



10405 Merrill Road
P.O. Box 157
Hamburg, MI 48139
(810) 231-1000
www.hamburg.mi.us

PLANNING COMMISSION REGULAR MEETING

Wednesday, September 18, 2024 at 7:00 PM
Hamburg Township Hall Board Room

AGENDA

CALL TO ORDER

PLEDGE TO THE FLAG

APPROVAL OF THE AGENDA

APPROVAL OF MINUTES

1. Approval of the June 19, 2024 Planning Commission Minutes.

CALL TO THE PUBLIC

OLD BUSINESS

2. Final Site Plan Review (PPAM24-001): The Crossing at Lakelands Trail

NEW BUSINESS

ZONING ADMINISTRATOR'S REPORT

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Supervisor Pat Hohl Clerk Mike Dolan Treasurer Jason Negri Trustees Bill Hahn, Patricia Hughes, Chuck Menzies, Cindy Michniewicz

PLANNING COMMISSION MEETING

Wednesday, 6-19-2024 at 7:00 PM
Hamburg Township Hall Board Room

MINUTES

CALL TO ORDER

Commissioner Muir called the meeting to order at 7:00 pm.

PLEDGE TO THE FLAG

ROLL CALL OF THE BOARD:

1) **PRESENT:**

John Hamlin
Patricia Hughes
Victor Leabu Jr
Deborah Mariani
Ron Muir, Chair

2) **ABSENT:**

Jeff Muck
Joyce Priebe

APPROVAL OF MEETING AGENDA for tonight.

Approval Motion made by Commissioner Mariani, seconded by Commissioner Hughes, to approve the agenda as presented.

VOTE: MOTION CARRIED

APPROVAL OF THE MEETING MINUTES

Approval Motion made by Commissioner Hamlin, seconded by Commissioner Mariani, to approve May 15, 2024, Planning Commission Meeting Minutes with two corrections.

VOTE: MOTION CARRIED

CALL TO THE PUBLIC- No public response

OLD BUSINESS

None

NEW BUSINESS

- 1. Proposed text amendments (PZTA 24-0002)** to Zoning Ordinance Article 3, Section 36-429, Elderly Cottage Housing Opportunity (ECHO) Planned Unit Development.

Chair Muir opened and closed the public meeting for open comment for this line item. No one was present in the audience. Chair Muir opened the meeting to David Rohr for the overview of his staff report. Commissioner Hamlin, Leabu and David met a few months ago to discuss some changes that would be needed to this amendment. Then David brought it to the Planning Commission board meeting last month to ask each member to send David any proposed changes, questions or concerns before today's meeting. David shared that several members had emailed him, which he noted in his notes in red lined language in the document that everyone has. This was formerly referred to as an (ECHO) Elderly Cottage Housing Opportunity which has been reduced to a Cottage Housing Opportunity (CHO). David asked if this acronym name was something everyone was comfortable with? Commissioners Leabu, Hamlin, and Mariani agreed that "CHO" abbreviation was unnecessary. Commissioners Leabu and Hamlin agreed that "Cottage" referred to what this development truly is, and the term "Community" in its place would not. David confirmed that this amendment change would be called the "Cottage Housing Opportunity" without using an acronym. The VC would still contain the development term "Cottage Housing Planned Unit Development" that might be changed later by the PC, if needed. Everyone on the board agreed.

David then opened the meeting to the Planning Commission members for comments and questions. Commissioner Hughes asked for some clarification on the "Schedule of area, height and bulk regulations" table. She stated that she would like to see that the minimum setbacks around these type of developments within a parcel are kept at least 20 feet from any surrounding single-family homes in the vicinity, or perimeter setback of the whole development. These bulk minimum setbacks are based on one single home on an individual parcel, but we are working on a larger scale community where there aren't individual parcels or lots. Having a 10-foot rear and side lot setback doesn't make sense in this type of density development so the PC agreed that this should be removed. Commissioner Leabu asked Hamlin if the 10-foot overhang is included in this setback for a fire code requirement. Commissioner Hamlin wasn't sure. David clarified that our ordinance measures setbacks based on the foundation and not the roof drip lines. Commissioner Leabu mentioned that architecturally that the roof overhangs looks better and that we should require it, as well as fire separation. Fire trucks would not access between the homes to address fires. Hamlin and Leabu agreed that they should keep the 10 feet setback separation between each cottage in the development. Commissioner Hughes asked about the 15 feet from the street right of way, and the 5 feet setback for the "common access drive". Commissioner Leabu stated that the first one refers to the distance the whole development would be set back from the public or private road. The access drive would be the internal roads that connect the units within the development. David clarified that the private road right of ways cover both the roads coming into the development as well as the roads within the development. Commissioner Hughes and

Mariani stated that having only 5 feet between units in a development would allow vehicular traffic to pass too closely to the home and this might be unsafe. Commissioner Leabu mentioned that the PC worked to plan each unit in Regency Village with a two-vehicle parking area with narrow roads to reduce street parking. David stated that the PC doesn't have a good working definition for what a "common access road" is. He said that it is common to have 4-5 feet between lots for a driveway. The Planning Commission members discussed where parking should be allowed in such developments. Commissioner Leabu said he envisions these types of developments being like Regency Village with smaller homes. He asked David what the fire Marshall will require for the right of way. David said 66 ft. Leabu mentioned that our ordinance doesn't require such a wide right of way for private roads. The 66 feet is based on traffic and with reduced traffic the roads got narrower. Commissioner Hamlin said instead of putting 10 feet between structures, we should put "per building code" in the language incase anything ever changes in the future. David recommended that they stay with our zoning ordinance and require setbacks to be measured from the structure and not the roof overhangs. The PC agreed to get rid of the 5 feet from common access drives and 4 feet from all lot lines, while keeping the 15 feet setback from the private road right of way and 10 ft from structure to structure.

Commissioner Hughes asked for clarification on whether the PC would require such dense developments to be connected to available water and septic system service, if they are close. A septic system drain field would take up more room than the housing units so requiring connection to sewer would be needed. The PC members decided to strike line 12.

Approval motion made by Commissioner Hamlin, seconded by Commissioner Leabu, to approve the recommendation for approval of Section 36-429 Cottage Housing Opportunity Planned Unite Development. Changes to the Area, Height and Bulk Regulations:

1. Change under minimum setbacks, 10 feet from street or private road right of way. Eliminate 10 feet from the side and rear lot lines. Eliminate 5 feet from the common access drives. Eliminate 4 feet from all lot lines under common access drives. Remove the question mark and make 20 feet from the shared adjacent parcel lines.
2. Eliminate line 12 under Section 36-432 where a sewer septic system is required and is required previously.
3. Parking has to be located within the project.

VOTE: MOTION CARRIED

2. General discussion of PUD Regulation flexible standards.

Planning Commissioners discussed the PUD Regulatory flexible standards making recommendations to staff. Commissioner Hamlin began the discussion about recent site plan approvals and flexibility given by the Planning Commission. He asked for clarification on what standards the PC needed to uphold and which ones they could allow regulatory flexibility with. Hamlin asked why the townhouse project did not preserve some of the natural features onsite. David began by saying the reason that we have these PUDs in the Zoning Ordinance, and every municipality in Michigan use PUDs, is because it gives townships,

developers, residents and planners the ability to be flexible with developments. This regulatory flexibility is a give and take process of negotiating where allowed. David let Hamlin know that if the developer meets all our ordinance development standards, he checks them off and he is required to approve the development if it meets our ordinance. If he doesn't, then the case could be taken to the courts. The things that we are allowed to be flexible with things that can be seen and controlled on a site plan such as setbacks, buffers, and density. The last two projects have asked for modifications to the district requirements. The PC determines if these modifications seem reasonable and if those make the development better for the community or worse. During the conceptual and preliminary site plan review stages, the developer throws a lot of their ideas out there and changes their site plans to match what is recommended by the PC. This is part of regulatory flexibility while viewing if the development makes the master plan for the area.

Commissioner Leabu mentioned that if the PC doesn't like the rules, then they need to change them. David reminded the PC that they can allow for modifications on a PUD site plan or a formal waiver at the board level. The townhouse development asked for waivers from the landscaping buffer due to the narrowness of the parcel. Hamlin said that there was no discussion on the development preserving any of the natural features, and it would have benefited the community if the PC would have asked for reservation on the whole parcel being developed. David agreed with that.

Commissioner Hughes stated that she felt that recent projects did not reflect the master plan for the Village Center. She said that the original plans from seven years ago were more community friendly, but the recent submittals have grown more in density. David agreed that the plans did change from the past submittals, but the VC area has an identity crisis. Commissioner Muir said that we paid a great deal to have a marketing study to tell us where our shortcomings are. Making sewer available in the VC has supported increasing the density in the VC district, according to the master plan. Commissioner Leabu said it is expensive to develop in the VC because of the cost of sewer and water hookup. He wanted to work with these developers to ensure that they didn't leave like the others due to costs. The VC is zoned for over 2000 units. Commissioners Leabu and Hamlin agree that they need to be careful when they set precedence in the area of PUD developments. Everyone was happy for the chance for this discussion together.

3. Zoning Administrator's Report

No Planning Commission Meeting in July 2024.

The Apartments will be making some adjustments to their development plans, and back before the PC at the August 2024 Meeting.

In the Fall, David would like to put together a work plan for the 25-calendar year. Commissioner Hughes reminded the PC members that the Township will be closed on Fridays due to a implemented and approved 4, 10-hour work week starting on July 1, 2024.

Commissioner Leabu asked about the storage unit project and the existing debilitated building that is still standing onsite there. David let him know that we have received several complaints about that building. Now that we have the abandoned and dangerous building ordinance, we now have a mechanism to address this building. David let the PC members know that the self-storage building project permit has now expired. He was told that the road extension might have declined the builder's interest. David let the members know that he is working with the fire department on some of the decrepit buildings downtown.

ADJOURNMENT

Approval motion to adjourn at 8:28 pm, was made by Commissioner Hamlin and seconded by Commissioner Muir.

VOTE: MOTION CARRIED

Respectfully submitted,

Lisa Perschke

Planning/Zoning Coordinator & Recording Secretary

David Rohr

Planning & Zoning Director

The minutes were approved as presented/corrected: _____

Commissioner **Jeff Muck**, Chairperson

PHONE: 810-231-1000
FAX: 810-231-4295



P.O. Box 157
10405 Merrill Road
Hamburg, Michigan 48139-0157

To: Planning Commissioners
From: David Rohr
Hamburg Township
Township Planner
Date: September 18, 2024
Agenda Item:
Project Number: Final Site Plan Application for General Planned Unit
Development (PCPUD24-0001)
Project Location: Learning Ln. (15-25-400-048)
Owner: Michael Parliament/Alan Gottlieb
Applicant: Elevate Land Holdings, LLC

LOCATION:

The project is located on a 15-acre site south of E. M-36. The site is accessed by Learning Lane. The site is currently vacant.

PROJECT HISTORY:

Project PCPUD24-0001, Site Plan Application for General Planned Unit Development received conceptual site plan review from the Planning Commission on February 21, 2024. No formal action was taken at the meeting and the project was scheduled to be returned to the Planning Commission for formal preliminary site plan review.

The Planning Commission granted preliminary site plan approval on May 15, 2024. The Hamburg Township Board of Trustees granted preliminary site plan approval on June 4, 2024.

Location Map



PROJECT DESCRIPTION:

The proposed project will utilize the General Planned Unit Development (GPUD) regulations (Section 36-439). The proposed project proposes a 208-unit apartment complex with a club house. The complex will be located on old Hamburg Elementary Site. The subject property

consists of five existing parcels (15-25-200-056 (VC), 15-25-200-062(GI), 15-25-400-013 (VC), 15-25-400-042 (VC), and 15-25-101-084 (VR)) totaling 15.4 acres. The apartment complex will consist of 22 residential structures, 14 structures with 8 residential units and 15 structures with between 8-16 residential units; a community club house with offices, a gym, a community recreational room, and a pool.

GENERAL PLANNED UNIT DEVELOPMENT REVIEW PROCESS:

Sec. 36-447. - Final PUD site plan review.

(a) The applicant shall submit a final PUD site plan which contains all information required for site plan review under [section 36-73](#)(6) and approvals from all appropriate county, state and federal agencies, including, but not limited to, the county road commission, county drain commissioner, county health department and the Michigan Department of Transportation.

(b) The planning commission shall review the submitted final PUD site plan to ensure compliance with all standards and criteria of the Hamburg Township zoning ordinance, the master plan, village center master plan, and the Southeast Livingston County Greenways Plan where applicable. The planning commission then shall take action to recommend approval or denial of the final PUD site plan to the Township Board based upon compliance with the above referenced standards.

(c) Upon receipt of the report and recommendation of the planning commission, the Township Board shall review all findings. If the Township Board determines that approval would be appropriate, it shall work with the application and the Township Attorney to prepare a development agreement setting forth the conditions upon which such approval is based. Such conditions shall include, where appropriate, identification of the phases and timetable for development, and an estimate of the costs of implementing each phase.

(d) After approval by resolution of the Township Board, the development agreement shall be executed by the Township and the applicant and recorded in the county records. Approval shall be granted only upon the Township Board determining that all qualification requirements, conditions of approval, and provisions of this and other Township ordinances have been met, and that the proposed development will not adversely affect the public health, welfare and safety. Approval shall further be subjected to the condition that the contract will be properly recorded.

(e) Approval of a PUD site plan shall be effective upon recording the contract and filing proof of recording with the Township Clerk.

(f) Once an area has been included, within the boundaries of an approved PUD, no development may take place in the PUD except in accordance with the Township Board-approved PUD site plan.

(g) Prior to any development within the area involved, an approved PUD site plan may be terminated by the applicant or the applicant's successors or assigns, by filing with the Township

and recording in the county records an affidavit so stating. The approval of the plan shall terminate upon such recording.

(h) No approved plan shall be terminated after development commences except with the approval of the Township Board and of all parties having an equity interest in the land.

ZONING ORDINANCE REGULATIONS:

The subject site is located within the **Village Center (VC)** Zoning District. The zoning district regulations are listed below with the GPUD process allows flexibility to the required regulations. Table 1 summarizes the zoning regulations that apply for the proposed project:

Table 1 (Page 3 Site Plan)

SITE DATA			
EXISTING ZONING: GENERAL PLANNED UNIT DEVELOPMENT (GPUD)			
SITE AREA - 15.478 ACRES			
MAX. DWELLING UNITS PER ACRE (VC): 10 DU/CCRE			
NO. OF BUILDING ON SITE: 16			
NO. OF UNITS PROPOSED: 208			
DWELLING UNITS PER ACRE: 13.44 DU/CCRE (AMEND TO PUD AGREEMENT)			
BUILDING SETBACKS:	REQUIRED	PREVIOUSLY APPROVED	PROPOSED
FRONT (FROM PAVEMENT):	20'	15'	N/A
SIDE:	10'	15'	20' MIN.
REAR: TO PROPERTY LINE	25'	30'	20' MIN.
BUILDING TO BUILDING:	35'	N/A	N/A
BUILDING FRONT TO SIDE:	N/A	25'	N/A
BUILDING SIDE TO SIDE:	N/A	15'	N/A
MAXIMUM BUILDING HEIGHT:	35'	35'	35'
MAXIMUM BUILDING STORIES:	2.5 STORIES	2 STORIES	2 STORIES
MINIMUM FLOOR AREA:			
1 BEDROOM	550 S.F.	875 S.F.	815 S.F.
2 BEDROOMS	650 S.F.	1,100 S.F.	1,106 S.F.
3 BEDROOMS		N/A	1,435 S.F.
BUILDING COVERAGE:	50% MAX.	16%	16.8%
IMPERVIOUS AREA CALCULATION:	N/A	32%	37.85%
OPEN SPACE REQUIRED:			
1,500 S.F./ UNIT=1,500 x 208			
312,000 S.F. (7.16 AC.)			
OPEN SPACE PROVIDED:	44%	37%	42.56%
		6.03 AC.	6.41 AC.
PARKING REQUIRED: (1.5 SPACE/UNIT)			
1.5 x 208 = 312 SPACES			
PARKING PROPOSED: 409 SPACES			
(INCLUDING 10 B.F. SPACES)			
(1.966 SPACES/UNIT)			
		PREVIOUSLY APPROVED PLANS	CURRENT PLANS
SITE AREA		16.1 AC.	15.478 AC.
NO. OF BUILDING ON SITE:		23	16
NO. OF UNITS PROPOSED:		208	208
DWELLING UNITS PER ACRE:		12.91 DU/CCRE	13.44 DU/CCRE
BUILDING COVERAGE:		16%	15.8%
PAVED SURFACE PARKING AND ROADS CIRCULATION		32%	35.4%
OPEN SPACE:		37%	41.41%
PARKING PROVIDED:		406 SPACES (1.952 SPACES/UNIT)	409 SPACES (1.966 SPACES/UNIT)

Landscaping:
The final plan provides a tree planting plan. L-1, L-2, L-3, and L-4 provide detailed landscaping details for different sections of the development.

The landscaping plan does not note a continuous 20foot buffer and proposes a six-foot vinyl fence in areas abutting residential housing.

In the Zoning Regulations the Planning Commission may waive or reduce the buffer zone landscaping requirement if equivalent screening is provided by existing or planned parks, parkways, recreation areas, or by existing woodlands on the lot, and topographic or other natural conditions. Existing quality trees (hickory, oak, maple, ash) with a caliper at least eight inches shall count as two trees toward the above requirements.

Because this project is a General Planned Unit Development the landscape requirements can be set by the Development Agreement as part of the Planned Unit Development process and the Planning Commission does not need to officially waive the landscaping requirements.

Lighting:

In the Village Center area, A consistent type of pedestrian scale ornamental lighting shall be provided along all sidewalks, within any off-street parking lots and along road frontages.

Suggested Condition 1:
A lighting plan that should include additional pedestrian scale lighting in the common areas between buildings.

Signs:
Sign details were submitted. Proposed signage should be provided as a part of the final site plan review and shall meet the requirements of the zoning regulations.

<p>Sidewalks/pedestrian circulation.</p> <ol style="list-style-type: none">1. Site design shall demonstrate a special sensitivity to pedestrian circulation and safety.2. Sidewalks at least five feet wide and at least seven feet wide where abutting parking shall be provided along public streets and private roads; bike paths shall be required in locations designated in the Hamburg Village master plan or to provide linkages with existing or planned bikepaths.3. All developments shall provide pedestrian linkages between public	<p>✓</p> <p>✓</p>
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<p style="text-align: center;">sidewalks and the building entrances.</p> <p>Staff Analysis: The sidewalk system within the development has been designed to provide good pedestrian access within the site and to Hamburg Rd.</p>	<p>✓</p>
<p>Architecture.</p> <ol style="list-style-type: none"> 1. Buildings shall possess architectural variety but enhance the overall cohesive and historic village character. ✓ 2. Building architecture shall meet the standards of section 36-73(7). ✓ 3. The first floor of front facades shall include at least 30 percent windows. The approximate size, shape, orientation and spacing shall match that of buildings on adjacent lots. ✓ 4. The mass and proportion of structures shall be similar to structures on adjacent lots and on the opposite side of the street. Larger buildings may be broken-up with varying building lines and rooflines to provide a series of smaller scale sections which are individually similar in mass and proportion to surrounding structures. ✓ 5. Buildings located on corner lots shall provide distinct and prominent architectural features or site elements which reflect the importance of the building's corner location and creates a positive visual landmark. An entry feature or site landmark shall be required at corners designated for such a feature in the Hamburg Village master plan. The architectural feature or site element shall be subject to planning commission approval. ✓ 	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
<p>GPUD Requirements:</p> <ol style="list-style-type: none"> A. Location. A GPUD shall only be created on development sites within the Township which have a portion of the property located within the Neighborhood Service (NS), Community Service (CS), Mixed Use Development (MD), Village Residential (VR), or Village Center (VC) zoning districts. ✓ B. Size. A GPUD shall only be created on development sites one (1) acre in area or greater. ✓ C. Permitted Uses. <ol style="list-style-type: none"> 1. Uses that are listed as Permitted Uses or Special Uses in the underlying zoning district or uses identified in the underlying future land use category of the Township Master Plans may be permitted in a GPUD development. 	<p>✓</p> <p>✓</p>

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Planned Unit Development Project Standards (Section 36-442)

In considering any application for approval of any Planned Unit Development community site plan, the Planning Commission shall make their determinations on the basis of the standards for site plan approval set forth in Article 3 of this chapter, as well as the following standards and requirements:

(1)

A GPUD shall promote the goals and objectives of the Township master plan, and village center master plan. Including the intent and guidelines related to site design as stated in the transportation section of the master plan, and the village design chapter of the Hamburg Township village center master plan, where applicable. Along with other appropriate site design standards, guidelines, and principles, the following site development elements shall also be reviewed for consistency with the applicable guidelines of the master plan and the village center master plan:

- a. Sidewalks/pedestrian circulation.
- b. Parking/loading areas.
- c. Architecture.
- d. Signs.
- e. Street and access design.
- f. Lighting.
- g. Landscaping.

This project has been designed to comply with the Village Center Master Plan. The future land use designation of the subject site is Village Core along M-36.

(2)

A GPUD shall result in a higher quality of development than could be achieved under conventional zoning.

The common open space areas, private amenities and the extensive sidewalk connections will make this development a very desirable location for area residents and will result in a higher quality of development than could be achieved otherwise.

(3)

A GPUD shall not be created in situations where the same land use objectives can be accomplished by the application of conventional zoning provisions or standards without the need for variances.

The developer is requesting an increase in density.

(4)

A GPUD may be created only when the proposed land use will not add public service and facility loads beyond those contemplated in the master plan or other applicable plans or policies of the Township unless the applicant can demonstrate to the sole satisfaction of the Township Board that such added loads will be accommodated or mitigated by the proponent as part of the GPUD or by some other means deemed acceptable to the Township Board.

The proposed GPUD will add additional public service and facility loads envisioned by the Village center master plan. The Township Board should confirm this in the final site plan review.

(5)

Creation of a GPUD shall establish land use patterns which are compatible with and protect existing or planned use. The use of the GPUD option shall not be for the purpose of avoiding applicable zoning requirements of the underlying zoning district.

The proposed project is a General Planned Unit Development (GPUD). The proposed project meets most of the regulations of the zoning district.

The Hamburg Township zoning ordinance states that the intent of the GPUD is to

- Permit private development which is substantially in accordance with the goals and objectives of the Township Master Plan which and the Township Village Center Master Plan.
- Permit regulatory flexibility to achieve development that comply with the Township's Master Plans in order to achieve economy and efficiency in the use of land, natural resources, energy and in the provision of public services and utilities; to encourage the creation of useful open space particularly suited to the proposed development and parcel on which it is located; and to provide appropriate housing, employment, services and shopping opportunities to satisfy the needs of residents of the Township of Hamburg.

The GPUD should be laid out so that proposed uses, buildings, and site improvements relate to each other and to adjoining existing and planned uses in such a way that they will be compatible, with no material adverse impact of one use on another.

It appears that the proposed project will meet the intent of the GPUD. By allowing this project some slight regulatory flexibility, the proposed development will be compatible with the Master Plan, provided needed multi-unit housing within the village area, achieve the efficient use of the land, and will provide important pedestrian connections and amenities in the village area.

(6)

A GPUD shall not be allowed solely as a means of increasing the density or intensity of development.

The density of the project will increase. However, the development will provide additional amenities for residents.

(7)

A GPUD shall improve the appearance of the Township through quality building design and site development, the provision of trees and landscaping consistent with or beyond minimum requirements; the preservation of unique and/or historic sites or structures; and the provision of open space or other desirable features of a site beyond minimum requirements.

The design of this project will improve the appearance of the Township and will provide needed connection through the site to the surrounding community., The proposed for-rent apartments will provide the Village area with a much-needed housing alternative to the existing single-family housing within the Village.

Standards for Site Plan Review (Section 36-73).

Compliance with the standards of this section are required as a part of the final Site Plan review. Staff has included these standards into the review of the preliminary site plan to make sure that if the preliminary site plan review is approved the applicant is aware that the project will need to meet the requirement of this section once all the required information is submitted for final site plan review. In the review of all site plans, the Zoning Administrator and the Planning Commission shall endeavor to assure the following:

a. The proposed development conforms to all provisions of this chapter.

The proposed development has been designed to meet all the required site plan review requirements.

b. All required information has been provided.

The application is for the final site plan for the GPUD. It appears that the applicant has submitted adequate information for the planning commission review of the preliminary site plan for the proposed GPUD project. All required information under section 36-73 and as to address the initial comments from the different agencies and reviewing bodies will be required prior to final site plan review.

c. The movement of vehicular and pedestrian traffic within the site and in relation to access streets and sidewalks will be safe and convenient.

The Township fire district and township engineer has reviewed the roadway and sidewalk layout of the project.

MDOT approvals will also be required prior to issuance of a zoning permit for this project.

d. The proposed development will be harmonious with existing and future uses in the immediate area and the community.

The development will be harmonious with existing and future uses.

- e. **The proposed development provides the necessary infrastructure improvements, such as roads, drainage, pedestrian facilities and utilities, to serve the site, and be adequately coordinated with the current and future use of adjacent properties.**
Please see engineering comments attached.

- f. **The applicable requirements of Township, county and state agencies are met regarding grading and surface drainage and for the design and construction of storm sewers, stormwater holding facilities, water mains, and sanitary sewers.**
See comments in item e above. The plans submitted as a part of the final site plan review will address the Township Engineers initial comments and will provide greater details on the drainage, the design and construction of storm sewers, stormwater holding facilities, water mains, and sanitary sewers.

- g. **Natural resources will be preserved to the maximum extent possible in the site design by developing in a manner which will not detrimentally affect or destroy natural features such as lakes, ponds, streams, wetlands, steep slopes, and woodlands.**
There are not any lakes, ponds, streams, wetlands, or steep slopes on the site. The site is vacant cleared land.

- h. **The proposed development shall respect the natural topography to the maximum extent possible by minimizing the amount of cutting, filling, and grading required.**
A detailed grading plan has been submitted. The subject property is relatively flat and the location of the improvements on the site have been placed on the areas with the least slope.

- i. **The proposed development will not cause soil erosion or sedimentation.**
Prior to issuance of a building permit for this project the Livingston County Drainage Commission will require approval of a soil erosion and sedimentation plan that meets the local and state requirements.

- j. **Landscaping, including trees, shrubs and other vegetative material is provided to maintain, improve and/or restore the aesthetic quality of the site.**
A detailed landscape plan has been provided as a part of the GPUD final site plan review.

- k. **Conformance to the adopted Hamburg Township Engineering and design standards.**
 - b. Please see engineering comments attached.

- a. **All proposed commercial, office, industrial, institutional and multiple-family development shall utilize quality architecture to ensure that buildings are compatible with surrounding uses, protect the investment of adjacent landowners, blend harmoniously into the streetscape and meet the objectives the Township master plan. New buildings, additions and renovations shall be designed to preserve or complement the design character of existing development, provide visual harmony between old and new buildings, and create a positive image for the Township's various commercial shopping nodes. Commercial, office, industrial, institutional and multiple-family architecture shall be reviewed by the planning commission under the following criteria:**

- 1. Buildings shall front towards and relate to the public street. Buildings shall be located to create a defined streetscape through uniform setbacks and proper relationship to adjacent structures. Proper relationship to existing structures in the area shall be maintained through building mass, proportion, scale, roofline shapes and rhythm. Buildings within the area designated on the master plan and Village Center master plan as the "Hamburg Village" shall be compatible with the historic character of the unincorporated place commonly referred to as the "Old Hamburg Village."**
- 2. Building materials and colors shall relate well and be harmonious with the surrounding area. Roof shape and materials shall be architecturally compatible with adjacent buildings and enhance the predominant streetscape. For any side of a principal building facing a public or private street, at least 50 percent of the facade shall be constructed of, or covered with, the following materials:**
 - 1. Brick;**
 - 2. Fluted or scored concrete block;**
 - 3. Cut stone;**
 - 4. Vinyl siding;**
 - 5. Wood siding;**
 - 6. Glass; or**
 - 7. Other materials similar to the above as determined by the planning commission.**
- 3. Buildings shall possess architectural variety, but enhance the overall cohesive community character. Buildings shall provide architectural features, details and ornaments such as archways, colonnades, towers, cornices or peaked rooflines.**
- 4. Building walls over 100 feet in length shall be broken up with a combination of the following: varying building lines, windows, architectural accents and trees.**
- 5. Building entrances shall utilize windows, canopies and awnings; provide unity of scale, texture, and color; and provide a sense of place.**
- 6. Where the rear facade of a building will be visible from a residential zoning district, or the rear of the site will be used for public access or parking, such rear facade shall be constructed to a finished quality comparable to the front facade.**
- 7. Signs, landscaping, lighting and other site elements shall be coordinated and compatible with the building design, as well as harmonious with other nearby developments. Developments shall provide site features such as decorative entry signs, ornamental lighting, pedestrian plazas and/or pedestrian furniture.**

The proposed layout and structures on the site have been designed to be compatible with the village character of the ‘Old Hamburg Village’ and to comply with the Village Center Master Plan.

RECOMMENDATIONS:

The Planning Commission should review and discuss the final GPUD site plan application, the submitted materials including the project plans, the staff report, and any information presented at the public meeting; and either recommend approval or denial of the preliminary site plan for the GPUD to the Township Board.

Example Approval Motion:

The Planning Commission recommends approval of the final GPUD site plan, as shown on project plan (Exhibit A) , to the Township Board because the project as conditioned it is consistent with the requirements of the General Planned Unit Development regulations and will be able to meet site plan review standards of the zoning ordinance as discussed at the meeting tonight and presented in the staff report with the following conditioned of approval:

Suggested Condition 1:

The lighting plan should include pedestrian scale lighting in the park to allow safe pedestrian access.

Suggested Condition 2:

Prior to the issuance of a land use permit, all appropriate approvals from local, county, state, and federal agencies, including, but not limited to, Hamburg Township Fire, Accessor, and Public Works Departments, the Livingston County Road Commission, Drain Commissioner, and Health Department; and the Michigan Department of Environment, Great Lakes and Energy and Transportation shall be received.

Suggested Condition 3:

A development agreement including master deeds and bylaws will be submitted for this project. This agreement will be reviewed by the Township Attorney. This agreement shall include a cross access agreement that allows public use of the private roadways, sidewalks and parks within the project.

Next Steps:

If the Planning Commission recommends approval of the final GPUD site plan, the Township Board shall consider the Planning Commission recommendation and shall take action to approve, deny or remand the site plan back to the Planning Commission for further review.

Upon receipt of the report and recommendation of the Planning Commission, the Township Board shall review all findings. If the Township Board determines that approval would be appropriate, it shall instruct the Applicant to work with the Township Attorney to prepare a development agreement setting forth the conditions upon which such approval is based. Such conditions shall include, where appropriate, identification of the phases and timetable for development, and an estimate of the costs of implementing each phase.

After approval by resolution of the Township Board, the Development Agreement shall be executed by the Township and the applicant and recorded in the County records. Approval shall be granted only upon the Township Board determining that all qualification requirements, conditions of approval, and provisions of this and other Township Ordinances have been met, and that the proposed development will not adversely affect the public health, welfare and safety. Approval shall further be subjected to the condition that the contract will be properly recorded.

Exhibits:

Exhibit A: Project Application.

Exhibit B: Final GPUD site plan and other project plans.

Exhibit D: Hamburg Township Fire Department Initial Review

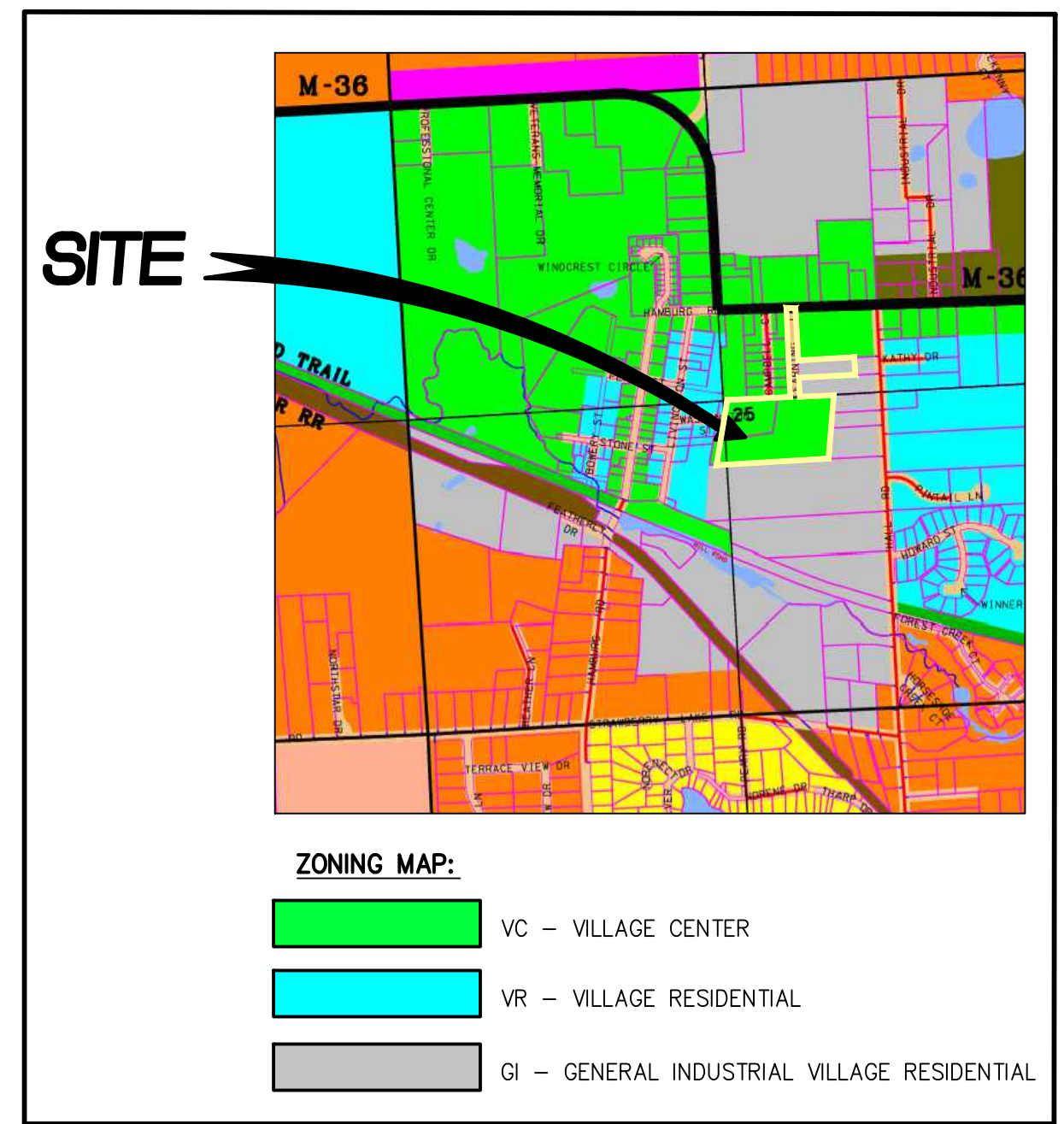
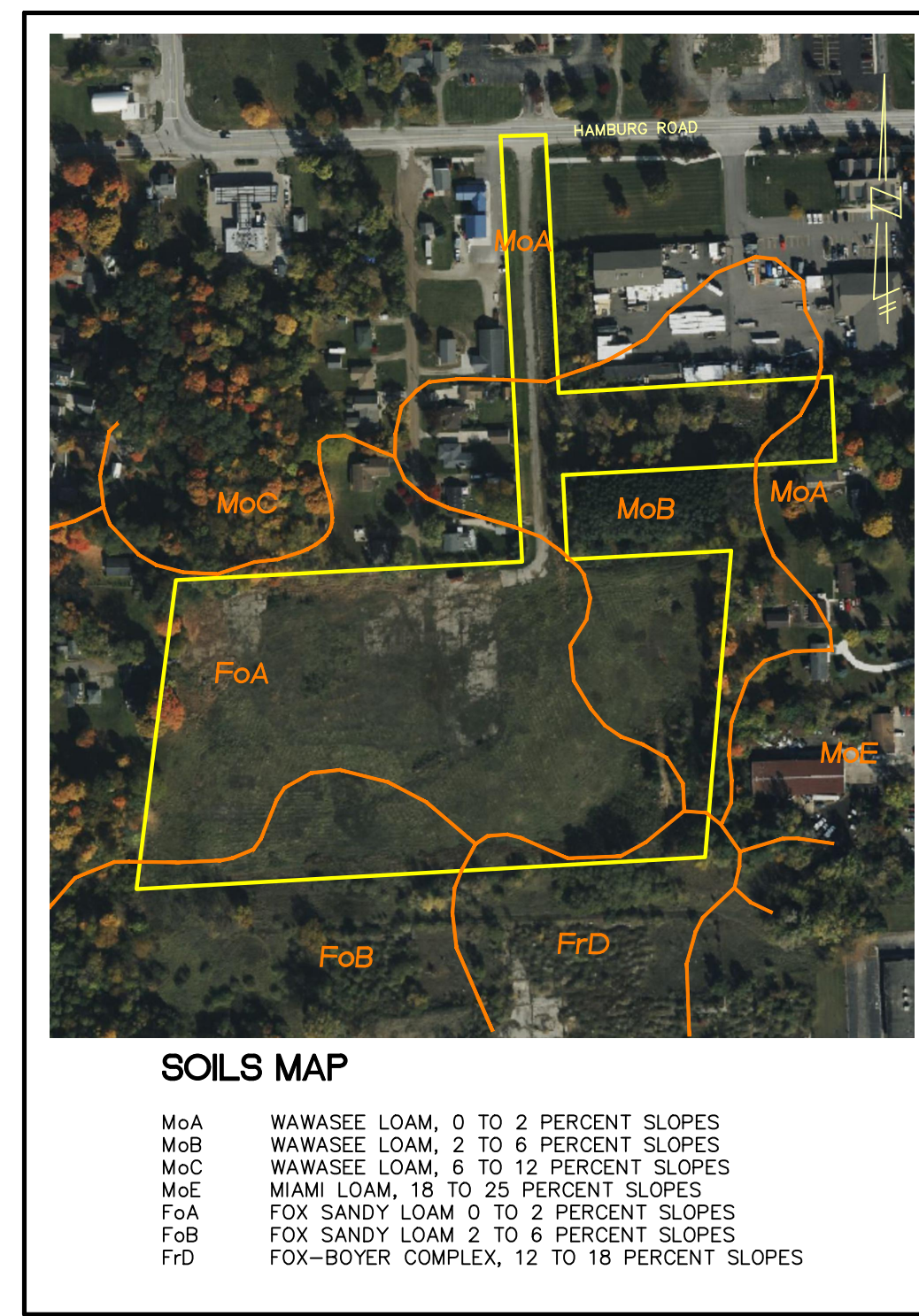
Exhibit E: Hamburg Township Engineering Consultant Initial Review

Exhibit F: Township Board Meeting Minutes

PRELIMINARY SITE PLANS FOR: **THE CROSSING AT LAKELANDS TRAIL**

PART OF E. 1/2 OF SECTION 25, TOWN 1 NORTH, RANGE 5 EAST
HAMBURG TWP., LIVINGSTON COUNTY, MICHIGAN

PREPARED FOR:
ELEVATE LAND HOLDINGS - THE CROSSING
128 N. CENTER STREET
NORTHVILLE, MICHIGAN 48167
248.344.1885



SHEET INDEX

ENGINEERING PLANS:

- COVER SHEET
- PREVIOUSLY APPROVED OPEN SPACE PLAN
- OVERALL PLAN AND OPEN SPACE PLAN
- UTILITIES PLAN
- GRADING PLAN
- GRADING PLAN
- GRADING PLAN
- STORM WATER MANAGEMENT PLAN

LANDSCAPE PLANS:

- LANDSCAPE PLAN
- LANDSCAPE PLAN
- LANDSCAPE PLAN
- LANDSCAPE DETAILS

ARCHITECTURAL PLANS PREPARED BY:
TK DESIGN & ASSOCIATES
26030 PONTIAC TRAIL
SOUTH LYON, MICHIGAN, 48178
PHONE: 248.446.1960

LANDSCAPE PLANS PROVIDED BY:
ALLEN DESIGN
557 CARPENTER
NORTHVILLE, MICHIGAN 48167
PHONE: 248.467.4668

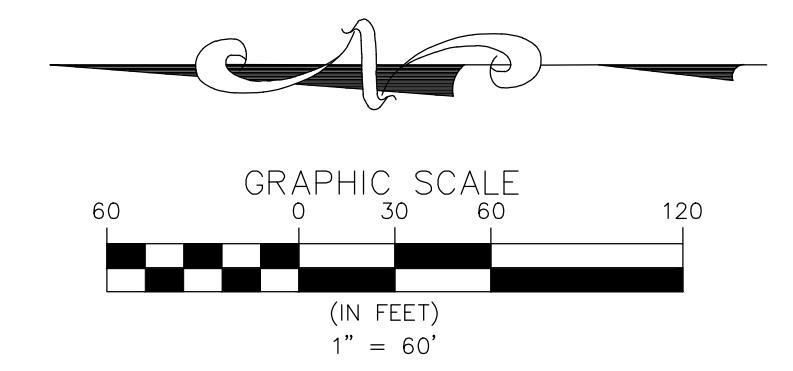
TOPOGRAPHIC SURVEY PREPARED BY:
M. E. G. A.
298 VETERANS DRIVE
FOWLerville, MICHIGAN, 48836
PHONE: 517.223.3512

**SKL SEIBER KEAST LEHNER
ENGINEERING | SURVEYING**

CLINTON TOWNSHIP OFFICE
17001 NINETEEN MILE ROAD, SUITE 3
CLINTON TOWNSHIP, MI 48038
586.412.7050

FARMINGTON HILLS OFFICE
39205 COUNTRY CLUB DRIVE, SUITE C8
FARMINGTON HILLS, MI 48331
248.308.3331

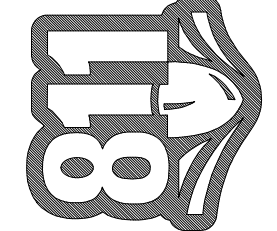
REVISIONS			ENGINEER'S SEAL
NO.	ITEM	DATE	
1.	PRE-APP SUBMITTAL	4-22-24	
2.	SUBMIT TO HAMBURG TWP.	8-16-24	
DATE: 1-5-2024 DESIGNED BY: A.A. CHECKED BY: C.S.			JOB NUMBER: 23-299 DRAWING FILE: 1-23289-CV.dwg

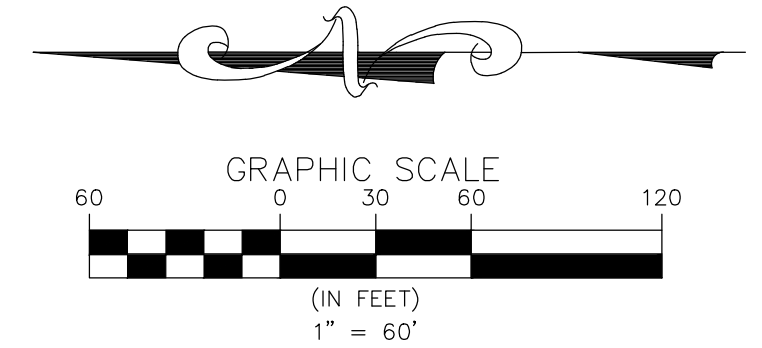


PER PREVIOUSLY APPROVED PLANS
 PREPARED BY M.E.G.A. ENGINEERING
 DATED: 8-30-2022

OPEN SPACE REQUIRED:
 1,500 S.F./ UNIT=1,500 x 208
 312,000 S.F. (7.16 AC.) 44% OF SITE AREA (16.1 AC.)

