy's and Biggby Coffee to come up and share a few words.

Mrs. Amy Harris 943 Watersmeet Dr., Oxford, MI presented.

Mrs. Harris said that she has lived in the area for ten years. All four of their adult children went to Lake Orion High School. They are affiliated with Lake Orion although they technically are in Oxford. She stated that she owned Sweet Amy's Eating House in Lake Orion for six years. She said she worked in restaurants for seven years throughout high school and college. She then went into advertising and worked 18 years at a larger advertising agency managing a multimillion-dollar automotive, casino, and healthcare accounts. After those 18 years, she got burnt out in corporate America and she always had the desire to open a healthy restaurant. Her family eats very healthy and clean, and her daughter has 10 plus anaphylactic food allergies. No restaurants in the area can truly accommodate her allergies. They did some research and found there was a need for a healthy primarily non-GMO restaurant in the area that does accommodate individuals with special dietary restrictions. They decided to open an Honest to Goodness Breakfast & Smoothies in May of 2016. That evolved into Sweet Amy's Eating House during COVID as people were not so apt to go out for breakfast. They had to pivot and change their primary focus to lunches and dinners, and still served the breakfast that they were known for. They were an award-winning restaurant for six years; they won various awards, everything from best breakfast to best lunch in the local advertiser and as well as the Oakland Press. They were consistently rated 4.5 and higher on all social media. With heavy hearts, they had to make a decision to close their doors on January 30, 2022, due to the everlasting effects of COVID. They were not able to maintain a kitchen crew, they tried for over 6 months to no avail. They had to make a hard decision and take a break and close at that location. However, the intent was always to open in a better location. They have been interested in partnering with Dr. John Canine for years. It just recently came to the realization that they were going to be part of this Hudson Square plan, within the last year. She added that two years ago she was diagnosed with celiac. Between herself and her daughter's allergies, they understand the challenges that the community and people with special dietary restrictions go through on a daily basis. There is literally nowhere in town where she can feel comfortable dining, or her daughter, that she won't have a severe allergic reaction and end up in the hospital. Restaurants say they can accommodate but the reality is most can't. Therefore, she always felt Sweet Amy's was her way of giving back and helping others in the community that goes through similar challenges.

Mrs. Harris added that they did previously own Sweet Amy's Eating House located at 1166 S. Lapeer Rd. in Orion Township. It was located in the Sherman Williams Plaza just north of OSB across from Planet Fitness. They developed quite a following as they were a scratch kitchen 90% non-GMO and accommodated special diets such as celiac, vegetarians, and vegans, and did their best to accommodate those with anaphylactic food allergies. In her kitchen, they would utilize only the highest ingredients such as nitrate-free breakfast meats, cage-free eggs, grass-fed beef, wild-caught salmon, and as much organic dairy and produce as they could. All of their sauces, pancake mixes, and salad dressings, were made from scratch, handmade. Just as an example they had three varieties of their pancake mix, organic buttermilk, gluten-free dairy free, and a vegan mix made without eggs and dairy. They take their allergies very seriously. On that note, they had a separate gluten-free griddle, gluten-free fryer, that only touched potatoes, gluten-free toaster, and a gluten-free prep area to avoid contamination with gluten and other major allergens. Many of their breakfast, lunch, and dinner options are naturally gluten-free since they are making items from scratch. Some of their local favorites were gluten-free dairy-free carrot cake pancakes, gluten-free eggs over ham hash, gluten-free vegan hash, grass-fed burger slider that had an option for gluten-free slider bun, and 100% gluten-free fried varieties.

Mrs. Harris noted that this new Sweet Amy's Restaurant would follow suit with the same scratch kitchen model that accommodates special diets, however, this restaurant will be primarily focused on dinners with a brunch offering on the weekends. In the renderings, it displays that they are proposing a 4,000-square-foot building with a 1,000-square-foot mezzanine above it for VIP social gathering space. It would have a minimum of 1,000 square foot patio surrounded by beautiful foliage that overlooks the pond. There would be lots of glass so even those dining from inside would be able to enjoy the beautiful scenery. The overall look will be upscale in nature, two unique aspects of their restaurants to the area would be the fact that they would have a private dining room fishbowl style, so it would be open surrounded by wine on the walls. They are going to have soft seating in the front all the way to the middle of the restaurant where there will be sofas, tables, and chairs so people can come and socialize over appetizers and hors d'oeuvres. In addition, they are going to have a window that showcases and displays one of those luxury classic cars that Dr. John Canine would have in his car club. Truly nothing like it from an ambiance perspective along with food offerings in their area. They would need to drive to southern Oakland County or Detroit to find something comparable. They are excited to bring the second rendition of Sweet Amy's to Lake Orion. There is a need for Sweet Amy's number two in Lake Orion, additionally, there is a need for another coffee venue in Lake Orion. They would like to bring a Biggby Coffee to the area. There are currently no Biggby Coffee locations in Lake Orion. The closest Biggby Cafes are in Metamora, which is 16.3 miles away, 27 minutes north, and in Auburn Hills 4.5 miles away, 9 minutes southwest. Additionally, there is no coffee venue with a drive-through once you pass Tim Hortons on Lapeer Rd. Tim Hortons is 2.6 miles away. The closest non-drive-through coffee shop is Lava Mountain which is 1.7 miles away. Their new big café will fill the void of a somewhat coffee dessert area for morning commuters. Especially for those moms with young children or those in a hurry looking for a quick convenient drive-through venue. For those who drive Lapeer Rd. every day you can't help but notice the backed-up traffic at Starbucks and Tim Hortons where the traffic wraps around the road. This would help alleviate that backup by providing another coffee venue. For those looking for a place for a business meeting, or to work remotely, there will be a café available for them. Biggby offers a wide array of unique coffee drinks and hot and cold beverages such as Biggby Blast energy drinks. Biggby also serves items such as bragel sandwiches and baked goods. Because of her personal issue with celiac, she is passionate about adding a gluten-free component to Biggby's model. They are currently working with a local baker that can potentially produce mass quantities to see if they can make this happen. Biggby is a Michigan-based company. The first Biggby Café originated in Lansing, MI in 1955, and its headquarters is based there to this day. The rendering is of an existing Biggby Café that resides in Allegan County, and theirs will look very similar to that. For all of these reasons and more, they feel the addition of this Biggby Café with a drive-through will be a positive addition to the community.

Mr. Wayne said that the third component is the Orion Classic Car Club. This was a concept that was approved by this Commission previously. What is most critical about it is that it is really a one-of-a-kind destination, it is about more than storing cars, this is really a community in that these gentlemen and

ladies share a love for cars over and use it to create that community and socialize. Nothing like this in the Township currently and certainly creates a unique asset.

Mr. Wayne stated that for the fourth component they are presenting Hudson Valley which is six individual buildings with four homes in each. These are two-story structures, and the maximum height measured to the midpoint of the roofline is about 27-ft. They know that height is critical and that was a key element to this design. Each building has two, two-bedroom units on the first floor, over 1,100 square feet of living space plus a 420 square foot garage area, and a 200 square foot outdoor patio. A short trip up the steps and they will arrive at the three-bedroom units located on the second floor. Those enjoy 1,600 square feet of living space plus a 420 square foot garage, and over a 400 square foot rooftop patio. The variation between the two and three bedrooms allows them to attract a wide range of demographics in terms of the renter base. They really envision two primary demographics with these homes. First, it would be young families, a married couple with a dog and a kid on the way might be in between housing options, maybe not quite ready to buy a home. This serves as a perfect way to keep those people in the community and give them a housing type that is conducive to their needs. The second would be the late baby boomer generation so perhaps empty nesters free of kids looking for a hassle-free, maintenance-free, living environment. This serves perfectly for those demographics. Keep in mind that these residential dwellings are very high-end. The rental rates on these drawings will be comparable to the monthly mortgage payments of many homes in the surrounding areas. This demonstrates that the demographic will blend nicely with the existing landscape. Another feature of the Hudson Valley design is that all garages are side entry. This means that from the front façade view as they walk down the street no garages are visible, which gives it a quiet neighborhood feel. One other item of note would be that half of the homes are handicap accessible.

Mr. Wayne said when they compared this product type to others in the area and they found a very similar example and that would be in the Summerfield Condo community. This property is just to the north of the proposed site, and these are two-story condos that were built in the early 2000s. The similarities are strong between the two structures both from a height perspective as well as a general overall architecture mass and scale. They blend nicely with the existing landscape in the area, they do not immediately about the Summerfield Condo community so it is an example of a similar product type in the surrounding area but there is no visual connection between the properties.

Mr. Wayne stated that there is a tremendous need for residential housing options in the community and the existing ones are at their capacity. In order for the Township to continue to grow responsibly it must add housing options of this type to support this need. Since 2000 they have only seen 353 for-lease residential dwellings built in the Township. Despite the 15% population growth over that same period, so clearly a big need in the community today. Mr. Wayne said when apartments are built in Orion Township, they lease out immediately.

Mr. Wayne said regarding density and public resources. From a commercial density perspective, their proposal is 21,000 square feet less of total commercial space as compared to the already approved site plan. They reduced that density by 71% in this proposal. From a residential perspective, the Future Land Use on the parcel is high-density residential, which means 3-5 dwelling units per acre, they are proposing 6. This meets the intent of the Future Land Use of high-density residential. One extra unit per acre on a 4-acre site they are only asking for a total of 4 additional units compared to the underlining future land use permitted density. If they take that a step further and assume that there are two people per one of those dwelling units that is a total of 8 additional heartbeats for public resources like police, fire, and EMS demand. The (RM-1) density category of 6 units per acre is what they are proposing. This exact zoning designation exists to the east, north, and also partially to the south. He thought they were in good company as far as the (RM-1) category is concerned.

Mr. Wayne stated in terms of Stormwater Management one of the most critical aspects of every development is to effectively manage that stormwater, and ensure that it has no negative effects on surrounding properties. They will show this through an underground series of catch basins with

underground storage on site. He added that they are going to work with OHM to ensure that their design meets the ordinance. This is the same ordinance that of course is designed to prevent this exact issue from happening. So, trusting with collaboration with OHM they will develop a design that has been thoroughly reviewed and confirmed that it meets the standards of the ordinance.

Mr. Wayne said that OHM acknowledges in their review letter that the stormwater on this site flows to the southeast. The southeast corner of the Hudson's proposal is at the corner of Waldon and Lapeer Roads. There are no properties to the east for any of their stormwater to flow onto. On the contrary, all of the properties surrounding them are flowing toward their property. This really eliminates the potential of their site depositing any stormwater or disturbing any surrounding property as a result.

Mr. Wayne stated that as it relates to site circulation and traffic this was a key component of their site design. They did not provide access through Waldon Rd. This was deliberate for two reasons, the first was to preserve the tree line, and the second was to not deposit any new traffic volume onto Waldon Rd. roadway. They understood that there are some existing concerns over traffic at this intersection and they believe that Hudson Square could potentially be the impetus to solve this problem through collaborating with MDOT. They have submitted a traffic study to the Township. It is currently in review, and they also submitted the study to MDOT. They look forward to working with MDOT to develop whatever mitigation requirements MDOT deems necessary, they are willing to provide. They look forward to that process to ensure that they are mitigating traffic congestion to the fullest extent.

Mr. Wayne said that nature preservation was a really critical piece of their design. The large part of the natural water feature but also the buffering surrounding the site gets them to the 40% open space. Of that total ruffly 30% will be completely preserved in its natural habitat.

Mr. Wayne said lastly, they are bringing walking trails to the natural features so existing they are completely inaccessible. Through the construction of both the safety paths as well as their interior site circulation these natural features will be able to be enjoyed by residents, customers and businesses in the community alike.

Mr. Wayne stated that they are at a public hearing, so they wanted to share some feedback that they got from the virtual town square, Facebook. Their proposal was posted on the Orion Township Facebook group as well as a couple of various other groups within the community. The results were overwhelmingly positive. Almost 500 total likes between the posts, and over 250 total comments, and when they compared the positive comments to the negative comments, they saw about 96% positivity for the project. Clearly, hundreds of their community members have spoken and 96% of them were supportive of this project.

Chairman Reynolds asked if there were any public comments. He asked them to limit themselves to 3 minutes. He added that they were taking notes so if something was mentioned previously, they will have that in their notes when they further deliberate on the project.

Ms. Tracy Deuman 270 Waldon Rd. She is the west property adjacent to the proposed property. She really appreciated Mr. Wayne's how he addressed a lot of their concerns. The three main points that she heard were that there was no intent to combine the adjacent parcel behind her property, so she was very impressed by that and hoped that stood true. The next one is that there is no access off of Waldon Rd. Currently, there is an unofficial driveway on Waldon Rd. already and there is a mailbox there. She asked if that would be blocked. She appreciated the preservation of the tree line on Waldon Rd. Her personal concern for her property was she hoped they could keep the tree line and the berm that is on the west side of the property, so adjacent to her property. I would provide light pollution coverage, so it would block the light and privacy from the apartments. Also, there is a big fence there that was put up intentionally and she wanted to make sure that they keep that fence. She has a half-acre pond, and it could be a liability problem with her with an apartment next to her. She was worried about the traffic, and the water runoff.

Al Hassinger 1600 S. Baldwin Rd., Brandon Twp., is a property owner in Lake Orion Village. He wanted to say that getting to know Amy and Scott and really admiring their entrepreneurial spirit, wanting to pick up again where they had to leave off through no fault of their own and bring a fantastic business to Lake Orion. He thought it would be a tremendous addition and a great gateway into and out of the town.