OPEN SPACE PROVIDED:
 262,684 S.F. (6.03 AC.) 37% OF SITE AREA (16.1 AC.)

PAGE No.: 2	PROJECT NAME: THE CROSSING AT LAKELANDS TRAIL PART OF E. 1/2 OF SEC. 25, T.1N., R.5E., HAMBURG TWP., LIVINGSTON COUNTY, MI	CLIENT INFO: ELEVATE LAND HOLDINGS- THE CROSSING 128 N. CENTER STREET NORTHVILLE, MI 48167 248.344.1885	 <p>3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 TOLL FREE FOR THE LOCATION OF UNDERGROUND FACILITIES</p>
SHEET TITLE: PREVIOUSLY APPROVED SITE PLAN - OPEN SPACE			



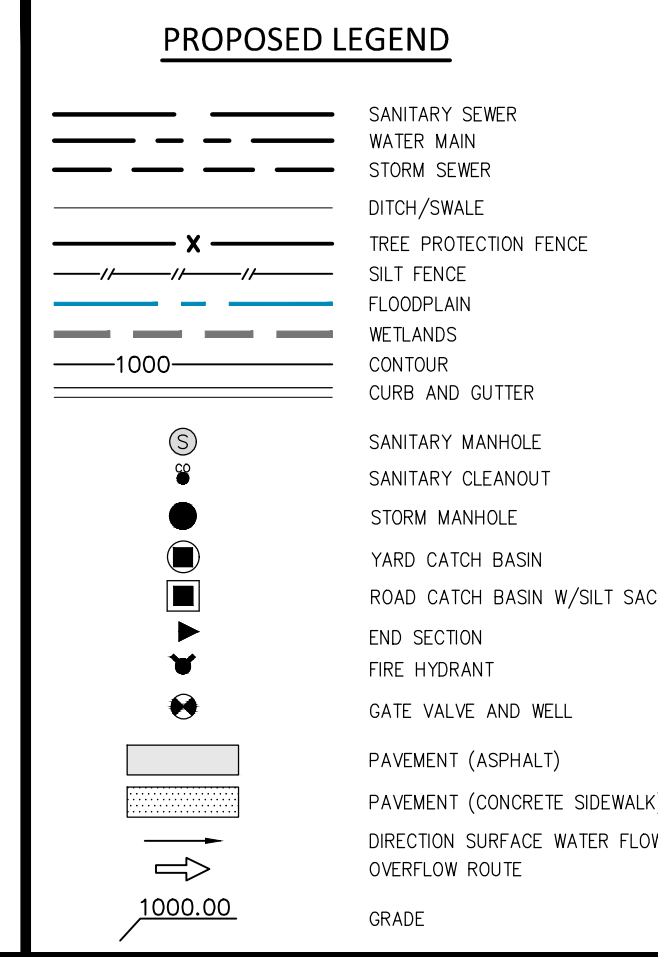
BUILDING TYPE	1BR	2BR	3BR	TOTAL UNITS PER BLDG TYPE	TOTAL B/R PER BLDG TYPE	NO OF BLDGS	TOTAL B/R ALL BLDG TYPE
77' VD	4	4	0	8	12	4	48
154' VD	10	4	2	16	24	6	144
167' VD	6	8	2	16	28	5	140
1BR/UNITS	106	51%				15	332
2BR/UNITS	80	38%					
3BR/UNITS	22	11%					
	208	100%					

SITE DATA
 EXISTING ZONING: GENERAL PLANNED UNIT DEVELOPMENT (GPUD)
 SITE AREA = 15.478 ACRES
 MAX. DWELLING UNITS PER ACRE (VC): 10 DU/CCRE
 NO. OF BUILDING ON SITE: 16
 NO. OF UNITS PROPOSED: 208
 DWELLING UNITS PER ACRE: 13.44 DU/CCRE (AMEND TO PUD AGREEMENT)

BUILDING SETBACKS:	REQUIRED	PREVIOUSLY APPROVED	PROPOSED
FRONT (FROM PAVEMENT):	20'	15'	N/A
SIDE:	10'	15'	20' MIN.
REAR: TO PROPERTY LINE	25'	30'	20' MIN.
BUILDING TO BUILDING:	35'	N/A	N/A
BUILDING FRONT TO SIDE:	N/A	25'	N/A
BUILDING SIDE TO SIDE:	N/A	15'	N/A
MAXIMUM BUILDING HEIGHT:	35'	35'	35'
MAXIMUM BUILDING STORIES:	2.5 STORIES	2 STORIES	2 STORIES
MINIMUM FLOOR AREA:			
1 BEDROOM	550 S.F.	875 S.F.	815 S.F.
2 BEDROOMS	650 S.F.	1,100 S.F.	1,106 S.F.
3 BEDROOMS			1,435 S.F.
BUILDING COVERAGE:	50% MAX.	16%	16.8%
IMPERVIOUS AREA CALCULATION:	N/A	32%	37.85%
OPEN SPACE REQUIRED:			
1,500 S.F./UNIT=1,500 x 208			
312,000 S.F. (7.16 AC.)	44%	37%	42.56%
OPEN SPACE PROVIDED:		6.03 AC.	6.41 AC.
PARKING REQUIRED: (1.5 SPACE/UNIT)			
1.5 x 208 =		312 SPACES	
PARKING PROVIDED: 409 SPACES (INCLUDING 10 B.F. SPACES)			
(1,966 SPACES/UNIT)			

	PREVIOUSLY APPROVED PLANS	CURRENT PLANS
SITE AREA	16.1 AC.	15.478 AC.
NO. OF BUILDING ON SITE:	23	16
NO. OF UNITS PROPOSED:	208	208
DWELLING UNITS PER ACRE:	12.91 DU/CCRE	13.44 DU/CCRE
BUILDING COVERAGE:	16%	15.8%
PAVED SURFACE PARKING AND ROADS CIRCULATION	32%	35.4%
OPEN SPACE:	37%	41.41%
PARKING PROVIDED:	406 SPACES (1,952 SPACES/UNIT)	409 SPACES (1,966 SPACES/UNIT)

SEE LANDSCAPE PLANS FOR SCREENING WALL DETAILS



NO.	REVISIONS	DESCRIPTION	DATE
1.	REV. LAYOUT PER HAMBURG TWP. REVIEW		4-22-24
2.	REV. ISLAND, ADD VINYL FENCE		6-26-24
3.	SUBMIT TO HAMBURG TWP.		8-16-24

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 CALL MISS DIG
 1-800-482-7171
 TOLL FREE FOR THE LOCATION OF UNDERGROUND UTILITIES

PROJECT NUMBER:
PROJECT MANAGER:
DRAWN BY:
CHECKED BY:
DATE:
OFFICE:

CLIENT INFO:
 ELEVATE LAND HOLDINGS-
 THE CROSSING TRAIL
 128 N. CENTER STREET
 NORTHVILLE, MI 48167
 248.344.1885

PROJECT NAME:
 THE CROSSING AT
 LAKELANDS TRAIL
 PART OF E. 1/2 OF SEC. 25, T.1N., R.5E.,
 HAMBURG TWP., LIVINGSTON COUNTY, MI

SHEET TITLE:
 OVERALL PLAN AND
 OPN SPACE PLAN

PAGE No.:
 3

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PROPOSED LEGEND

	SANITARY SEWER
	WATER MAIN
	STORM SEWER
	DITCH/SWALE
	TREE PROTECTION FENCE
	SILT FENCE
	FLOODPLAIN
	WETLANDS
	CONTOUR
	CURB AND GUTTER
	SANITARY MANHOLE
	SANITARY CLEANOUT
	STORM MANHOLE
	YARD CATCH BASIN
	ROAD CATCH BASIN W/SILT SAC
	END SECTION
	FIRE HYDRANT
	GATE VALVE AND WELL
	PAVEMENT (ASPHALT)
	PAVEMENT (CONCRETE SIDEWALK)
	DIRECTION SURFACE WATER FLOW
	OVERFLOW ROUTE
	GRADE

CLIENT INFO:
 ELEVATE LAND HOLDINGS—
 THE CROSSING
 128 N. CENTER STREET
 NORTHVILLE, MI 48167
 248.344.1885

PROJECT NAME:
 THE CROSSING AT
 LAKELANDS TRAIL

SHEET TITLE:
 UTILITIES PLAN

PAGE No.:
 4

PROJECT NUMBER:
 PROJECT MANAGER:
 B. EMERINE
 DRAWN BY:
 A. AWAD
 CHECKED BY:
 J.S.
 DATE: 7/24
 OFFICE:
 FARMINGTON HILLS

811

3 WORKING DAYS
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 OF UNDERGROUND UTILITIES

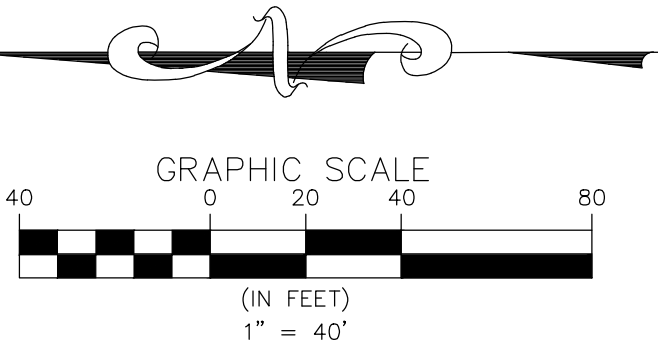
REVISIONS

NO.	DESCRIPTION	DATE
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811

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1-800-482-7171
TOLL FREE FOR THE LOCATION OF UNDERGROUND UTILITIES

PROJECT NUMBER:	
PROJECT MANAGER:	B. EMERINE
DRAWN BY:	A. AWAD
CHECKED BY:	J.S.
DATE:	06/24
OFFICE:	FARMINGTON HILLS

CLIENT INFO:
ELEVATE LAND HOLDINGS—
THE CROSSING
128 N. CENTER STREET
NORTHVILLE, MI 48167
248.344.1885

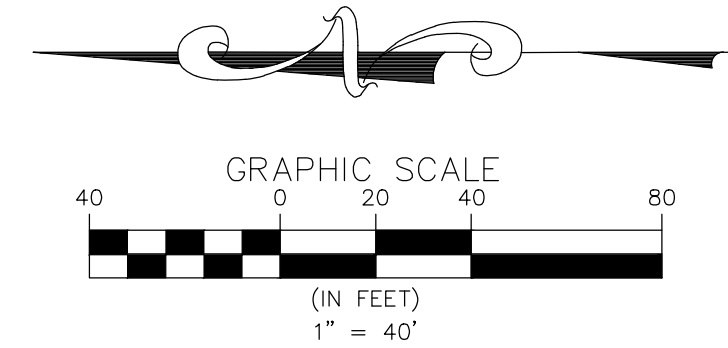
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LAKELANDS TRAIL
PART OF E. 1/2 OF SEC. 25, T.1N., R.1E.,
HAMBURG TWP., LIVINGSTON COUNTY, MI.

SHEET TITLE:
GRADING PLAN

PAGE No.:
5

(SEE SHEET 5)

(SEE SHEET 7)



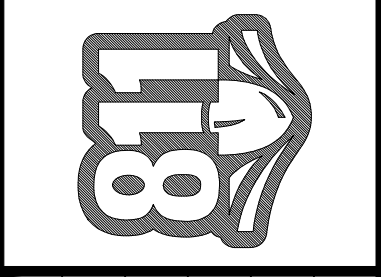
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PROJECT NUMBER:	B. EMERIE
PROJECT MANAGER:	A. AWAD
DRAWN BY:	C.S.
CHECKED BY:	J.F.
DATE:	04/24/24
OFFICE:	FARMINGTON HILLS

CLIENT INFO:
ELEVATE LAND HOLDINGS—
THE CROSSING AT
LAKELANDS TRAIL
128 N. CENTER STREET
NORTHVILLE, MI 48167
248.344.1885

PROJECT NAME:
THE CROSSING AT
LAKELANDS TRAIL
PART OF E. 1/2 OF SEC. 26, T.1N., R.6E.,
HAMBURG TWP., LIVINGSTON COUNTY, MI

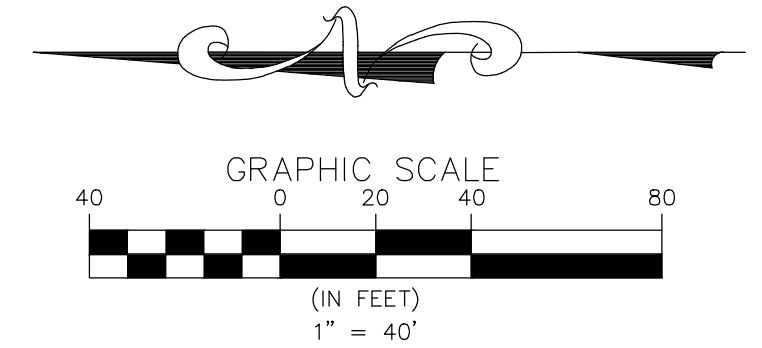
SHEET TITLE:
GRADING PLAN

PAGE No.:
6

PROPOSED LEGEND

	SANITARY SEWER
	WATER MAIN
	STORM SEWER
	DITCH/SWALE
	TREE PROTECTION FENCE
	SILT FENCE
	FLOODPLAIN
	WETLANDS
	CONTOUR
	CURB AND GUTTER
	SANITARY MANHOLE
	SANITARY CLEANOUT
	STORM MANHOLE
	YARD CATCH BASIN
	ROAD CATCH BASIN W/SILT SAC
	END SECTION
	FIRE HYDRANT
	GATE VALVE AND WELL
	PAVEMENT (ASPHALT)
	PAVEMENT (CONCRETE SIDEWALK)
	DIRECTION SURFACE WATER FLOW
	OVERFLOW ROUTE
	GRADE

(SEE SHEET 6)



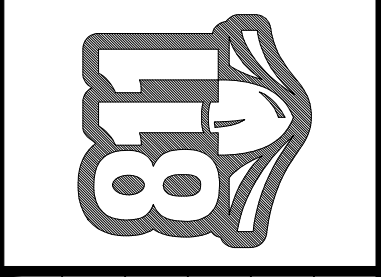
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PROJECT NUMBER:	
PROJECT MANAGER:	B. EMERIE
DRAWN BY:	A. AWAD
CHECKED BY:	C.S.
DATE:	07/24
OFFICE:	FARMINGTON HILLS

CLIENT INFO:
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 THE CROSSING
 128 N. CENTER STREET
 NORTHVILLE, MI 48167
 248.344.1885

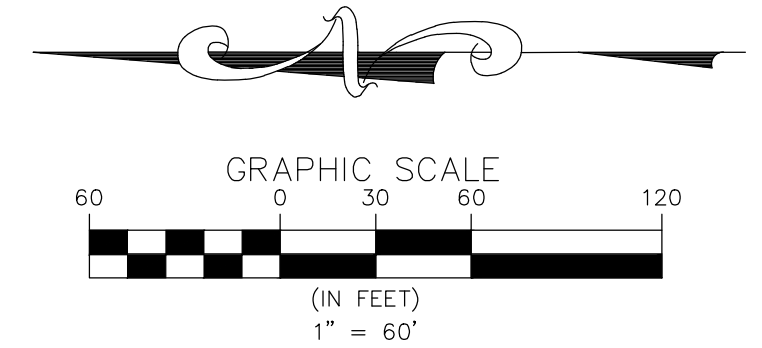
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 PART OF E. 1/2 OF SEC. 25, T. 1N., R. 6E.,
 HAMBURG TWP., LIVINGSTON COUNTY, MI

SHEET TITLE:
 GRADING PLAN

PAGE No.:
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PROPOSED LEGEND

	SANITARY SEWER
	WATER MAIN
	STORM SEWER
	DITCH/SWALE
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	SILT FENCE
	FLOODPLAIN
	WETLANDS
	CONTOUR
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	PAVEMENT (ASPHALT)
	PAVEMENT (CONCRETE SIDEWALK)
	DIRECTION SURFACE WATER FLOW
	OVERFLOW ROUTE
	GRADE



WATER QUALITY VOLUME REQUIRED

A =	15.11	Ac
C =	0.65	
Vw-q = 3,630 x C x A = 35,652 ft ³ required < Vr-a		

DETERMINE DETENTION REQUIREMENTS (100-YEAR STORM)

Ac =	15.11	Ac	(Onsite Area Tributary to Basin)
Ac _{off} =	0.00	Ac	(Offsite Area Tributary to Basin)
Q ₁₀₀ =	3.02	cfs	(0.2 CFS/ACRE)
C =	0.65		

CALCULATE VARIABLE RELEASE RATE

Q _{vrr} =	1.1055-0.206 ln(A)	Q _{vrr} = Allowable release rate in cfs/acre
Q _{vrr} =	0.55 cfs/acre	A = Contribuign area in acres (does not govern)
Q _{100p} =	Q _{vrr} x A	Q _{100p} = Allowable 100-year post-development peak flow rate in cfs
Q _{100p} =	3.02 cfs	(0.2 CFS/ACRE)

CALCULATE 100-YEAR DETENTION VOLUME (V_{100D})

Ac =	15.11	Ac	(Onsite Area Tributary to Basin)
Ac _{off} =	0.00	Ac	(Offsite Area Tributary to Basin)
V _{100D} =	18985 x C x A	V _{100D} = POST-DEVELOPMENT 100-YEAR RUNOFF VOLUME in cf	
V _{100D} =	186461 cf		

CALCULATE 100-YEAR PEAK INFLOW RATE (Q_{100IN})

Ac =	15.11	Ac	(Onsite Area Tributary to Basin)
Ac _{off} =	0.00	Ac	(Offsite Area Tributary to Basin)
Q _{100IN} =	C x I ₁₀₀ x A	Q _{100IN} = 100-YEAR POST-DEVELOPMENT PEAK INFLOW RATE in cfs	
I ₁₀₀ =	83.3 / (Tc + 9.17) ^{0.81}	I ₁₀₀ = 100-year peak rainfall intensity in inches/hour	
I ₁₀₀ =	4.658 in/hr		
Q _{100IN} =	45.75 cfs		

CALCULATE STORAGE CURVE FACTOR FOR THE 100-YEAR DETENTION VOLUME (R)

R =	[0.206-0.15IN (Q _{100P} /Q _{100IN})]
R =	0.614

CALCULATE 100-YEAR REQUIRED DETENTION BASIN VOLUME

V _{100D} =	(V _{100R} x R) - VCP-P	V _{100D} = Required 100-year detention volume in cf
V _{100D} =	114413 C.F.	V _{100R} = 100-Year runoff volume in cf
		R = Storage curve factor
		Vcp-p = Provided CVPC Volume in cf
		V _{100D} >= VED
V _{100D} =	117041 C.F.	REQUIRED DETENTION VOLUME
		PROVIDED DETENTION VOLUME

DETERMINE STORAGE IN SEDIMENT BASIN

Elevation	Area	Volume (c.f.)
904	6964	0
905	8526	7695
906	10321	17119
907	12214	28386

HW EL = 907.0 Volume at HW = 28386

DETERMINE STORAGE IN DETENTION BASIN

Elevation	Area	Volume (c.f.)
904	24897	0
905	27939	26418
906	31098	55937
907	34338	88655

HW EL = 907.0 Volume at HW = 88655

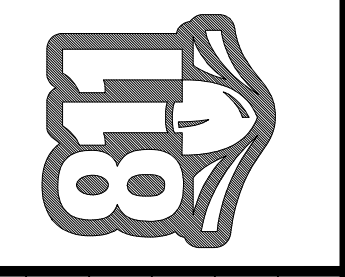
C-Factor Determination

Tributary Area =	15.11 Acres		
Impervious Areas Bldgs, Roads and S/W =	8.83 Ac.	at C =	0.90
PerVIOUS Areas Lawn Areas =	5.60 Ac.	at C =	0.20
Low Water	0.68 Ac.	at C =	1.00
C Avg. =			0.65

REVISIONS

NO.	DESCRIPTION	DATE
1.	REV. LAYOUT PER HAMBURG TWP. REVIEW	4-22-24
2.	SUBMIT TO HAMBURG TWP.	8-16-24

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CHECKED BY:
DATE:
OFFICE:

CLIENT INFO:
ELEVATE LAND HOLDINGS—
THE CROSSING
128 N. CENTER STREET
NORTHVILLE, MI 48167
248.344.1885

PROJECT NAME:
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LAKELANDS TRAIL
PART OF E. 1/2 OF SEC. 25, T. 1 N., R. 6 E.,
HAMBURG TWP., LIVINGSTON COUNTY, MI.
SHEET TITLE:
STORM WATER
MANAGEMENT PLAN

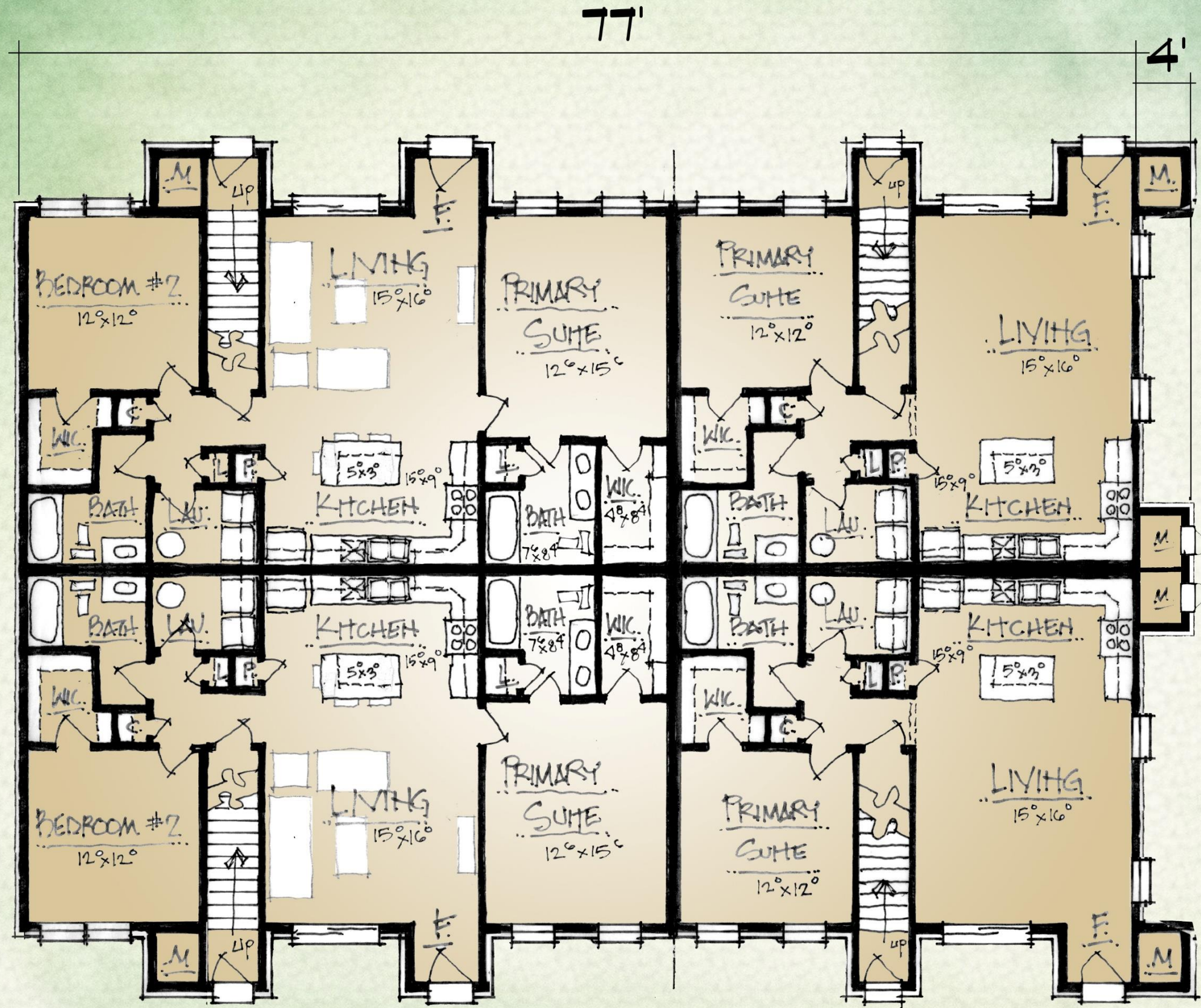


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THE CROSSING AT LAKELANDS TRAIL

PROPOSED APARTMENT DEVELOPMENT
8-12-2024





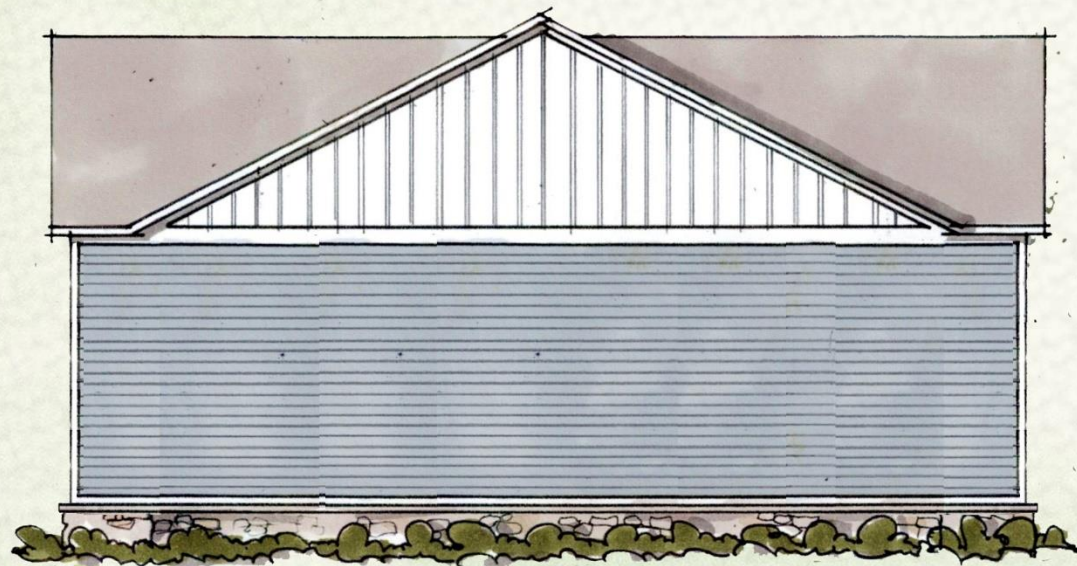
77' 8 UNIT BUILDING FLOOR PLAN



ELEVATION 1



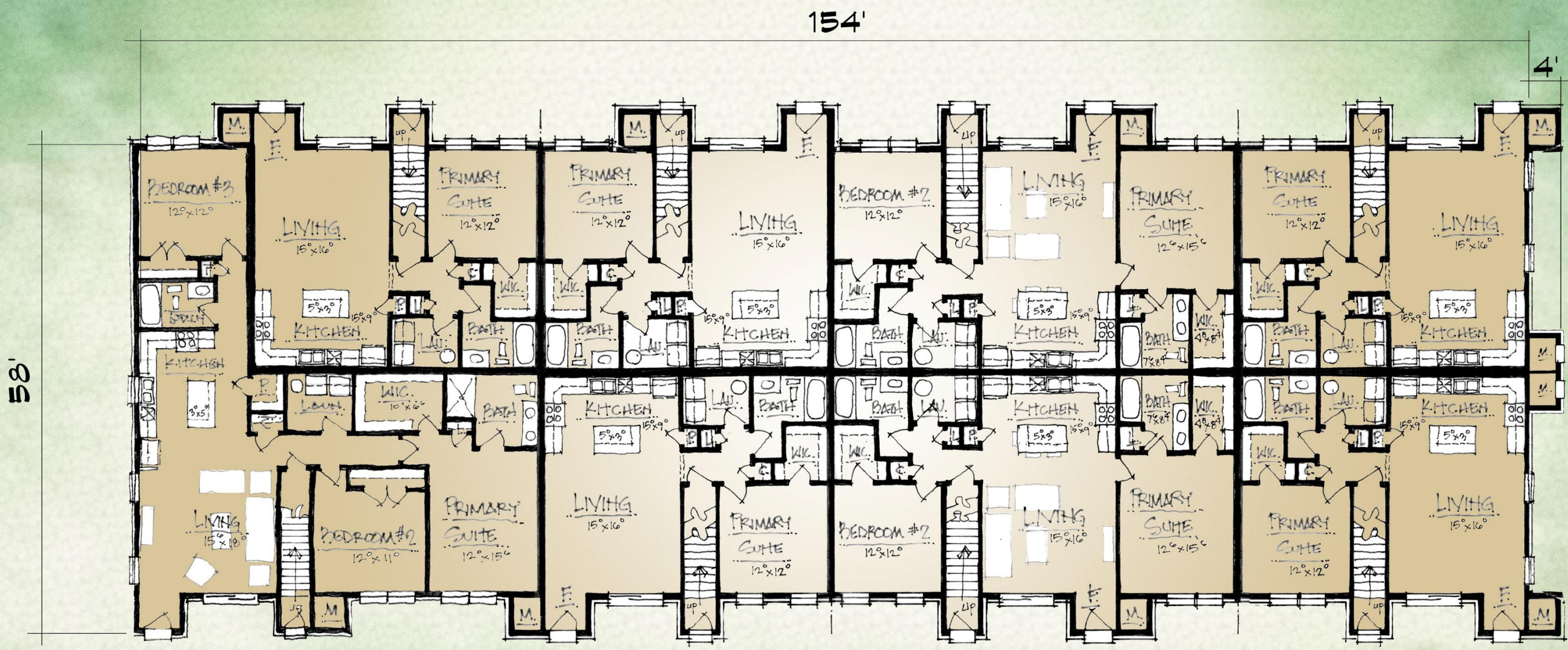
ELEVATION 2



LEFT ELEVATION



RIGHT ELEVATION



58'

154'

4'

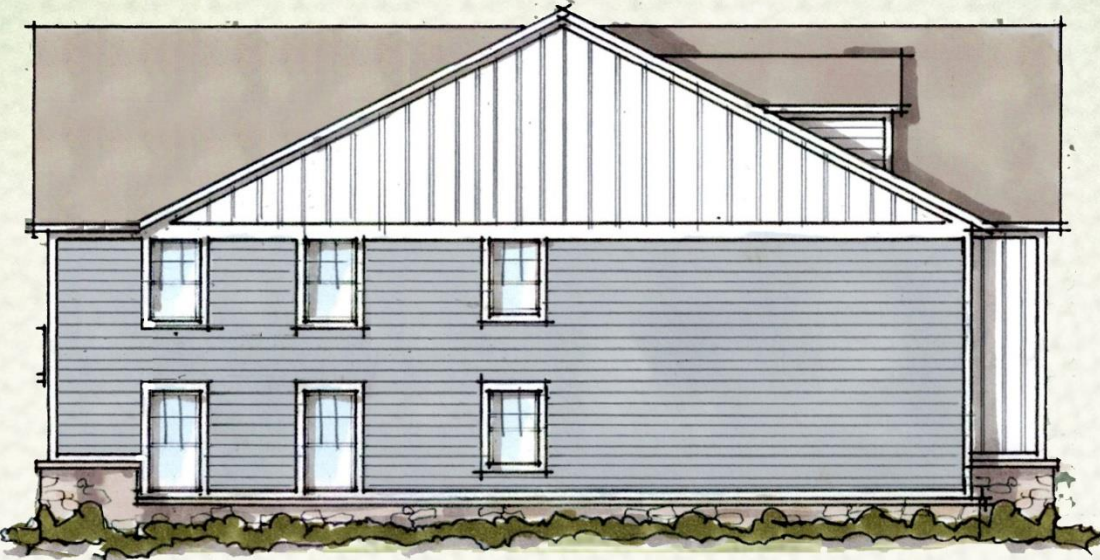
154' 16 UNIT BUILDING FLOOR PLAN



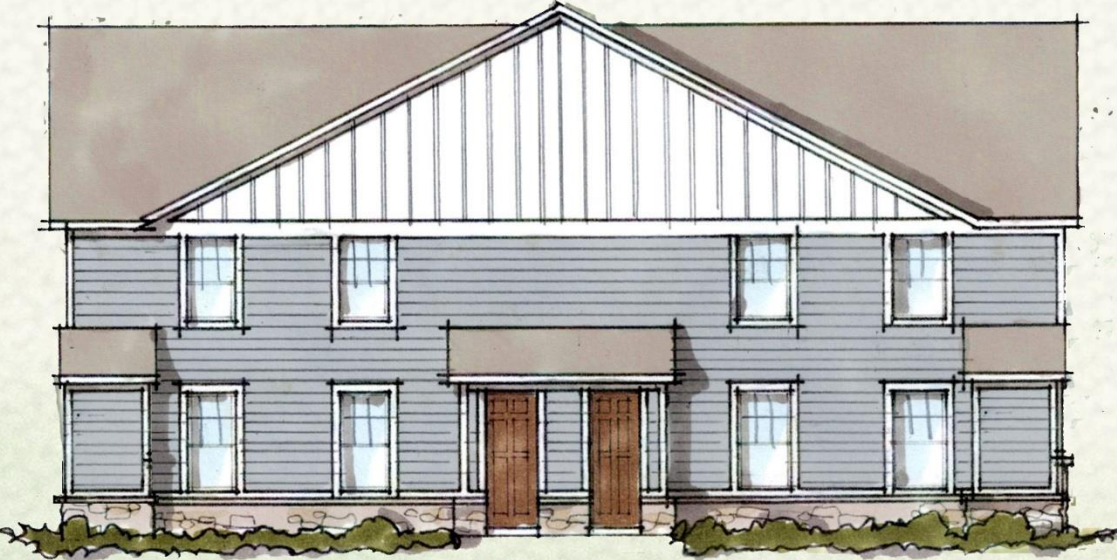
ELEVATION 1



ELEVATION 2



LEFT ELEVATION



RIGHT ELEVATION

167'

6'

12'

58'

3 BEDROOM UNIT PLAN

1450 sf.

2 BEDROOM UNIT PLAN

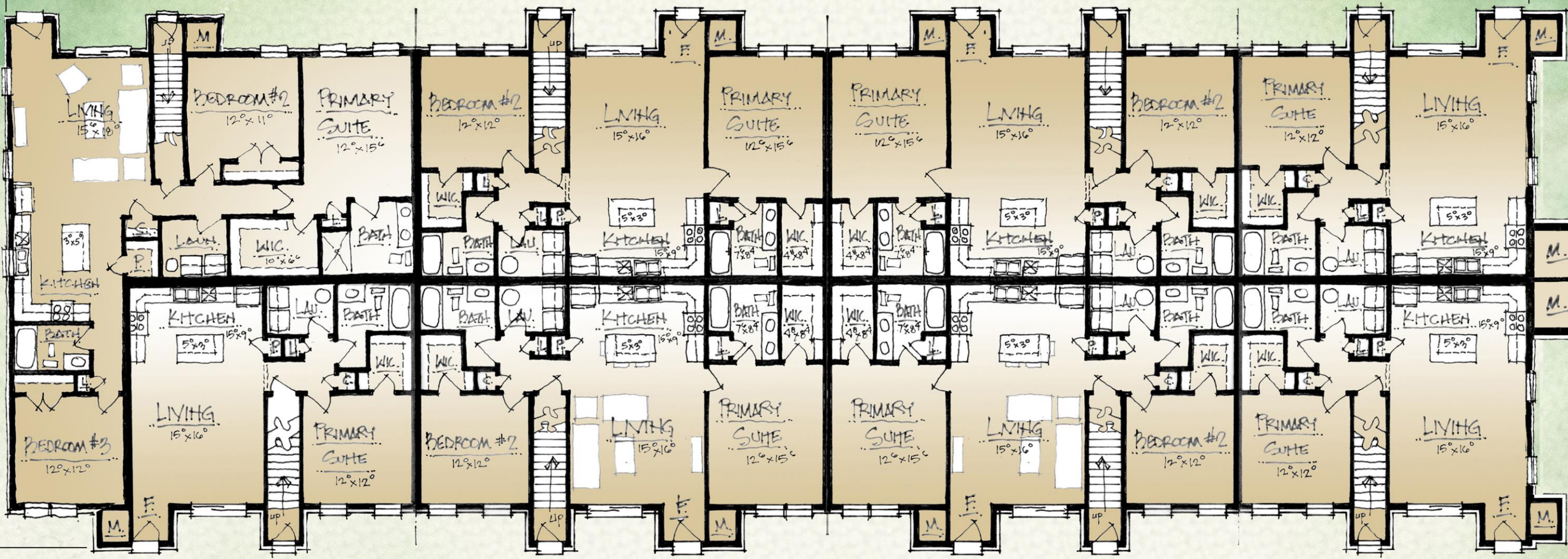
1125 sf.

2 BEDROOM UNIT PLAN

1125 sf.

1 BEDROOM UNIT PLAN

800 sf.



1 BEDROOM UNIT PLAN

800 sf.

2 BEDROOM UNIT PLAN

1125 sf.

2 BEDROOM UNIT PLAN

1125 sf.

1 BEDROOM UNIT PLAN

800 sf.

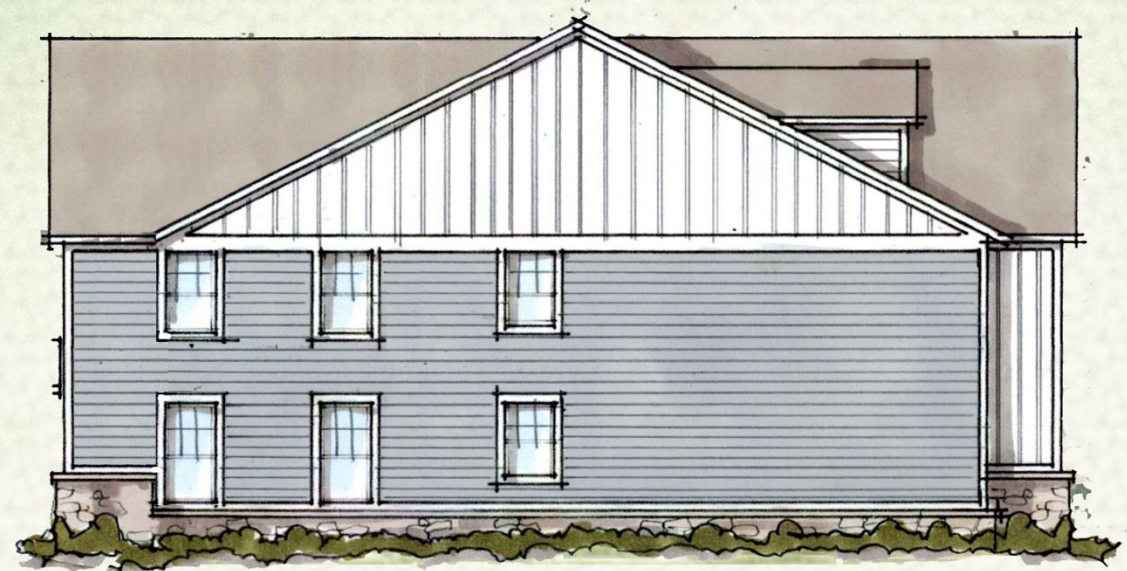
167' 16 UNIT BUILDING FLOOR PLAN



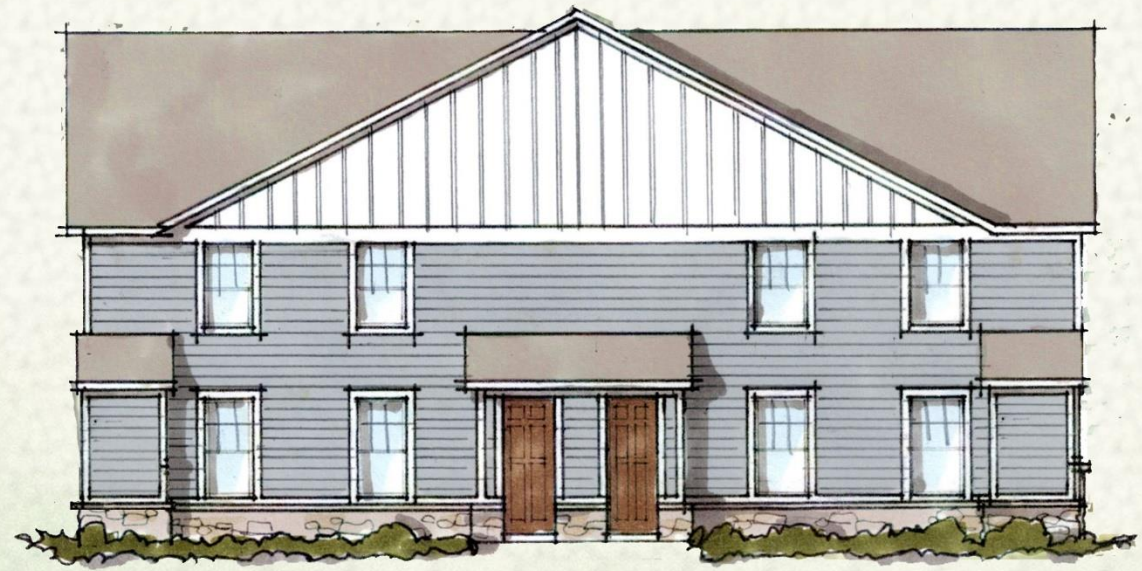
ELEVATION 1



ELEVATION 2

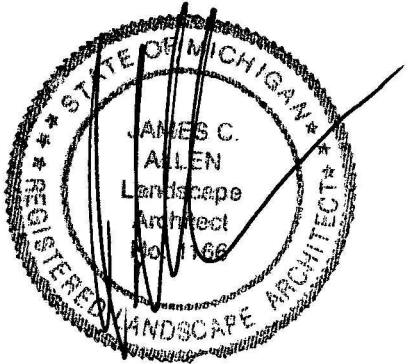


LEFT ELEVATION



RIGHT ELEVATION

Seal:



Title:

Landscape Plan

Project:

Lakeland Trails
Hamburg Township, Michigan

Prepared for:

Elevate Property Partners, LLC
128 North Center
Northville, Michigan 48167

Revision: Issued:

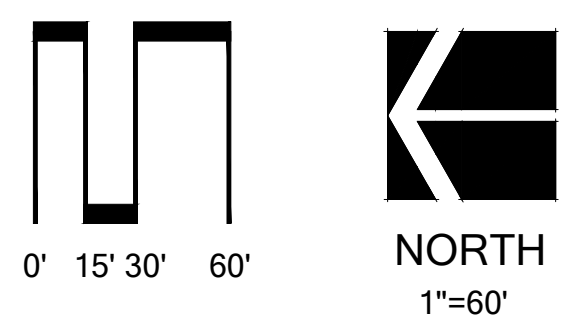
Review April 11, 2024
Revised April 22, 2024
Revised August 16, 2024

Job Number:

24-019

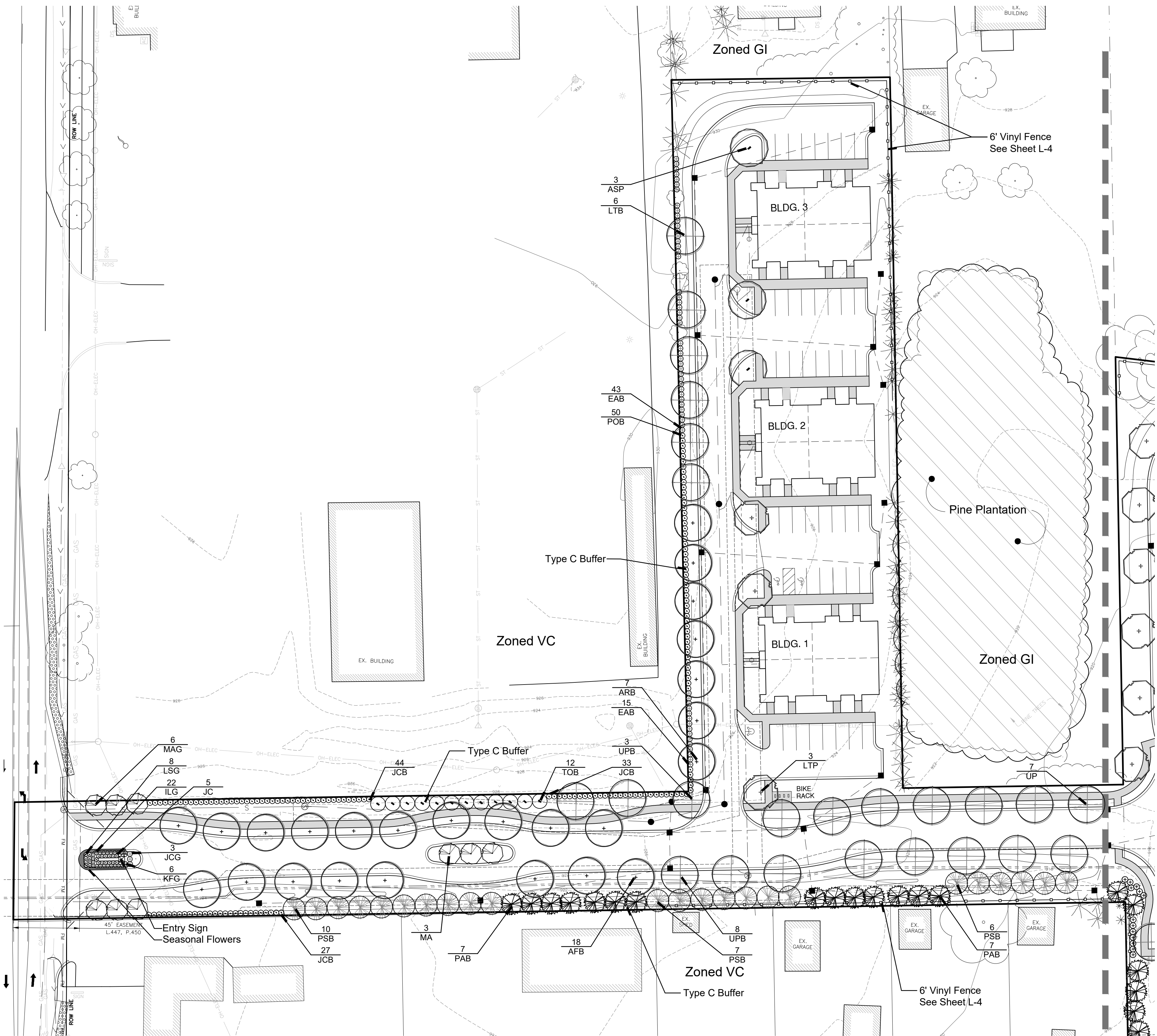
Drawn By: Checked By:

jca jca



Sheet No.