Matt Malenich 4014 Sunfish Dr., Lapeer, was there to speak on behalf of Scott and Amy Harris. First, he would like to say that he wholeheartedly supports the business ventures that Scott and Amy are taking. His wife and he are regular patrons of the Lake Orion community and would love to see an upscale restaurant added to their dining community. As a patron of Scott and Amy's previous restaurant, he can speak from experience about the quality of food and service that was provided. Everything was created with the highest standards in terms of the foods that were used, the presentation of the food, the taste of the food, which for him is the most important, and the service in which it was provided. He truly believed that adding an upscale restaurant to their community run by Scott and Amy would be beneficial to all and would run successfully. He also believed that adding another coffee venue to the Lake Orion community would be beneficial as well. He knew that there are plenty of places to get coffee in Lake Orion, but to his knowledge, there are only two venues with drive-through services. He believed that adding another coffee place with a drive-through would benefit the members of their community and those who travel through their city every day simply due to convenience. He has known Scott his entire life and his wife for many years. In terms of Scott, he didn't think there was anyone who could talk about his character better than him, except for his parents or his wife. Scott is the most dedicated hard-working person that he knows. It doesn't matter if it is in his professional or his personal life, if there is something that needs to be done there is nothing that would stop Scott from doing it. He also saw the driving dedication that Scott and Amy put into their previous business venture. The amount of sacrifice and time they put into their restaurant shows they are willing to do whatever it takes to be successful in their ventures. There is no doubt in his mind that approving these two venues would be beneficial to the Lake Orion community.

Mr. John Slocombe 3066 Waldon Meadows Dr. said that a personal friend got killed on Lapeer Rd. last year and he lost a very dear friend from England, it is a very dangerous road. He has nothing against the project, he hopes it works. He hoped the city would do something about the traffic situation because more traffic would mean it is harder to get off Waldon. He goes out onto Waldon Rd. sometimes and some people are frozen in terror, they just sit there. There are 14-18 people trying to get out. He knew it had nothing to do with the development, but they already have a dangerous situation, he has lost a personal friend and he will never be the same after it. He hoped in partnership with these people that they put a traffic light in. He would like to know what the details were and that they can make it all work and make it less dangerous for people.

Ms. Elizabeth Glassford 389 Hunters Rill, Oxford, MI, said she has been in the food industry for 10 years and an operating partner for 6 years. What she has noticed is it is impossible to fully accommodate severe allergies. The model she has can suffice multiple allergies, and felt it would really create a positive buzz for the community because it is something that not everybody offers. She also does drive down Lapeer Rd. southbound toward 75. The few coffee places that do have drive-throughs are very busy in the morning and she felt that adding the Biggby would be great, a great spot, a great location, and definitely the customers to pull from. She moved out to Lake Orion a couple of years ago. When she was looking, she was looking for 2-3 bedrooms with 2 baths, with amenities such as a washer and dryer, and it was very difficult to find availability in the area. It actually took her over six months, and she had to pay double rent for 4 of those months just to ensure that she had a place locked in. She felt that adding those residential properties to the community would definitely be a positive for the community as well. As far as ownership, great customer service, and having owners that live in the community are very positive when it comes to retention, profitability, and just maintenance, maintaining the area as well.

Ms. Emily Glassford 24 Leslie Lane, Waterford, MI, said she has a lot of family in the Lake Orion/Oxford area, so she is frequently out here. She was a patron often at Sweet Amy's restaurant and since they have had a shutdown it has been hard. A lot of her family does have very severe food allergies. It is hard going to restaurants and feeling safe enough to have them eat there without wondering if they are going to

end up in the hospital because of an anaphylactic issue. She is extremely happy to hear that Amy and Scott Harris are trying to make another location, their family has really missed it.

Ms. Linda Martin-Seng 6625 Shelley Dr., Clarkston, MI, said both she and her husband both have food allergies, especially her husband, his are pretty severe. They have been patrons of Sweet Amy's for many years, and they really trust the owners to take the care that is necessary to make food that is safe for them to eat, and her husband won't be sick for a week after eating there. Their food is delicious and well-presented and the owners and the people that work there are all wonderful. They have really missed it since they have been gone. Also, as for Biggby Coffee, she is not a Starbucks fan she likes Biggby way better and there is always a line at the Starbucks on Lapeer Rd. You can't get in it backs up onto Lapeer Rd. She thought another coffee shop with a drive-through would be a real benefit to the area. They also bring lots of family members to their facility. They celebrated their Mother's Day there one year. They then go into Lake Orion and do shopping, so they bring business to the area as well. She did know a lot of other people, her friend from Rochester loves their restaurant. Her friend from Royal Oak drives up here and eats at their restaurant. She thought it would be a benefit to the community overall. She loves them as people and also their food.

Ms. Kelly Mihelich 275 Waldon Rd. said over the last few months their neighborhood has been here quite often because of the proposed Woodlands development. Once again, she wanted to reiterate that her neighborhood on Waldon Rd. does not come out and fight against development. She lives right next door to the Orion Kennel Club and the new Vet Clinic; they are wonderful neighbors. She has the driving range directly behind her, they are also wonderful neighbors. She knows that Sweet Amy's restaurant obviously everybody loves, its wonderful food, and there is a need for it in their Township. Biggby Coffee is wonderful. Her only concern is the apartments and where they are going to be located. She was concerned that even though they have a dense tree line on Waldon Rd. she was concerned that they are going to see a lot of rooftops and a lot of light pollution, flood lights, that type of thing. They did have to go to the Kennel Club and the Vet and ask them to please tone down their night security cameras because their house was lit up at night, and they had to put extra shades up, it was not good. They cooperated and it is wonderful. So far, she was impressed with what she has seen, she doesn't have any objections, her only concern is the traffic because it is already terrible for them to get out of Waldon Rd. She hoped that they could get a traffic light, the noise pollution, and she is worried about the ponds. The owner of that property used to have a running windmill that he used to keep his pond full. That has not been in operation since he passed away a number of years ago. His pond is way down, and Tracy's Pond at 270 Waldon is way down. She was concerned that the ponds were going to get dried up. Are they going to bring the windmill, which was beautiful, or are they going to put that back into operation to help the ponds and keep everything healthy? Other than that, she really can't see anything to object to at this point. She asked if anyone addressed getting a liquor license for the restaurant. She might have a concern about that, other than that she was impressed with what she saw.

Ms. Elizabeth Fenwick 1133 Devon St. stated she thought that his project would be a great asset to the community. She enjoyed hearing more about it, but she was excited about it already. Seeing it broken down was a lot more exciting. Ever since Sweet Amy's closed, she hasn't been able to find a restaurant that can meet her dietary needs. She works in Rochester and has sent a lot of the Rochester community here too and they are eagerly awaiting their reopening also for the same reason, you can really find a place like that. She felt for them as people and their businesses were a great asset to the community when they were in business and is eager to see them reopen.

Ms. Melisa Canelis, 986 Maloney Ave., Oxford, MI, said she was a resident and a business owner in northern Lake Orion (Oxford). She wanted to be here in support of Amy and Scott Harris today. They did buy a home this last year, having a boy and a girl there was nowhere they could live without a three-bedroom. Fortunately, they found a house they could buy but there were not a lot of options when it came to apartments with three bedrooms, so she really liked and appreciated that. Anybody that drives south on M24 does see a backup, and as an insurance agent she is terrified that her insurers are going to get rear-ended or rear-end someone else on a daily basis, hopefully, that would cause a little less panic attack.