L-1



Landscape Summary - This Sheet

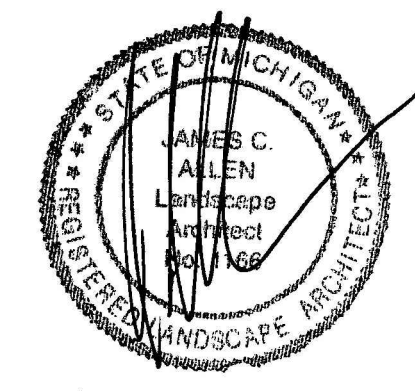
Existing Zoning	GPUD
Greenbelt	
Street Frontage	80 l.f.
Trees Required	2 Trees (80 / 40)
Trees Provided	6 Trees
Shrubs Required	8 Shrubs (80 / 40) x 4
Shrubs Provided	25 Shrubs
Land Use Buffers	
Buffer Length	903 l.f. (Type C)
Trees Required	45.2 Trees (903 / 20)
Trees Provided	38 Trees
Shrubs Required	180.6 Shrubs (903 / 20) x 4
Shrubs Provided	185 Shrubs
Buffer Length West	710 l.f. (Type C)
Trees Required	35.5 Trees (710 / 20)
Trees Provided	53 Trees
Shrubs Required	142 Shrubs (710 / 20) x 4
Shrubs Provided	27 Shrubs (Shrubs have been Reduced Due to Vinyl Fence)
Parking Lot Landscaping	
Parking Lot Area	
Trees Required	5.8 Trees (11,654 / 2,000)
Trees Provided	6 Trees

Plant List - This Sheet

sym	qty.	botanical name	common name	caliper	spacing	root	height
Greenbelt							
ILG	22	Ilex glabra 'Nordic'	Nordic Inkberry		as shown	cont	24"
JCG	3	Juniperus ch. keteleeri	Keteleeri Juniper		as shown	B&B	6', Hedge to 5'
KFG	6	Calamagrostis x. s. 'Karl Forester'	Karl Forester Grass		as shown	cont	#3
LSG	8	Leucanthemum 'Snow Lady'	Short Shasta Daisy		as shown	cont	#2
MAG	6	Malus 'Adirondack'	Adirondack Crab Apple	2.0"	as shown	B&B	
ROG	13	Rosa 'Knockout'	Knockout Rose		spacing	cont	#3
	6	Trees Provided					
	25	Shrubs Provided					
Land Use Buffers							
AFB	18	Acer x. 'freemanii' 'Autumn Blaze'	Autumn Blaze Maple	2.5"	as shown	B&B	
ARB	7	Acer rubrum 'Redpoint'	Redpoint Maple	2.5"	as shown	B&B	
EAB	58	Euonymus alata 'Compacta'	Burning Bush		as shown	cont	24"
JCB	104	Juniperus ch. keteleeri	Keteleeri Juniper		as shown	B&B	6', Hedge to 5'
LTB	6	Liriodendron tulipifera	Tulip Tree	2.5"	as shown	B&B	
PAB	14	Picea abies	Norway Spruce		as shown	B&B	6'
POB	50	Physocarpus opulifolius 'Diablo'	Diablo Ninebark		as shown	cont	24"
PSB	23	Pinus strobus	White Pine		as shown	B&B	6'
TOB	12	Thuja pl. 'Green Giant'	Green Giant Arborvitae		as shown	B&B	6'
UPB	11	Ulmus americana 'Princeton'	Princeton Elm	2.5"	as shown	B&B	
	91	Trees Provided					
	212	Shrubs Provided					
Parking Lot Trees							
ASP	3	Acer saccharum 'Legacy'	Sugar Maple	2.5"	as shown	B&B	
LTP	3	Liriodendron tulipifera	Tulip Tree	2.5"	as shown	B&B	
	6	Trees Provided					
General Plantings							
MA	3	Malus 'Adirondack'	Adirondack Crab Apple	2.0"	as shown	B&B	
UP	7	Ulmus americana 'Princeton'	Princeton Elm	2.5"	as shown	B&B	



Seal: _____



Title:
Landscape Plan

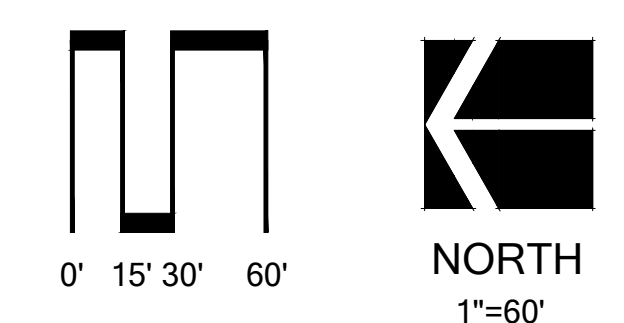
Project:
**Lakeland Trails
 Hamburg Township, Michigan**

Prepared for:
 Elevate Property Partners, LLC
 128 North Center
 Northville, Michigan 48167

Revision: _____ Issued: _____
 Review April 11, 2024
 Revised April 22, 2024
 Revised August 16, 2024

Job Number:
 24-019

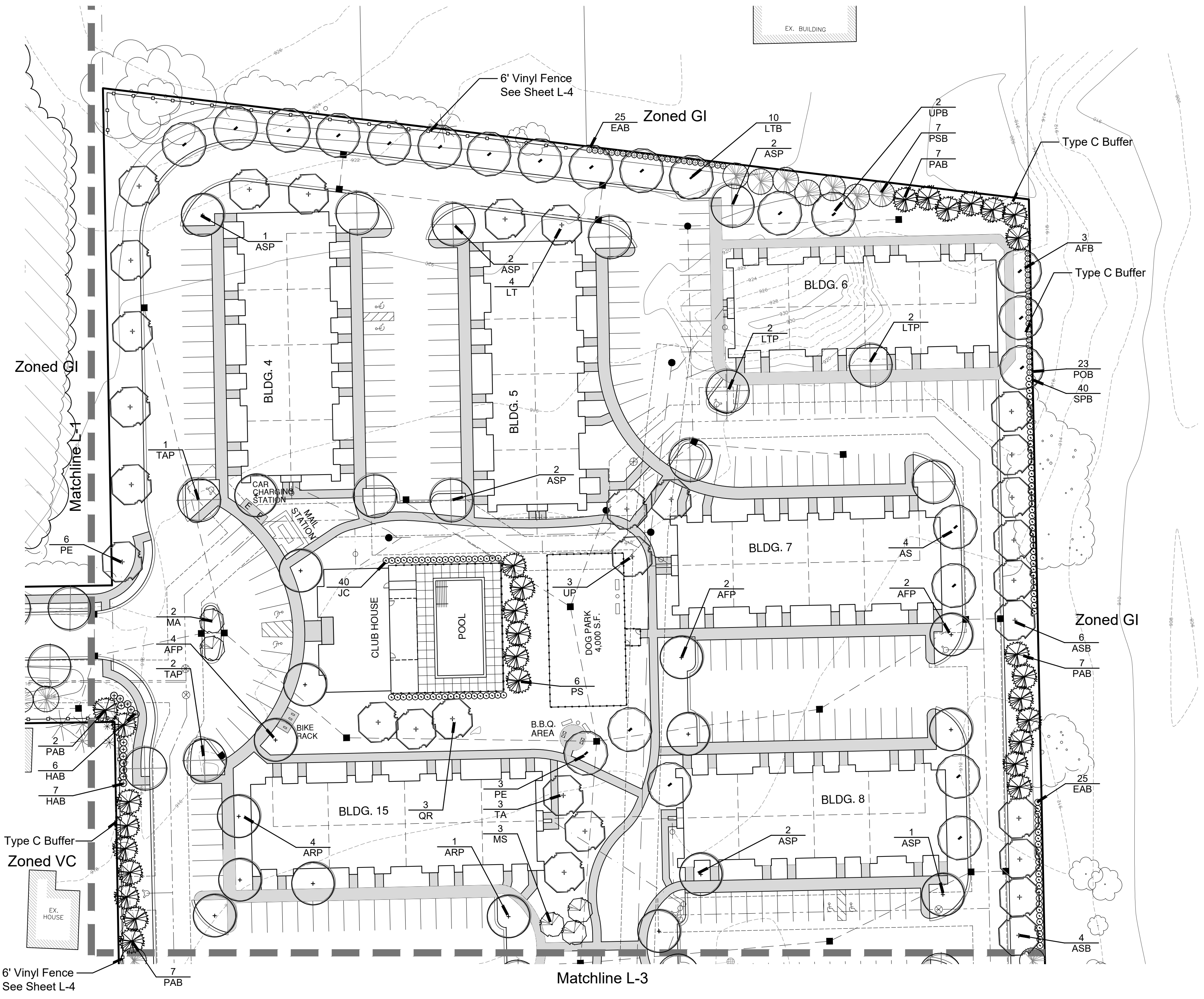
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 jca jca



Sheet No. _____



L-2

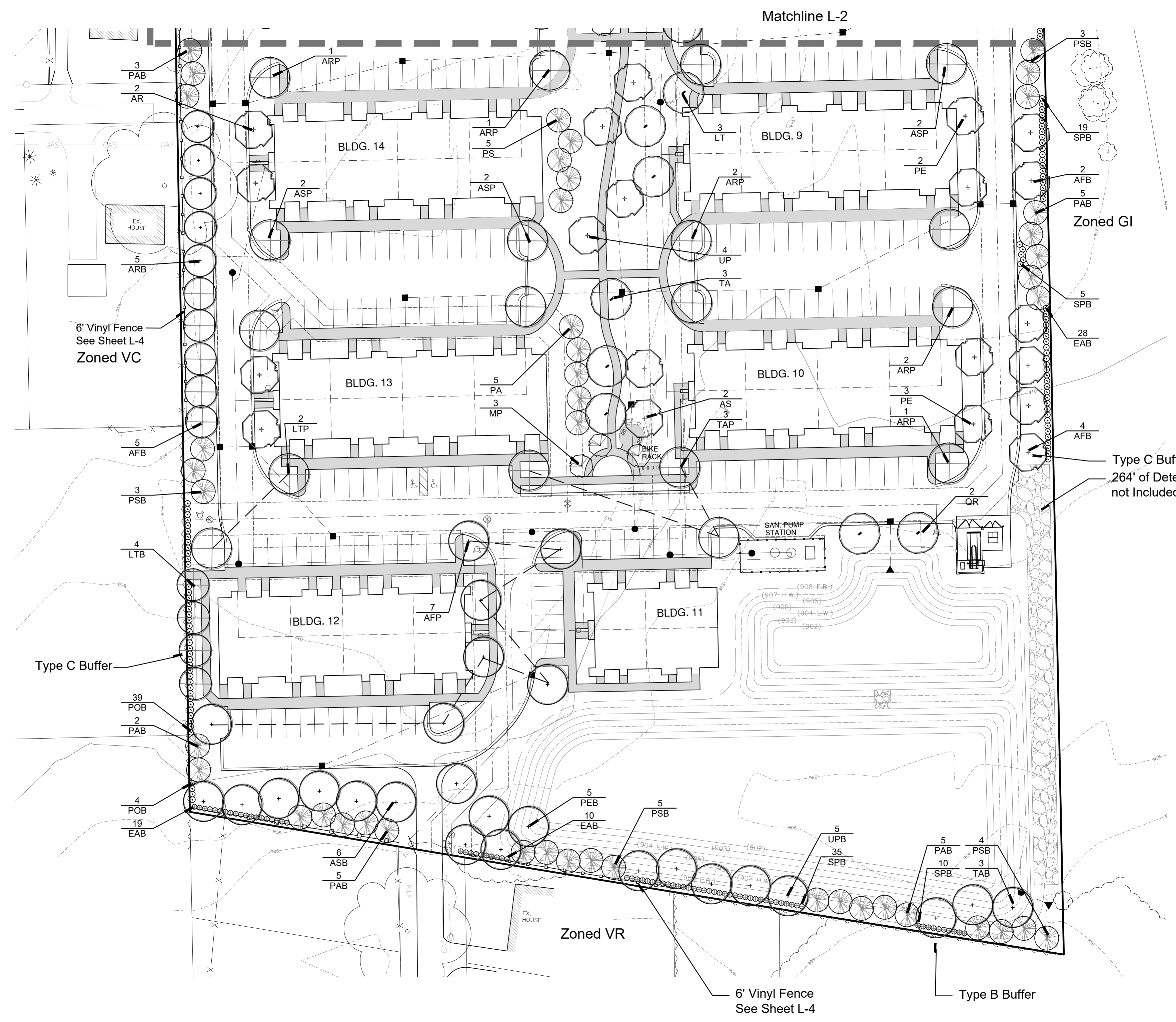


Landscape Summary - This Sheet

Existing Zoning	GPUD
Land Use Buffers	
Buffer Length East	546 l.f. (Type C)
Trees Required	27.3 Trees (546 / 20)
Trees Provided	24 Trees (3 Existing, Trees have been Reduced Due to Vinyl Fence)
Shrubs Required	109.2 Shrubs (546 / 20) x 4
Shrubs Provided	25 Shrubs (Shrubs have been Reduced Due to Vinyl Fence)
Buffer Length South	441 l.f. (Type C)
Trees Required	22.1 Trees (441 / 20)
Trees Provided	22 Trees
Shrubs Required	88.2 Shrubs (441 / 20) x 4
Shrubs Provided	88 Shrubs
Buffer Length North	136 l.f. (Type C)
Trees Required	6.8 Trees (136 / 20)
Trees Provided	9 Trees
Shrubs Required	27.2 Shrubs (136 / 20) x 4
Shrubs Provided	13 Shrubs (Shrubs have been Reduced Due to Vinyl Fence)
Parking Lot Landscaping	
Parking Lot Area	
Trees Required	29.4 Trees (58,786 / 2,000)
Trees Provided	30 Trees

Plant List - This Sheet

sym.	qty.	botanical name	common name	caliper	spacing	root	height
Land Use Buffers							
AFB	3	Acer x. freemanii 'Autumn Blaze'	Autumn Blaze Maple	2.5"	as shown	B&B	
ASB	10	Acer saccharum 'Legacy'	Sugar Maple	2.5"	as shown	B&B	
EAB	50	Euonymus alata 'Compacta'	Burning Bush		as shown	cont	24"
HAB	13	Hydrangea aoreoscens 'Annabelle'	Annabelle Hydrangea		as shown	cont	24"
LTB	10	Liriodendron tulipifera	Tulip Tree	2.5"	as shown	B&B	
PAB	23	Picea abies	Norway Spruce		as shown	B&B	6'
POB	23	Physocarpus opulifolius 'Diablo'	Diablo Ninebark		as shown	cont	24"
PSB	7	Pinus strobus	White Pine		as shown	B&B	6'
SPB	40	Spiraea j. 'Little Princess'	Little Princess Spiraea		as shown	cont	24"
UPB	2	Ulmus americana 'Princeton'	Princeton Elm	2.5"	as shown	B&B	
	55	Trees Provided					
	126	Shrubs Provided					
Parking Lot Trees							
AFP	8	Acer x. freemanii 'Autumn Blaze'	Autumn Blaze Maple	2.5"	as shown	B&B	
ARP	5	Acer rubrum 'Redpoint'	Redpoint Maple	2.5"	as shown	B&B	
ASP	10	Acer saccharum 'Legacy'	Sugar Maple	2.5"	as shown	B&B	
LTP	4	Liriodendron tulipifera	Tulip Tree	2.5"	as shown	B&B	
TAP	3	Tilia americana 'Redmond'	Redmond Linden	2.5"	as shown	B&B	
	30	Trees Provided					
General Plantings							
AS	4	Acer saccharum 'Legacy'	Sugar Maple	2.5"	as shown	B&B	
JC	40	Juniperus ch. kataebei	Kataebei Juniper		as shown	B&B	6'; Hedge to 5'
LT	4	Liriodendron tulipifera	Tulip Tree	2.5"	as shown	B&B	
MA	2	Malus 'Adirondack'	Adirondack Crab Apple	2.0"	as shown	B&B	
MS	3	Malus 'Spring Snow'	Spring Snow Crab Apple	2.0"	as shown	B&B	
PE	9	Platanus x acerifolia 'Exclamation'	Exclamation London Planetree	2.5"	as shown	B&B	
PS	6	Pinus strobus	White Pine		as shown	B&B	6'
QR	3	Quercus rubra	Red Oak	2.5"	as shown	B&B	
TA	3	Tilia americana 'Redmond'	Redmond Linden	2.5"	as shown	B&B	
UP	3	Ulmus americana 'Princeton'	Princeton Elm	2.5"	as shown	B&B	



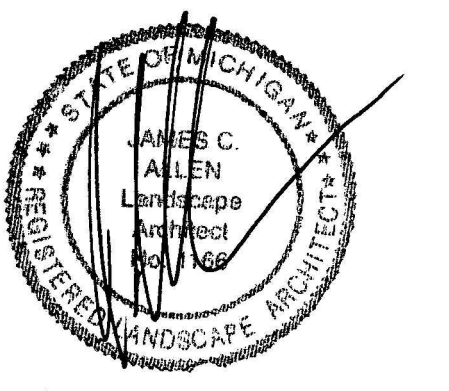
Landscape Summary - This Sheet

Existing Zoning	GPUD
Land Use Buffers	
Buffer Length	554 l.f. (Type B)
Deciduous Trees Required	18.5 Trees (554 / 30)
Deciduous Trees Provided	19 Trees
Evergreen Trees Required	18.5 Trees (554 / 30)
Evergreen Trees Provided	19 Trees
Shrubs Required	73.8 Shrubs (554 / 30) x 4
Shrubs Provided	74 Shrubs
Buffer Length - South	262 l.f. (Type C)
Trees Required	13.1 Trees (262 / 20)
Trees Provided	14 Trees
Shrubs Required	52.4 Shrubs (262 / 20) x 4
Shrubs Provided	52 Shrubs
Buffer Length - North	480 l.f. (Type C)
Trees Required	25.1 Trees (480 / 20)
Trees Provided	22 Trees (Trees have been Reduced Due to Vinyl Fence)
Shrubs Required	100.2 Shrubs (480 / 20) x 4
Shrubs Provided	43 Shrubs (Shrubs have been Reduced Due to Vinyl Fence)
Parking Lot Landscaping	
Parking Lot Area	
Trees Required	25.4 Trees (50,809 / 2,000)
Trees Provided	25 Trees

Plant List - This Sheet

sym.	qty.	botanical name	common name	caliper	spacing	root	height
Land Use Buffers							
AFB	11	Acer x. freemanii 'Autumn Blaze'	Autumn Blaze Maple	2.5"	as shown	B&B	
ARB	5	Acer rubrum 'Redpoint'	Redpoint Maple	2.5"	as shown	B&B	
ASB	6	Acer saccharum 'Legacy'	Sugar Maple	2.5"	as shown	B&B	
EAB	57	Euonymus alata 'Compacta'	Burning Bush		as shown	cont	24"
LTB	4	Liriodendron tulipifera	Tulip Tree	2.5"	as shown	B&B	
PAB	20	Picea abies	Norway Spruce		as shown	B&B	6'
PEB	5	Platanus x acerifolia 'Exclamation'	Exclamation London Planetree	2.5"	as shown	B&B	
POB	43	Physocarpus opulifolius 'Diablo'	Diablo Ninebark		as shown	cont	24"
PSB	15	Pinus strobus	White Pine		as shown	B&B	6'
SPB	69	Spirea j. 'Little Princess'	Little Princess Spirea		as shown	cont	24"
TAB	3	Tilia americana 'Redmond'	Redmond Linden	2.5"	as shown	B&B	
UPB	5	Ulmus americana 'Princeton'	Princeton Elm	2.5"	as shown	B&B	
	74		Trees Provided				
	169		Shrubs Provided				
Parking Lot Trees							
AFP	7	Acer x. freemanii 'Autumn Blaze'	Autumn Blaze Maple	2.5"	as shown	B&B	
ARP	7	Acer rubrum 'Redpoint'	Redpoint Maple	2.5"	as shown	B&B	
ASP	6	Acer saccharum 'Legacy'	Sugar Maple	2.5"	as shown	B&B	
LTP	2	Liriodendron tulipifera	Tulip Tree	2.5"	as shown	B&B	
TAP	3	Tilia americana 'Redmond'	Redmond Linden	2.5"	as shown	B&B	
	25		Trees Provided				
General Plantings							
AR	2	Acer rubrum 'Redpoint'	Redpoint Maple	2.5"	as shown	B&B	
AS	2	Acer saccharum 'Legacy'	Sugar Maple	2.5"	as shown	B&B	
LT	3	Liriodendron tulipifera	Tulip Tree	2.5"	as shown	B&B	
MP	3	Malus 'Profusion'	Profusion Crab Apple	2.0"	as shown	B&B	
PA	5	Picea abies	Norway Spruce		as shown	B&B	6'
PE	4	Platanus x acerifolia 'Exclamation'	Exclamation London Planetree	2.5"	as shown	B&B	
PS	5	Pinus strobus	White Pine		as shown	B&B	6'
QR	2	Quercus rubra	Red Oak	2.5"	as shown	B&B	
TA	3	Tilia americana 'Redmond'	Redmond Linden	2.5"	as shown	B&B	
UP	4	Ulmus americana 'Princeton'	Princeton Elm	2.5"	as shown	B&B	

Seal:



Title:

Landscape Plan

Project:

Lakeland Trails
Hamburg Township, Michigan

Prepared for:

Elevate Property Partners, LLC
128 North Center
Northville, Michigan 48167

Revision:

Review	April 11, 2024
Revised	April 22, 2024
Revised	August 16, 2024

Issued:

Job Number:

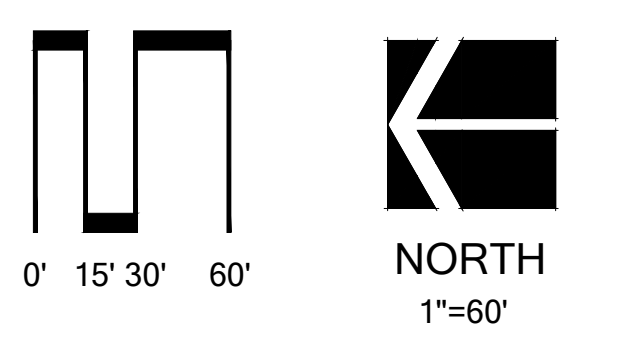
24-019

Drawn By:

jca

Checked By:

jca



Sheet No.

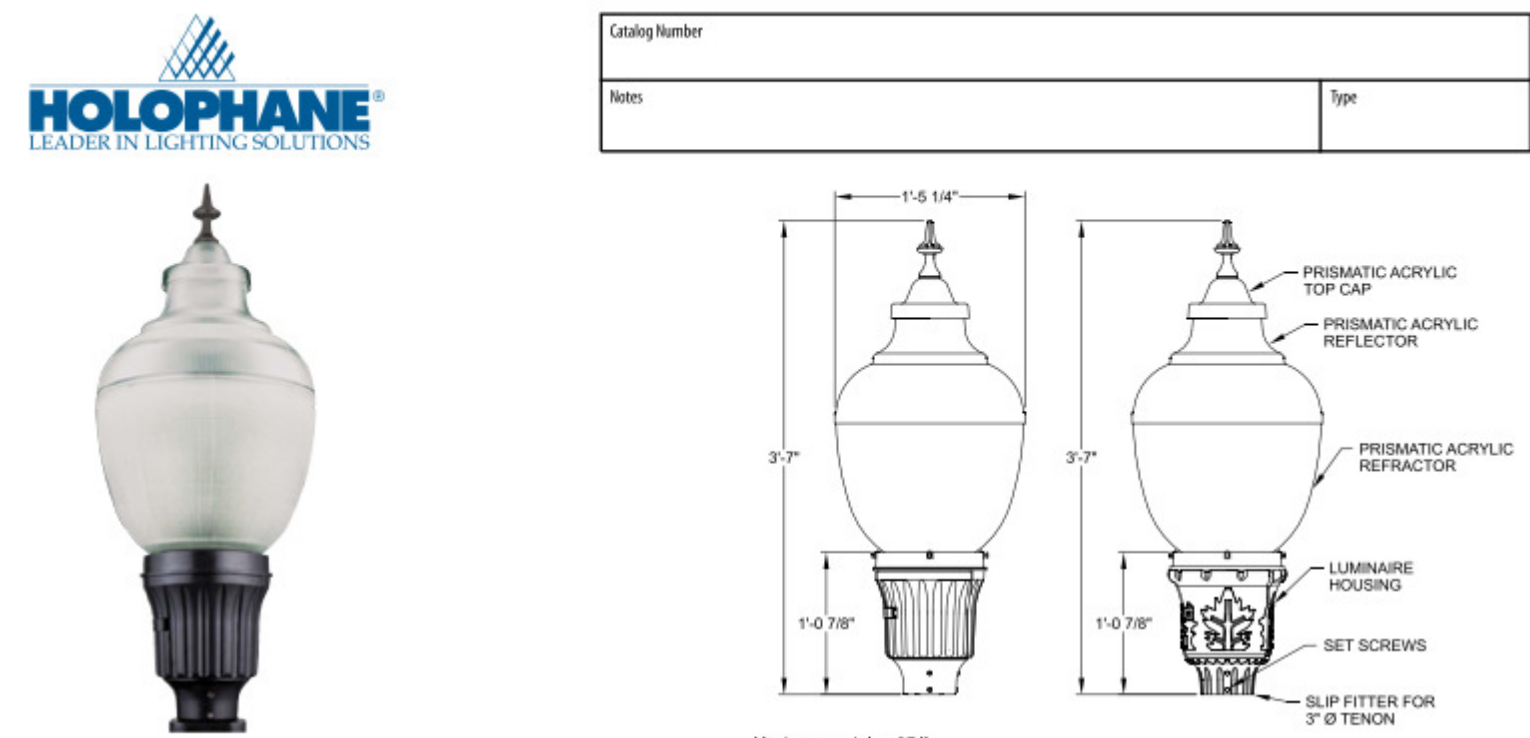
L-3



Symbol	Label	QTY	Manufacturer	Catalog	Description	Lamp Output	LLF	Input Power
	P1	14	Holophane	AWDE3 P40 40K XXXX AL5	Acrylic Washington Gen3, P40 performance package, 4000K CCT 70CRI, Refractive Acrylic Optic with Type 5 distribution	11983	0.9	79

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Overall/Grade	+	0.2 fc	1.6 fc	0.0 fc	N/A	N/A



AWDE3
Acrylic Washington Postlite Utility LEDs

SPECIFICATIONS

General Description
The Acrylic Washington Postlite Utility LED is designed for ease of maintenance with the plug-in electrical module common to each of the luminaires in Holophane's Utility Luminaire Series. The large acorn-shaped luminaire, while reminiscent of the T500, contains powerful, scale-mounted Chip-On-Board (COB) LED's with a precision optical system that maximizes post spacings while maintaining uniform illumination.

Mechanical Specifications
The luminaire housing shall:
- Be heavy grade A5052 cast aluminum (aluminum with <1% copper)
- IP53 rated housing provides tool less access with a spring-loaded latch
- Incorporate a hidden hinge door allowing the door to swing open and remain open
- Offer units with an EE-1636 twist lock photoelectric receptacle; the housing contains a tempered glass window to allow light to reach the cell
- Mount to slip-fitter that will accept 3" high by 2-7/8" x 3-1/8" LED pole top
- Provide four uniquely designed stainless steel spring clips, enclosed in a clear polyvinyl chloride sleeve and adjusted by 1/4-20 hex head bolts that securely cradle the prismatic acrylic refractor. The same 1/4-20 bolts also support the decorative rib and banding assembly the finish shall:
- Utilize a polyester power coat paint to ensure maximum durability
- Rigorous multi-stage pre-treating and painting process yields a finish that achieves a scrub resistance rating of 8 per ASTM D1654 after over 5,000 hours exposure to salt fog chamber (operated per ASTM B117) on standard and RAL finish options.
- RAL (RAL1000/CR35) paint colors are Super Durable Corrosion Resistant, 80% gloss.

Electrical Specifications
The driver shall meet the following requirements:
- Certified by UL or CSA for wet locations
- A factory programmable electronic driver with 0-10V dimming control leads
- LEDs shall have a minimum of 70 CRI and available in 2700K, 3000K, 4000K, and 5000K CCT
- The electrical system shall be designed to meet ANSI/IEEE C62.41.2 and shall offer a 10KV/5KA surge protection, fail off, as standard with an upgradable 20KV/10KA surge protection, fail off with indicator light, option
- Lumen output can be customized prior to manufacturing by way of PFDux Options
- The electrical components are mounted on an aluminum plate that is removable with minimum use of tools. A matching five conductor plug connects the receptacle in the luminaire housing to complete the wiring. For photoelectric operation, the electrical module is provided with an EE-NEMA twist-lock photoelectric receptacle.

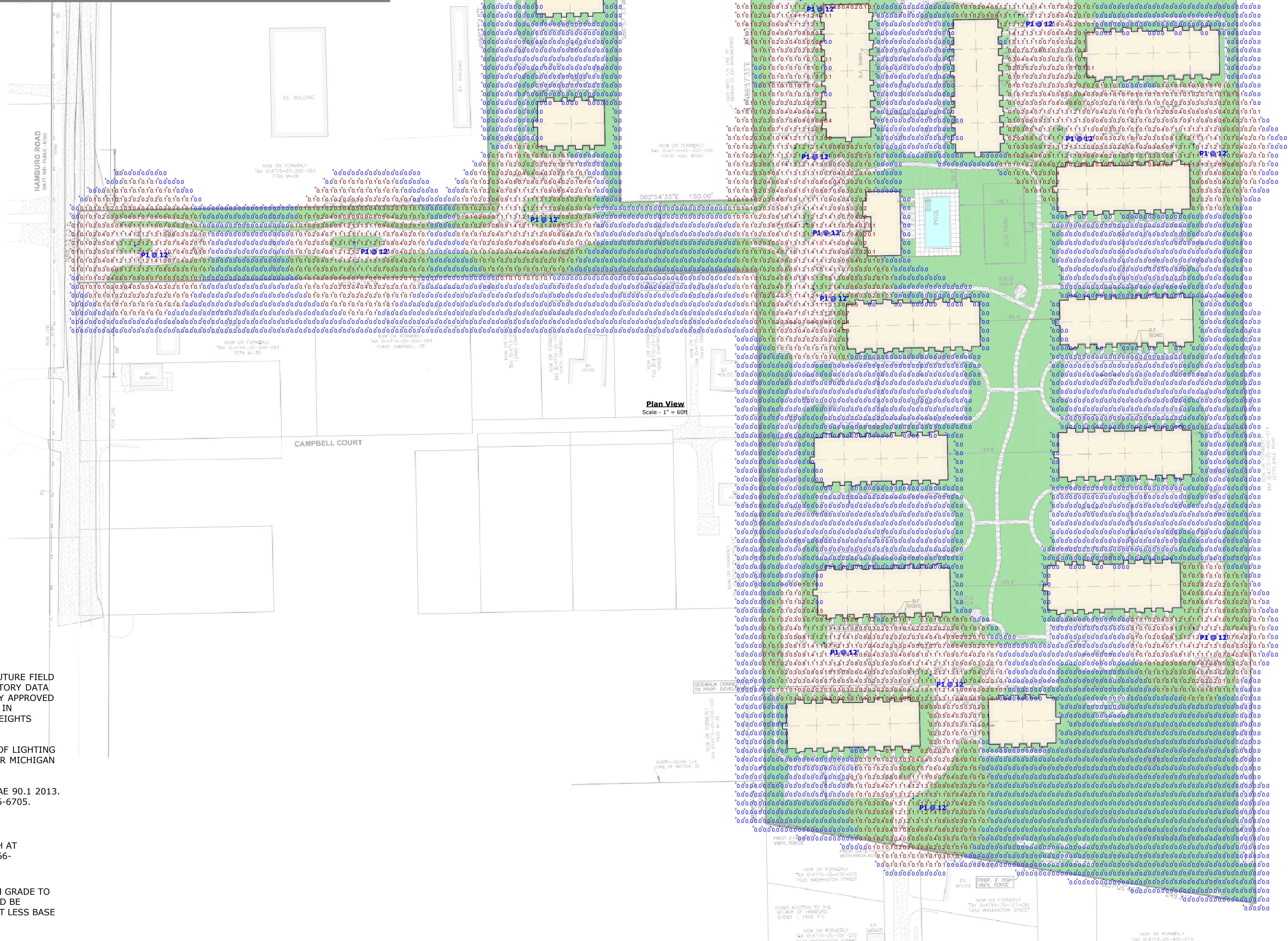
Optical Specifications
The optical system is IP66 rated and consists of a precisely molded thermal resistant acrylic refractor and top reflector mounted within the decorative acrylic optic. The top reflector reflects over 50% of the upward light into the controlling refractor while allowing a soft, up-light component to define the traditional acorn shape of the luminaire. The lower refractor uses precisely molded prisms to maximize the pole spacings while maintaining uniform illumination. Two refractors are available, designed for IES Type III and V distributions. Linear Optics shielding is available for asymmetric and symmetric distributions.

Control Options
The control options shall include, but not limited to, the following:
- Field adjustable output to adjust output to luminaire - 40
- Long life photoelectric, 20 year - PCLL P34 and P40 with ILL
- 7 pin receptacles internally in housing (PRT) or inside-glass mounted (PRT) - not for use with photocells & notes must have photoelectric disabled)
- night Air eSDB, outdoor fixture-mounted motion and photo-sensor, features a dual rail to communicate wirelessly to other light Air devices for group response to motion, on/off control in response to daylight and by switch - eSDB6
- Fixture embedded 1/4" Air network interface for individual fixture control and dimming - NTAIR2.

Certification and Standards
- Luminaire shall be UL or CSA listed.
- Suitable for operation in an ambient temperature up to 40°C / 105°F per UL or CSA certification
- IML79 compliant
- Design lights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.dlcqualify.com to confirm which versions are qualified.

Government Procurement
BAA - Buy American Act: Product qualifies as a domestic end product under the Buy America Act as implemented in the FAR and DFARS. Product also qualifies as manufactured in the United States under DOT Buy America regulations.
BABA - Build America Buy America: Product qualifies as produced in the United States under the definitions of the Buy America Act.
Please refer to www.acuitybrands.com/resources/buy-america for additional information.

Warranty
5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.



General Note

- SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
- SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTOR.
- CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: GRADE

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIREMENTS DEFINED IN ASHRAE 90.1 2013. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT ASG@GASSERBUSH.COM OR 734-266-6705.

Alternates Note
THE USE OF FIXTURE ALTERNATES MUST BE RESUBMITTED TO THE CITY FOR APPROVAL.

Drawing Note
THIS DRAWING WAS GENERATED FROM AN ELECTRONIC IMAGE FOR ESTIMATION PURPOSE ONLY. LAYOUT TO BE VERIFIED IN FIELD BY OTHERS.

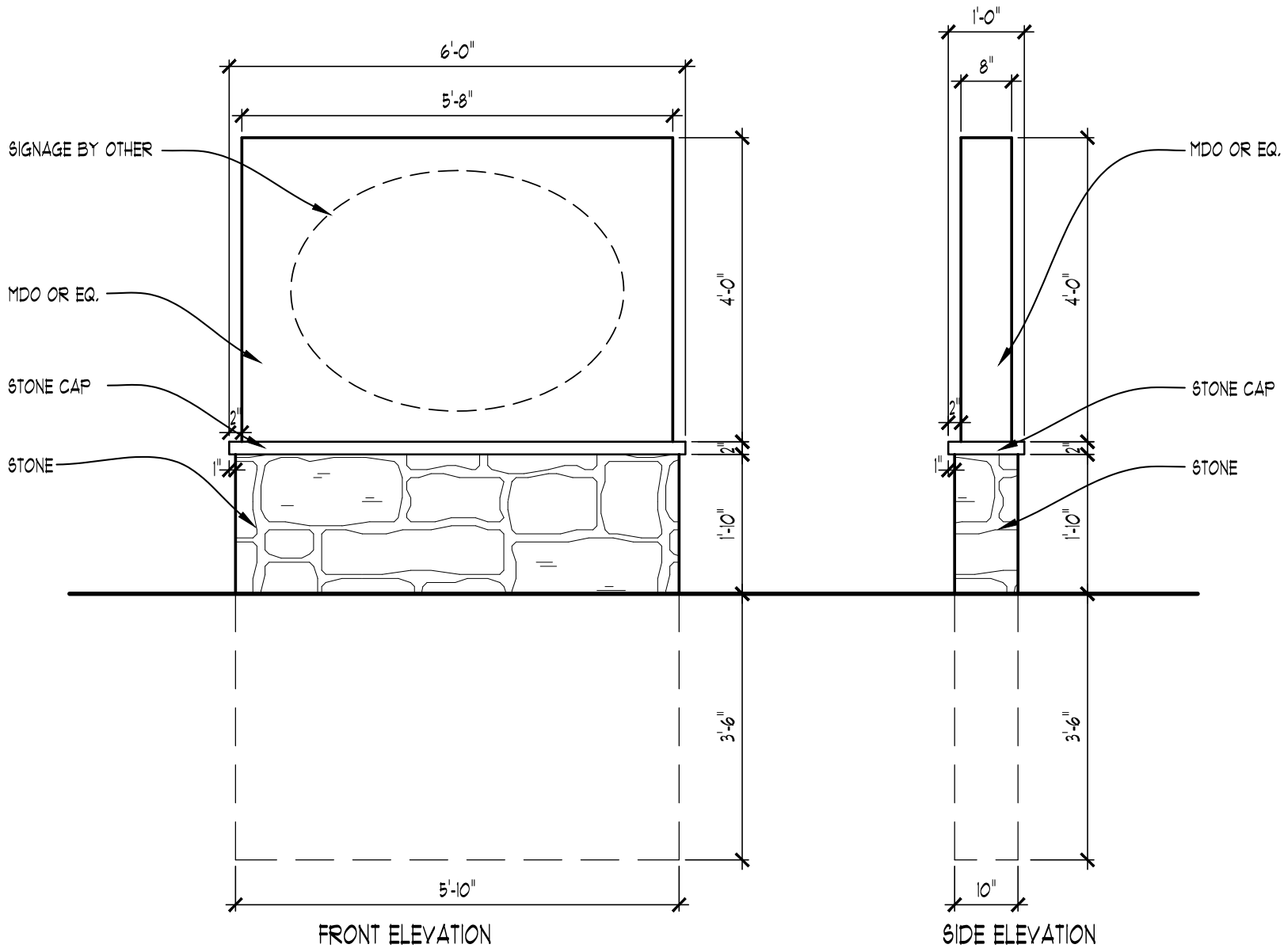
Ordering Note
FOR INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.

Mounting Height Note
MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.



THE CROSSING AT LAKELAND TRAIL
EXTERIOR PHOTOMETRIC PLAN
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

Designer
BK
Date
07/03/2024
Scale
Not to Scale
Drawing No.
#24-31166



SIGNAGE DETAIL

SCALE: 1/2" = 1'-0"



**TK DESIGN
&
ASSOCIATES**

WWW.TKHOMEDSIGN.COM

26030 PONTIAC TRAIL
SOUTH LYON, MI 48178
PHONE: (248)-446-1960
FAX: (248)-446-1961

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-DO NOT SCALE DRAWINGS. USE CALCULATED DIMENSIONS ONLY
-CONTRACTOR TO FIELD VERIFY ALL DRAWING ASPECTS BEFORE CONSTRUCTION. DISCREPANCIES AND DESIGN CHANGES SHALL BE REPORTED TO THE DESIGNER IN WRITTEN FORM IMMEDIATELY
-CALL MISS D/C AT 688-482-7271 3 DAYS PRIOR TO ANY EXCAVATION
-CONSTRUCTION IS THE SOLE RESPONSIBILITY OF THE PERMIT HOLDER

CLIENT / PROJECT

**THE CROSSING
AT
LAKELANDS
TRAIL**

HAMBURG, MI

MEMO

VIA EMAIL bobl@elevate-property.com

To: Elevate Land Holdings

From: Jacob Swanson, PE, PTOE
Paul Bonner, EIT
Fleis & VandenBrink

Date: September 5, 2024

Re: **The Crossing at Lakelands Trail**
Hamburg Township, Michigan
Traffic Impact Study

1 INTRODUCTION

This memorandum presents the results of the Traffic Impact Study (TIS) for the proposed residential development in Hamburg Township, Michigan. The project site is located south of M-36, adjacent to the existing Learning Lane, as shown on the attached **Figure 1**. The proposed development includes the construction of multi-family residential units on property that is currently vacant; however, the site was previously occupied by Hamburg Elementary School. Site access is proposed via the existing Learning Lane access location on M-36, which is under the jurisdiction of the Michigan Department of Transportation (MDOT). This TIS has been performed pursuant to MDOT requirements for the permitting of site access and the requirements of Hamburg Township for site plan approval.

The scope of work for this study was developed based on Fleis & VandenBrink's (F&V) knowledge of the study area, understanding of the development program, accepted traffic engineering practices, and information published by the Institute of Transportation Engineers (ITE). 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), Hamburg Township, MDOT, the Southeast Michigan Council of Governments (SEMCOG), and ITE.

2 BACKGROUND DATA

2.1 EXISTING ROAD NETWORK

The lane use and traffic control at the study intersections is shown on the attached **Figure 2** and the study roadways are further described below. For the purposes of this study, minor streets and driveways were assumed to have an operating speed of 25 miles per hour (mph), unless otherwise noted.

M-36 runs in the generally in the east / west directions, adjacent to the north side of the project site. The study section of M-36 is classified as a *Minor Arterial*, is under the jurisdiction of MDOT, and has an Annual Average Daily Traffic (AADT) volume of approximately 9,300 (SEMCOG 2022) vehicles per day (vpd). The posted speed limit changes at the Hall Road intersection, from 45-mph east of the intersection to 40-mph west of the intersection. The study section of roadway provides a typical two-lane cross-section, with one (1) lane of travel in each direction. Additionally, the roadway turns north/south for a short section, north of Hamburg Road, and widens to provide a typical three-lane cross-section, with one (1) lane of travel in each direction and a center two-way left-turn lane (TWLTL). An exclusive westbound right-turn lane is also provided on the M-36 approach at the Hamburg Road intersection.

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Hamburg Road generally runs in the north / south directions, southwest of M-36, approximately 600-feet west of the project site. Hamburg Road is classified as a *Major Collector*, is under the jurisdiction of LCRC, has a posted speed limit of 25-mph, and has an AADT volume of approximately 3,500 vpd (SEMCOG 2022). The study section of roadway provides a typical two-lane cross-section, with one (1) lane of travel in each direction.

Hall Road runs in the north / south directions, approximately 700-feet east of the project site. The study section of roadway is classified as a *Local Road*, is under the jurisdiction of LCRC, has an assumed prima facie speed limit of 55-mph, and has an AADT volume of approximately 592 vpd (MDOT 2023). Hall Road provides a typical two-lane cross-section, with one (1) lane of travel in each direction.

2.2 EXISTING TRAFFIC VOLUMES

F&V subconsultant QC collected existing Turning Movement Count (TMC) data on Thursday, July 18, 2024, during the AM (7:00 AM to 9:00 AM) peak period and Wednesday, July 17, 2024, during the PM (4:00 PM to 6:00 PM) peak period, at the following study intersections:

- M-36 & Hamburg Road
- M-36 & Hall Road
- M-36 & Learning Lane

During collection of the turning movement counts, Peak Hour Factors (PHFs), pedestrian and bicycle volumes, and commercial truck percentages were recorded and used in the traffic analysis. The peak hour of each of the study intersections was utilized and the through volumes were balanced upwards through the roadway network. Therefore, the traffic volumes utilized in the analysis and shown on the attached traffic volume figures may not match the raw traffic volumes shown in the attached data collection.

The weekday AM and PM peak hours for the adjacent study roadway network were observed to generally occur between 7:15 AM to 8:15 AM and 4:00 PM to 5:00 PM, respectively. F&V collected an inventory of the existing lane use and traffic control, as shown on the attached **Figure 2**. The existing 2024 peak hour traffic volumes used in the analysis are shown on the attached **Figure 3**. All applicable background data is attached.

3 EXISTING CONDITIONS (2024)

Existing peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersections using Synchro/SimTraffic (Version 11) traffic analysis software. This analysis was 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* (HCM6).

Note: The study intersection of M-36 & Hamburg Road currently contains unique two-way stop-control, with stop signs on adjacent approaches (eastbound and southbound). None of the HCM methodologies support this unique geometry; therefore, SimTraffic Delay Reports were utilized to evaluate this study intersection.

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 of the existing conditions analysis are attached and summarized in **Table 1**.

The results of the existing conditions analysis indicates that all approaches and movements at the study intersections are currently operating acceptably, at LOS D or better, during both the AM and PM peak hours, with the exception of the following:

M-36 & Hamburg Road

- During the PM peak hour: The eastbound approach is currently operating at LOS E.

Review of SimTraffic network simulations indicates occasional periods of vehicle queues; however, these queues were observed to dissipate and were not present throughout the entire peak period. The reported 95th percentile vehicle queue lengths were observed to not exceed 180-feet (7-8 vehicles). Additionally, it should be noted that MDOT has programmed improvements for this study intersection (all-way stop-control); therefore, mitigation measures are not recommended at this time.

Review of SimTraffic network simulations for the remaining study roadway network indicates acceptable operations during both peak periods. Vehicles were observed to find adequate gaps within the through traffic along M-36, without experiencing significant delays or excessive vehicle queueing.

Table 1: Existing Intersection Operations

	Intersection	Control	Approach	Existing Conditions			
				AM Peak		PM Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS
1	M-36 & Hamburg Road	Stop (EB & SB)	EB	9.3	A	40.1	E
			WBT	Free			
			WBR	Free			
			SBL	10.7	B	15.1	C
			SBT	3.4	A	4.9	A
2	M-36 & Learning Lane / Church Drive	Stop (Minor)	EBL	0.0*	A	9.3	A
			WBL	0.0*	A	0.0*	A
			NB	0.0*	A	0.0*	A
			SB	0.0*	A	17.2	C
3	M-36 & Hall Road	Stop (Minor)	EB	Free			
			WBL	9.1	A	8.2	A
			NB	16.3	C	21.0	C

* Indicates no vehicle volume present.

4 BACKGROUND CONDITIONS (2028)

4.1 BACKGROUND GROWTH

Historical population and economic profile data was obtained for Hamburg Township from the Southeast Michigan Council of Governments (SEMCOG) database, in order to calculate an annual background growth rate to project the existing 2024 peak hour traffic volumes to the site buildout year of 2028. Population and employment projections from 2020 to 2050 were reviewed and showed average annual growth rates of approximately 0.35% and 0.40%, respectively. Therefore, a conservative annual background growth rate of **0.50%** per year was applied to the existing 2024 peak hour traffic volumes, in order to forecast the background 2028 peak hour traffic volumes without the proposed development.

In addition to background growth, it is important to account for traffic that will be generated by approved developments within the vicinity of the study roadway network, that have yet to be constructed or are currently under construction. At the time of this study, the following development plan was identified by MDOT and was included as background traffic:

- M-36 & Hamburg Road – Mixed Use Development

The projected trips generated by this development were applied to the study roadway network, based on the TIS completed for the project site. Therefore, these trips were added to the existing traffic volumes, after applying the **0.50%** annual growth rate, in order to calculate the background 2028 peak hour traffic volumes **without the proposed development**, as shown on the attached **Figure 4**.

Additionally, the background development has proposed a fourth leg to the existing study intersection of M-36 & Hamburg Road. Therefore, as part of the background development, MDOT has programmed improvements to update the existing traffic control for the intersection to all-way stop-control; these improvements were assumed as a baseline condition for the study roadway network for both the background and the future conditions analyses. Furthermore, the revised intersection geometry and traffic control has removed the unique stop-control condition; therefore, the HCM6 evaluation methodologies were utilized for this study intersection under the background and future condition analyses.

4.2 BACKGROUND INTERSECTION OPERATIONS

Background peak hour vehicle delays and LOS **without the proposed development** were calculated at the study intersections based on the background 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 HCM6. The results of the background conditions analysis are attached and summarized in **Table 2**.

Table 2: 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
1 M-36 & Hamburg Road / Driveway	Existing Stop (EB & SB)	EB	9.3	A	40.1	E	12.9	B	14.3	B	3.6	A→B	-25.8	E→B
		WBTL	Free				10.8	B	10.5	B	N/A			
		WBR	Free				16.5	C	108.9	F	N/A			
	Background Stop (All-Way)	NB	N/A				10.6	B	11.9	B	N/A			
		SBL	10.7	B	15.1	C	52.6	F	28.0	D	41.9	B→F	12.9	C→D
		SBTR	3.4	A	4.9	A	8.9	A	10.8	B	5.5	-	5.9	A→B
		Overall	N/A				32.5	D	64.8	F	N/A			
2 M-36 & Learning Lane / Church Drive	Stop (Minor)	EBL	0.0*	A	9.3	A	0.0*	A	9.4	A	0.0*	-	0.1	-
		WBL	0.0*	A	0.0*	A	0.0*	A	0.0*	A	0.0*	-	0.0*	-
		NB	0.0*	A	0.0*	A	0.0*	A	0.0*	A	0.0*	-	0.0*	-
		SB	0.0*	A	17.2	C	0.0*	A	18.0	C	0.0*	-	0.8	-
3 M-36 & Hall Road	Stop (Minor)	EB	Free				Free				Free			
		WBL	9.1	A	8.2	A	9.2	A	8.3	A	0.1	-	0.1	-
		NB	16.3	C	21.0	C	17.2	C	22.5	C	0.9	-	1.5	-

* Indicates no vehicle volume present. NOTE: Decreased delays and improved LOS are the result of the baseline background improvements.

The results of the background conditions analysis indicates that all approaches and movements at the study intersections are expected to continue operating acceptably, at LOS D or better, during both peak periods, in a manner similar to the existing conditions analysis, with the exception of the following:

M-36 & Hamburg Road

- During the AM peak hour: The southbound left-turn lane is expected to operate at LOS F.
- During the PM peak hour: The westbound right-turn is expected to operate at LOS F.

Review of SimTraffic network simulations indicates occasional periods of vehicle queues; however, these queues were observed to dissipate and were not present throughout the entire peak period.

Review of SimTraffic network simulations indicates acceptable operations throughout the remaining study roadway network, similar operations to the existing conditions observations.

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 calculated using the information published by ITE in the *Trip Generation Manual, 11th Edition*. The proposed development includes the construction of multi-family residential units, with access provided via the existing Learning Lane access location on M-36. The stie trip generation forecast utilized for this study is summarized in **Table 3**.

Table 3: Site Trip Generation Summary

Land Use	ITE Code	Amount	Units	Average Daily Traffic (vpd)	AM Peak Hour (vph)			PM Peak Hour (vph)		
					In	Out	Total	In	Out	Total
Multi-Family Housing (Low-Rise)	220	208	DU	1,409	21	66	87	69	41	110

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. The site trip distributions utilized in the analysis are summarized in **Table 4**.

Table 4: Site Trip Distribution

To/From	Via	AM	PM
Northwest	M-36	33%	30%
South	Hall Road	2%	4%
East	M-36	58%	56%
Southwest	Hamburg Road	7%	10%
Total		100%	100%

The site-generated traffic volumes shown in **Table 3** were distributed to the study roadway network according to the distribution shown in **Table 4**. 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 CONDITIONS (2028)

Future peak hour vehicle delays and LOS **with the addition of the proposed development**, were calculated based on the background and proposed lane use and traffic controls shown on the attached **Figure 2**, the future peak hour traffic volumes shown on the attached **Figure 6**, and the methodologies presented in the HCM6. The results of the future conditions analysis are attached and summarized in **Table 5**.

Table 5: 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
1 M-36 & Hamburg Road / Driveway	Stop (All-way)	EB	12.9	B	14.3	B	13.2	B	14.9	B	0.3	-	0.6	-
		WBT	10.8	B	10.5	B	11.0	B	10.8	B	0.2	-	0.3	-
		WBR	16.5	C	108.9	F	18.4	C	127.1	F	1.9	-	18.2	-
		NB	10.6	B	11.9	B	10.8	B	12.1	B	0.2	-	0.2	-
		SBTL	52.6	F	28.0	D	59.7	F	32.8	D	7.1	-	4.8	-
		SBR	8.9	A	10.8	B	9.1	A	10.9	B	0.2	-	0.1	-
		Overall	32.5	D	64.8	F	36.0	E	74.5	F	3.5	D→E	9.7	-
2 M-36 & Learning Lane / Church Drive	Stop (Minor)	EBL	0.0*	A	9.4	A	0.0*	A	9.4	A	0.0*	-	0.0	-
		WBL	0.0*	A	0.0*	A	9.1	A	8.4	A	9.1	-	8.4	-
		NB	0.0*	A	0.0*	A	20.1	C	23.3	C	20.1	A→C	23.3	A→C
		SB	0.0*	A	18.0	C	0.0*	A	20.0	C	0.0*	-	2.0	-
3 M-36 & Hall Road	Stop (Minor)	EB	Free				Free				Free			
		WBL	9.2	A	8.3	A	9.4	A	8.4	A	0.2	-	0.1	-
		NB	17.2	C	22.5	C	18.4	C	26.0	D	1.2	-	3.5	C→D

* Indicates no vehicle volume present.

The results of the future conditions analysis indicates that all approaches and movements at the study intersections are expected to continue operating in a manner similar to the background conditions analysis, with minimal increases in delay. Additionally, the proposed site driveway (Learning Lane) intersection is expected to operate acceptably, at LOS D or better, during both peak periods.

Review of SimTraffic network simulations throughout the study roadway network indicates similar observations to those made during the existing and background conditions analyses. Occasional periods of vehicle queues were observed at the programmed all-way stop-control study intersection of M-36 & Hamburg Road; however, these queues were observed to dissipate and were not present throughout the peak periods. Additionally, vehicles were observed to find adequate gaps within the through traffic along M-36, without experiencing significant delays or excessive vehicle queueing.

8 ACCESS MANAGEMENT

8.1 DRIVEWAY SPACING

The MDOT Geometric Design Guidance, Section 1.2.2, was utilized to evaluate the proposed site driveway location, in relation to the nearby driveways and access points along M-36. The MDOT desirable unsignalized access spacing criteria were evaluated for the 40-mph section of roadway. The distance of the proposed site driveways from nearby access points and the warranting criteria are summarized in **Table 6** and displayed in **Exhibit 1**.

Table 6: Driveway Spacing Summary

Adjacent Driveways & Intersections		Spacing	Criteria (40-mph)	Meets
Learning Lane	To Water Treatment Drive	50 feet	300 feet	No
Learning Lane	to CEI Drive	370 feet	300 feet	Yes

The results of the driveway spacing analysis indicates that the proposed site driveway (Learning Lane) is not expected to meet desirable MDOT spacing criteria. Additional and/or alternative site access to the west, via Washington Road, was reviewed; however, it was determined that only emergency access would be feasible at the location on Washington Road.

Furthermore, potential ingress left-turn conflict with the existing Church Driveway was evaluated. The results indicate that the potential for interlocking left-turns occurring between the proposed site driveway (Learning Lane) and the Church is negligible, based on the minimal volume (3 vehicles or less) of ingress left-turn traffic associated with the church activities.

Exhibit 1: Driveway & Intersection Spacing



8.2 AUXILIARY TURN LANE EVALUATION

The MDOT auxiliary turn lane warranting criteria were evaluated at the proposed site driveway (Learning Lane) on M-36. 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 7**.

Table 7: Auxiliary Turn Lane Analysis Summary

Intersection	Treatment	AM Peak Hour	PM Peak Hour	Recommendation
M-36 & Learning Lane / Church Drive	Right-Turn	No Treatment	No Treatment	No Treatment
	Left-Turn	No Treatment	Left-Turn Lane	Left-Turn Lane

The results of the auxiliary turn lane evaluation indicates that a westbound left-turn lane is warranted on M-36 at the proposed site driveway (Learning Lane).

8.3 FUTURE CONDITIONS WITH IMPROVEMENTS ANALYSIS

The results of the future improvements analysis, with the implementation of the recommended auxiliary westbound left-turn lane at Learning Lane, are attached and summarized in **Table 8**.

Table 8: Future Intersection Operations

Intersection	Control	Approach	Future Conditions				Future IMP				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
M-36 & Learning Lane / Church Drive	Stop (Minor)	EBL	0.0*	A	9.4	A	0.0*	A	9.4	A	0.0*	-	0.0	-
		WBL	0.0*	A	0.0*	A	9.1	A	8.4	A	0.0	-	0.0	-
		NB	20.1	C	23.3	C	20.1	C	22.9	C	0.0	-	-0.4	-
		SB	0.0*	A	20.0	C	0.0*	A	19.8	C	0.0*	-	-0.2	-

* Indicates no vehicle volume present.

The results of the future conditions with improvements analysis indicates that, with the implementation of the recommended auxiliary left-turn lane, all approaches and movements at the study intersection of M-36 & Learning Lane / Church Drive are expected to continue to operate acceptably, at LOS D or better, during both the AM and PM peak hours.

Review of SimTraffic microsimulations also indicates acceptable operations during both peak periods, throughout the study roadway network.

9 CONCLUSIONS

Conclusions of this TIS are as follows:

1. Existing Conditions (2024)

- The results of the existing conditions analysis indicates that all approaches and movements at the study intersections are currently operating acceptably, at LOS D or better, during both the AM and PM peak hours, with the exception of the following:

M-36 & Hamburg Road: The EB approach is currently operating at LOS E during the PM peak hour. Review of SimTraffic network simulations indicates occasional periods of vehicle queues; however, these queues were observed to dissipate and were not present throughout the entire peak period.

- Review of SimTraffic network simulations for the remaining study roadway network indicates acceptable operations during both peak periods. Vehicles were observed to find adequate gaps within the through traffic along M-36, without experiencing significant delays or excessive vehicle queuing.

2. Background Conditions (2028)

- A conservative annual background growth rate of **0.5%** per year was utilized to project the existing 2024 peak hour traffic volumes to the buildout year of 2028.
- The following approved background developments were identified for construction within the vicinity of the project site and were included within the background traffic volumes:
 - *M-36 & Hamburg Road – Mixed Use Development*
 - As part of the background development, a fourth leg will be added to the study intersection of M-36 & Hamburg Road. Therefore, MDOT has programmed improvements to update the existing traffic control for the intersection to all-way stop-control.
- The results of the background conditions analysis indicates that all approaches and movements at the study intersections are expected to continue operating acceptably, at LOS D or better during both peak periods, in a manner similar to the existing conditions analysis, with the exception of the following:
M-36 & Hamburg Road: The SB left-turn movement is expected to operate at LOS F during the AM peak hour. Additionally, the WB right-turn movement is expected to operate at LOS F during the PM peak hour.

3. Future Conditions (2028)

- The results of the future conditions analysis indicates that all approaches and movements at the study intersections are expected to continue to operate in a manner similar to the background conditions analysis, with minor increases in delay. Additionally, the proposed site driveway (Learning Lane) intersection is expected to operate acceptably, at LOS D or better, during both peak periods.
- Review of SimTraffic indicates similar observations to those made during the existing and background conditions analyses. Occasional periods of vehicle queues were observed at the programmed all-way stop-control study intersection of M-36 & Hamburg Road; however, these queues were observed to dissipate and were not present throughout the peak periods. Additionally, vehicles were observed to be able to find adequate gaps within the through traffic along M-36, without experiencing significant delays or excessive vehicle queueing.

4. Access Management

- The driveway spacing analysis indicates that the proposed site driveway (Learning Lane) is not expected to meet the desirable MDOT spacing criteria. However, the Learning Lane access is the only access for this development and there is not sufficient property frontage to locate the driveway in an alternative location along M-36.
- Additional and/or alternative site access to the west, via Washington Road, was reviewed; however, it was determined that only emergency access would be feasible at the location on Washington Road
- The results of the auxiliary turn lane treatment evaluation indicates that a westbound left-turn lane is warranted along M-36 at the proposed site driveway (Learning Lane).

5. Future Conditions with Improvements (2028)

- The results of the future conditions with improvements analysis indicates that, with the implementation of the recommended auxiliary westbound left-turn lane, all approaches and movements at the proposed site driveway (Learning Lane) are expected to continue to operate acceptably, at LOS D or better, during both peak periods.

Review of SimTraffic network simulations also indicates acceptable operations, throughout the remaining study roadway network, during both peak periods.

10 RECOMMENDATIONS

Recommendations of this TIS are as follows:

M-36 & Learning Lane / Church Drive

- Provide a westbound left-turn lane along M-36 at the proposed site driveway (Learning Lane).

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.

Digitally signed
by Jacob Swanson
Date: 2024.09.05
15:09:23 -04'00'

- Attachments:** Figures 1 – 6
Proposed Site Plan
Traffic Volume Data
SEMCOG Data
Synchro / SimTraffic Results
Auxiliary Lane Warrants



FIGURE 1
SITE LOCATION MAP

THE CROSSING TIS - HAMBURG TOWNSHIP, MI

LEGEND

 SITE LOCATION



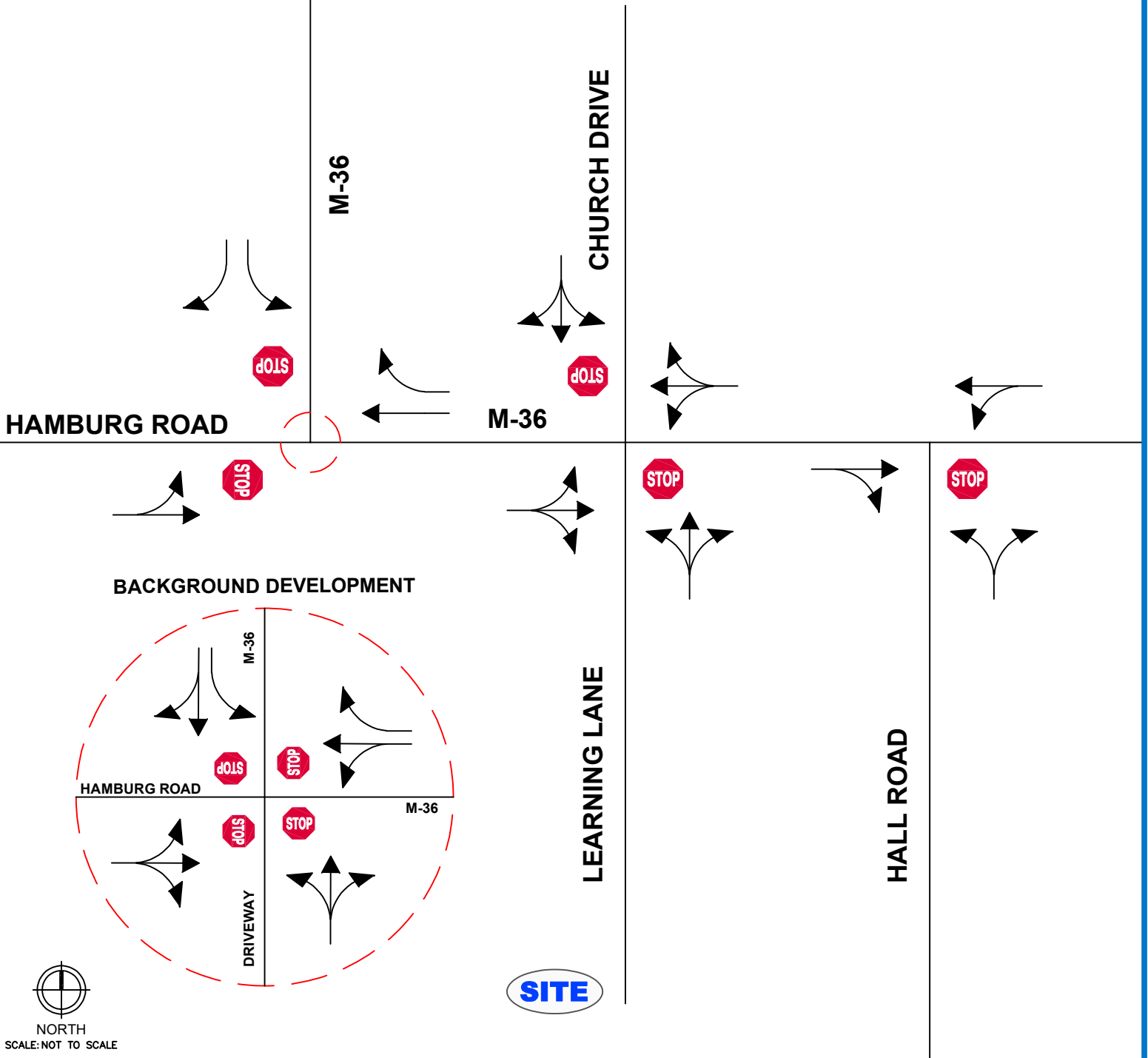
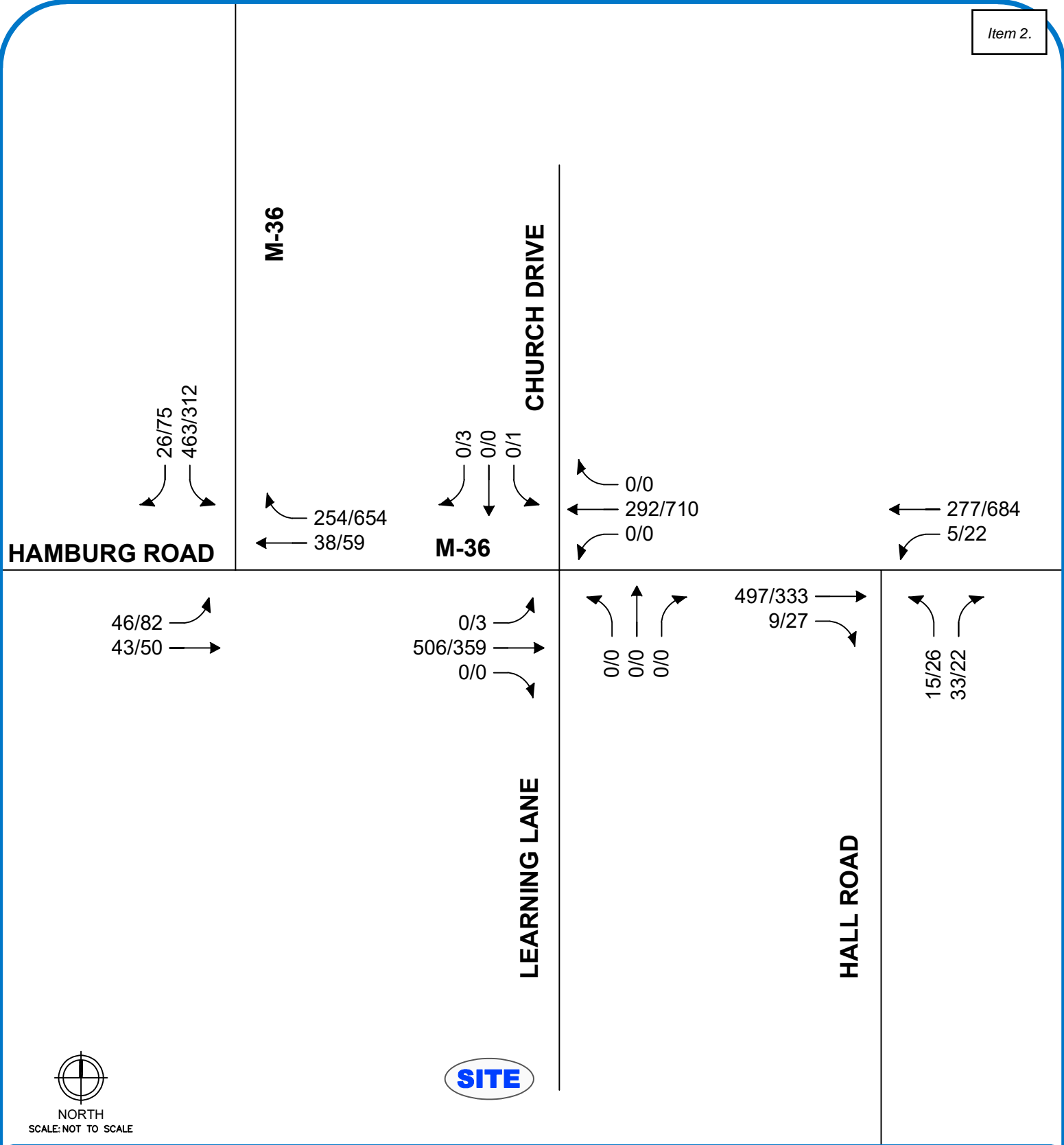


FIGURE 2
LANE USE AND TRAFFIC CONTROL

THE CROSSING TIS - HAMBURG TOWNSHIP, MI

LEGEND

- ROADS
- ↔ LANE USE
- STOP UNSIGNALIZED INTERSECTION



NORTH
SCALE: NOT TO SCALE



FIGURE 3
EXISTING (2024)
TRAFFIC VOLUMES

THE CROSSING TIS - HAMBURG TOWNSHIP, MI

LEGEND

- ROADS
- - - PROPOSED ROADS
- TRAFFIC VOLUMES (AM/PM)

HAMBURG ROAD
27/77
13/10
472/318

M-36
259/667
39/60
8/18
M-36

CHURCH DRIVE
0/3
0/0
0/1
M-36

0/0
306/742
0/0

291/715
5/22

47/84
44/51
3/2

3/3
12/14
21/6

0/3
537/372
0/0

0/0
0/0
0/0

528/345
9/28

15/27
34/22

DRIVEWAY

LEARNING LANE

HALL ROAD

SITE



NORTH
SCALE: NOT TO SCALE

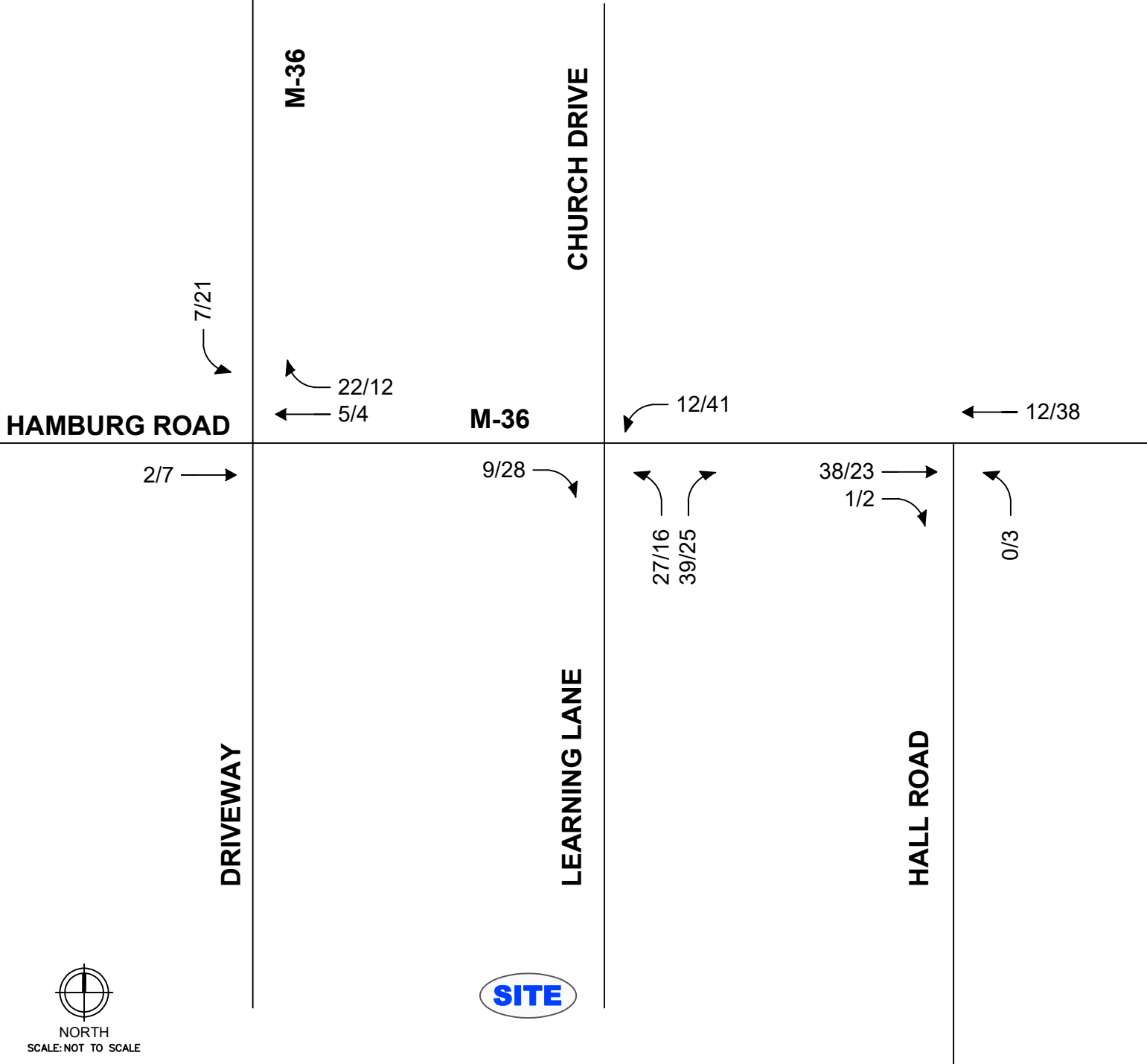


FIGURE 4 BACKGROUND (2028) TRAFFIC VOLUMES

THE CROSSING TIS - HAMBURG TOWNSHIP, MI

LEGEND

- ROADS
- - - PROPOSED ROADS
- TRAFFIC VOLUMES (AM/PM)



SITE

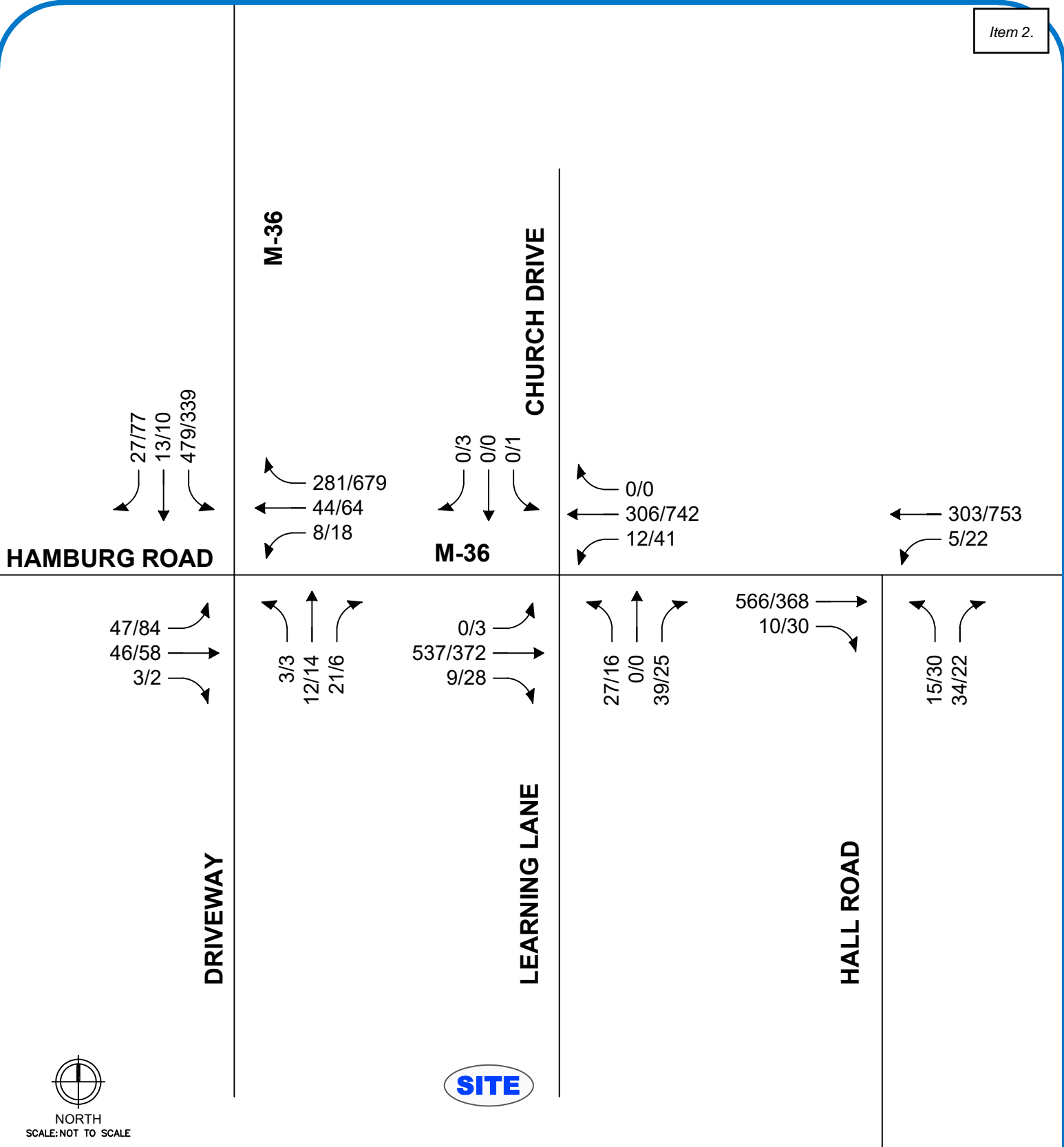


FIGURE 5 SITE-GENERATED TRAFFIC VOLUMES

THE CROSSING TIS - HAMBURG TOWNSHIP, MI

LEGEND

- ROADS
- - - PROPOSED ROADS
- ↔ TRAFFIC VOLUMES (AM/PM)



SITE

NORTH
SCALE: NOT TO SCALE



**FIGURE 6
FUTURE (2028)
TRAFFIC VOLUMES**

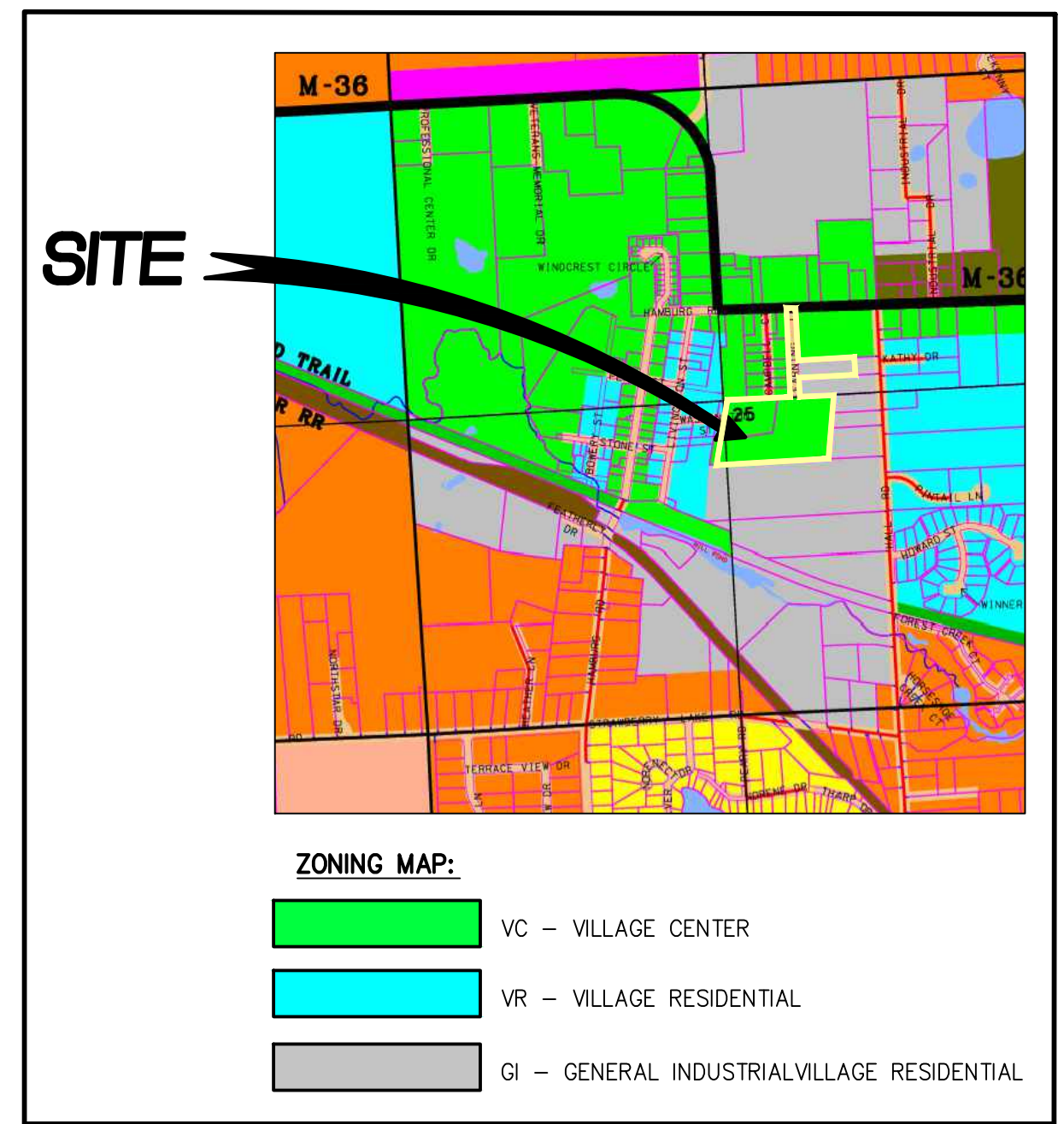
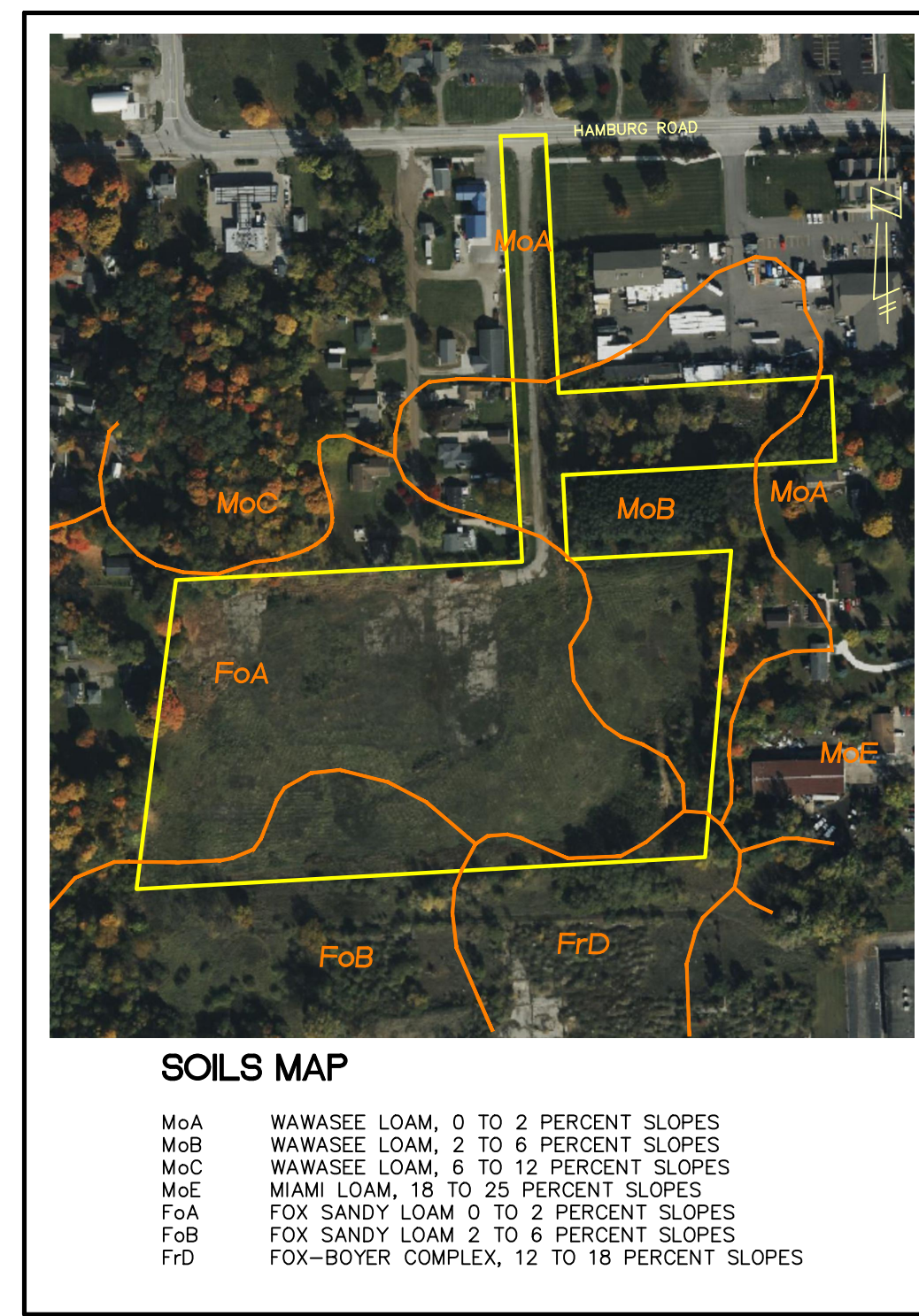
THE CROSSING TIS - HAMBURG TOWNSHIP, MI