She liked the idea in general of having the drive-through with the convenience and everything else. She did like the idea of a stoplight because she used to live at Joslyn and Silverbell and anytime, they took that way down it was terrible. Outside of the consumers' side, she was there as personal support for Scott and Amy. Her husband was a chef at their restaurant for multiple years. Not only was he a chef at their restaurant but they also became close friends with them. On top of that anything that they did, they took more care than many other business owners she had ever seen. They were much more thorough than many other business owners, herself included and she is a crazy analytical person. They were genuine anytime from the pandemic to struggles with seating, or anything to do with the restaurant, loss of business, closing down, reopening, and shutting down officially, every step along the way they communicated with the staff, they were incredibly professional and organized. Genuinely as humans they are amazing people, and she would love to see them own another restaurant in the area and more.

Ms. Jen Gaczi 776 Fairledge, Lake Orion said the coffee shop would be amazing. She lives off of Heights Rd., so they get stuck by all the traffic-stopping for Starbucks and blocking all the traffic. That would be a phenomenal idea to have another option. As for Sweet Amy's, her family of seven has multiple food allergies and it has been missed greatly. She really appreciated it when they went into the restaurant, it wasn't just a restaurant it was like a family, they were very kind and considerate, they knew them. Whether you had not been in for a while or you were there all the time, they knew them. They recognized them tonight and she hasn't seen them in probably 9 months. She really would appreciate this being approved.

Ms. Susan Johnson 348 Four Seasons Dr., which is the condo development north of the church. It doesn't sound like it, but she was wondering if there were plans for outdoor car shows like Culvers with music and people showing off their vehicles. She didn't want to listen to 50's music which she would hear if there were something like that planned in the works once a week, or even once a month might be too much. The other concern she had was the traffic. For them to go north on 24 and to have to use the turnaround, people are afraid to go they sit there forever, or other people go when they shouldn't, it is dangerous already, and this is going to add a lot to it. She was also wondering about air quality there will be a lot of idling vehicles maybe only morning and night but in that line for the coffee shop where is all that exhaust, is it going to concentrate in her backyard, she is on the south side of her condo development. Having a coffee shop with high-calorie sweet drinks within walking distance is going to be dangerous for her.

Mr. John Whitley 6581 Eastlawn Ave., Clarkston, MI, is a former resident of Lake Orion. He has known Scott for 25 years and Amy for about 10 years. He is a small business owner as well in the area, they are very fortunate to have small business owners like Scott and Amy, very high-integrity people. His wife and he are both vegans, so they appreciate the ability to have vegan alternative and was a big fan of Biggby as well.

Ms. Mary Ann Ryan, 301 Waldon Rd., lives across the street from this development. The parcel of property that sits on the corner of M24 and Waldon Rd. was previously owned by Tim Jones. People might remember the flower shop that existed there, but she was a guest that was frequently invited to the rest of the property. Tim had done landscaping, but that doesn't adequately describe what he really did, he was an artist. Flower trees and bushes planted on this piece of heaven are beyond description. The number of annuals, biannuals, and perennials that bloomed throughout the year was stunning. He would sit on his patio which overlooked the pond and bask in the peace and tranquility of the place. She can't think of a better use for this property than a restaurant with a patio overlooking that pond. She was sure that the vegetation that he planted remained to some degree. She believed that the citizens of Orion Township deserve to experience the solemn beauty of the place. It would honor Tim if others could enjoy the environment he sought to create. She and the neighborhood have been expecting the antique car club to appear for a very long time now, they have no idea why it hasn't. As for the apartment density, she leaves that to the Zoning Board to sort out.

Mr. Ryan Soldan 4124 Calumet Dr., Oakland Twp., was there to support Scott Harris and his wife Amy. He has known Scott for over 15 years echoing some of the people that have spoken before him. Scott is a very passionate individual and anything he commits to is in it 110%. What he has seen and heard tonight about their plans and their development is very impressive. He is a big dog owner so his route is right there on Waldon and a Biggby would be awesome because he would go there and get his coffee and then take his dogs and life would be good.

Ms. Shirley Moran said that Scott Harris was her son, and Amy was her daughter-in-law. They live at 9257 Monica Dr., Davison, MI. They frequent their restaurant at least two times a month. They have to drive 40 minutes to get there but they appreciate the quality of the food. She is also a Naturopathic Doctor so the types of food that her family eats are very important to her. She appreciates going to a restaurant and she knows that the quality of the food is there, and it is what they say it is. It always tastes very good no matter what they eat. She thought that the addition of this restaurant would be a great addition to Lake Orion and for health reasons too.

Ms. Marcie Ramsey 335 Waldon Rd. said it was her understanding that the restaurant, the car club, and a coffee shop were already approved so it was just the four-family housing that was what this meeting was really about. She would really love to have the restaurant, the car club, and all of it approved as long as they can somehow get that traffic light in at Waldon and Lapeer because it is a traffic nightmare, pretty constant to get off Waldon onto Lapeer Rd. If there are accidents somewhere in the area, they take off and come back down Waldon Rd. and sometimes it is a mile backup. That is her only concern. She was concerned about the wildlife, but it sounded like that is kind of being addressed so she appreciated it.

Mr. Scott Harris 947 Watersmeet Dr., Oxford, MI stated that the thought that came to his mind was the conversation he had with his wife in late summer or early fall of 2015. He got a different rendition than a burnout on marketing, she was actually in a company where they lost two major accounts back-to-back and was caught up in a riff. They lost the Greek Town Casino account and the Blue Cross Michigan account. They had been talking about this restaurant concept for some time and her desire to do something special. They talked about creating this little brunch/breakfast spot where she would know everyone's name like Cheers, and it was a common conversation in their house. For those who know him, he was a former commercial banker turned insurance consultant, pretty conservative by nature. When she asked to turn this from something that they were just talking about to something that they actually might do the thing he told her was you don't start a restaurant or business because it would be cute or nice, you do it because there is a business need. Her due diligence literally went from the top of Oxford when the Palace was still standing to where the Palace was, and they did the same thing on Baldwin Rd. They got the menus from every single restaurant and evaluated them, dined in many of them, and determined that nobody was doing what she envisioned. Nobody was doing upscale in Lake Orion, so they started just two years into their marriage and blended family they said they are going to do this crazy restaurant thing. For those of you who have patronized her restaurant you know the rest of the story. It was a great business not because they made a lot of money because it was always a challenge for those who knew the location was at but because they put every ounce of everything into this restaurant in order to build something that helped the community. Fast forward to today, with the absence of her restaurant there is still no one doing what she and her team did, the way they did it. By this time division is even grander. For the same reasons that Honest to Goodness became a reality in May of 2016, they are hopeful that once again this will become a reality sometime around the summer of 2024. Just like there is a business case for Amy's Restaurant there is also a business case for all of the other components of this development. The car club, the Biggby, and the new luxury dwelling units, all have a need for a purpose that will provide value and benefit to his Lake Orion community. Hence, he enthusiastically supports this project and respectfully requests the Planning Commission to also share in his excitement by providing conceptual approval this evening.

Chairman Reynolds asked Secretary St. Henry to read the citizens that they received into the record.