LEGEND
 ——— ROADS
 - - - - PROPOSED ROADS
 TRAFFIC VOLUMES (AM/PM)

PRELIMINARY SITE PLANS FOR: **THE CROSSING AT LAKELANDS TRAIL**

PART OF E. 1/2 OF SECTION 25, TOWN 1 NORTH, RANGE 5 EAST
HAMBURG TWP., LIVINGSTON COUNTY, MICHIGAN

PREPARED FOR:
ELEVATE LAND HOLDINGS - THE CROSSING
128 N. CENTER STREET
NORTHVILLE, MICHIGAN 48167
248.344.1885



SHEET INDEX

ENGINEERING PLANS:

- COVER SHEET
- PREVIOUSLY APPROVED OPEN SPACE PLAN
- OVERALL PLAN AND OPEN SPACE PLAN
- UTILITIES PLAN
- GRADING PLAN
- GRADING PLAN
- GRADING PLAN
- STORM WATER MANAGEMENT PLAN

LANDSCAPE PLANS:

- LANDSCAPE PLAN
- LANDSCAPE PLAN
- LANDSCAPE PLAN
- LANDSCAPE DETAILS

ARCHITECTURAL PLANS PREPARED BY:
TK DESIGN & ASSOCIATES
26030 PONTIAC TRAIL
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LANDSCAPE PLANS PROVIDED BY:
ALLEN DESIGN
557 CARPENTER
NORTHVILLE, MICHIGAN 48167
PHONE: 248.467.4668

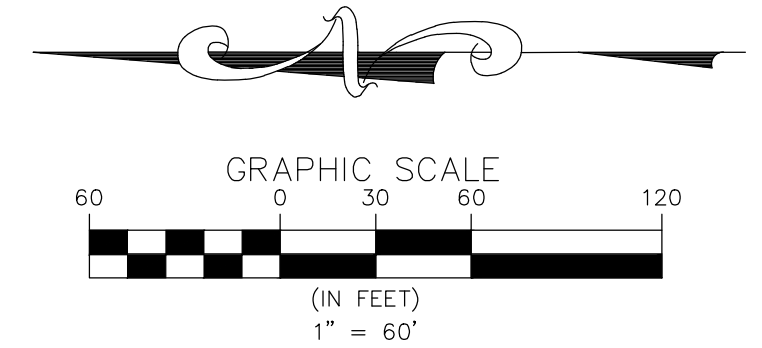
TOPOGRAPHIC SURVEY PREPARED BY:
M. E. G. A.
298 VETERANS DRIVE
FOWLerville, MICHIGAN, 48836
PHONE: 517.223.3512

**SKL SEIBER KEAST LEHNER
ENGINEERING | SURVEYING**

CLINTON TOWNSHIP OFFICE
17001 NINETEEN MILE ROAD, SUITE 3
CLINTON TOWNSHIP, MI 48038
586.412.7050

FARMINGTON HILLS OFFICE
39205 COUNTRY CLUB DRIVE, SUITE C8
FARMINGTON HILLS, MI 48331
248.308.3331

REVISIONS			ENGINEER'S SEAL
NO.	ITEM	DATE	
1.	PRE-APP SUBMITTAL	4-22-24	
DATE: 1-5-2024 DESIGNED BY: A.A. CHECKED BY: C.S.			JOB NUMBER: 23-299 DRAWING FILE: 1-23289-CV.dwg



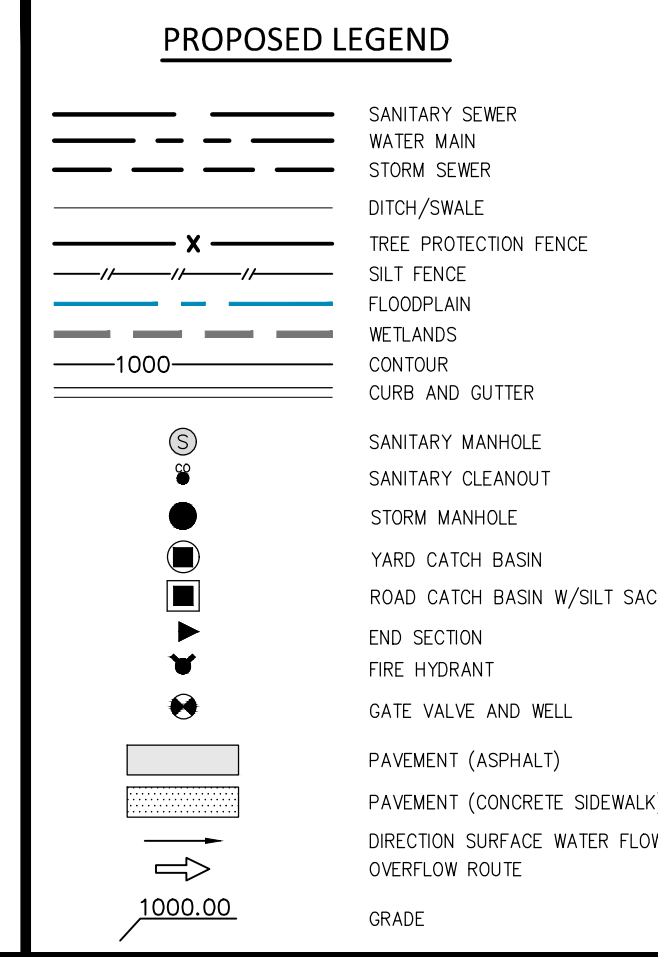
SITE DATA
 EXISTING ZONING: GENERAL PLANNED UNIT DEVELOPMENT (GPUD)
 SITE AREA = 15.478 ACRES
 MAX. DWELLING UNITS PER ACRE (VC): 10 DU/CCRE
 NO. OF BUILDING ON SITE: 16
 NO. OF UNITS PROPOSED: 208
 DWELLING UNITS PER ACRE: 13.44 DU/CCRE (AMEND TO PUD AGREEMENT)

BUILDING SETBACKS:	REQUIRED	PREVIOUSLY APPROVED	PROPOSED
FRONT (FROM PAVEMENT):	20'	15'	N/A
SIDE:	10'	15'	20' MIN.
REAR: TO PROPERTY LINE	25'	30'	20' MIN.
BUILDING TO BUILDING:	35'	N/A	N/A
BUILDING FRONT TO SIDE:	N/A	25'	N/A
BUILDING SIDE TO SIDE:	N/A	15'	N/A
MAXIMUM BUILDING HEIGHT:	35'	35'	35'
MAXIMUM BUILDING STORIES:	2.5 STORIES	2 STORIES	2 STORIES
MINIMUM FLOOR AREA:			
1 BEDROOM	550 S.F.	875 S.F.	600 S.F.
2 BEDROOMS	650 S.F.	1100 S.F.	898 S.F.
3 BEDROOMS		N/A	936 S.F.
BUILDING COVERAGE:	50% MAX.	16%	15.83%
IMPERVIOUS AREA CALCULATION:	N/A	32%	37.85%
OPEN SPACE REQUIRED: 1,500 S.F./ UNIT=1,500 x 208 312,000 S.F. (7.16 AC.)	44%	37%	42.56%
OPEN SPACE PROVIDED:		6.03 AC.	6.59 AC.

PARKING REQUIRED: (1.5 SPACE/UNIT)
 1.5 x 208 = 312 SPACES
 PARKING PROVIDED: 407 SPACES
 (INCLUDING 10 B.F. SPACES)
 (1.957 SPACES/UNIT)

	PREVIOUSLY APPROVED PLANS	CURRENT PLANS
SITE AREA	16.1 AC.	15.478 AC.
NO. OF BUILDING ON SITE:	23	16
NO. OF UNITS PROPOSED:	208	208
DWELLING UNITS PER ACRE:	12.91 DU/CCRE	13.44 DU/CCRE
BUILDING COVERAGE:	16%	15.8%
PAVED SURFACE PARKING AND ROADS CIRCULATION	32%	37.85%
OPEN SPACE:	37%	42.96%
PARKING PROVIDED:	406 SPACES (1.952 SPACES/UNIT)	407 SPACES (1.957 SPACES/UNIT)

SEE LANDSCAPE PLANS FOR SCREENING WALL DETAILS



REVISIONS

NO.	DESCRIPTION	DATE
1.	REV. LAYOUT PER HAMBURG TWP. REVIEW	4-22-24
2.	REV. ISLAND, ADD VINYL FENCE	6-26-24

3 WORKING DAYS BEFORE YOU DIG
 CALL MISS DIG
 1-800-482-7171
 TOLL FREE FOR THE LOCATION OF UNDERGROUND UTILITIES

PROJECT NUMBER: 248-344-1885
PROJECT MANAGER: B. EMERINE
DRAWN BY: A. AWAD
CHECKED BY: C.S.
DATE: 6/24/24
OFFICE: FARMINGTON HILLS

CLIENT INFO:
 ELEVATE LAND HOLDINGS - THE CROSSING TRAIL
 128 N. CENTER STREET
 NORTHVILLE, MI 48167
 248-344-1885

PROJECT NAME: THE CROSSING AT LAKELANDS TRAIL
 PART OF E. 1/2 OF SEC. 25, T.1N., R.5E., HAMBURG TWP., LIVINGSTON COUNTY, MI

SHEET TITLE: OVERALL PLAN

PAGE No.: 3

SEIBER KEAST LEHNER
 ENGINEERING | SURVEYING

SKL

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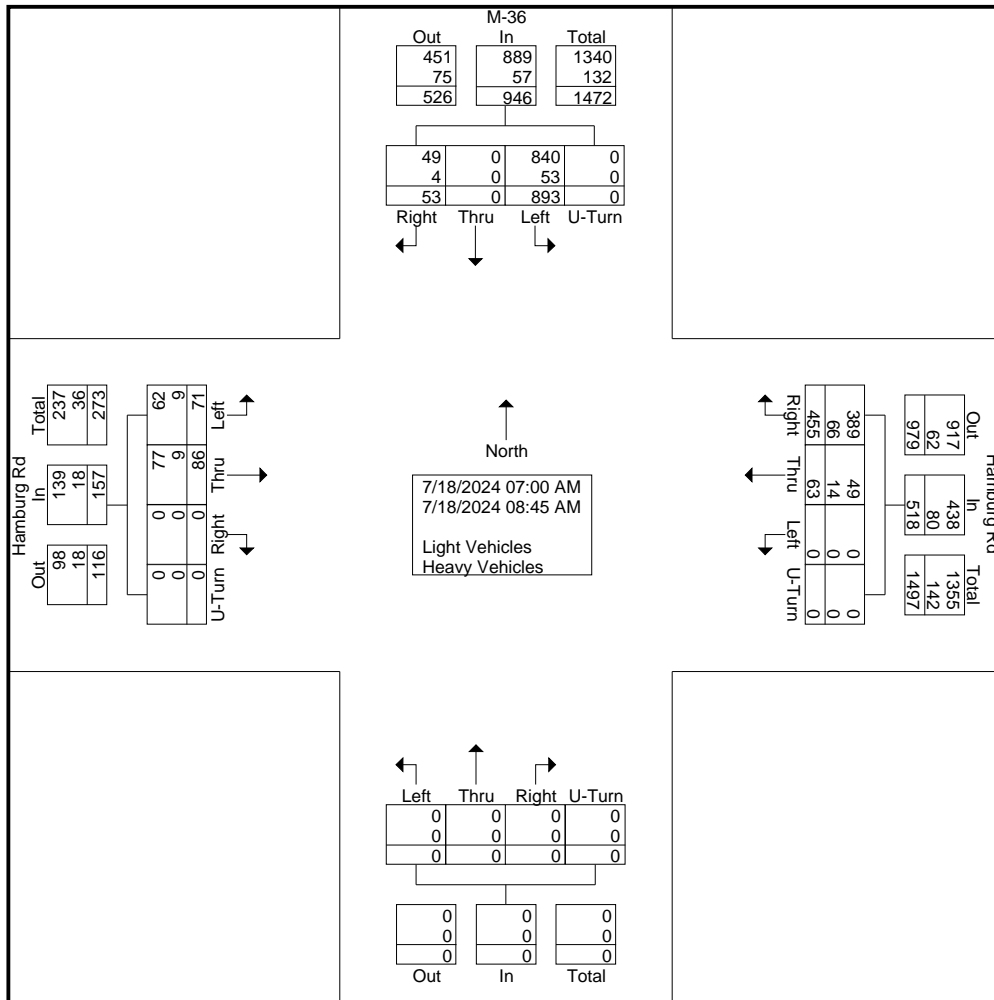
TRUE DATA TO IMPROVE MOBILITY

File Name : 16678701 - M-36 -- Hamburg Rd
 Site Code : 16678701
 Start Date : 7/18/2024
 Page No : 1

Item 2.

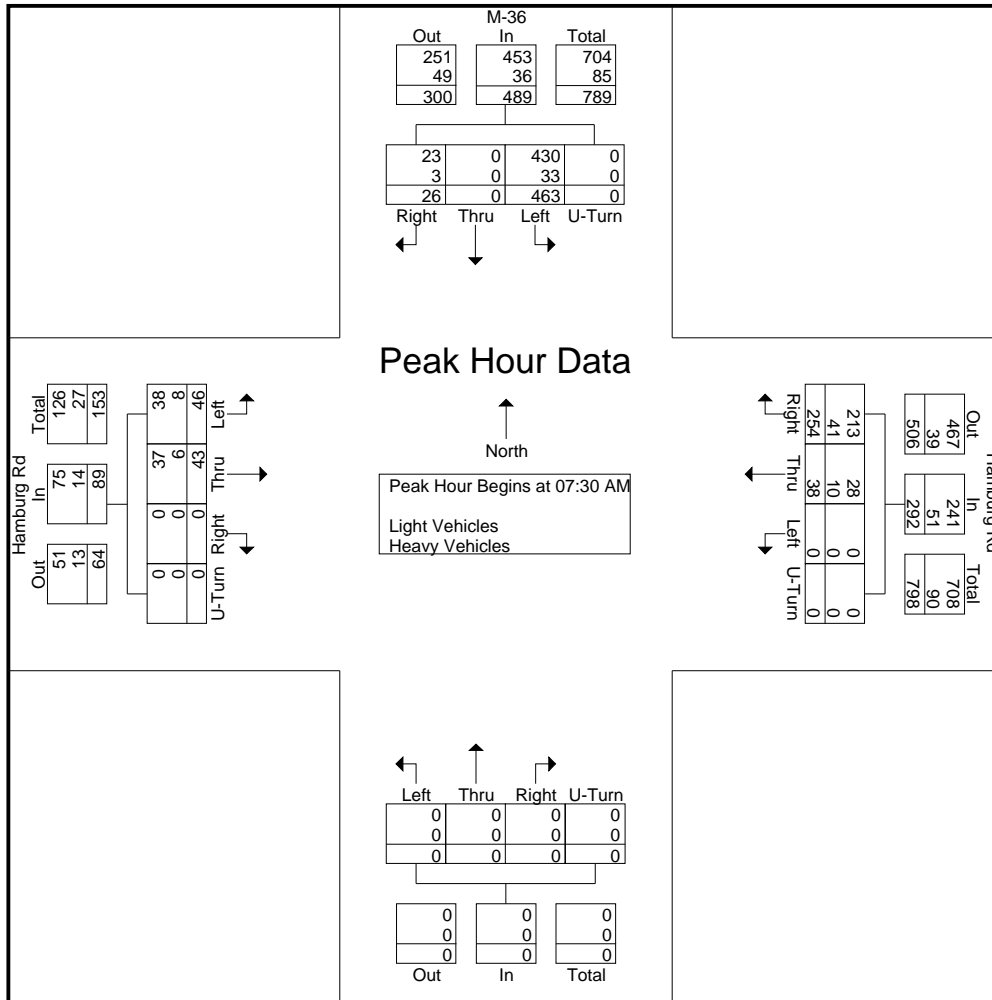
Groups Printed- Light Vehicles - Heavy Vehicles

Start Time	Hamburg Rd Eastbound					Hamburg Rd Westbound					Northbound					M-36 Southbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
07:00 AM	3	9	0	0	12	0	6	36	0	42	0	0	0	0	0	109	0	3	0	112	166
07:15 AM	3	11	0	0	14	0	8	41	0	49	0	0	0	0	0	133	0	4	0	137	200
07:30 AM	10	10	0	0	20	0	7	51	0	58	0	0	0	0	0	123	0	9	0	132	210
07:45 AM	11	13	0	0	24	0	16	72	0	88	0	0	0	0	0	120	0	6	0	126	238
Total	27	43	0	0	70	0	37	200	0	237	0	0	0	0	0	485	0	22	0	507	814
08:00 AM	13	13	0	0	26	0	8	57	0	65	0	0	0	0	0	115	0	4	0	119	210
08:15 AM	12	7	0	0	19	0	7	74	0	81	0	0	0	0	0	105	0	7	0	112	212
08:30 AM	10	9	0	0	19	0	5	61	0	66	0	0	0	0	0	97	0	7	0	104	189
08:45 AM	9	14	0	0	23	0	6	63	0	69	0	0	0	0	0	91	0	13	0	104	196
Total	44	43	0	0	87	0	26	255	0	281	0	0	0	0	0	408	0	31	0	439	807
Grand Total	71	86	0	0	157	0	63	455	0	518	0	0	0	0	0	893	0	53	0	946	1621
Apprch %	45.2	54.8	0	0		0	12.2	87.8	0		0	0	0	0		94.4	0	5.6	0		
Total %	4.4	5.3	0	0	9.7	0	3.9	28.1	0	32	0	0	0	0	0	55.1	0	3.3	0	58.4	
Light Vehicles	62	77	0	0	139	0	49	389	0	438	0	0	0	0	0	840	0	49	0	889	1466
% Light Vehicles	87.3	89.5	0	0	88.5	0	77.8	85.5	0	84.6	0	0	0	0	0	94.1	0	92.5	0	94	90.4
Heavy Vehicles	9	9	0	0	18	0	14	66	0	80	0	0	0	0	0	53	0	4	0	57	155
% Heavy Vehicles	12.7	10.5	0	0	11.5	0	22.2	14.5	0	15.4	0	0	0	0	0	5.9	0	7.5	0	6	9.6





Start Time	Hamburg Rd Eastbound					Hamburg Rd Westbound					Northbound					M-36 Southbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	10	10	0	0	20	0	7	51	0	58	0	0	0	0	0	123	0	9	0	132	210
07:45 AM	11	13	0	0	24	0	16	72	0	88	0	0	0	0	0	120	0	6	0	126	238
08:00 AM	13	13	0	0	26	0	8	57	0	65	0	0	0	0	0	115	0	4	0	119	210
08:15 AM	12	7	0	0	19	0	7	74	0	81	0	0	0	0	0	105	0	7	0	112	212
Total Volume	46	43	0	0	89	0	38	254	0	292	0	0	0	0	0	463	0	26	0	489	870
% App. Total	51.7	48.3	0	0		0	13	87	0		0	0	0	0		94.7	0	5.3	0		
PHF	.885	.827	.000	.000	.856	.000	.594	.858	.000	.830	.000	.000	.000	.000	.000	.941	.000	.722	.000	.926	.914
Light Vehicles	38	37	0	0	75	0	28	213	0	241	0	0	0	0	0	430	0	23	0	453	769
% Light Vehicles	82.6	86.0	0	0	84.3	0	73.7	83.9	0	82.5	0	0	0	0	0	92.9	0	88.5	0	92.6	88.4
Heavy Vehicles	8	6	0	0	14	0	10	41	0	51	0	0	0	0	0	33	0	3	0	36	101
% Heavy Vehicles	17.4	14.0	0	0	15.7	0	26.3	16.1	0	17.5	0	0	0	0	0	7.1	0	11.5	0	7.4	11.6

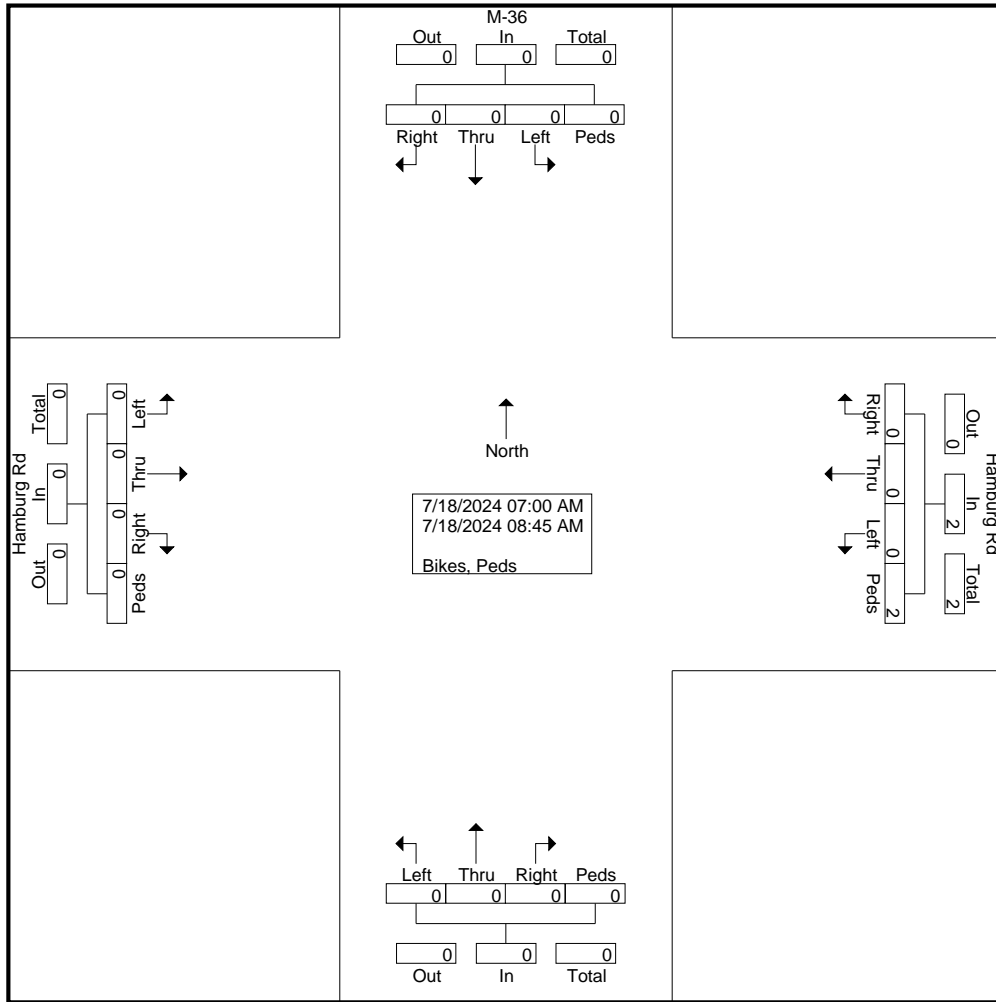




Item 2.

Groups Printed- Bikes, Peds

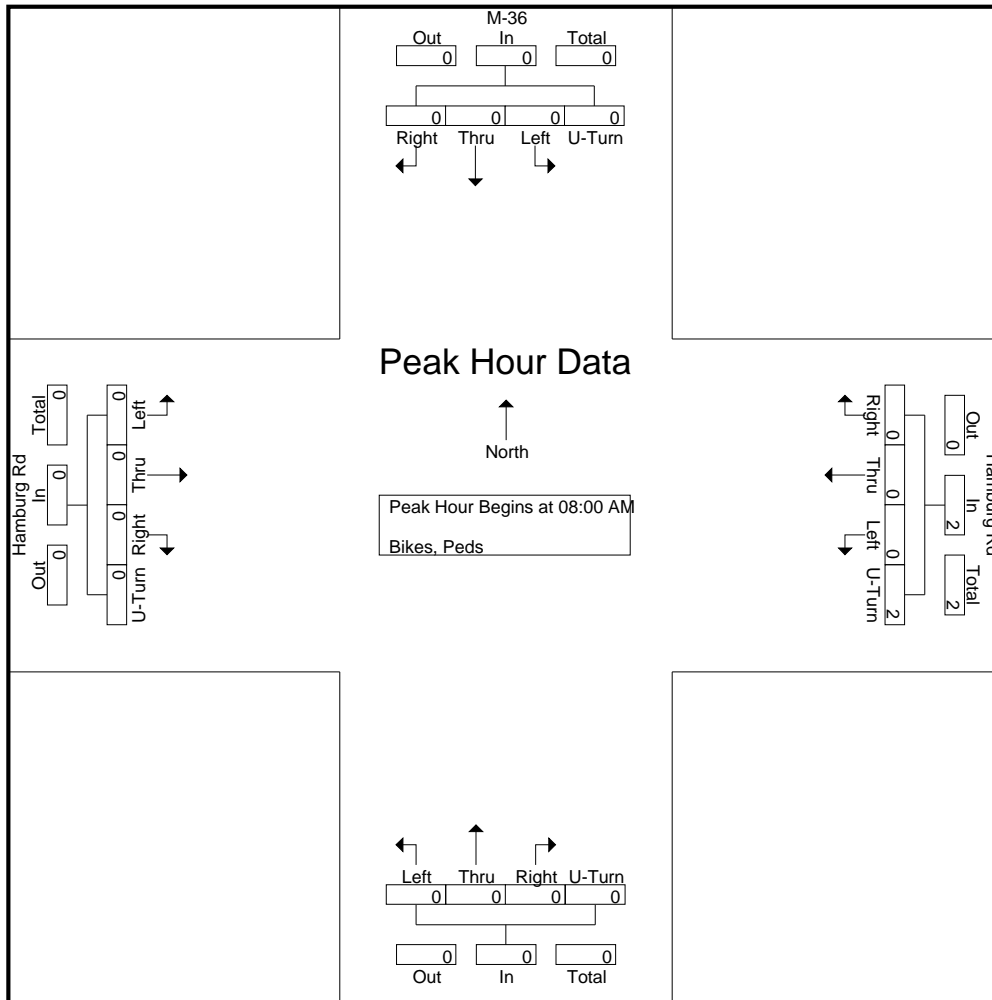
Start Time	Hamburg Rd Eastbound					Hamburg Rd Westbound					Northbound					M-36 Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
Grand Total	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
Apprch %	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0	0	
Total %	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0	0	





Item 2.

Start Time	Hamburg Rd Eastbound					Hamburg Rd Westbound					Northbound					M-36 Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
% App. Total	0	0	0	0	0	0	0	0	100		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250



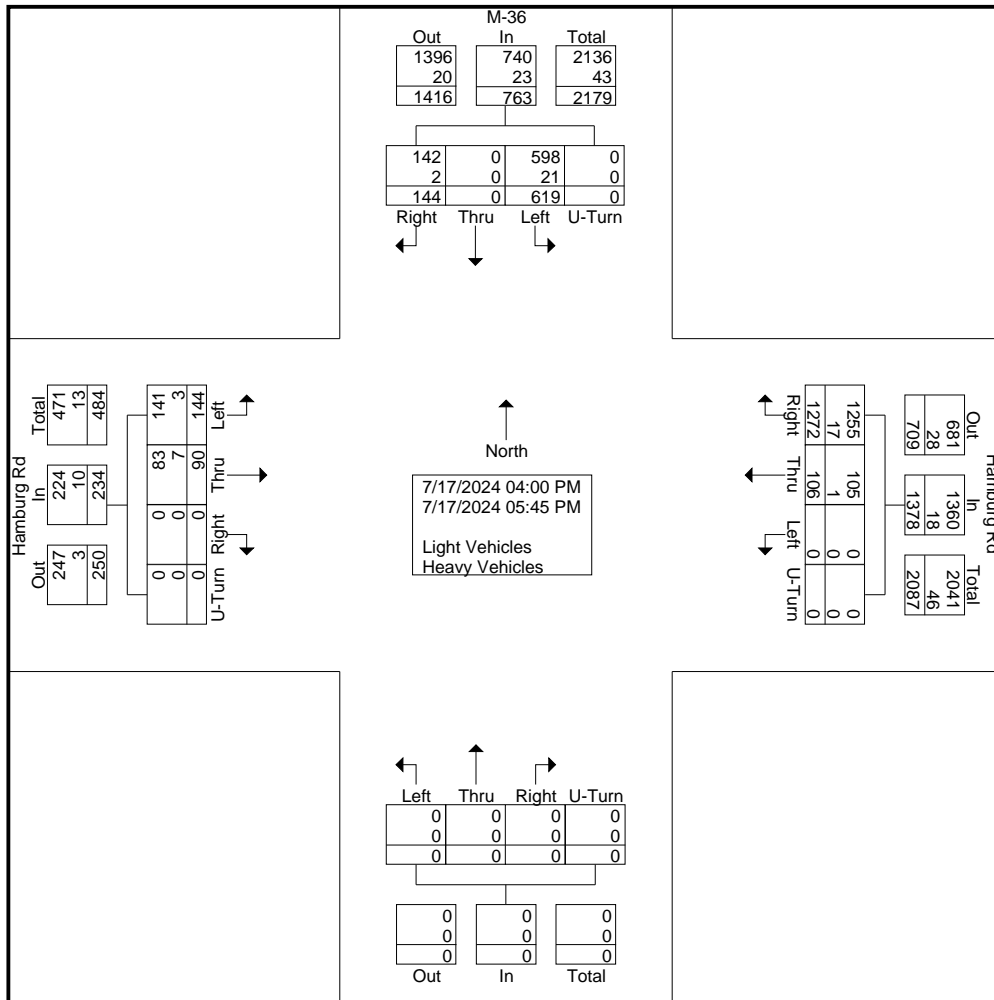


TRUE DATA TO IMPROVE MOBILITY

Item 2.

Groups Printed- Light Vehicles - Heavy Vehicles

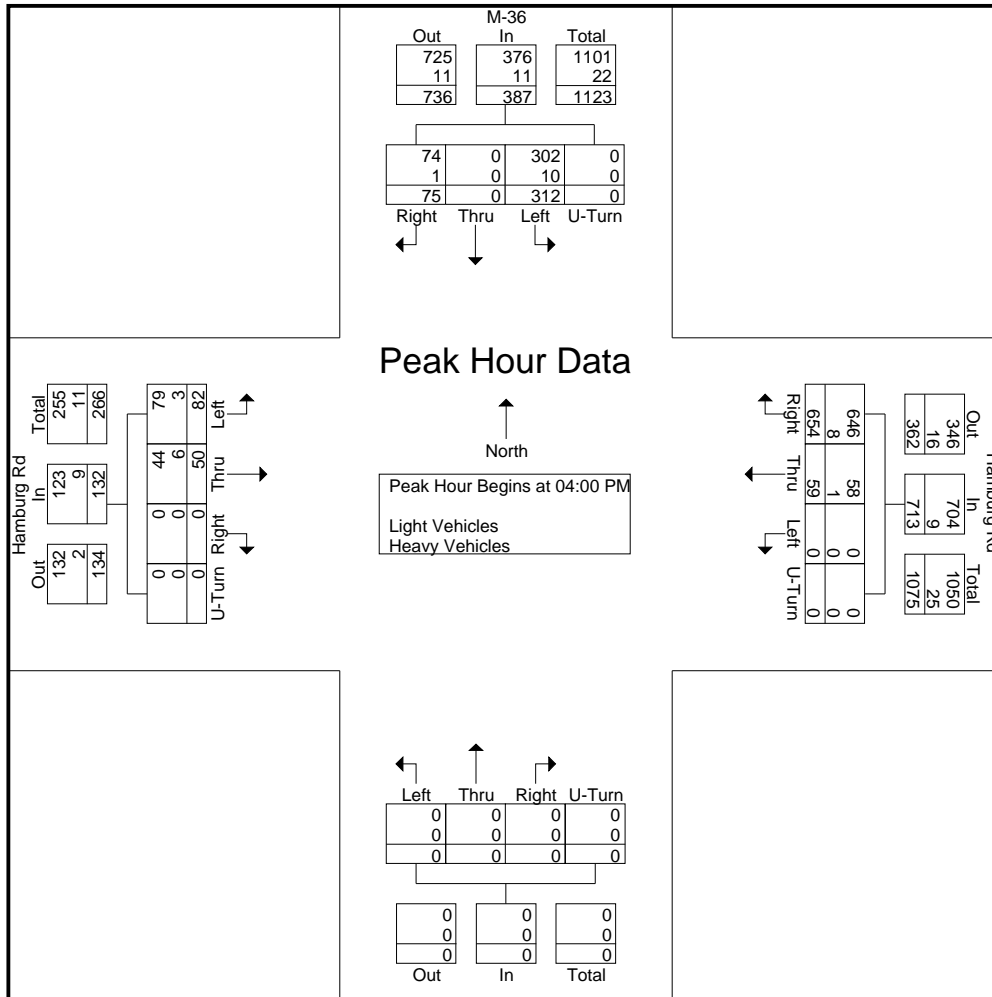
Start Time	Hamburg Rd Eastbound					Hamburg Rd Westbound					Northbound					M-36 Southbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
04:00 PM	15	16	0	0	31	0	13	170	0	183	0	0	0	0	0	81	0	16	0	97	311
04:15 PM	23	14	0	0	37	0	16	144	0	160	0	0	0	0	0	86	0	20	0	106	303
04:30 PM	24	9	0	0	33	0	15	176	0	191	0	0	0	0	0	69	0	18	0	87	311
04:45 PM	20	11	0	0	31	0	15	164	0	179	0	0	0	0	0	76	0	21	0	97	307
Total	82	50	0	0	132	0	59	654	0	713	0	0	0	0	0	312	0	75	0	387	1232
05:00 PM	14	9	0	0	23	0	17	163	0	180	0	0	0	0	0	82	0	18	0	100	303
05:15 PM	22	13	0	0	35	0	12	157	0	169	0	0	0	0	0	77	0	23	0	100	304
05:30 PM	15	6	0	0	21	0	9	162	0	171	0	0	0	0	0	79	0	14	0	93	285
05:45 PM	11	12	0	0	23	0	9	136	0	145	0	0	0	0	0	69	0	14	0	83	251
Total	62	40	0	0	102	0	47	618	0	665	0	0	0	0	0	307	0	69	0	376	1143
Grand Total	144	90	0	0	234	0	106	1272	0	1378	0	0	0	0	0	619	0	144	0	763	2375
Apprch %	61.5	38.5	0	0		0	7.7	92.3	0		0	0	0	0		81.1	0	18.9	0		
Total %	6.1	3.8	0	0	9.9	0	4.5	53.6	0	58	0	0	0	0	0	26.1	0	6.1	0	32.1	
Light Vehicles	141	83	0	0	224	0	105	1255	0	1360	0	0	0	0	0	598	0	142	0	740	2324
% Light Vehicles	97.9	92.2	0	0	95.7	0	99.1	98.7	0	98.7	0	0	0	0	0	96.6	0	98.6	0	97	97.9
Heavy Vehicles	3	7	0	0	10	0	1	17	0	18	0	0	0	0	0	21	0	2	0	23	51
% Heavy Vehicles	2.1	7.8	0	0	4.3	0	0.9	1.3	0	1.3	0	0	0	0	0	3.4	0	1.4	0	3	2.1





Item 2.

Start Time	Hamburg Rd Eastbound					Hamburg Rd Westbound					Northbound					M-36 Southbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	15	16	0	0	31	0	13	170	0	183	0	0	0	0	0	81	0	16	0	97	311
04:15 PM	23	14	0	0	37	0	16	144	0	160	0	0	0	0	0	86	0	20	0	106	303
04:30 PM	24	9	0	0	33	0	15	176	0	191	0	0	0	0	0	69	0	18	0	87	311
04:45 PM	20	11	0	0	31	0	15	164	0	179	0	0	0	0	0	76	0	21	0	97	307
Total Volume	82	50	0	0	132	0	59	654	0	713	0	0	0	0	0	312	0	75	0	387	1232
% App. Total	62.1	37.9	0	0		0	8.3	91.7	0		0	0	0	0		80.6	0	19.4	0		
PHF	.854	.781	.000	.000	.892	.000	.922	.929	.000	.933	.000	.000	.000	.000	.000	.907	.000	.893	.000	.913	.990
Light Vehicles	79	44	0	0	123	0	58	646	0	704	0	0	0	0	0	302	0	74	0	376	1203
% Light Vehicles	96.3	88.0	0	0	93.2	0	98.3	98.8	0	98.7	0	0	0	0	0	96.8	0	98.7	0	97.2	97.6
Heavy Vehicles	3	6	0	0	9	0	1	8	0	9	0	0	0	0	0	10	0	1	0	11	29
% Heavy Vehicles	3.7	12.0	0	0	6.8	0	1.7	1.2	0	1.3	0	0	0	0	0	3.2	0	1.3	0	2.8	2.4

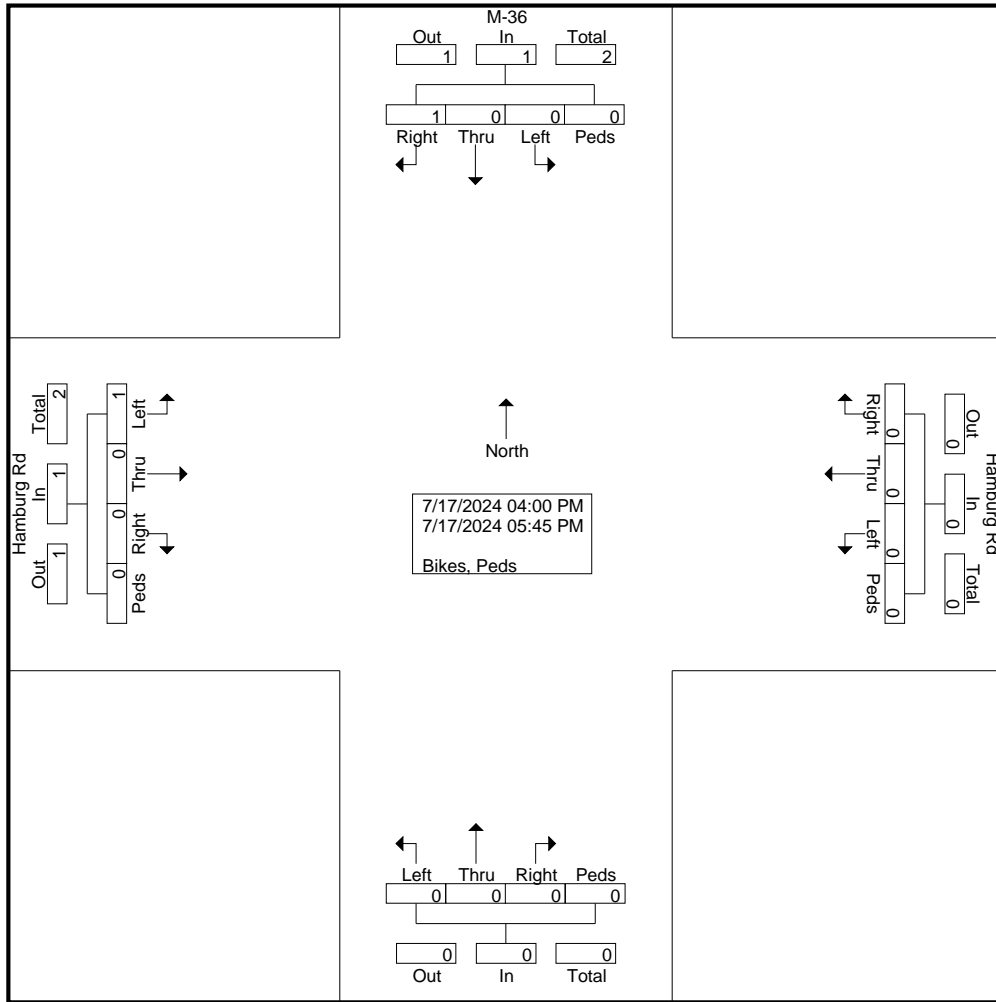




Item 2.