Secretary St. Henry said they received a total of 10 letters, 6 were in favor of the development, and 4 were opposed. The residents that sent letters were Cheryl Querro, Michael Caldwell, Beverly Walton, Linda and Michael Seng, Amy Harris, Rilee Harris, Giselle Graham, Carlee Hass, and Jessica Williams. For those that supported the development, the overall general theme was how much they enjoy Sweet Amy's restaurant and recognizing the need for additional dining options in the community. Those that were against it had concerns about traffic and the size/footprint of the development. The applicant covered some of the statistical bullet points that came from Facebook. Amy Harris provided a letter that reiterated those in terms of general feedback that resulted from the Facebook postings: they had 494 overall like posts, 151 overall love posts, 8 overall wow faces, 1 sad face, 2 overall care faces emojis with hearts, 249 positive comments, 11 negative comments, 191 positive likes to the comments, 17 positive loves to the comments, 3 positive care to the comments, 8 negative likes to the comments, it was shared 27 times, and there were 6 individuals provide negative comments.

Chairman Reynolds turned it over to the Planning Commissioners for any comments or questions they would like to add during the public hearing portion of this evening. No comments.

Chairman Reynolds turned it over to the Board of Trustees.

Supervisor Barnett asked if there were any comments or questions from the Board of Trustees.

Trustee Flood said he thought people liked the restaurant. He counted 18 folks coming to that podium and 75% 12 out of 18 were good. Usually, they come to these, and they hear the opposite, displeasure, not pleasure. This is not their first rodeo on this parcel. Compared to what they had before he likes to see the open space and all that property along Waldon Rd. preserved, especially those pine trees. He liked the concept of not having an entrance on Waldon Rd. He understood the need for a traffic light, he had lived out here all his life and agreed it was not going to get any better. If they didn't have all the development to the north of them keep those people from northern Orion otherwise known as Oxford coming down through there, they would probably have a lot more space. The Planning Commission is going to have a lot of work to do; he has read all of the review letters from the Planner, OHM Engineering, and the Fire Marshal. He was very confident that the men and women that represent the Planning Commission would do their due diligence along with our consultants and go through this diligently. As has been previously stated in the past, someday somehow somewhere this property will be developed. The property owner has the right on private property to come forward to this body and go with (PUD), it is part of our ordinance, our zoning, and our Master Plan. Looking forward to the Planning Commission doing their due diligence and finding out what recommendation is to the Township Board.

Trustee Steele thanked everyone for coming. She always appreciates community involvement because that is what makes a good project a good project. She thanked the developer and felt they had been very diligent and patient. She asked regarding the community benefit and wanted to see if the water feature and the tree line features were just actually part of the green space and the water retention and not necessarily additional green space and water space. The safety path connection yes connects safety paths, but what is the actual contribution that they are making, in addition to what is already required for that development? She knew there was a gap on M24 because the land was never equaled out very well and so there is a big gap on M24 if that is what they were referring to. Height of the design, she knew that height was an issue on the other development and didn't know if they were in the guidelines of where it needed to be or if it higher than normal. She knew that single ownership was one of the criteria and it seemed to her there might be two or three, she wasn't sure how that was going to work. Regarding the drive-through use with the coffee, she asked if that was a Special Use, or if it is allowed because it is a (PUD). The price point of the apartments and to just verify that they are looking at the water drainage because she knew that had been an issue from day one. She asked if that back lot is back up for sale or is that a development that is going to come down at a different time.

Supervisor Barnett thanked everyone for coming. He said if he thought you ever wanted to have anything positive done, he is going to call Scott and Amy to run PR. He thought that this was a tough site, and they

knew the issues. When he reviewed the notes this afternoon from the last couple of times, they were in front of them and the notes he had was the main concerns were traffic, preservation of wetlands, and natural resources, the height, and the general fit of the building for the area, and the storm drainages came up over and over in that area. They have had lots of conversations to the credit of the Detroit Riverside Capitol, and they have been extremely diligent working with our consultants, OHM, and our team to try to do the best they could to take the feedback they received over the last few opportunities that they presented in front of them and put all that together. He thanked them because they don't always get that. A lot of times when people don't get their way, we get lawsuits and so thank you for not doing that. That doesn't always bode well for the Township, unfortunately. He agreed with what Trustee Flood said, he generally sits at these meetings because a lot of times this is the only time, they see some of them when something is going to be built in their backyard and they want to come to tell them how they feel about it. They want to see them but are happy to see them anytime. It is a challenge because as Trustee Flood said this is the busiest road in northern Oakland County, and it is not a park. He appreciated Mary Ann's comments because he didn't know the previous owner, but he got to know her 10 years ago when he was first running for this job. There is a lot of history on this site, he used to buy flowers there too. It was a very unique piece. People get very passionate about these things, they know it is not a park, and the Township doesn't own it, so unless they decide to do that it will never be a park. It is nice when they do have developers that do want to work with them and property owners as Dr. Canine to his credit have really come to them multiple times and asked what he thought the Township would want to see there. Not everyone is going to be happy with what goes on this corner, but he personally thinks this is a lot better than what they have seen in the past. He felt that they have addressed a lot of the issues that have been brought up by the people that live around there. The one thing that he told them all about is the traffic and the traffic lights. He and Jim Stevens from OHM met with MDOT the director of MDOT for their region a couple of months ago, on a few areas on Lapeer Rd. They are under their jurisdiction the Township owns no roads. Waldon is the Road Commission, but MDOT is the organization that they would work with on this project. He stated that they specifically asked about a light at this intersection, will they require it, and will they put the light in because there is a ton of traffic there. This is generally considered a small-scale development a drop in the ocean, and to require this developer to bear the cost of that traffic light which would be very costly is a challenge as well, probably making it a no go. They are working with MDOT and ultimately, they are going to be the ones what improvements will be required there. Their conversations with the developer have been really positive, and MDOT. Once MDOT reviews all of these things they will be able to make those determinations as to what improvements will be needed if any. There are lots of places that need traffic improvements. The challenge is they have no jurisdiction except they can sometimes be a squeaky enough wheel to force improvements. He thought it was great to see positive support. They worked a lot together on their first site, the food was amazing, parking was tough, and the location was you drove by it before you saw it, it was a tough spot for a restaurant. Obviously, they have a great following and great food. He did think it was the first time they had emojis read into the record. He explained that they will close their Board of Trustees public hearing and the three of them will leave. This is a multi-step process so he was sure he would be watching the rest of this meeting as well as his colleagues, but they were not leaving because they were not interested.

Chairman Reynolds said he wanted to address some of the comments from the petitioner. Supervisor Barnett talked a little bit about it, but can they just touch base on traffic mitigation, runoff, and drainage those were a couple of topics here, and then they have a few more.

Mr. Wayne said the traffic topic as the Supervisor outlined is an MDOT-controlled road. No one in this room has any authority on whether or not they could put a traffic light there. All they can be is the squeaky wheel. In this case, they might be the only wheel because absent of another development proposal that produces a traffic impact study and hands it to MDOT they are never going to look at this intersection. Really by proposing this and submitting this traffic study they are forcing them to identify the problem. What they decide to do about the problem is completely up to them. There are a lot of variables that they have to consider. There is a lot of traffic volume on Lapeer Rd. as they know. The idea of stopping it at a traffic light may not be their first reaction. Certainly, their job in this state is to ensure that they have drivable, functioning, hopefully, well-operating roads. They trust that they will do this for this project. As

far as their current process with them they have completed the TIS they have submitted to them, they have also submitted it to the Township. It didn't get fully reviewed before the meeting because they were late on the submission of that. What that traffic study basically says is that the existing conditions warrant a stop light at that intersection, today without their project warranting that stop light, it recommends the mitigation of that stop light. The determination on how or if that can happen is not theirs. They will certainly be the biggest cheerleader and be adequately working with MDOT to try to deliver that solution.

Mr. Wayne said regarding drainage the best way he can describe this is that the whole corner drains to that southeast corner of the site. If they drew a 45-degree line that hit that corner that basically is where all the flow of water is going. Notice none of the surrounding properties that have a concern about stormwater are in that flow, the water is flowing from the surrounding properties onto their site into the culvert that goes under M24. It would completely have to reverse stream and go in the opposite direction from the way that gravity is pulling it in order for the water to move in that direction. That is just a general concept, but on top of that of course they have to manage the stormwater from their site and make sure that despite any of their developments that it doesn't now all of a sudden go to a neighboring property and that is what their stormwater management system will do. That underground detention, they will go through the ordinance, and they are aware of what those requirements are. They briefly designed a system with their civil team. At this stage in the process, it is a little too early to get tremendously detailed about that. They understand it will be a thoroughly reviewed system and it will meet the ordinance. They have faith in satisfying that and eliminating stormwater concerns.

Mr. Wayne stated that there would be no connection to the adjoining 20-acre parcel and no intent to connect. There is a road on Waldon Rd. existing, it was an old service drive, and their plan calls for it to be turned into a pathway, so just a walking path, not a driveway, it will be eliminated there is no chance of a car coming by. He added as far as the fence he was not aware of where that was but will make himself aware of it and will make sure that they do what they can to mitigate that.

Mr. Wayne said as far as the apartment themselves and light pollution, one thing they have going for them just on their apartments themselves which of course is the furthest west is that because of the residential character they would have similar lighting to what a single-family home would have. It would likely have a couple of garage lights adjacent to the entry point of the garage, then a couple of lights along the front façade. They are not talking about huge parking lot lights lighting up a big sea of parking for the apartments. The commercial lights will be blocked from those houses by the apartments as they sit in between them but even still those lights will point in the direction of the light down to mitigate light pollution as much as possible, and that is also covered in the ordinance so they will achieve that.

Mr. Wayne stated as far as noise is concerned these are residential dwellings there are only 24 of them, he didn't think that they would create any kind of noise above and beyond what typical single-family homes would do, the garage door opens, and dog barking but that is about it.

Mr. Wayne said as far as ponds not remaining full as he had mentioned the water all does drain there. Not being a civil engineer himself he doesn't have a hypothesis as to why that is, but he understands the general flow is to that southeast corner.

Mr. Wayne stated regarding the outdoor car shows he can't speak for Dr. Canine he was sure he could answer that question but that is not an intent of the development, the goal is to be able to store the cars inside the structure and that is what the building is there for.

Chairman Reynolds asked about control and ownership. Mr. Wayne replied that the site is currently controlled solely by Dr. Canine. There are agreements that are formulated for each of their respective parties DRC, Scott, Amy, and Dr. Canine being one of them to purchase these individual parcels following the approval process, but for the sake of this application, the land is currently owned by one individual.

Chairman Reynolds closed the public hearing at 8:24⁴²⁶ p.m.

Roll call vote was as follows: Urbanowski, yes; Gingell, yes; Walker, yes; Brackon, yes; St. Henry, yes; Reynolds, yes. **Motion carried 6-0. (Gross absent)**

C. PC-22-39, Hudson Square Planned Unit Development (PUD) Concept Plan, located at 3030 S. Lapeer Rd. (Sidwell #09-26-101-021).

Chairman Reynolds asked for the consultants to read through their reviews.

Planner Pietsch read through his review date stamped received November 11, 2022.

Engineer Landis read through his review date stamped received November 9, 2022.

Chairman Reynolds said that the Fire Marshal did review the conceptual plans and had some concerns about some of the turnarounds.

Chairman Reynolds stated that there was a site walk completed by the Site Walk Committee from Vice-Chairman Gross. They have completed a site walk a few times on this parcel in the past. There was also a preliminary review from WRC.

Planner Gingell asked when they will have that traffic study to review. Engineer Landis replied that they should have their review completed within about a week to a week and a half.

Commissioner Walker said he wasn't sure if anyone on this dais or on the other dais is a more frequent patron of their restaurant than him. He wanted to disclose that right up front. He has no interest in their restaurant other than he really wanted them to make it happen. Anything negative he says up here has nothing to do with their restaurant or with Biggby Coffee. He did have some questions. His biggest concern is the traffic. He understands that they cannot control MDOT any more than they can. Every developer that comes before them says this, it is only going to be 26, 37, 48, more cars, whatever the number is. Southbound M24 in the morning and any time of the day now, north, and southbound M24 are hideous the traffic is terrible. That stop sign at Waldon and M24 is not sufficient. Something must be done, and he is not saying they can do it. To him, if there was a light there or a light coming out at the ingress or egress point of their development on M24 it would make him extremely happy. He thought that everybody would forget about a whole lot of other things if they could pull that off. He knew they couldn't do it, and the Township couldn't do it. That is his biggest concern. The next concern he had was water runoff, and he is not an engineer, but he is worried about the water runoff, especially with the stream configuration change. They indicated that all the water runs to the southeast quadrant of their development and then goes into a culvert that runs under M24. He asked if that was true. Mr. Wayne replied that when the Classic Car Club plans were approved it was approved that that stream would get rerouted basically into that 6-ft. culvert and that is where all the water flows naturally. There was already a permit from EGLE to relocate the stream, and they plan to copy the exact path of relocation and update the permit just to reflect the new design. The stream relocation has already been through the eyes of EGLE, and they deemed that this path is feasible.

Commissioner Walker said he was somewhat concerned about the lighting. They indicated that there are enough trees and things in the way that there is not going to be any input to the neighbors to the west. Mr. Wayne said the west portion of the site is where their residential is located and so those have modest lighting similar lighting to what a single-family home would have in terms of exterior façade lighting. The parking lot to the east would have more traditional parking lot lighting. His point was that the whole tree line on Waldon is going to remain part of

the nature preservation effort. From Waldon Rd.'s point of view, they will have the tree line completely blocking any lights in that parking lot. He added that the beauty of this site is there are some trees on property lines and in areas that are being preserved that stand 50-60 feet tall. Those trees will serve as a great natural buffer both for light and for the buildings themselves. Commissioner Walker asked if those trees are going to remain. Mr. Wayne replied yes, they haven't done a tree survey yet to tell you exactly which ones but there is a big line of trees on Waldon Rd., the intent is to preserve those trees, and then those other trees that are at the entry point and over by the wetland.