Groups Printed- Bikes, Peds

Start Time	Hamburg Rd Eastbound					Hamburg Rd Westbound					Northbound					M-36 Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Grand Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Apprch %	100	0	0	0		0	0	0	0		0	0	0	0		0	0	100	0		
Total %	50	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	50	0	50	

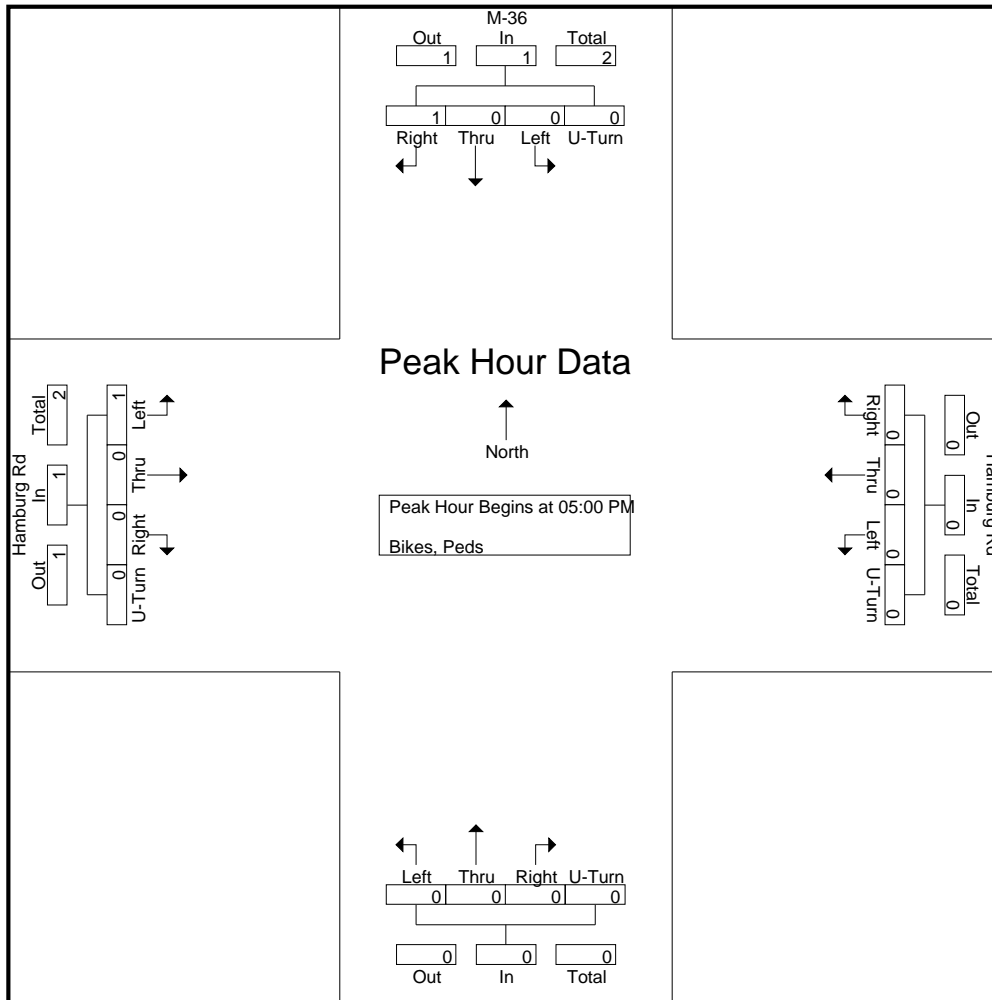




TRUE DATA TO IMPROVE MOBILITY

Item 2.

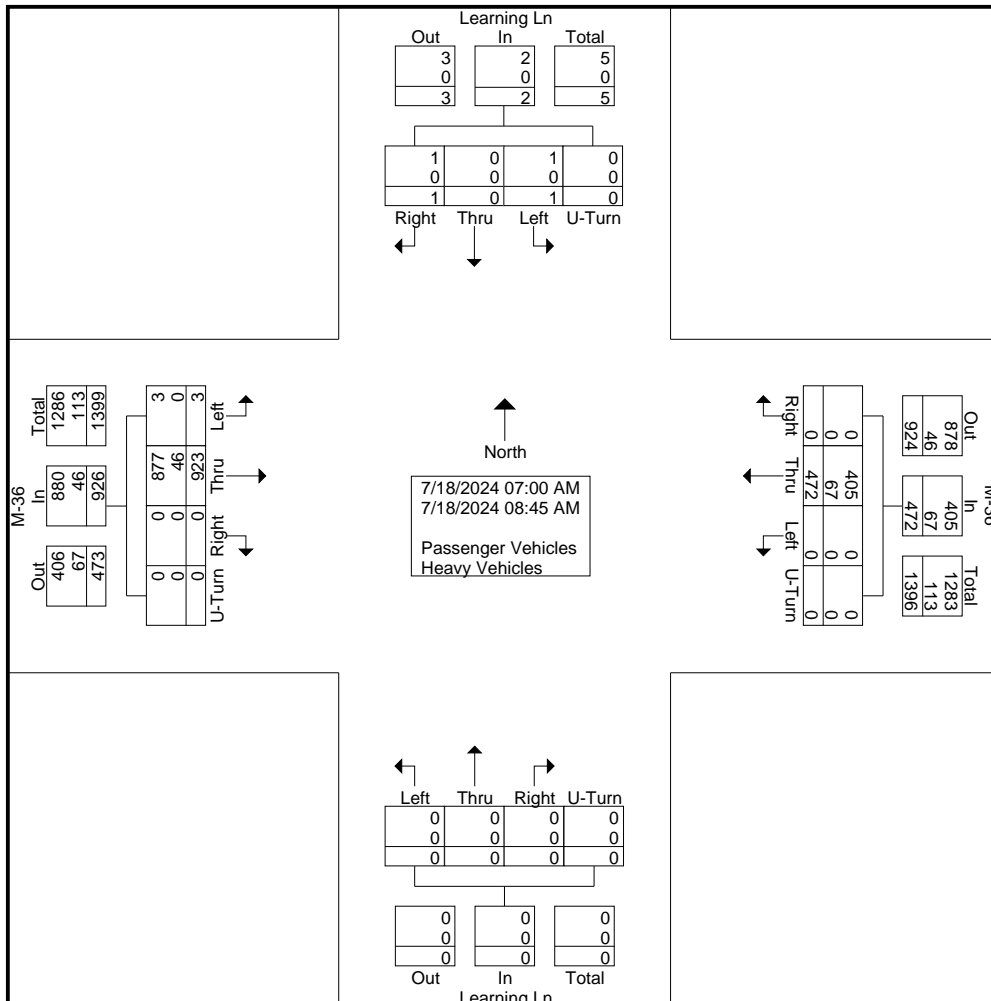
Start Time	Hamburg Rd Eastbound					Hamburg Rd Westbound					Northbound					M-36 Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
% App. Total	100	0	0	0		0	0	0	0		0	0	0	0		0	0	100	0		
PHF	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.500





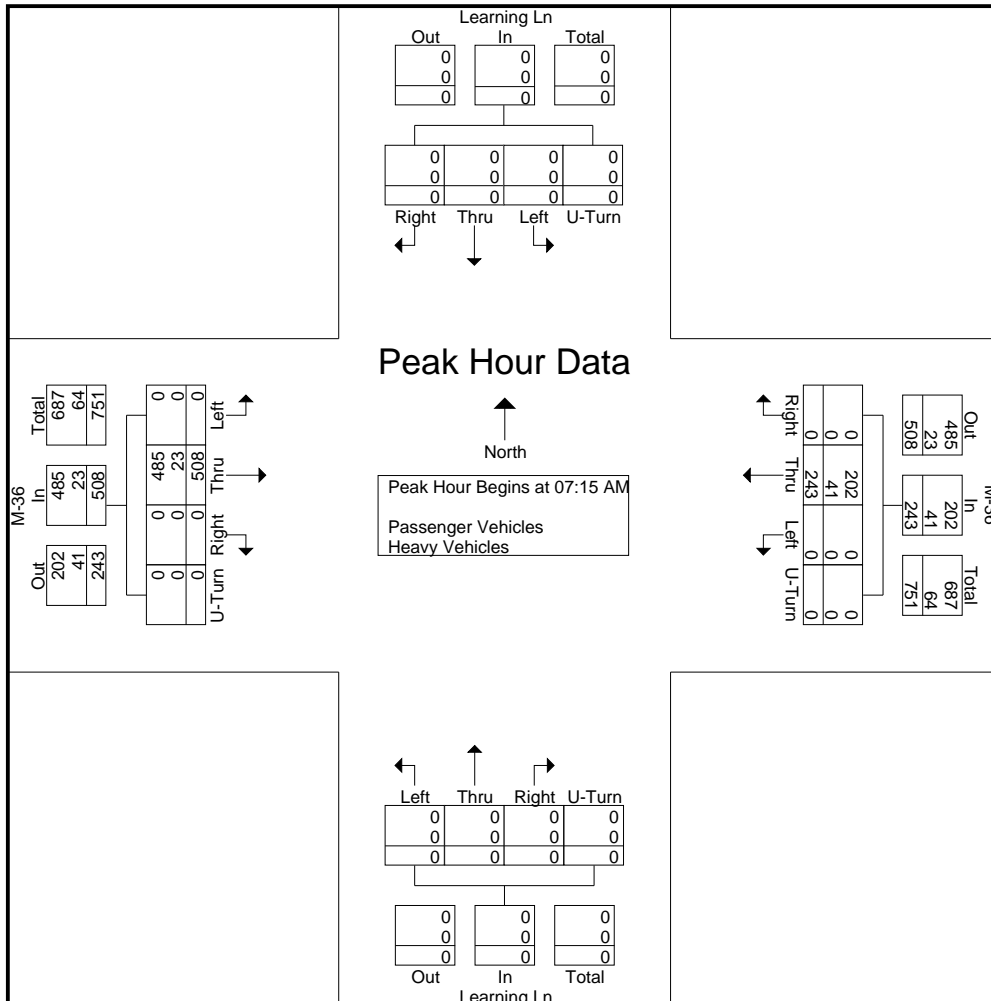
Groups Printed- Passenger Vehicles - Heavy Vehicles

Start Time	M-36 Eastbound					M-36 Westbound					Learning Ln Northbound					Learning Ln Southbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
07:00 AM	2	113	0	0	115	0	37	0	0	37	0	0	0	0	0	1	0	1	0	2	154
07:15 AM	0	146	0	0	146	0	48	0	0	48	0	0	0	0	0	0	0	0	0	0	194
07:30 AM	0	130	0	0	130	0	57	0	0	57	0	0	0	0	0	0	0	0	0	0	187
07:45 AM	0	119	0	0	119	0	78	0	0	78	0	0	0	0	0	0	0	0	0	0	197
Total	2	508	0	0	510	0	220	0	0	220	0	0	0	0	0	1	0	1	0	2	732
08:00 AM	0	113	0	0	113	0	60	0	0	60	0	0	0	0	0	0	0	0	0	0	173
08:15 AM	0	106	0	0	106	0	69	0	0	69	0	0	0	0	0	0	0	0	0	0	175
08:30 AM	0	102	0	0	102	0	58	0	0	58	0	0	0	0	0	0	0	0	0	0	160
08:45 AM	1	94	0	0	95	0	65	0	0	65	0	0	0	0	0	0	0	0	0	0	160
Total	1	415	0	0	416	0	252	0	0	252	0	0	0	0	0	0	0	0	0	0	668
Grand Total	3	923	0	0	926	0	472	0	0	472	0	0	0	0	0	1	0	1	0	2	1400
Apprch %	0.3	99.7	0	0		0	100	0	0		0	0	0	0		50	0	50	0		
Total %	0.2	65.9	0	0	66.1	0	33.7	0	0	33.7	0	0	0	0	0	0.1	0	0.1	0	0.1	
Passenger Vehicles	3	877	0	0	880	0	405	0	0	405	0	0	0	0	0	1	0	1	0	2	1287
% Passenger Vehicles	100	95	0	0	95	0	85.8	0	0	85.8	0	0	0	0	0	100	0	100	0	100	91.9
Heavy Vehicles	0	46	0	0	46	0	67	0	0	67	0	0	0	0	0	0	0	0	0	0	113
% Heavy Vehicles	0	5	0	0	5	0	14.2	0	0	14.2	0	0	0	0	0	0	0	0	0	0	8.1





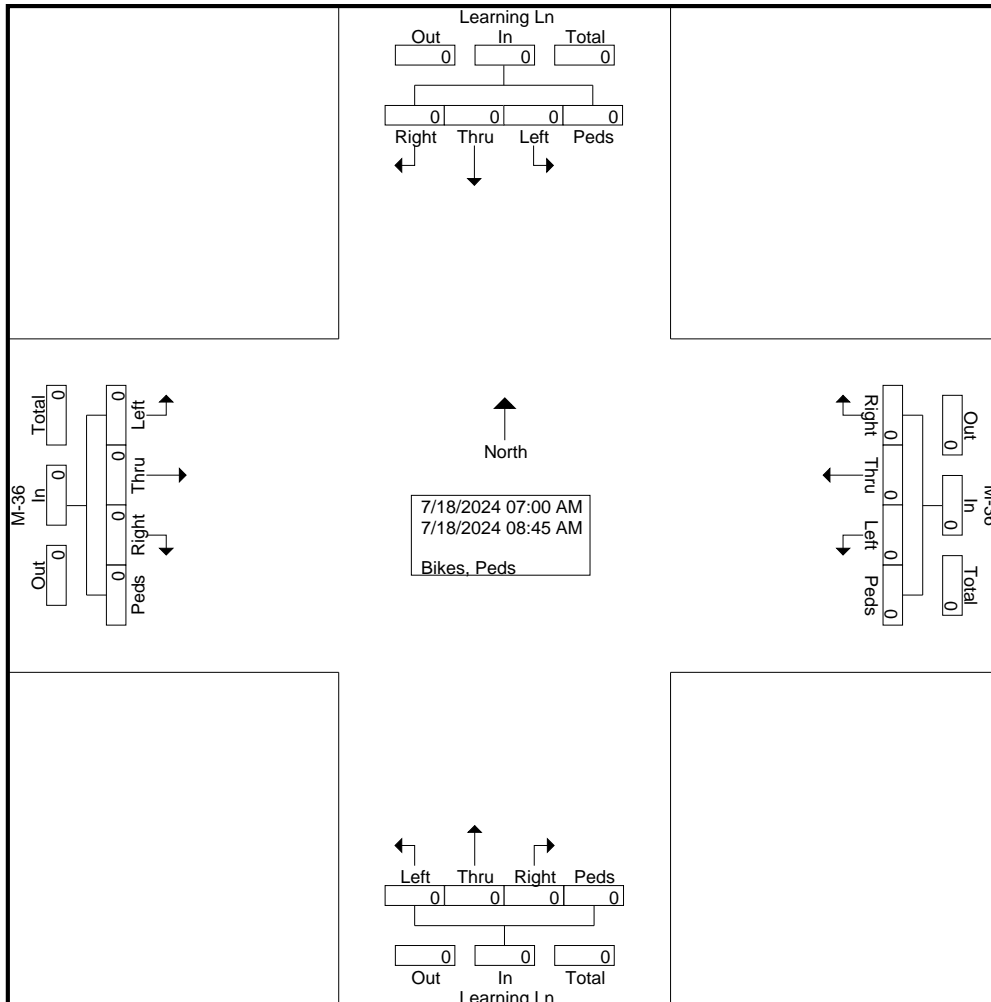
Start Time	M-36 Eastbound					M-36 Westbound					Learning Ln Northbound					Learning Ln Southbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	146	0	0	146	0	48	0	0	48	0	0	0	0	0	0	0	0	0	0	194
07:30 AM	0	130	0	0	130	0	57	0	0	57	0	0	0	0	0	0	0	0	0	0	187
07:45 AM	0	119	0	0	119	0	78	0	0	78	0	0	0	0	0	0	0	0	0	0	197
08:00 AM	0	113	0	0	113	0	60	0	0	60	0	0	0	0	0	0	0	0	0	0	173
Total Volume	0	508	0	0	508	0	243	0	0	243	0	0	0	0	0	0	0	0	0	0	751
% App. Total	0	100	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.870	.000	.000	.870	.000	.779	.000	.000	.779	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.953
Passenger Vehicles	0	485	0	0	485	0	202	0	0	202	0	0	0	0	0	0	0	0	0	0	687
% Passenger Vehicles	0	95.5	0	0	95.5	0	83.1	0	0	83.1	0	0	0	0	0	0	0	0	0	0	91.5
Heavy Vehicles	0	23	0	0	23	0	41	0	0	41	0	0	0	0	0	0	0	0	0	0	64
% Heavy Vehicles	0	4.5	0	0	4.5	0	16.9	0	0	16.9	0	0	0	0	0	0	0	0	0	0	8.5





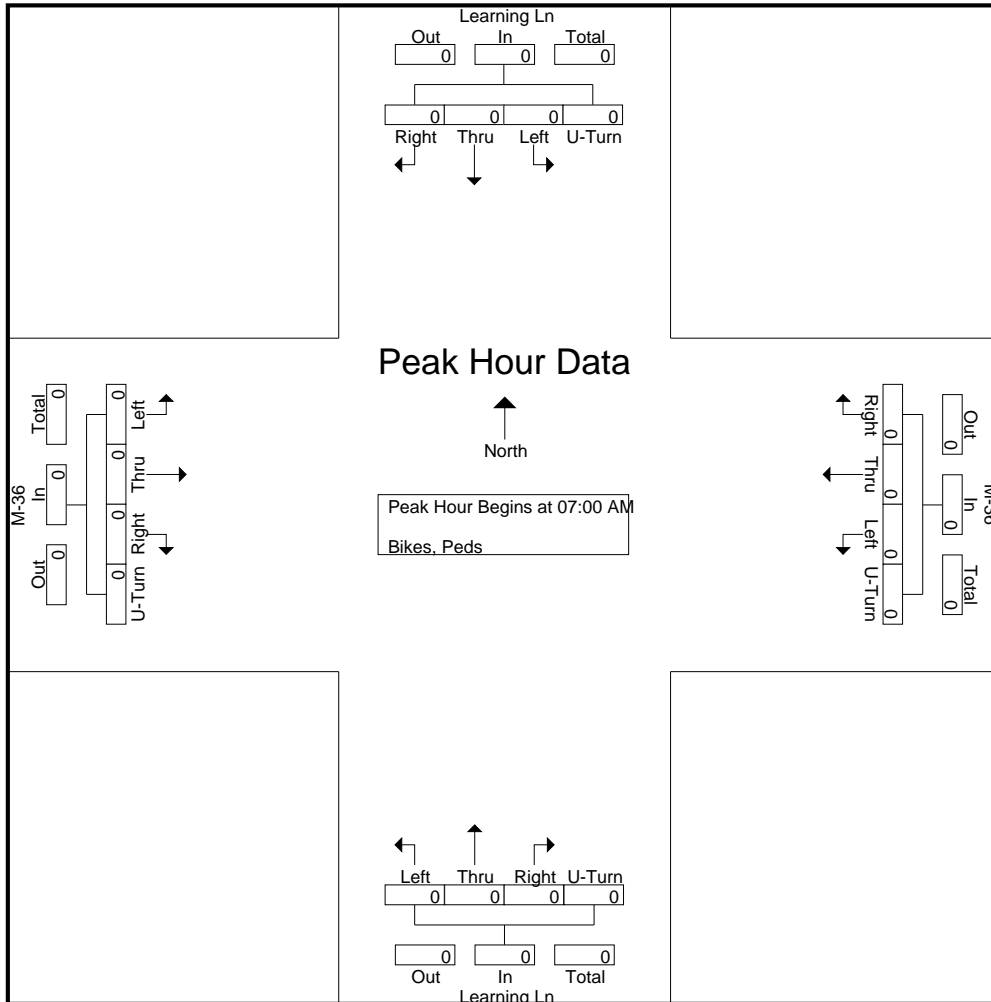
Groups Printed- Bikes, Peds

Start Time	M-36 Eastbound					M-36 Westbound					Learning Ln Northbound					Learning Ln Southbound					Int. Total					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total						
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																										





Start Time	M-36 Eastbound					M-36 Westbound					Learning Ln Northbound					Learning Ln Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

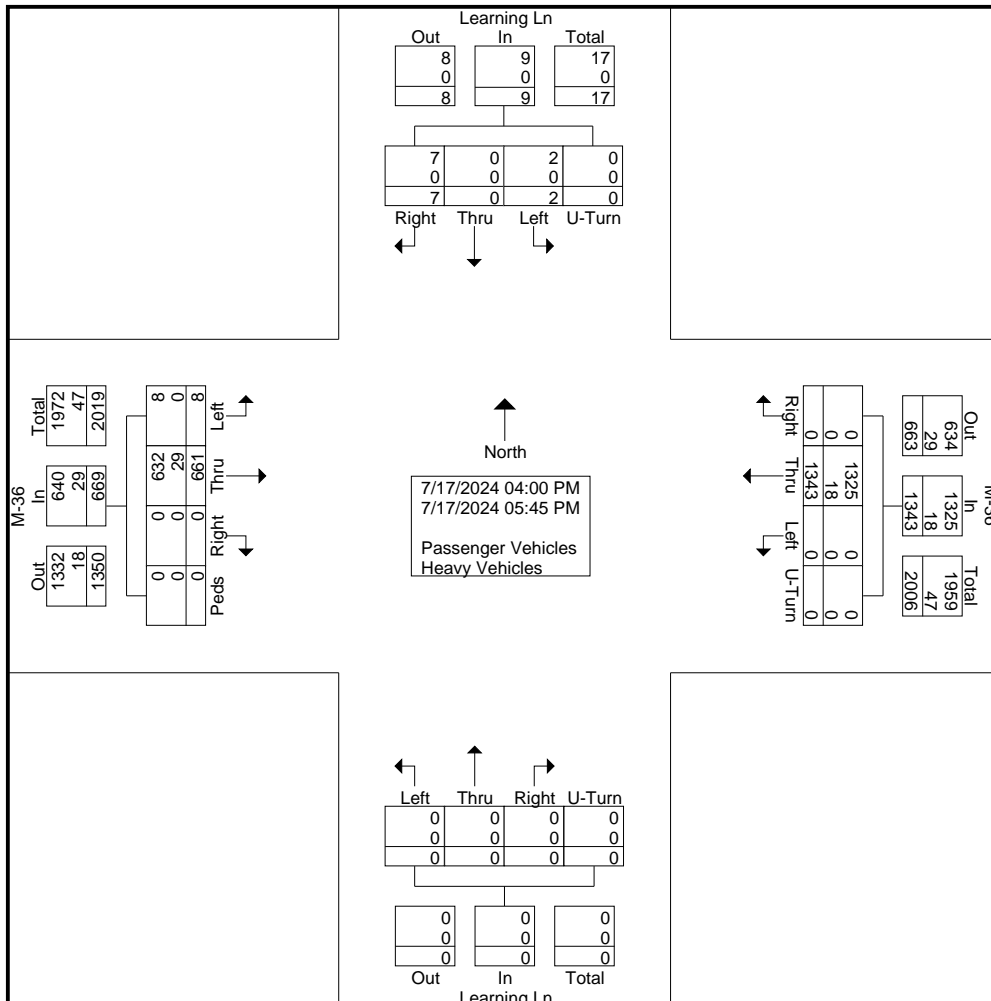




TRUE DATA TO IMPROVE MOBILITY

Groups Printed- Passenger Vehicles - Heavy Vehicles

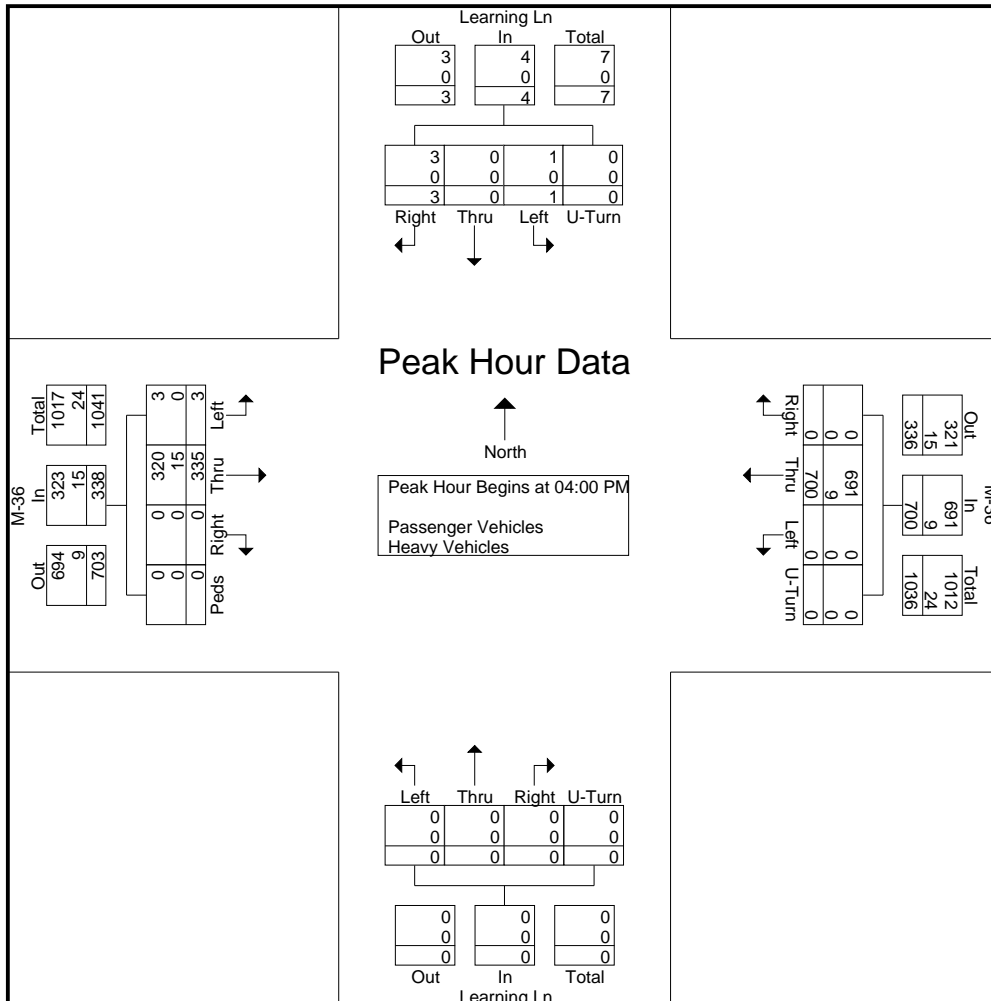
Start Time	M-36 Eastbound					M-36 Westbound					Learning Ln Northbound					Learning Ln Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
04:00 PM	0	88	0	0	88	0	188	0	0	188	0	0	0	0	0	0	0	1	0	1	277
04:15 PM	1	94	0	0	95	0	152	0	0	152	0	0	0	0	0	1	0	0	0	1	248
04:30 PM	0	74	0	0	74	0	184	0	0	184	0	0	0	0	0	0	0	0	0	0	258
04:45 PM	2	79	0	0	81	0	176	0	0	176	0	0	0	0	0	0	0	2	0	2	259
Total	3	335	0	0	338	0	700	0	0	700	0	0	0	0	0	1	0	3	0	4	1042
05:00 PM	1	79	0	0	80	0	169	0	0	169	0	0	0	0	0	0	0	1	0	1	250
05:15 PM	2	89	0	0	91	0	161	0	0	161	0	0	0	0	0	0	0	1	0	1	253
05:30 PM	0	81	0	0	81	0	173	0	0	173	0	0	0	0	0	1	0	1	0	2	256
05:45 PM	2	77	0	0	79	0	140	0	0	140	0	0	0	0	0	0	0	1	0	1	220
Total	5	326	0	0	331	0	643	0	0	643	0	0	0	0	0	1	0	4	0	5	979
Grand Total	8	661	0	0	669	0	1343	0	0	1343	0	0	0	0	0	2	0	7	0	9	2021
Apprch %	1.2	98.8	0	0		0	100	0	0		0	0	0	0		22.2	0	77.8	0		
Total %	0.4	32.7	0	0	33.1	0	66.5	0	0	66.5	0	0	0	0	0	0.1	0	0.3	0	0.4	
Passenger Vehicles	8	632	0	0	640	0	1325	0	0	1325	0	0	0	0	0	2	0	7	0	9	1974
% Passenger Vehicles	100	95.6	0	0	95.7	0	98.7	0	0	98.7	0	0	0	0	0	100	0	100	0	100	97.7
Heavy Vehicles	0	29	0	0	29	0	18	0	0	18	0	0	0	0	0	0	0	0	0	0	47
% Heavy Vehicles	0	4.4	0	0	4.3	0	1.3	0	0	1.3	0	0	0	0	0	0	0	0	0	0	2.3





TRUE DATA TO IMPROVE MOBILITY

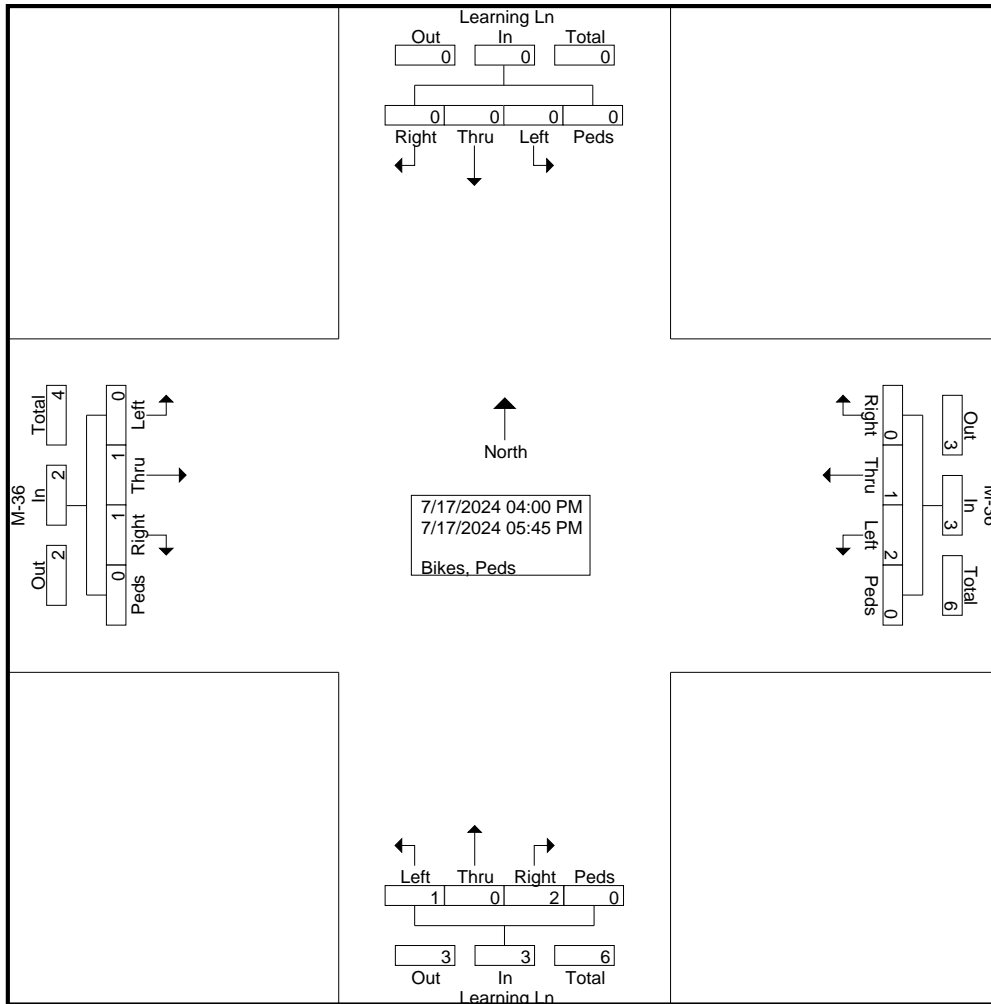
Start Time	M-36 Eastbound					M-36 Westbound					Learning Ln Northbound					Learning Ln Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	88	0	0	88	0	188	0	0	188	0	0	0	0	0	0	0	1	0	1	277
04:15 PM	1	94	0	0	95	0	152	0	0	152	0	0	0	0	0	1	0	0	0	1	248
04:30 PM	0	74	0	0	74	0	184	0	0	184	0	0	0	0	0	0	0	0	0	0	258
04:45 PM	2	79	0	0	81	0	176	0	0	176	0	0	0	0	0	0	0	2	0	2	259
Total Volume	3	335	0	0	338	0	700	0	0	700	0	0	0	0	0	1	0	3	0	4	1042
% App. Total	0.9	99.1	0	0		0	100	0	0		0	0	0	0		25	0	75	0		
PHF	.375	.891	.000	.000	.889	.000	.931	.000	.000	.931	.000	.000	.000	.000	.250	.000	.375	.000	.500		.940
Passenger Vehicles	3	320	0	0	323	0	691	0	0	691	0	0	0	0	0	1	0	3	0	4	1018
% Passenger Vehicles	100	95.5	0	0	95.6	0	98.7	0	0	98.7	0	0	0	0	0	100	0	100	0	100	97.7
Heavy Vehicles	0	15	0	0	15	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	24
% Heavy Vehicles	0	4.5	0	0	4.4	0	1.3	0	0	1.3	0	0	0	0	0	0	0	0	0	0	2.3





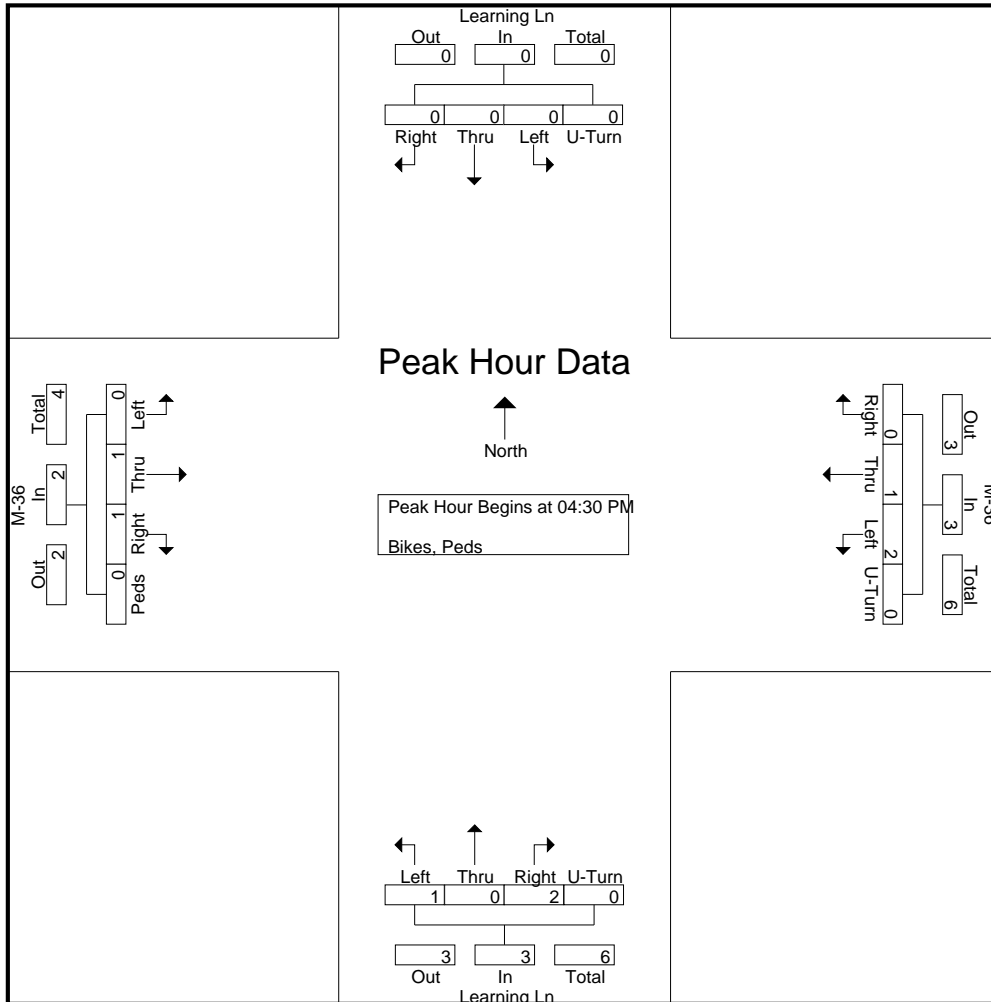
Groups Printed- Bikes, Peds

Start Time	M-36 Eastbound					M-36 Westbound					Learning Ln Northbound					Learning Ln Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	2	1	0	0	3	1	0	0	0	1	0	0	0	0	0	4
05:15 PM	0	1	1	0	2	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	4
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	1	0	2	2	1	0	0	3	1	0	2	0	3	0	0	0	0	0	8
Grand Total	0	1	1	0	2	2	1	0	0	3	1	0	2	0	3	0	0	0	0	0	8
Apprch %	0	50	50	0		66.7	33.3	0	0		33.3	0	66.7	0		0	0	0	0		
Total %	0	12.5	12.5	0	25	25	12.5	0	0	37.5	12.5	0	25	0	37.5	0	0	0	0	0	





Start Time	M-36 Eastbound					M-36 Westbound					Learning Ln Northbound					Learning Ln Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	2	1	0	0	3	1	0	0	0	1	0	0	0	0	0	0
05:15 PM	0	1	1	0	2	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0
Total Volume	0	1	1	0	2	2	1	0	0	3	1	0	2	0	3	0	0	0	0	0	0
% App. Total	0	50	50	0		66.7	33.3	0	0		33.3	0	66.7	0		0	0	0	0	0	
PHF	.000	.250	.250	.000	.250	.250	.250	.000	.000	.250	.250	.000	.250	.000	.375	.000	.000	.000	.000	.000	.500

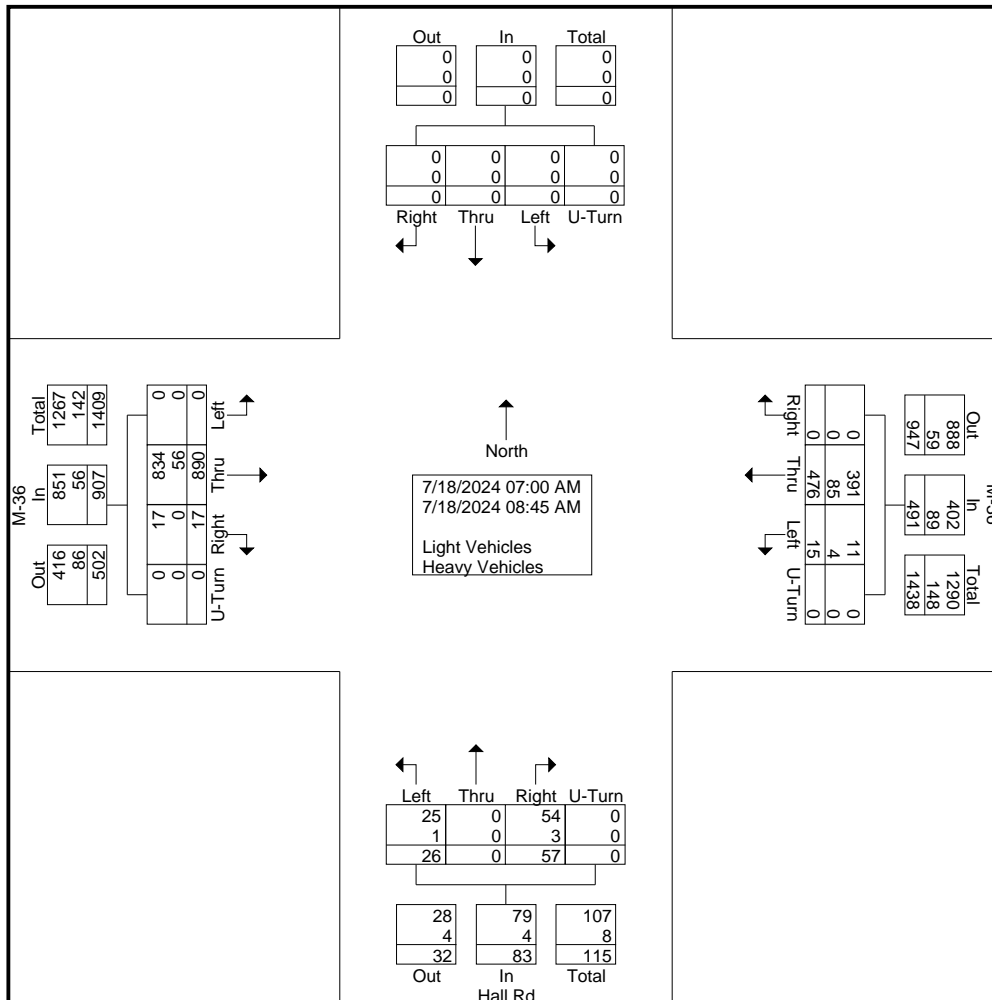




TRUE DATA TO IMPROVE MOBILITY

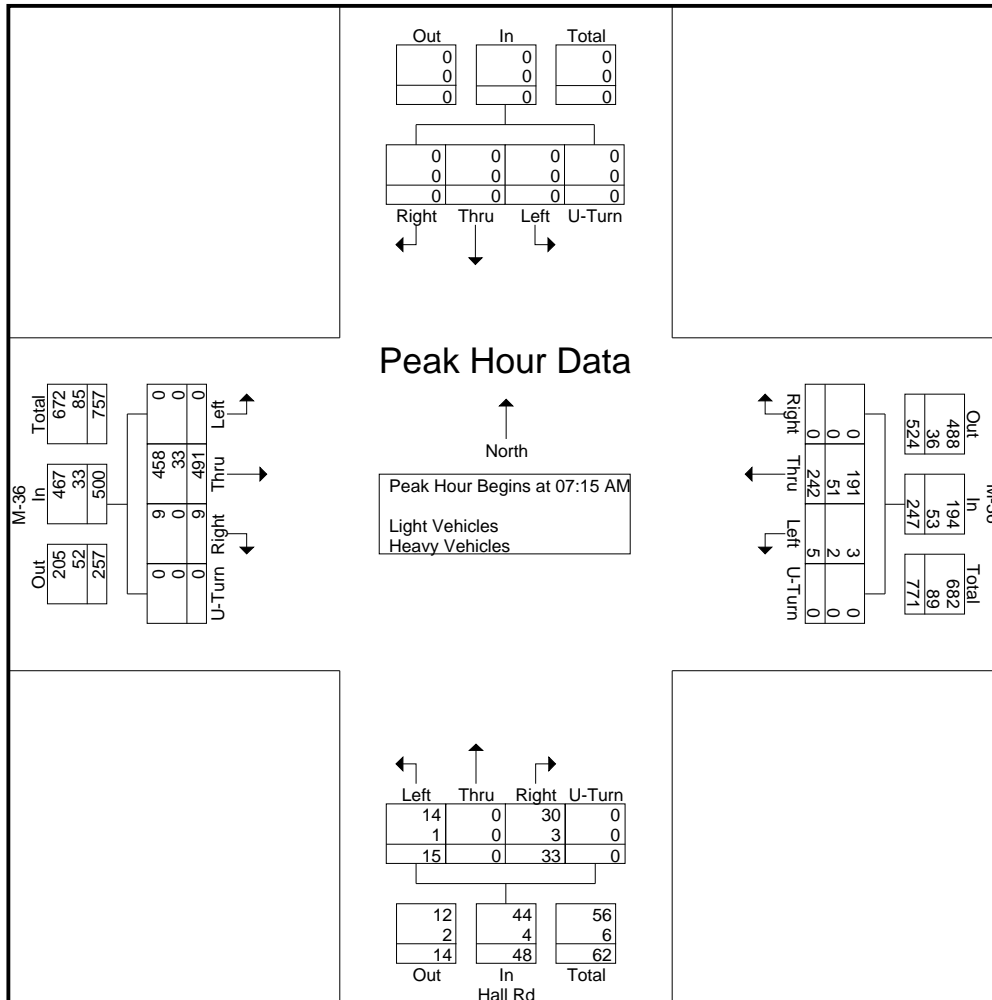
Groups Printed- Light Vehicles - Heavy Vehicles