Commissioner Walker said the only other person who is a bigger tree hugger than he is, that he knows of is Mary Ann Ryan who was one of the people that spoke during public comment. She gave them their full endorsement.

Trustee Urbanowski said that Engineer Landis had said that the stream relocation will need wetland and or EGLE permits. Mr. Wayne said it was previously permitted for the conditional rezoning for the previously approved site plan. That same stream location design, basically the direction that it is moving is exactly what they copied on. The previous site plan was approved with that stream location, so they are going to take the same one and place it on this site plan.

Trustee Urbanowski asked if there were any changes because that came before the change in the Engineering Standards. Engineer Landis said that the stream relocation would not necessarily be impacted by the new standards. The new standards would be more towards promoting infiltration outside of the detention area. He didn't recall the previous site plan relocating that stream, he thought the stream was being enhanced in place, but he would have to look and see if he can find that.

Trustee Urbanowski stated that they have been here many times and she appreciated their tenacity and listening because there were three people that came up to speak tonight that had been here before for The Woodlands and they were not quite happy with that development. It sounds like they all are ok with the development now. Probably no small part to Sweet Amy's but she also thought it was the other parts too, the car club is something that people wanted before, it has been approved already and it is something she thought people were looking forward to. Then other people say the need for these apartments, which is something that they have discussed. Mary Ann's endorsements were huge, she was waiting to see what she was going to say.

Trustee Urbanowski questioned the turnaround and the Fire Department turnaround, a cult-de-sack or something. Mr. Wayne said there is a proposed turnaround area. He understood the concern of the turnaround configuration is that if cars were parked outside of that garage, it would block the firetruck from being able to pull all the way in. They do have a little space to the west so he spoke with their engineers about this previously and one concept was to extend those driveways further to the west so that it would provide a space where the car could still be parked in front of the garage without blocking part of the driveway that the firetruck would use. He didn't know if that was feasible yet because they are working through that, but the intent would be to basically configure that driveway in a way where it achieves the goal of the turnaround.

Chairman Reynolds said they are at the initial step of this process, concept, and eligibility plan. He did think that the proposal as they see it here tonight from previous proposals on the parcel or adjacent parcels is much improved from density impact and it does meet a lot of the criteria in their Master Plan from that missing housing component. He thought that was a great benefit. He stated that they heard a large outcry of support for Sweet Amy's and essentially the coffee shop. He thought that there were some positives there. He did think there are a number of

technical items that still need to be addressed. One of the things was the turnaround and talking about extending that. His concern was about some of the buffer and transitional zones between this property and the adjacent ones. Regarding the west, if they were to extend that then that essentially eliminates any natural buffer that is going to remain or any tree buffer that would be proposed, that was a concern of his. It also seemed like he is in support of the coffee shop, he thought it was great, he knew previously when they approved the conditional rezone with the asterisk of no drive-through that was in relation to traffic. His biggest concern right now would be that they ask for a 100-ft. setback to residential and it is significantly reduced here in this plan. The building is 52 feet from the driveway it looks around 30 feet. He felt that if there is indeed a hardship here because of some of the limitations of the natural features, he was in support of working with that but to just flat out just say it is 50-ft. without other measures being proposed and he thought that brings him back to the landscape discussion. It did get brought up this evening about proximity and they have had other projects here straight zoned that it is a special land use that is something they always talk about is sound, sound transfer, and traffic flow. He thought those were topics to consider in this plan. He would like to see that drive-through, he liked the orientation of the site, but can they shift some things down, can they start to make that buffer greater, if they are going to indeed decrease it? They are not speaking about what remains of the natural features of trees, they are talking about preservation. What does grading do to this? They know that they can love that tree but if they are bringing that grade up two feet that tree is never going to survive. That was a big topic for him to discuss and he would like some input on the proximity of the drive-through in relationship to the site.

Chairman Reynolds added that he knew they are talking round and round about the likelihood and the response and what the traffic study might bring them. One of their measures here about looking at a (PUD) is the detrimental impact on surrounding areas and felt that was an important piece for them to at least have a formal review on or response before they further deliberate no matter how positive they feel about this evening. It seemed like if that is something that they require of everyone else that should be some facts they have in front of them before they just say, yep, I agree, or hope that there isn't. Maybe there is something that they need to ask for in addition. Going back to the conditional rezoning of the past they said that asterisk because of the proximity to Waldon Rd. that it probably isn't going to get much better, but they also want to mitigate that risk moving forward with whatever proposed uses might be there. He was in support, but they are up there to do their due diligence.

Chairman Reynolds said he knew that there were some comments on reduced setbacks of some of the drives. The T-turnaround was another thing he wrote down. He would like to move forward no matter what condition, they must make sure the density fits. He thought that also the conditions also need to include that asterisk of making sure they are being smart with drainage and runoff on this parcel.

Chairman Reynolds said he would like some discussion on the drive-through area and the thoughts on preceding/not preceding without having their formal review of the traffic study that was submitted.

Trustee Urbanowski stated that the traffic continues to be the major issue that got brought up a lot. She thought that with all the positivity that has come from the changes she did agree that they must have the opportunity to fully review the traffic study. Also figuring out the turn-around for the firetrucks is important.

Chairman Reynolds said to be perfectly clear there are usually components and items that get to be worked through with future steps of this. He thought that where conditions come into the comment, they agree bigger picture, the final grading, and things that will come. If it is a huge make or break or it is not possible that maybe break their initial thoughts.

Secretary St. Henry said he thought that this concept development is much more appealing than what they have seen in the past. He did like the mixed-use nature of it. He thought that the four different components of this development provide benefits. The traffic is his biggest concern, it is good to see that they are not routing cars in and off Waldon. He lives off M24 and he knows what M24 is like, and they are seeing a lot of proposed developments up and down M24. It is bad, it is going to get bad plus with the other developments. Recognizing that this is a responsible well thought-out concept plan. In terms of the turnaround with the fire department, later in the process, it is his understanding that those things typically are figured out one way or another. He thought that the developer and everyone recognizes that fire access and so forth is critical to any development and felt they would figure that out. This is a much more appealing development concept than what they have seen in the past for this area.

Commissioner Walker asked if they still had the windmill. Mr. Wayne replied that the last time he was there the windmill was still there about a month ago. He jotted that down when that comment got made because if they could preserve and keep that water flowing.

Engineer Landis said regarding the stream relocation, the previous Classic Car Club site plan did show the stream relocation as included on this plan before them tonight.

Mr. Wayne said they mentioned a residential setback, does that have to do with the fact that the north property is zoned residential? Chairman Reynolds replied that the required setback to residential for a drive-through in a special land use is 100 feet. That is kind of the key criterion there. There is a 35-foot residential setback to the residential units, which is a deviation. He thought that seemed like they were scrunching that up close and without understanding other mitigation measures it is a concern. Mr. Wayne asked if that deviation from their own residential. Chairman Reynolds replied to the north adjacent property owners. Mr. Wayne asked if that parcel was zoned institution or commercial zoning, what would that setback be in that case. Chairman Reynolds believed that the setback was 50-ft. Mr. Wayne said the underline zoning is (R-2) the current use is the church, technically it is residential zoning practically speaking it is functioning as a commercial business or an institutional business he thought a 50-ft. requirement should be considered.

Mr. Wayne said they would certainly like to maximize it, the challenge they have is they are pushing from each end to try to fit all the pieces in with the necessary setbacks, and meeting all the ordinances that is a challenge every developer faces. These minor tweaks that they can make, he thought, could improve the overall orientation, and allow them to come closer to the setbacks. One specifically that he asked for feedback on is the extra 5 feet on the residential being 30 feet as opposed to 35 feet. That area behind those residences is intended to remain as natural and undisturbed as possible. Their intent was to provide a 30-ft. setback there, and their hope is that that is sufficient. Trustee Urbanowski asked if there was a deck or patio back there. Mr. Wayne said for the first-floor units the 200-ft. outdoor patios would be between the buildings.

Chairman Reynolds said it is not that he is not open to decreasing the setback it is what other measures are in place to mitigate that. They are lacking some landscaping here to just say they have just spoken to propose buffers between evergreens staggering between uses on the parcel. They are kind of saying it is going to be maintained or proposed but thought that was something that would help them come to those conclusions. At least to say that it is going to be a solid buffer or whatever it might have been.

Chairman Reynolds said just proceeding this evening without the formal review of the traffic study, in favor or not. It would have to be their next meeting, or it seems like it could be ready

by their next packet. He asked Engineer Landis if that was possible. Engineer Landis replied yes. Mr. Wayne said it will be ready and reviewed and he doesn't want to convey that he is diminishing the importance of it. It is going to say that the existing conditions warrant a traffic signal. It is going to analyze the warrant signals for that and describe how each of those is met. It is then going to look at background conditions that add to population growth for the next two years. Then it is going to look at the future conditions with their development built and will compare the signalization and the unsignalized. What it shows is that even with their project built and the addition of signalization the then traffic conditions will then be better than they are today without the site built. He would love to guarantee a light, but they don't know that yet. He thought in the Planning Commissions' eyes to consider how to manage that situation given that it is not this entity that controls that. Chairman Reynolds stated that he understood. He thought what was important to them was the traffic reviews and their process. It isn't so much about that that might change it is just the opportunity for their professional review of that. He understood and knew how to read a traffic study but at the same time, they have a process and a duty on these projects and this process. He stated that he wouldn't mark this plan substantially complete without that together. He didn't want to delay the process but at the same time, it is a pivotal piece to a (PUD).

Trustee Urbanowski agreed with Chairman Reynolds. She stated that the need to look at traffic. She agrees that they should not make any decision on it until they have all of the pieces of the puzzle. She asked what the hours of operation were for the car club and the restaurant. She asked what the capacity was for the restaurant, and how many patrons were they expecting. What is the average for a Biggby drive-through? Ms. Amy Harris replied that the restaurant seats about 100 people on the main floor, the patio seats about 30, and the mezzanine will potentially seat around 30. The hours of operation during the week for the restaurant would potentially be open 4 p.m. to 10 p.m. on Fridays 4 p.m. to 11 p.m. and Saturdays and Sundays they would be open for brunch. So probably 9 a.m. to 11 p.m. on Saturdays, and Sundays would probably be 9 a.m. to 3 p.m. or 4 p.m. Biggby, would be open from 6 a.m. till 8 p.m. most days of the week, maybe on Saturdays and Sundays a little bit earlier. Biggby would probably have a max of 20 seats in there. She added because of the road that is being developed there will not be that backup of traffic that they see on Lapeer Rd.

Dr. John Canine 1247 Lake Shore Blvd. said the current car club they have had three inside parties in seven years at the current location. The hours of operation are fully secured with cameras, and they give the car owners keys to the building, and security codes and they can come and go 24/7. He heard one of the comments about loud cars, they leave that to Joe Zimmer down at Culver's he can handle the car shows and he does a nice job with it, but they will not be having car shows like that. Chairman Reynold replied so a private-based use. Trustee Urbanowski said she wanted to get a general idea of when the traffic was going to be coming and going.

Moved by Trustee Urbanowski, seconded by Commissioner Walker, that the Planning Commission **postpones** action on PC-22-39, Planned Unit Development Concept and Eligibility plan, located at 3030 S. Lapeer Rd. (Sidwell #09-26-101-021) for plans date stamped received October 20, 2022, for the following reasons: they still have an outstanding report on the traffic study that they need to look at and digest; and T-turnaround for the Fire Departments' approval.

Discussion on the motion:

Secretary St. Henry asked when the applicant comes back before them after they have a chance to look at the traffic study, they will have an opportunity to make some changes to their concept plan. Chairman Reynolds replied that they are not encouraging necessarily another submittal it would be a review of what was submitted. If there are

going to be additional conditions or items that they bring forth for them to consider in addition to the submitted plans that would be the current thought. There wouldn't be time to recur and get resubmitted with time. Secretary St. Henry said that their plan is to come back quickly. Chairman Reynolds replied correct, with this plan with their reviews complete. If there were to be additional items that maybe meet or are discussion points, they could present that and they could say as presented. Secretary St. Henry said that was what he was getting at if they want to address any of these outstanding concerns no matter what it is if they think they can tweak the plan accordingly.

Mr. Wayne said he agreed with Chairman Reynolds that they would like to be back in two weeks, he will check with Tammy and Lynn just to see if they can be on that meeting. They would like to be back as soon as possible absent of another submission. If they are unable to be at the next meeting, then perhaps they would just resubmit and be on in two meetings from now with an updated plan and traffic study. Their preference is to come back as soon as they can.

Chairman Reynolds said if there are some thoughts and at least some of those items that they can clarify some additional information or as submitted he thought that would be helpful and that potentially mitigates some of the conditions that might be brought forth.

Mrs. Amy Harris said regarding the hours of the restaurant they will be closed on Mondays and Tuesdays; it will only be Wednesdays – Fridays they will open starting at 4 p.m.

Planning & Zoning Specialist Harrison asked if the Planning Commission would like to see revised plans back or not or if it is just the traffic study. Chairman Reynolds replied that they are seeking the postponement for the ability for the traffic study to come forth. They weren't asking for submitted plans, they were just asking if there were clarifications during a future presentation to address some of their concerns, they are appropriate with that, but they weren't trying to get into a whole revised plan at this point.

Roll call vote was as follows: Brackon, yes; St. Henry, yes; Urbanowski, yes; Gingell, yes; Walker, yes; Reynolds, yes. **Motion carried 6-0. (Gross absent)**

D. 2023 Planning Commission Meeting Dates

Chairman Reynolds said as always, they meet on the first and third Wednesday of each month beginning on January 4th and ending on December 20th. They want any dates potentially considered for review; they could talk about amending those if not they can adopt as presented.

Moved by Commissioner Gingell, seconded by Trustee Urbanowski, that the Planning Commission approve the 2023 PC Meeting Dates Resolution as presented and **forward it to the Board of Trustees for adoption.**

Roll call vote was as follows: Gingell, yes; Brackon, yes; St. Henry, yes; Urbanowski, yes; Walker, yes; Reynolds, yes. **Motion carried 6-0. (Gross absent)**