Start Time	M-36 Eastbound					M-36 Westbound					Hall Rd Northbound					Southbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
07:00 AM	0	106	2	0	108	2	42	0	0	44	2	0	6	0	8	0	0	0	0	0	160
07:15 AM	0	148	1	0	149	0	46	0	0	46	3	0	3	0	6	0	0	0	0	0	201
07:30 AM	0	117	3	0	120	3	55	0	0	58	5	0	14	0	19	0	0	0	0	0	197
07:45 AM	0	113	4	0	117	0	79	0	0	79	4	0	10	0	14	0	0	0	0	0	210
Total	0	484	10	0	494	5	222	0	0	227	14	0	33	0	47	0	0	0	0	0	768
08:00 AM	0	113	1	0	114	2	62	0	0	64	3	0	6	0	9	0	0	0	0	0	187
08:15 AM	0	98	5	0	103	1	66	0	0	67	3	0	7	0	10	0	0	0	0	0	180
08:30 AM	0	102	0	0	102	3	57	0	0	60	3	0	8	0	11	0	0	0	0	0	173
08:45 AM	0	93	1	0	94	4	69	0	0	73	3	0	3	0	6	0	0	0	0	0	173
Total	0	406	7	0	413	10	254	0	0	264	12	0	24	0	36	0	0	0	0	0	713
Grand Total	0	890	17	0	907	15	476	0	0	491	26	0	57	0	83	0	0	0	0	0	1481
Apprch %	0	98.1	1.9	0		3.1	96.9	0	0		31.3	0	68.7	0		0	0	0	0		
Total %	0	60.1	1.1	0	61.2	1	32.1	0	0	33.2	1.8	0	3.8	0	5.6	0	0	0	0	0	
Light Vehicles	0	834	17	0	851	11	391	0	0	402	25	0	54	0	79	0	0	0	0	0	1332
% Light Vehicles	0	93.7	100	0	93.8	73.3	82.1	0	0	81.9	96.2	0	94.7	0	95.2	0	0	0	0	0	89.9
Heavy Vehicles	0	56	0	0	56	4	85	0	0	89	1	0	3	0	4	0	0	0	0	0	149
% Heavy Vehicles	0	6.3	0	0	6.2	26.7	17.9	0	0	18.1	3.8	0	5.3	0	4.8	0	0	0	0	0	10.1





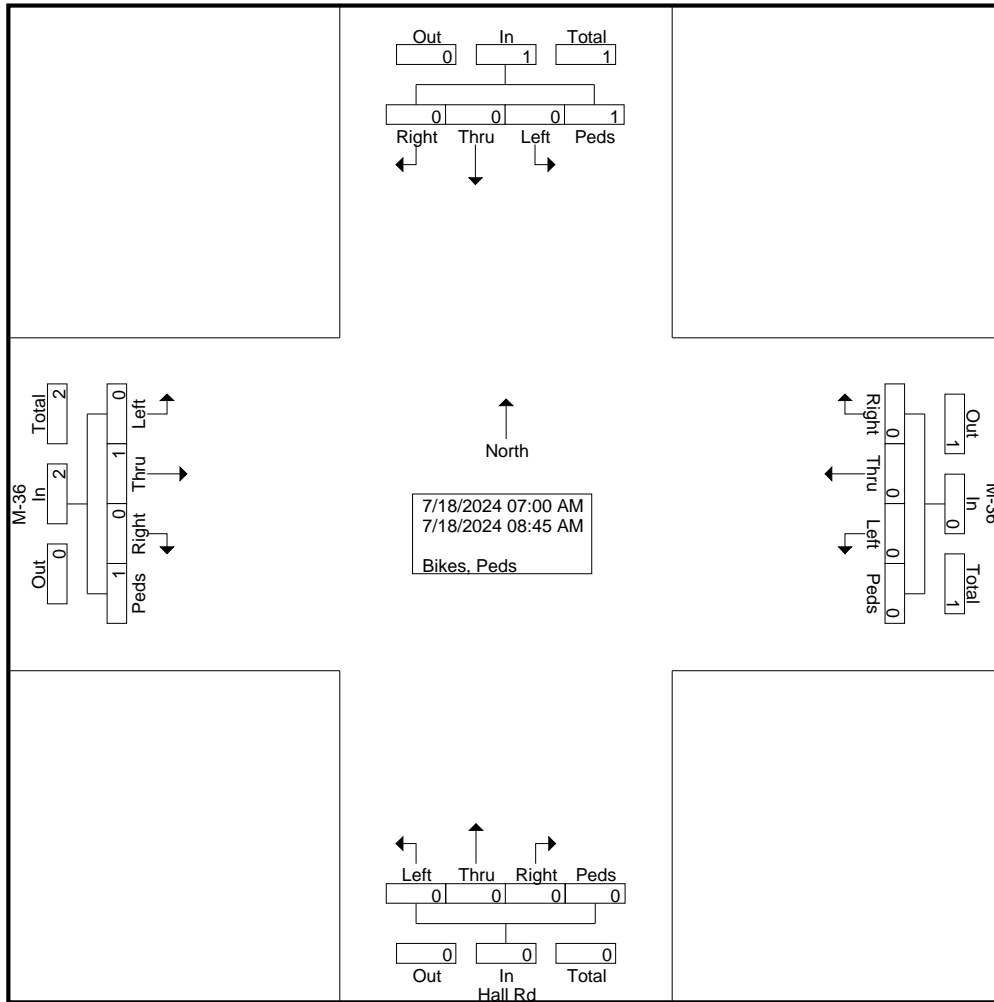
Start Time	M-36 Eastbound					M-36 Westbound					Hall Rd Northbound					Southbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	148	1	0	149	0	46	0	0	46	3	0	3	0	6	0	0	0	0	0	201
07:30 AM	0	117	3	0	120	3	55	0	0	58	5	0	14	0	19	0	0	0	0	0	197
07:45 AM	0	113	4	0	117	0	79	0	0	79	4	0	10	0	14	0	0	0	0	0	210
08:00 AM	0	113	1	0	114	2	62	0	0	64	3	0	6	0	9	0	0	0	0	0	187
Total Volume	0	491	9	0	500	5	242	0	0	247	15	0	33	0	48	0	0	0	0	0	795
% App. Total	0	98.2	1.8	0		2	98	0	0		31.2	0	68.8	0		0	0	0	0		
PHF	.000	.829	.563	.000	.839	.417	.766	.000	.000	.782	.750	.000	.589	.000	.632	.000	.000	.000	.000	.000	.946
Light Vehicles	0	458	9	0	467	3	191	0	0	194	14	0	30	0	44	0	0	0	0	0	705
% Light Vehicles	0	93.3	100	0	93.4	60.0	78.9	0	0	78.5	93.3	0	90.9	0	91.7	0	0	0	0	0	88.7
Heavy Vehicles	0	33	0	0	33	2	51	0	0	53	1	0	3	0	4	0	0	0	0	0	90
% Heavy Vehicles	0	6.7	0	0	6.6	40.0	21.1	0	0	21.5	6.7	0	9.1	0	8.3	0	0	0	0	0	11.3



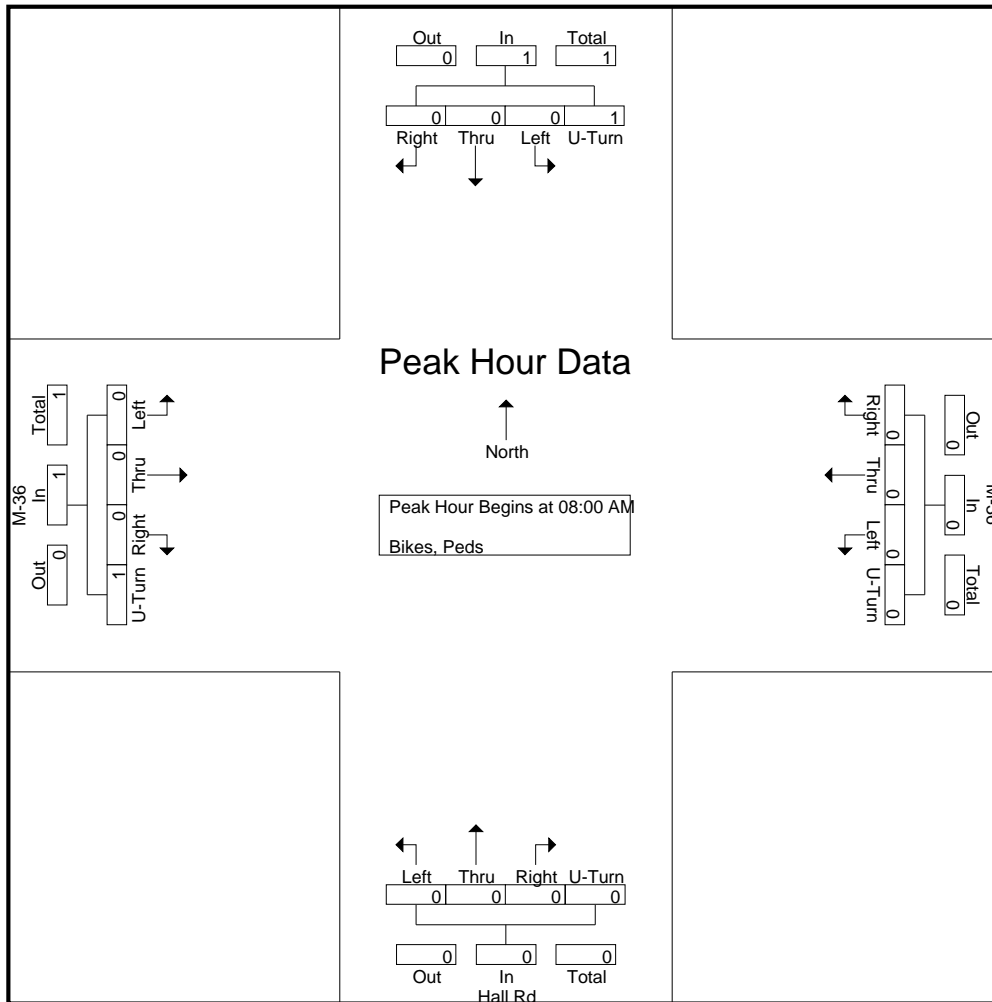


Groups Printed- Bikes, Peds

Start Time	M-36 Eastbound					M-36 Westbound					Hall Rd Northbound					Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Total	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Grand Total	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
Apprch %	0	50	0	50		0	0	0	0		0	0	0	0		0	0	0	100		
Total %	0	33.3	0	33.3	66.7	0	0	0	0	0	0	0	0	0	0	0	0	0	33.3	33.3	



Start Time	M-36 Eastbound					M-36 Westbound					Hall Rd Northbound					Southbound					Int. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 08:00 AM																						
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Total Volume	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1		2
% App. Total	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	100			
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250		.250

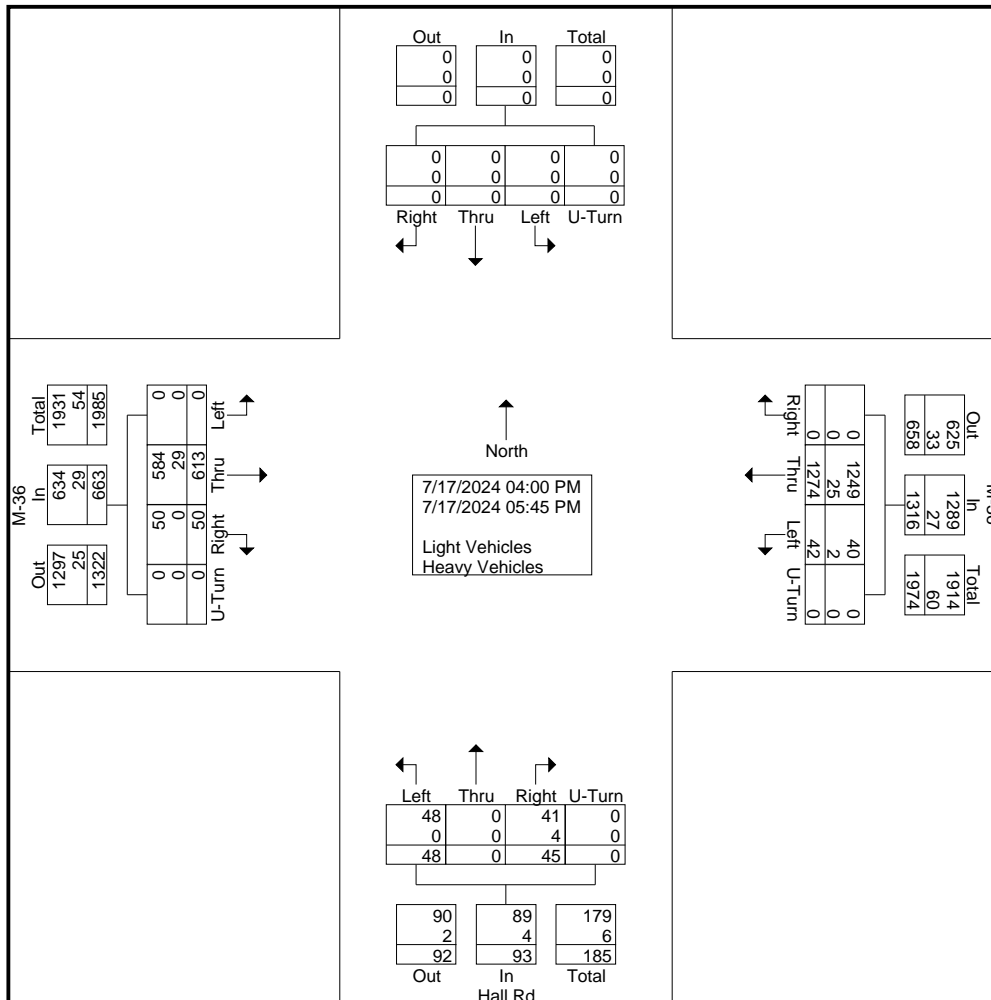




TRUE DATA TO IMPROVE MOBILITY

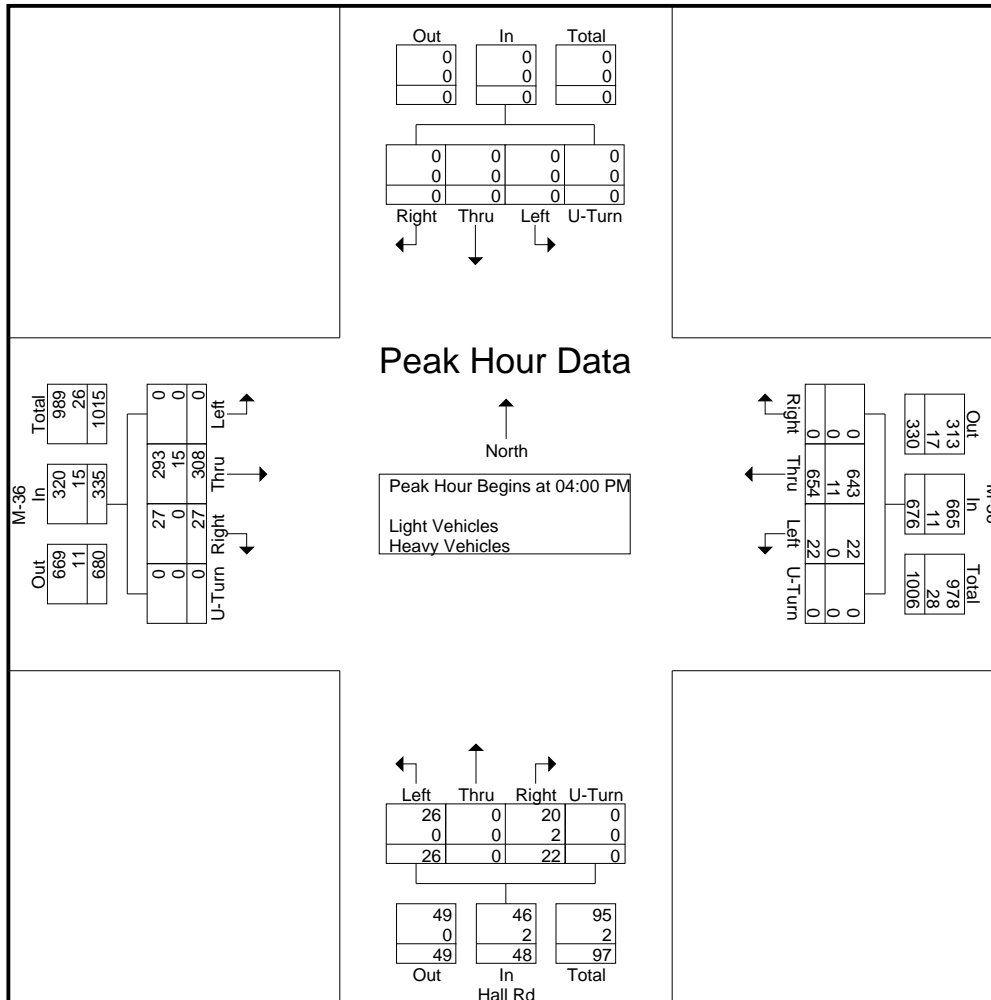
Groups Printed- Light Vehicles - Heavy Vehicles

Start Time	M-36 Eastbound					M-36 Westbound					Hall Rd Northbound					Southbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
04:00 PM	0	80	8	0	88	5	178	0	0	183	7	0	9	0	16	0	0	0	0	0	287
04:15 PM	0	92	5	0	97	10	142	0	0	152	7	0	5	0	12	0	0	0	0	0	261
04:30 PM	0	64	6	0	70	2	169	0	0	171	2	0	4	0	6	0	0	0	0	0	247
04:45 PM	0	72	8	0	80	5	165	0	0	170	10	0	4	0	14	0	0	0	0	0	264
Total	0	308	27	0	335	22	654	0	0	676	26	0	22	0	48	0	0	0	0	0	1059
05:00 PM	0	73	5	0	78	5	165	0	0	170	5	0	3	0	8	0	0	0	0	0	256
05:15 PM	0	82	5	0	87	1	152	0	0	153	8	0	7	0	15	0	0	0	0	0	255
05:30 PM	0	81	6	0	87	9	170	0	0	179	4	0	8	0	12	0	0	0	0	0	278
05:45 PM	0	69	7	0	76	5	133	0	0	138	5	0	5	0	10	0	0	0	0	0	224
Total	0	305	23	0	328	20	620	0	0	640	22	0	23	0	45	0	0	0	0	0	1013
Grand Total	0	613	50	0	663	42	1274	0	0	1316	48	0	45	0	93	0	0	0	0	0	2072
Apprch %	0	92.5	7.5	0		3.2	96.8	0	0		51.6	0	48.4	0		0	0	0	0		
Total %	0	29.6	2.4	0	32	2	61.5	0	0	63.5	2.3	0	2.2	0	4.5	0	0	0	0	0	
Light Vehicles	0	584	50	0	634	40	1249	0	0	1289	48	0	41	0	89	0	0	0	0	0	2012
% Light Vehicles	0	95.3	100	0	95.6	95.2	98	0	0	97.9	100	0	91.1	0	95.7	0	0	0	0	0	97.1
Heavy Vehicles	0	29	0	0	29	2	25	0	0	27	0	0	4	0	4	0	0	0	0	0	60
% Heavy Vehicles	0	4.7	0	0	4.4	4.8	2	0	0	2.1	0	0	8.9	0	4.3	0	0	0	0	0	2.9





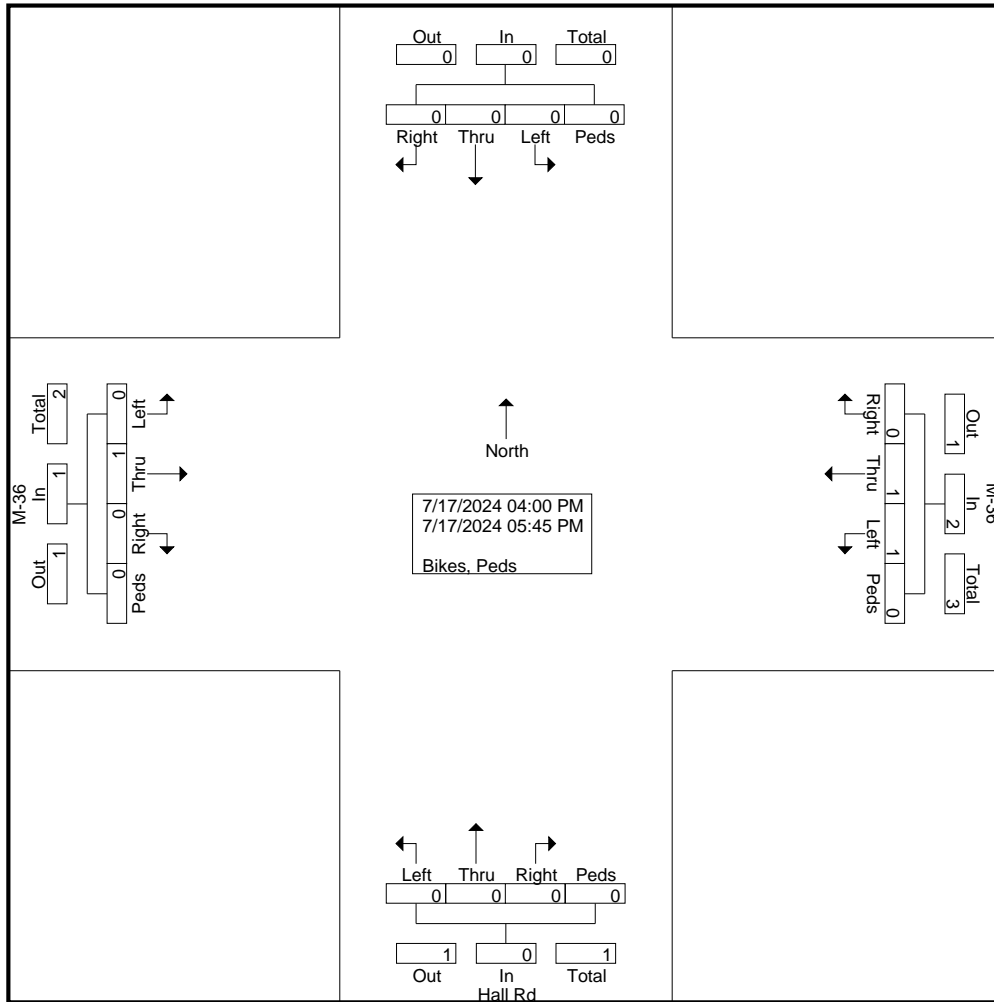
Start Time	M-36 Eastbound					M-36 Westbound					Hall Rd Northbound					Southbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	80	8	0	88	5	178	0	0	183	7	0	9	0	16	0	0	0	0	0	287
04:15 PM	0	92	5	0	97	10	142	0	0	152	7	0	5	0	12	0	0	0	0	0	261
04:30 PM	0	64	6	0	70	2	169	0	0	171	2	0	4	0	6	0	0	0	0	0	247
04:45 PM	0	72	8	0	80	5	165	0	0	170	10	0	4	0	14	0	0	0	0	0	264
Total Volume	0	308	27	0	335	22	654	0	0	676	26	0	22	0	48	0	0	0	0	0	1059
% App. Total	0	91.9	8.1	0		3.3	96.7	0	0		54.2	0	45.8	0		0	0	0	0		
PHF	.000	.837	.844	.000	.863	.550	.919	.000	.000	.923	.650	.000	.611	.000	.750	.000	.000	.000	.000	.000	.922
Light Vehicles	0	293	27	0	320	22	643	0	0	665	26	0	20	0	46	0	0	0	0	0	1031
% Light Vehicles	0	95.1	100	0	95.5	100	98.3	0	0	98.4	100	0	90.9	0	95.8	0	0	0	0	0	97.4
Heavy Vehicles	0	15	0	0	15	0	11	0	0	11	0	0	2	0	2	0	0	0	0	0	28
% Heavy Vehicles	0	4.9	0	0	4.5	0	1.7	0	0	1.6	0	0	9.1	0	4.2	0	0	0	0	0	2.6



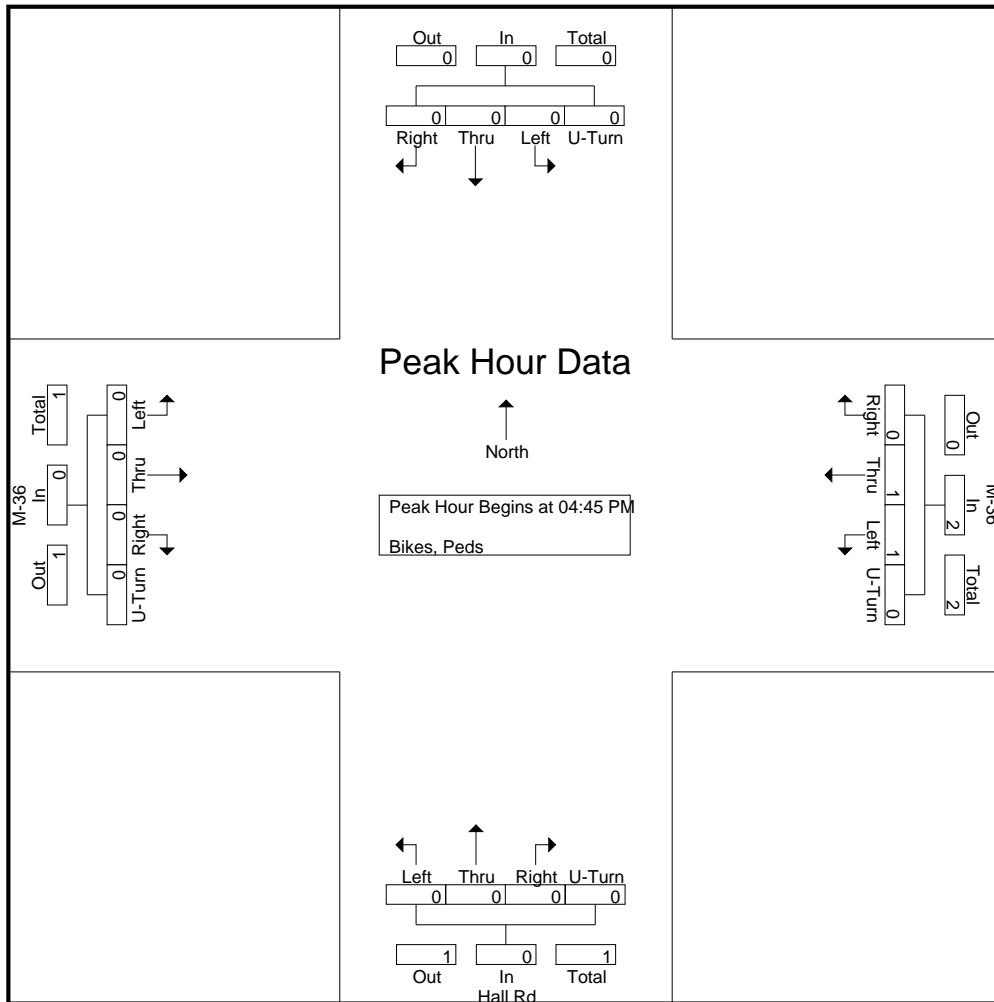


Groups Printed- Bikes, Peds

Start Time	M-36 Eastbound					M-36 Westbound					Hall Rd Northbound					Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
04:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Grand Total	0	1	0	0	1	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3
Apprch %	0	100	0	0		50	50	0	0		0	0	0	0		0	0	0	0		
Total %	0	33.3	0	0	33.3	33.3	33.3	0	0	66.7	0	0	0	0	0	0	0	0	0	0	



Start Time	M-36 Eastbound					M-36 Westbound					Hall Rd Northbound					Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	2
% App. Total	0	0	0	0	0	50	50	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.250	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500



Search... 

Crash and Road Data

Road Segment Report

Hamburg Rd, (PR Number 932903)

From:	Hamburg Rd 0.000 BMP
To:	MI State Road 36 E 0.100 EMP
Jurisdiction:	County
FALINK ID:	5278
Community:	Hamburg Township
County:	Livingston
Functional Class:	5 - Major Collector
Direction:	2 Way
Length:	0.100 miles
Number of Lanes:	2
Posted Speed:	45 (source: TCO)
Route Classification:	Not a route
Annual Crash Average 2018-2022:	<u>0</u>
Traffic Volume (2022)*:	3,500 (Default AADT)
Pavement Type (2022):	Asphalt
Pavement Rating (2022):	Good

* AADT values are derived from Traffic Counts

Street View



Search... 

Crash and Road Data

Road Segment Report

M 36, (PR Number 932903)

From:	MI State Road 36 E 0.100 BMP
To:	MI State Road 36 E 0.726 EMP
Jurisdiction:	State
FALINK ID:	5279
Community:	Green Oak Township , Hamburg Township
County:	Livingston
Functional Class:	4 - Minor Arterial
Direction:	2 Way
Length:	0.626 miles
Number of Lanes:	2
Posted Speed:	45 (source: TCO)
Route Classification:	M-36
Annual Crash Average 2018-2022:	0
Traffic Volume (2022)*:	9,300 (Default AADT)
Pavement Type (2022):	Asphalt
Pavement Rating (2022):	Poor

* AADT values are derived from **Traffic Counts**

Street View



[Home](#)
[Locate](#)
[Locate All](#)
[Email This](#)
 Auto-Locate:

Disclaimer: The Michigan Department of Transportation (MDOT) works with individual agencies (cities/villages, counties, metropolitan planning organizations (MPOs), regional planning organizations (RPOs), and other areas of MDOT) to identify existing traffic count programs and/or traffic data. [...more](#)

[List View](#)
[All DIRs](#)
[Report Center](#)

	Record			1		of 1	Goto Record	<input type="text"/>	go
Location ID	47-0359	MPO ID	1353						
Type	SPOT	HPMS ID							
On NHS	No	On HPMS	No						
LRS ID	0932906	LRS Loc Pt.	1.392353						
SF Group	Local Road	Route Type							
AF Group	NoFactor	Route							
GF Group	Local Road	Active	Yes						
Class Dist Grp	NTL_7	Category							
Seas Clss Grp									
WIM Group									
QC Group	Default								
Funct'l Class	(7) Local Road or Street	Milepost							
Located On	Hall Rd								
Loc On Alias									
BETWEEN	Strawberry Lake Rd AND M 59								
More Detail									

STATION DATA

Directions: [2-WAY](#) [NB](#) [SB](#)

AADT								
Year	AADT	DHV-30	K %	D %	PA	BC	Src	
2023	592	52	9		562 (95%)	30 (5%)		
2022	972 ³		11		923 (95%)	49 (5%)	Grown from 2021	
2021	981 ³		11		829 (85%)	152 (15%)	Grown from 2020	
2020	874	93	11		788 (90%)	86 (10%)		

VOLUME COUNT			
	Date	Int	Total
	Tue 5/23/2023	60	601
	Wed 6/3/2020	60	874

VOLUME TREND	
Year	Annual Growth
2023	-39%
2022	-1%
2021	12%

CLASSIFICATION			
	Date	Int	Total
No Data			

NOTES/FILES		
	Note	Date

Search... 

Community Profiles

YOU ARE VIEWING DATA FOR:

Hamburg Township

10405 Merrill Rd
Hamburg, MI 48139-0157
<https://www.hamburg.mi.us/>



Census 2020 Population: 21,259
Area: 36 square miles

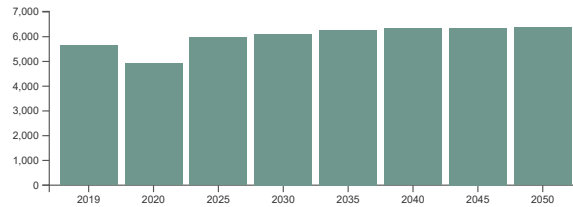
[VIEW COMMUNITY EXPLORER MAP](#)

[VIEW 2020 CENSUS MAP](#)

Economy & Jobs

Link to American Community Survey (ACS) Profiles: **Select a Year** **Economic
Historic Population and Employment by Minor Civil Division, Southeast Michigan**

Forecasted Jobs



Note: The base year for the employment forecast is 2019, as 2020 employment was artificially low due to the COVID recession.

Source: SEMCOG 2050 Regional Development Forecast

Forecasted Jobs by Industry Sector

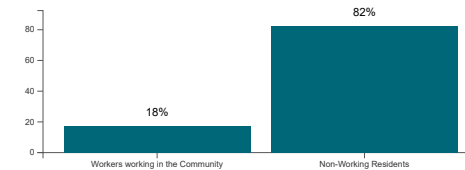
Forecasted Jobs By Industry Sector	2019	2020	2025	2030	2035	2040	2045	2050	Change 2019-2050	Pct Change 2019-2050
Natural Resources, Mining, & Construction	627	581	786	808	807	786	776	770	143	22.8%
Manufacturing	402	370	419	416	403	389	366	342	-60	-14.9%
Wholesale Trade	89	84	94	107	113	112	113	112	23	25.8%
Retail Trade	389	373	393	391	378	363	356	342	-47	-12.1%
Transportation, Warehousing, & Utilities	138	134	153	153	158	159	161	162	24	17.4%
Information & Financial Activities	892	745	864	886	918	930	943	959	67	7.5%
Professional and Technical Services & Corporate HQ	530	374	532	575	603	620	631	649	119	22.5%
Administrative, Support, & Waste Services	468	384	446	483	516	545	568	597	129	27.6%
Education Services	404	389	434	449	472	475	480	481	77	19.1%
Healthcare Services	340	312	459	470	491	501	503	510	170	50%
Leisure & Hospitality	672	548	689	713	747	769	769	765	93	13.8%
Other Services	502	427	476	477	486	499	506	511	9	1.8%
Public Administration	191	187	211	175	181	186	186	184	-7	-3.7%
Total Employment Numbers	5,644	4,908	5,956	6,103	6,273	6,334	6,358	6,384	740	13.1%

Note: The base year for the employment forecast is 2019, as 2020 employment was artificially low due to the COVID recession.

Source: SEMCOG 2050 Regional Development Forecast

Daytime Population

Daytime Population	ACS 2022
Workers working in the Community	2,202
Non-Working Residents	10,365
Age 15 and under	3,893
Not in labor force	5,833
Unemployed	639
Daytime Population	12,567



Source: 2018-2022 American Community Survey 5-Year Estimates. 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.

Search... 

Community Profiles

YOU ARE VIEWING DATA FOR:

Hamburg Township

10405 Merrill Rd
Hamburg, MI 48139-0157
<https://www.hamburg.mi.us/>



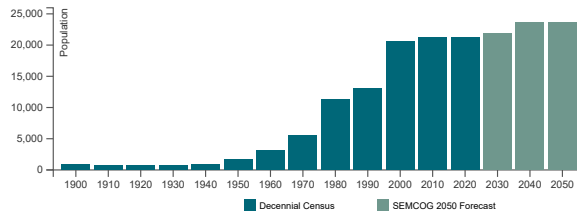
Census 2020 Population: 21,259
Area: 36 square miles

- VIEW COMMUNITY EXPLORER MAP
- VIEW 2020 CENSUS MAP

Population and Households

Link to American Community Survey (ACS) Profiles:
Population and Household Estimates for Southeast Michigan, 2023
Historic Population and Employment by Minor Civil Division, Southeast Michigan

Population Forecast



Population and Households

Population and Households	ACS 2020	Census 2010	Change 2010-2020	Pct Change 2010-2020	SEMCOG Jul 2023	SEMCOG 2050
Total Population	21,259	21,165	94	0.4%	21,229	23,616
Group Quarters Population	0	14	-14	-100.0%	12	69
Household Population	21,259	21,151	108	0.5%	21,217	23,547
Housing Units	8,926	8,668	258	3.0%	9,062	-
Households (Occupied Units)	8,257	7,860	397	5.1%	8,612	9,153
Residential Vacancy Rate	7.5%	9.3%	-1.8%	-	5.0%	-
Average Household Size	2.57	2.69	-0.12	-	2.46	2.57

Source: U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates, and SEMCOG 2050 Regional Development Forecast

Components of Population Change

Components of Population Change	2010-2020 Avg.	2020-2022 Avg.
Natural Increase (Births - Deaths)	17	5
Births	150	166
Deaths	133	161
Net Migration (Movement In - Movement Out)	-8	73
Population Change (Natural Increase + Net Migration)	9	78

Source: Michigan Department of Community Health Vital Statistics, U.S. Census Bureau, and SEMCOG

Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Exhibit 20-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular movement is a function of the number of vehicles in queue, the number of vehicles in the intersection, and the number of vehicles in the queue at the intersection. The average total delay for any particular movement is a function of the number of vehicles in queue, the number of vehicles in the intersection, and the number of vehicles in the queue at the intersection.

When signals are present on the major street, upstream of the subject intersection, flows may not be random but will likely have some platoon structure. Although the procedures in this chapter provide a method for approximating the operations of a TWSC intersection with an upstream signal, the operations of such an intersection is arguably best handled by including it in a complete simulation

Exhibit 20-2. Level of Service Criteria for Stop-Controlled Intersections (Motor Vehicles)

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. A total delay of 50 sec/veh is assumed as the break point between LOS E and F.

Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection.

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 6th Edition. Transportation Research Board, National Research Council

Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. 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

1: Hamburg Road & M-36 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.4	0.0	0.4
Denied Del/Veh (s)	0.1	0.1	0.0	0.1	3.3	0.9	1.8
Total Delay (hr)	0.1	0.1	0.0	0.1	1.3	0.0	1.6
Total Del/Veh (s)	9.3	7.1	0.8	0.8	10.7	3.4	6.8

HCM 6th TWSC
2: Learning Lane/Church Drive & M-36

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	506	0	0	292	0	0	0	0	0	0	0
Future Vol, veh/h	0	506	0	0	292	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	87	87	78	78	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	5	17	17	2	2	2	2	2	2	2
Mvmt Flow	0	582	0	0	374	0	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	374	0	0	582	0	0	956	956	582	956	956	374
Stage 1	-	-	-	-	-	-	582	582	-	374	374	-
Stage 2	-	-	-	-	-	-	374	374	-	582	582	-
Critical Hdwy	4.12	-	-	4.27	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.353	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1184	-	-	922	-	-	238	258	513	238	258	672
Stage 1	-	-	-	-	-	-	499	499	-	647	618	-
Stage 2	-	-	-	-	-	-	647	618	-	499	499	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1184	-	-	922	-	-	238	258	513	238	258	672
Mov Cap-2 Maneuver	-	-	-	-	-	-	238	258	-	238	258	-
Stage 1	-	-	-	-	-	-	499	499	-	647	618	-
Stage 2	-	-	-	-	-	-	647	618	-	499	499	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			0		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1184	-	-	922	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

HCM 6th TWSC
3: Hall Road & M-36

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	497	9	5	277	15	33
Future Vol, veh/h	497	9	5	277	15	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	78	78	63	63
Heavy Vehicles, %	7	7	22	22	8	8
Mvmt Flow	592	11	6	355	24	52

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	603	0	965 598
Stage 1	-	-	-	-	598 -
Stage 2	-	-	-	-	367 -
Critical Hdwy	-	-	4.32	-	6.48 6.28
Critical Hdwy Stg 1	-	-	-	-	5.48 -
Critical Hdwy Stg 2	-	-	-	-	5.48 -
Follow-up Hdwy	-	-	2.398	-	3.572 3.372
Pot Cap-1 Maneuver	-	-	884	-	276 491
Stage 1	-	-	-	-	538 -
Stage 2	-	-	-	-	688 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	884	-	274 491
Mov Cap-2 Maneuver	-	-	-	-	274 -
Stage 1	-	-	-	-	538 -
Stage 2	-	-	-	-	682 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	394	-	-	884	-
HCM Lane V/C Ratio	0.193	-	-	0.007	-
HCM Control Delay (s)	16.3	-	-	9.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

1: Hamburg Road & M-36 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.3	0.0	0.3
Denied Del/Veh (s)	0.2	0.2	0.0	0.0	3.2	0.8	0.9
Total Delay (hr)	1.0	0.4	0.0	0.4	1.3	0.1	3.2
Total Del/Veh (s)	40.1	28.0	1.4	2.0	15.1	4.9	9.3

HCM 6th TWSC
2: Learning Lane/Church Drive & M-36

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	359	0	0	710	0	0	0	0	1	0	3
Future Vol, veh/h	3	359	0	0	710	0	0	0	0	1	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	89	89	93	93	92	92	92	92	92	92	92
Heavy Vehicles, %	2	4	4	1	1	2	2	2	2	2	2	2
Mvmt Flow	3	403	0	0	763	0	0	0	0	1	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	763	0	0	403	0	0	1174	1172	403	1172	1172	763
Stage 1	-	-	-	-	-	-	409	409	-	763	763	-
Stage 2	-	-	-	-	-	-	765	763	-	409	409	-
Critical Hdwy	4.12	-	-	4.11	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.209	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	850	-	-	1161	-	-	169	192	647	169	192	404
Stage 1	-	-	-	-	-	-	619	596	-	397	413	-
Stage 2	-	-	-	-	-	-	396	413	-	619	596	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	850	-	-	1161	-	-	167	191	647	168	191	404
Mov Cap-2 Maneuver	-	-	-	-	-	-	167	191	-	168	191	-
Stage 1	-	-	-	-	-	-	616	593	-	395	413	-
Stage 2	-	-	-	-	-	-	393	413	-	616	593	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	0	17.2
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	850	-	-	1161	-	-	299
HCM Lane V/C Ratio	-	0.004	-	-	-	-	-	0.015
HCM Control Delay (s)	0	9.3	0	-	0	-	-	17.2
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	333	27	22	684	26	22
Future Vol, veh/h	333	27	22	684	26	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	92	92	75	75
Heavy Vehicles, %	5	5	2	2	4	4
Mvmt Flow	387	31	24	743	35	29

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	418	0	1194
Stage 1	-	-	-	-	403
Stage 2	-	-	-	-	791
Critical Hdwy	-	-	4.12	-	6.44
Critical Hdwy Stg 1	-	-	-	-	5.44
Critical Hdwy Stg 2	-	-	-	-	5.44
Follow-up Hdwy	-	-	2.218	-	3.536
Pot Cap-1 Maneuver	-	-	1141	-	204
Stage 1	-	-	-	-	671
Stage 2	-	-	-	-	443
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1141	-	197
Mov Cap-2 Maneuver	-	-	-	-	197
Stage 1	-	-	-	-	671
Stage 2	-	-	-	-	427

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	21
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	289	-	-	1141	-
HCM Lane V/C Ratio	0.221	-	-	0.021	-
HCM Control Delay (s)	21	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection: 1: Hamburg Road & M-36

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	100	222	54
Average Queue (ft)	44	85	13
95th Queue (ft)	80	163	36
Link Distance (ft)	713		1264
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		1000	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Learning Lane/Church Drive & M-36

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)

Intersection: 3: Hall Road & M-36

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	30	66
Average Queue (ft)	2	26
95th Queue (ft)	14	53
Link Distance (ft)	695	515
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Hamburg Road & M-36

Movement	EB	WB	SB	SB
Directions Served	LT	R	L	R
Maximum Queue (ft)	246	21	204	57
Average Queue (ft)	85	1	77	24
95th Queue (ft)	180	10	171	45
Link Distance (ft)	713			1264
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		200	1000	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Learning Lane/Church Drive & M-36

Movement	EB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	30	31
Average Queue (ft)	2	4
95th Queue (ft)	16	21
Link Distance (ft)	575	296
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Hall Road & M-36

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	47	67
Average Queue (ft)	4	27
95th Queue (ft)	24	55
Link Distance (ft)	695	515
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Intersection	
Intersection Delay, s/veh	32.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕		↕	↕	
Traffic Vol, veh/h	47	44	3	8	39	259	3	12	21	472	13	27
Future Vol, veh/h	47	44	3	8	39	259	3	12	21	472	13	27
Peak Hour Factor	0.86	0.86	0.86	0.83	0.83	0.83	0.92	0.92	0.92	0.93	0.93	0.93
Heavy Vehicles, %	16	16	16	18	18	18	2	2	2	7	7	7
Mvmt Flow	55	51	3	10	47	312	3	13	23	508	14	29
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	12.9	15.6	10.6	49.2
HCM LOS	B	C	B	E

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	8%	50%	17%	0%	100%	0%
Vol Thru, %	33%	47%	83%	0%	0%	32%
Vol Right, %	58%	3%	0%	100%	0%	68%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	36	94	47	259	472	40
LT Vol	3	47	8	0	472	0
Through Vol	12	44	39	0	0	13
RT Vol	21	3	0	259	0	27
Lane Flow Rate	39	109	57	312	508	43
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.076	0.232	0.112	0.547	0.947	0.068
Departure Headway (Hd)	6.996	7.647	7.108	6.31	6.715	5.731
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	515	472	501	568	538	622
Service Time	5.004	5.647	4.894	4.095	4.478	3.493
HCM Lane V/C Ratio	0.076	0.231	0.114	0.549	0.944	0.069
HCM Control Delay	10.6	12.9	10.8	16.5	52.6	8.9
HCM Lane LOS	B	B	B	C	F	A
HCM 95th-tile Q	0.2	0.9	0.4	3.3	12.1	0.2

HCM 6th TWSC
2: Learning Lane/Church Drive & M-36

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	537	0	0	306	0	0	0	0	0	0	0
Future Vol, veh/h	0	537	0	0	306	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	87	87	78	78	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	5	17	17	2	2	2	2	2	2	2
Mvmt Flow	0	617	0	0	392	0	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	392	0	0	617	0	0	1009	1009	617	1009	1009	392
Stage 1	-	-	-	-	-	-	617	617	-	392	392	-
Stage 2	-	-	-	-	-	-	392	392	-	617	617	-
Critical Hdwy	4.12	-	-	4.27	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.353	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1167	-	-	894	-	-	219	240	490	219	240	657
Stage 1	-	-	-	-	-	-	477	481	-	633	606	-
Stage 2	-	-	-	-	-	-	633	606	-	477	481	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1167	-	-	894	-	-	219	240	490	219	240	657
Mov Cap-2 Maneuver	-	-	-	-	-	-	219	240	-	219	240	-
Stage 1	-	-	-	-	-	-	477	481	-	633	606	-
Stage 2	-	-	-	-	-	-	633	606	-	477	481	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1167	-	-	894	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-	-	0
HCM Lane LOS		A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	528	9	5	291	15	34
Future Vol, veh/h	528	9	5	291	15	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	78	78	63	63
Heavy Vehicles, %	7	7	22	22	8	8
Mvmt Flow	629	11	6	373	24	54

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	640	0	1020 635
Stage 1	-	-	-	-	635 -
Stage 2	-	-	-	-	385 -
Critical Hdwy	-	-	4.32	-	6.48 6.28
Critical Hdwy Stg 1	-	-	-	-	5.48 -
Critical Hdwy Stg 2	-	-	-	-	5.48 -
Follow-up Hdwy	-	-	2.398	-	3.572 3.372
Pot Cap-1 Maneuver	-	-	855	-	256 468
Stage 1	-	-	-	-	517 -
Stage 2	-	-	-	-	675 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	855	-	254 468
Mov Cap-2 Maneuver	-	-	-	-	254 -
Stage 1	-	-	-	-	517 -
Stage 2	-	-	-	-	669 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	17.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	372	-	-	855	-
HCM Lane V/C Ratio	0.209	-	-	0.007	-
HCM Control Delay (s)	17.2	-	-	9.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Intersection	
Intersection Delay, s/veh	64.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕		↕	↕	
Traffic Vol, veh/h	84	51	2	18	60	667	3	14	6	318	10	77
Future Vol, veh/h	84	51	2	18	60	667	3	14	6	318	10	77
Peak Hour Factor	0.89	0.89	0.89	0.93	0.93	0.93	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles, %	7	7	7	1	1	1	2	2	2	3	3	3
Mvmt Flow	94	57	2	19	65	717	3	15	7	349	11	85
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	14.3	98.6	11.9	24.3
HCM LOS	B	F	B	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	13%	61%	23%	0%	100%	0%
Vol Thru, %	61%	37%	77%	0%	0%	11%
Vol Right, %	26%	1%	0%	100%	0%	89%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	23	137	78	667	318	87
LT Vol	3	84	18	0	318	0
Through Vol	14	51	60	0	0	10
RT Vol	6	2	0	667	0	77
Lane Flow Rate	25	154	84	717	349	96
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.055	0.318	0.154	1.156	0.717	0.169
Departure Headway (Hd)	8.413	7.731	6.631	5.802	7.845	6.701
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	428	468	543	631	465	538
Service Time	6.413	5.731	4.342	3.513	5.545	4.401
HCM Lane V/C Ratio	0.058	0.329	0.155	1.136	0.751	0.178
HCM Control Delay	11.9	14.3	10.5	108.9	28	10.8
HCM Lane LOS	B	B	B	F	D	B
HCM 95th-tile Q	0.2	1.4	0.5	23.5	5.6	0.6

HCM 6th TWSC
2: Learning Lane/Church Drive & M-36

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	372	0	0	742	0	0	0	0	1	0	3
Future Vol, veh/h	3	372	0	0	742	0	0	0	0	1	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	89	89	93	93	92	92	92	92	92	92	92
Heavy Vehicles, %	2	4	4	1	1	2	2	2	2	2	2	2
Mvmt Flow	3	418	0	0	798	0	0	0	0	1	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	798	0	0	418	0	0	1224	1222	418	1222	1222	798
Stage 1	-	-	-	-	-	-	424	424	-	798	798	-
Stage 2	-	-	-	-	-	-	800	798	-	424	424	-
Critical Hdwy	4.12	-	-	4.11	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.209	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	824	-	-	1146	-	-	156	180	635	156	180	386
Stage 1	-	-	-	-	-	-	608	587	-	380	398	-
Stage 2	-	-	-	-	-	-	379	398	-	608	587	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	824	-	-	1146	-	-	154	179	635	155	179	386
Mov Cap-2 Maneuver	-	-	-	-	-	-	154	179	-	155	179	-
Stage 1	-	-	-	-	-	-	605	584	-	378	398	-
Stage 2	-	-	-	-	-	-	376	398	-	605	584	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	0	18
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	824	-	-	1146	-	-	281
HCM Lane V/C Ratio	-	0.004	-	-	-	-	-	0.015
HCM Control Delay (s)	0	9.4	0	-	0	-	-	18
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	345	28	22	715	27	22
Future Vol, veh/h	345	28	22	715	27	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	92	92	75	75
Heavy Vehicles, %	5	5	2	2	4	4
Mvmt Flow	401	33	24	777	36	29

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	434	0	1243 418
Stage 1	-	-	-	-	418 -
Stage 2	-	-	-	-	825 -
Critical Hdwy	-	-	4.12	-	6.44 6.24
Critical Hdwy Stg 1	-	-	-	-	5.44 -
Critical Hdwy Stg 2	-	-	-	-	5.44 -
Follow-up Hdwy	-	-	2.218	-	3.536 3.336
Pot Cap-1 Maneuver	-	-	1126	-	191 631
Stage 1	-	-	-	-	660 -
Stage 2	-	-	-	-	427 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1126	-	184 631
Mov Cap-2 Maneuver	-	-	-	-	184 -
Stage 1	-	-	-	-	660 -
Stage 2	-	-	-	-	411 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	22.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	270	-	-	1126	-
HCM Lane V/C Ratio	0.242	-	-	0.021	-
HCM Control Delay (s)	22.5	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

Intersection: 1: Driveway & Hamburg Road & M-36

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	LTR	L	TR
Maximum Queue (ft)	96	79	137	50	167	49
Average Queue (ft)	44	31	67	23	85	18
95th Queue (ft)	77	63	109	48	142	39
Link Distance (ft)	713	575		491	1264	1264
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			200			
Storage Blk Time (%)			0			
Queuing Penalty (veh)			0			

Intersection: 2: Learning Lane/Church Drive & M-36

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)

Intersection: 3: Hall Road & M-36

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	35	61
Average Queue (ft)	2	23
95th Queue (ft)	16	51
Link Distance (ft)	695	515
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Driveway & Hamburg Road & M-36

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	LTR	L	TR
Maximum Queue (ft)	81	226	316	40	112	51
Average Queue (ft)	47	42	152	16	56	22
95th Queue (ft)	73	157	283	42	90	40
Link Distance (ft)	713	575		491	1264	1264
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200					
Storage Blk Time (%)	10					
Queuing Penalty (veh)	8					

Intersection: 2: Learning Lane/Church Drive & M-36

Movement	EB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	49	31
Average Queue (ft)	3	4
95th Queue (ft)	24	22
Link Distance (ft)	575	296
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Hall Road & M-36

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	6	52	61
Average Queue (ft)	0	6	25
95th Queue (ft)	0	32	50
Link Distance (ft)	658	695	515
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 8

Intersection	
Intersection Delay, s/veh	36
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕		↕	↕	
Traffic Vol, veh/h	47	46	3	8	44	281	3	12	21	479	13	27
Future Vol, veh/h	47	46	3	8	44	281	3	12	21	479	13	27
Peak Hour Factor	0.86	0.86	0.86	0.83	0.83	0.83	0.92	0.92	0.92	0.93	0.93	0.93
Heavy Vehicles, %	16	16	16	18	18	18	2	2	2	7	7	7
Mvmt Flow	55	53	3	10	53	339	3	13	23	515	14	29
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	13.2	17.2	10.8	55.8
HCM LOS	B	C	B	F

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	8%	49%	15%	0%	100%	0%
Vol Thru, %	33%	48%	85%	0%	0%	32%
Vol Right, %	58%	3%	0%	100%	0%	68%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	36	96	52	281	479	40
LT Vol	3	47	8	0	479	0
Through Vol	12	46	44	0	0	13
RT Vol	21	3	0	281	0	27
Lane Flow Rate	39	112	63	339	515	43
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.078	0.241	0.125	0.599	0.977	0.07
Departure Headway (Hd)	7.184	7.782	7.164	6.373	6.83	5.845
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	501	464	497	562	531	609
Service Time	5.191	5.784	4.961	4.17	4.598	3.612
HCM Lane V/C Ratio	0.078	0.241	0.127	0.603	0.97	0.071
HCM Control Delay	10.8	13.2	11	18.4	59.7	9.1
HCM Lane LOS	B	B	B	C	F	A
HCM 95th-tile Q	0.3	0.9	0.4	3.9	13.1	0.2

HCM 6th TWSC
2: Learning Lane/Church Drive & M-36

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	537	9	12	306	0	27	0	39	0	0	0
Future Vol, veh/h	0	537	9	12	306	0	27	0	39	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	87	87	78	78	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	5	17	17	2	2	2	2	2	2	2
Mvmt Flow	0	617	10	15	392	0	29	0	42	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	392	0	0	627	0	0	1044	1044	622	1065	1049	392
Stage 1	-	-	-	-	-	-	622	622	-	422	422	-
Stage 2	-	-	-	-	-	-	422	422	-	643	627	-
Critical Hdwy	4.12	-	-	4.27	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.353	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1167	-	-	886	-	-	207	229	487	200	227	657
Stage 1	-	-	-	-	-	-	474	479	-	609	588	-
Stage 2	-	-	-	-	-	-	609	588	-	462	476	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1167	-	-	886	-	-	203	224	487	180	222	657
Mov Cap-2 Maneuver	-	-	-	-	-	-	203	224	-	180	222	-
Stage 1	-	-	-	-	-	-	474	479	-	609	575	-
Stage 2	-	-	-	-	-	-	596	575	-	422	476	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.3			20.1			0		
HCM LOS							C			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	310	1167	-	-	886	-	-	-
HCM Lane V/C Ratio	0.231	-	-	-	0.017	-	-	-
HCM Control Delay (s)	20.1	0	-	-	9.1	0	-	0
HCM Lane LOS	C	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.9	0	-	-	0.1	-	-	-

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	566	10	5	303	15	34
Future Vol, veh/h	566	10	5	303	15	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	78	78	63	63
Heavy Vehicles, %	7	7	22	22	8	8
Mvmt Flow	674	12	6	388	24	54

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	686	0	1080
Stage 1	-	-	-	-	680
Stage 2	-	-	-	-	400
Critical Hdwy	-	-	4.32	-	6.48
Critical Hdwy Stg 1	-	-	-	-	5.48
Critical Hdwy Stg 2	-	-	-	-	5.48
Follow-up Hdwy	-	-	2.398	-	3.572
Pot Cap-1 Maneuver	-	-	821	-	235
Stage 1	-	-	-	-	492
Stage 2	-	-	-	-	664
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	821	-	233
Mov Cap-2 Maneuver	-	-	-	-	233
Stage 1	-	-	-	-	492
Stage 2	-	-	-	-	658

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	18.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	346	-	-	821	-
HCM Lane V/C Ratio	0.225	-	-	0.008	-
HCM Control Delay (s)	18.4	-	-	9.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Intersection	
Intersection Delay, s/veh	74.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕		↕	↕	
Traffic Vol, veh/h	84	58	2	18	64	679	3	14	6	339	10	77
Future Vol, veh/h	84	58	2	18	64	679	3	14	6	339	10	77
Peak Hour Factor	0.89	0.89	0.89	0.93	0.93	0.93	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles, %	7	7	7	1	1	1	2	2	2	3	3	3
Mvmt Flow	94	65	2	19	69	730	3	15	7	373	11	85
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	14.9	114.6	12.1	28.3
HCM LOS	B	F	B	D

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	13%	58%	22%	0%	100%	0%
Vol Thru, %	61%	40%	78%	0%	0%	11%
Vol Right, %	26%	1%	0%	100%	0%	89%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	23	144	82	679	339	87
LT Vol	3	84	18	0	339	0
Through Vol	14	58	64	0	0	10
RT Vol	6	2	0	679	0	77
Lane Flow Rate	25	162	88	730	373	96
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.056	0.339	0.165	1.203	0.772	0.168
Departure Headway (Hd)	8.637	7.891	6.756	5.933	7.95	6.805
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	417	458	533	613	458	531
Service Time	6.637	5.891	4.465	3.641	5.65	4.505
HCM Lane V/C Ratio	0.06	0.354	0.165	1.191	0.814	0.181
HCM Control Delay	12.1	14.9	10.8	127.1	32.8	10.9
HCM Lane LOS	B	B	B	F	D	B
HCM 95th-tile Q	0.2	1.5	0.6	25.9	6.7	0.6

HCM 6th TWSC
2: Learning Lane/Church Drive & M-36

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	372	28	41	742	0	16	0	25	1	0	3
Future Vol, veh/h	3	372	28	41	742	0	16	0	25	1	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	89	89	93	93	92	92	92	92	92	92	92
Heavy Vehicles, %	2	4	4	1	1	2	2	2	2	2	2	2
Mvmt Flow	3	418	31	44	798	0	17	0	27	1	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	798	0	0	449	0	0	1328	1326	434	1339	1341	798
Stage 1	-	-	-	-	-	-	440	440	-	886	886	-
Stage 2	-	-	-	-	-	-	888	886	-	453	455	-
Critical Hdwy	4.12	-	-	4.11	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.209	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	824	-	-	1117	-	-	132	156	622	130	152	386
Stage 1	-	-	-	-	-	-	596	578	-	339	363	-
Stage 2	-	-	-	-	-	-	338	363	-	586	569	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	824	-	-	1117	-	-	123	144	622	117	140	386
Mov Cap-2 Maneuver	-	-	-	-	-	-	123	144	-	117	140	-
Stage 1	-	-	-	-	-	-	593	575	-	337	337	-
Stage 2	-	-	-	-	-	-	311	337	-	558	566	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.4			23.3			20		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	241	824	-	-	1117	-	-	245
HCM Lane V/C Ratio	0.185	0.004	-	-	0.039	-	-	0.018
HCM Control Delay (s)	23.3	9.4	0	-	8.4	0	-	20
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	0.1

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	368	30	22	753	30	22
Future Vol, veh/h	368	30	22	753	30	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	92	92	75	75
Heavy Vehicles, %	5	5	2	2	4	4
Mvmt Flow	428	35	24	818	40	29

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	463	0	1312 446
Stage 1	-	-	-	-	446 -
Stage 2	-	-	-	-	866 -
Critical Hdwy	-	-	4.12	-	6.44 6.24
Critical Hdwy Stg 1	-	-	-	-	5.44 -
Critical Hdwy Stg 2	-	-	-	-	5.44 -
Follow-up Hdwy	-	-	2.218	-	3.536 3.336
Pot Cap-1 Maneuver	-	-	1098	-	173 608
Stage 1	-	-	-	-	641 -
Stage 2	-	-	-	-	408 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1098	-	166 608
Mov Cap-2 Maneuver	-	-	-	-	166 -
Stage 1	-	-	-	-	641 -
Stage 2	-	-	-	-	392 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	26
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	240	-	-	1098	-
HCM Lane V/C Ratio	0.289	-	-	0.022	-
HCM Control Delay (s)	26	-	-	8.4	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0.1	-

Intersection: 1: Driveway & Hamburg Road & M-36

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	LTR	L	TR
Maximum Queue (ft)	95	73	130	43	224	48
Average Queue (ft)	45	32	68	23	89	18
95th Queue (ft)	77	65	107	47	161	38
Link Distance (ft)	713	575		491	1264	1264
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200					
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Learning Lane/Church Drive & M-36

Movement	WB	NB
Directions Served	LTR	LTR
Maximum Queue (ft)	61	84
Average Queue (ft)	6	30
95th Queue (ft)	33	61
Link Distance (ft)	658	491
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Hall Road & M-36

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	5	35	64
Average Queue (ft)	0	3	24
95th Queue (ft)	4	18	48
Link Distance (ft)	658	695	515
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Driveway & Hamburg Road & M-36

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	LTR	L	TR
Maximum Queue (ft)	92	135	316	39	123	54
Average Queue (ft)	47	35	145	18	61	23
95th Queue (ft)	78	92	267	43	101	42
Link Distance (ft)	713	575		491	1264	1264
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			200			
Storage Blk Time (%)			8			
Queuing Penalty (veh)			6			

Intersection: 2: Learning Lane/Church Drive & M-36

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	36	80	57	32
Average Queue (ft)	2	13	26	5
95th Queue (ft)	15	48	51	23
Link Distance (ft)	575	658	491	296
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Hall Road & M-36

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	57	67
Average Queue (ft)	6	25
95th Queue (ft)	29	52
Link Distance (ft)	695	515
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 6

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	0	537	9	12	306	0	27	0	39	0	0	0
Future Vol, veh/h	0	537	9	12	306	0	27	0	39	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	87	87	78	78	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	5	17	17	2	2	2	2	2	2	2
Mvmt Flow	0	617	10	15	392	0	29	0	42	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	392	0	0	627	0	0	1044	1044	622	1065	1049	392
Stage 1	-	-	-	-	-	-	622	622	-	422	422	-
Stage 2	-	-	-	-	-	-	422	422	-	643	627	-
Critical Hdwy	4.12	-	-	4.27	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.353	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1167	-	-	886	-	-	207	229	487	200	227	657
Stage 1	-	-	-	-	-	-	474	479	-	609	588	-
Stage 2	-	-	-	-	-	-	609	588	-	462	476	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1167	-	-	886	-	-	204	225	487	180	223	657
Mov Cap-2 Maneuver	-	-	-	-	-	-	204	225	-	180	223	-
Stage 1	-	-	-	-	-	-	474	479	-	609	578	-
Stage 2	-	-	-	-	-	-	599	578	-	422	476	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.3			20			0		
HCM LOS							C			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	311	1167	-	-	886	-	-	-
HCM Lane V/C Ratio	0.231	-	-	-	0.017	-	-	-
HCM Control Delay (s)	20	0	-	-	9.1	-	-	0
HCM Lane LOS	C	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.9	0	-	-	0.1	-	-	-

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	3	372	28	41	742	0	16	0	25	1	0	3
Future Vol, veh/h	3	372	28	41	742	0	16	0	25	1	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	89	89	93	93	92	92	92	92	92	92	92
Heavy Vehicles, %	2	4	4	1	1	2	2	2	2	2	2	2
Mvmt Flow	3	418	31	44	798	0	17	0	27	1	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	798	0	0	449	0	0	1328	1326	434	1339	1341	798
Stage 1	-	-	-	-	-	-	440	440	-	886	886	-
Stage 2	-	-	-	-	-	-	888	886	-	453	455	-
Critical Hdwy	4.12	-	-	4.11	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.209	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	824	-	-	1117	-	-	132	156	622	130	152	386
Stage 1	-	-	-	-	-	-	596	578	-	339	363	-
Stage 2	-	-	-	-	-	-	338	363	-	586	569	-
Platoon blocked, %		-	-	-	-	-						
Mov Cap-1 Maneuver	824	-	-	1117	-	-	126	149	622	120	145	386
Mov Cap-2 Maneuver	-	-	-	-	-	-	126	149	-	120	145	-
Stage 1	-	-	-	-	-	-	593	575	-	337	349	-
Stage 2	-	-	-	-	-	-	322	349	-	558	566	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.4			22.9			19.8		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	245	824	-	-	1117	-	-	248
HCM Lane V/C Ratio	0.182	0.004	-	-	0.039	-	-	0.018
HCM Control Delay (s)	22.9	9.4	0	-	8.4	-	-	19.8
HCM Lane LOS	C	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	0.1

Intersection: 2: Learning Lane/Church Drive & M-36

Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	36	62
Average Queue (ft)	4	33
95th Queue (ft)	20	54
Link Distance (ft)		486
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 2: Learning Lane/Church Drive & M-36

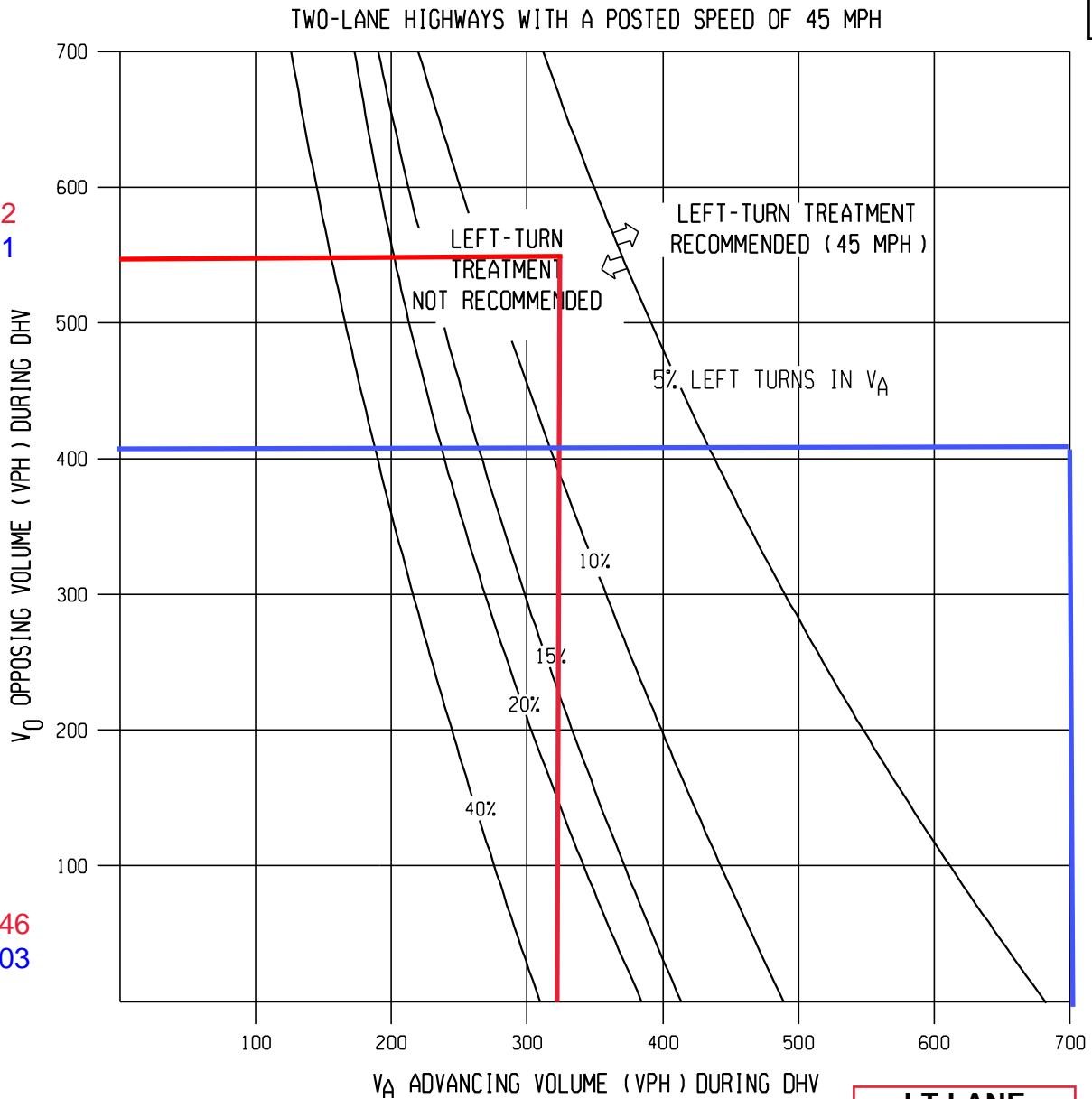
Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (ft)	25	30	30	106	33
Average Queue (ft)	1	8	2	30	5
95th Queue (ft)	11	25	24	99	23
Link Distance (ft)	575		658	486	290
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		100			
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

Zone Summary

Zone wide Queuing Penalty: 0

AM % Left in
 $V_a = 3.8\%$
 PM % Left in
 $V_a = 5.2\%$

AM Left-Turn = 12
 PM Left-Turn = 41



AM $V_o = 546$
 PM $V_o = 403$

AM $V_a = 318$
 PM $V_a = 783$

**LT LANE
 Recommended**

Instructions:

1. The family of curves represent the percentage of left turns in the advancing volume (V_A). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of 5, the designer should estimate where the curve lies.
2. Read V_A and V_O into the chart and locate the intersection of the two volumes.
3. Note the location of the point in #2 relative to the line in #1. If the point is to the right of the line, then a left-turn lane is recommended. If the point is to the left of the line, then a left-turn is not recommended based on traffic volumes.

MDOT
 Michigan Department of Transportation

TRAFFIC AND SAFETY
 NOTE

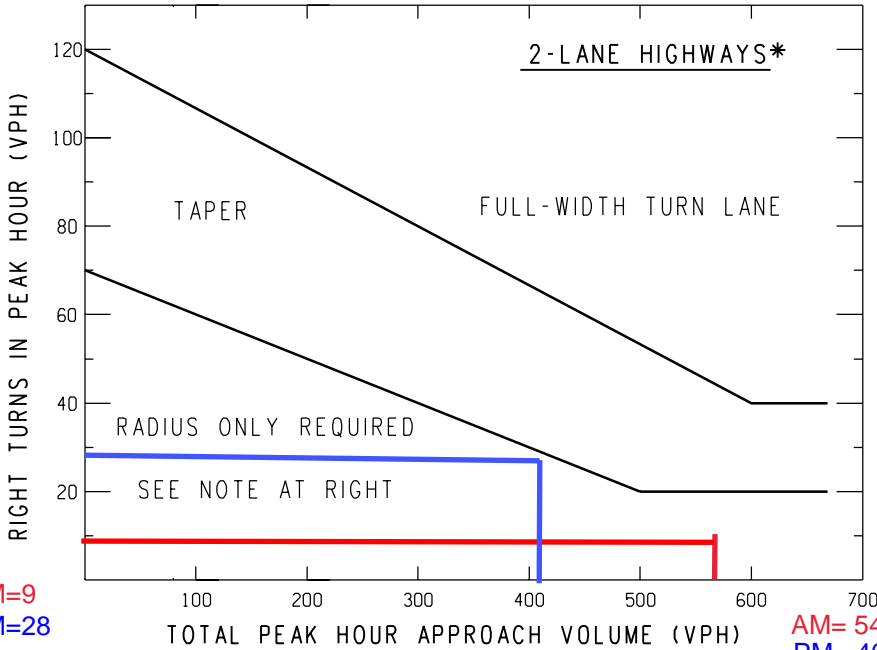
DRAWN BY: MTS
 CHECKED BY: JAT
 FILE: K:\DGN\ts notes\Note605A tsn.dgn

TRAFFIC VOLUME GUIDELINES
 FOR LEFT-TURN LANES AT
 UNSIGNALIZED INTERSECTIONS

08/05/2004
 PLAN DATE:

605A

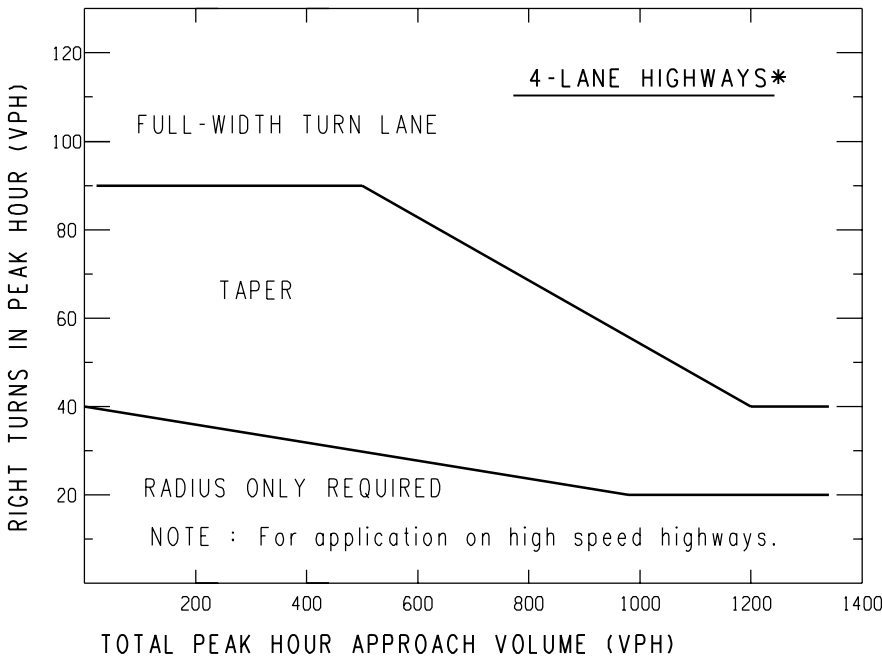
SHEET
 4 OF



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

RT LANE NOT Recommended



*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.

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 VOLUME GUIDELINES FOR RIGHT-TURN LANES AND TAPERS	
TRAFFIC AND SAFETY NOTE			
DRAWN BY: MTS	08/05/2004	604A	123
CHECKED BY: JAT	PLAN DATE:		
FILE: K:/DGN/ts notes/Note604A tsn.dgn		REV. 08/05/2004	



Hamburg Township Public Safety – Fire Division

Item 2.

10100 VETERANS MEMORIAL DRIVE
P.O. BOX 157 ♦ HAMBURG, MI 48139-0157
PHONE: 810-222-1100 ♦ FAX: 810-231-9401
E-MAIL: HTFD@HAMBURG.MI.US

DEPUTY FIRE CHIEF JORDAN ZERNICK *PLAN REVIEW RESULTS*

To: Hamburg Twp. Zoning

From: Deputy Fire Chief, Jordan Zernick

Subject: Site Plan Review – Lakeland Crossing

Date: September 5, 2024

I have completed the plan review of the Final Site Plan submittal for the Lakeland Crossing Development in Hamburg Township. The review was based on the applicable Fire Code and Hamburg Township Ordinance Requirements.

The plans are approved as submitted with the following requirements, revisions, and clarification:

1. All buildings on property are to be suppressed by an NFPA 13/NFPA 13R approved suppression system. This requirement is in place due to the road widths being decreased from a 26ft minimum road width in a hydrated district, to a 20ft minimum road width requirement.
2. There shall be no street parking in the 20ft drive isle other than in designated parking spaces that are not within the 20ft drive isle. All streets shall be posted as no parking other than in designated parking areas.
3. Building plans to be submitted to the fire department for review.
4. Suppression and alarm plans shall be submitted to the Hamburg Township Fire Department for review and approval.
5. A 3200 Series Knox Box shall be placed on the Club House. Copies of master keys for the property shall be placed in Knox Box at the time of C of O Inspection.
6. Fire extinguishers shall be placed within the Club House in locations as defined in the International Fire Code. Extinguishers shall be on site during the time of construction.
7. Address labeling and posting for each building shall be placed on each tenant space and each nonresidential building in conjunction with the requirements set forth in the International Fire Code.
8. Any additional plans through this process, including as built plans, shall be submitted directly to the Hamburg Township Fire Department. A minimum of one hard copy and electronic copies will be required.
9. Any gate or means of blocking permanent access to Washington St. shall be submitted to the fire department for approval prior to installation. (proposed Knox box will suffice)



Hamburg Township Public Safety – Fire Division

Item 2.

10100 VETERANS MEMORIAL DRIVE
P.O. BOX 157 ♦ HAMBURG, MI 48139-0157
PHONE: 810-222-1100 ♦ FAX: 810-231-9401
E-MAIL: HTFD@HAMBURG.MI.US

DEPUTY FIRE CHIEF JORDAN ZERNICK **PLAN REVIEW RESULTS**

This approval is subject to field inspection. This approval shall be valid for one year. If construction has not begun within 12 months of the date on this letter the plans must be resubmitted for approval. This approval does not exempt the project from complying with all applicable codes. Additional submittals and approvals may be required.

A handwritten signature in blue ink, appearing to read "J Zernick".

Deputy Chief Jordan Zernick



September 9, 2024

Mr. David Rohr, Planning and Zoning Director
Hamburg Township
10405 Merrill Road
P.O. Box 157
Hamburg, Michigan 48139

Re: The Crossings at Lakes Trail
Final Site Plan Review

Dear David:

We have reviewed the plans for the referenced site plan dated August 19, 2024, as prepared by Seiber Keast Lehner. We offer the following comments for your consideration:

1. No phasing is currently shown on the site plan. If the applicant plans to phase the project, phases should be clearly shown on the drawings with consideration of the proposed pump station, stormwater management, and any water main looping if required by the Livingston County Water Authority (LCWA).
2. A gravity sanitary sewer collection system with a pump station is proposed. The applicant will be required to go through the Township's sewer use application when appropriate. Ideally, the capacity of the proposed pump station is coordinated with the development to the north.
3. The pool shall not drain to the sanitary sewer.
4. The proposed water main will be reviewed and approved by LCWA prior to submitting for an Act 399 permit. Likely a second water main feed into the development will be required.
5. Insufficient detail is provided to determine any impacts offsite from the grading. The applicant should show proposed contours.
6. The preliminary storm water management calculations are generally in conformance with the Livingston County Drain Commissioner standards with the following comments.

- a. The time of concentration (TofC) shall be documented and justified.
- b. The applicant shall provide an analysis and consideration for infiltration.
- c. Conveyance calculations are required for the final site plan.
- d. Drainage areas for each catch basin should be delineated and the C Factor should be calculated for each.

7. An MDOT permit will be required for the entrance on M-36.

In summary, we offer no objection to the approval of the final site plan contingent upon these comments.

If you have any questions, please contact me at (734) 657-4925.

Ted Erickson
Digitally signed by Ted Erickson
DN: C=US,
E=ted.l.erickson@imegcorp.com,
O=IMEG Corp, CN=Ted Erickson
Date: 2024.09.09 11:53:29 -0400

Sincerely,

Ted L. Erickson
Principal

TLE/jdf

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Supervisor Pat Hohl Clerk Mike Dolan Treasurer Jason Negri Trustees Bill Hahn, Patricia Hughes, Chuck Menzies, Cindy Michniewicz

BOARD OF TRUSTEES REGULAR MEETING

Tuesday, June 04, 2024 at 2:30 PM
Hamburg Township Hall Board Room

MINUTES

CALL TO ORDER

The meeting was called to order at 2:30 pm.

PLEDGE TO THE FLAG

ROLL CALL OF THE BOARD

PRESENT

- Pat Hohl
- Bill Hahn
- Chuck Menzies
- Cindy Michniewicz
- Jason Negri
- Patricia Hughes

ABSENT

- Mike Dolan

ALSO PRESENT

- Mary Kuzner

CONSENT AGENDA

Motion by Menzies, Seconded by Michniewicz, to approve the consent agenda.

Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

1. 5-7-24 130 Township Board Work-Study Session Minutes
2. 5-21-24 700 Board of Trustees Regular Meeting Minutes
3. DPW Monthly Report - March-April 2024
4. Approved MUC Minutes - March 13, 2024
5. Parks and Recreation - Approved Minutes - May 2024

- 6. Township Coordinator - Monthly Report - May 2024
- 7. Senior Center - Monthly Report - May 2024
- 8. Bills List 06.04.2024

CALL TO THE PUBLIC

Sarah Bennett, 10582 Livingston St, is concerned about the apartment complex proposed at the old Hamburg Elementary property. Her concerns are the density it will bring, the traffic volume, the size of the proposed buildings, the landscaping, the location of the sanitary lift station, and the possibility of low income subsidies.

Brenda Vibbart, 10564 Hall Road, would like specifics of the utilities planned and has concerns with the lack of fencing to keep people and dogs on their own property, the increased traffic problems the proposed apartments will bring and how MDOT will manage it.

Makenzie Johnson, 10603 Livingston St, has many of the same concerns mentioned by others and wants to be sure all zoning ordinances are followed by the developer, including the 20 foot buffer zone and open space requirements.

Erin Gottbreht, 7930 Forest Creek Court, is concerned with the magnitude of a development of this size, the disregard for the township ordinances, the landscaping and open space ordinances. This will impact homeowners on Hamburg Lake due to the traffic increase and residents needing alternative driving routes.

Lisa Wack, 7860 Forest Creek Court, would like to know the cost of the proposed apartments compared to the benefits the township will see. Increased traffic on the Lakeland Trail will also bring the possibility of trash and problems.

APPROVAL OF THE AGENDA

Motion by Negri, Seconded by Hahn, to approve the agenda as presented, with items 9 & 13 to be tabled.

Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

UNFINISHED BUSINESS

- 9. Employee Evaluation Review form changes
Tabled.

- 10. Utilities & Special Projects Coordinator job description update
Motion by Hohl, Seconded by Michniewicz, to approve the changes to the job description, noting that we need to add the pay grade level to the job description header.

Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

- 11. Accounting & Benefits Coordinator job description update
Motion by Negri, Seconded by Hahn, to approve the changed job description of the Accounting & Benefits Coordinator, as presented in the packet.

Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

- 12. ARPA Update - May 22, 2024
Motion by Hohl, Seconded by Hughes, to receive and file the ARPA summary and to request the Clerk to schedule an update on the next board meeting for formal discussion.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

CURRENT BUSINESS

- 13. Deputy Clerk & Elections Coordinator Recognition
Tabled.

- 14. Updated Public Safety SOP
Motion by Hughes, Seconded by Negri, to approve the change to the Public Safety SOP 300-16, as updated in the packet.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

- 15. Preliminary Site Plan Review (GPUD24-0001) - The Crossing at Lakelands Trail
Motion by Negri, Seconded by Michniewicz, to approve the preliminary site plan application for GPUD24-0001, for the proposed project proposing a 208 unit apartment complex with a clubhouse with conditions 1-6 inclusive. The project does meet the site plan review standards A-L of section 36-73,7 of the zoning ordinance as discussed at the May 15, 2024 Planning Commission Meeting and as discussed here today and as presented in the staff report.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

Motion by Negri, Seconded by Michniewicz, to amend the original motion with the amendment to urge the Planning Commission to expand the buffer zone required.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

- 16. Treasury Department Personnel
Motion by Negri, Seconded by Hahn to approve the promotion of Susan Deadman, Senior Treasurer's Assistant, pay grade 4 to Assistant Deputy Treasurer, grade 5, step 8, effective July 1, 2024.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Hughes, Negri

Motion by Negri, Seconded by Hughes to approve the monetary recognition for the over-the-top work that Susan did during the transition for Deputy Treasurers in the amount of \$1400.00 for Susan Deadman, to be processed on payroll June 10, 2024.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Hughes, Negri

- 17. Community Drive SAD - Road Maintenance Bid Results
Motion by Hohl, Seconded by Negri, to award the 2 year contract to Bob Meyers Excavating and Big Barney's beginning on Jun 22, 2024 - June 21, 2026 for the maintenance of Community Drive. This bid was sent out to 14 contractors.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

- 18. Purchase Policy Update
Motion by Hughes, Seconded by Negri, to update the Hamburg Township purchase policy as presented in the packet.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

- 19. PTA waiver of penalties resolution
Motion by Negri, Seconded by Hughes, to adopt Resolution #240601, PTA Waiver of fines for not filing a Property Transfer Affidavit within 45 days of property transfer.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

- 20. Township Complex Survey
Motion by Hohl, Seconded by Hughes, to approve the endorsement of the agreement with Alpine Survey, and pay the \$5000.00 deposit and get the Hamburg Township property surveys done & recorded.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

- 21. Grinder Pump Station Purchase Request
Motion by Hohl, Seconded by Michniewicz, to authorize the purchase of the 55 simplex and 1 duplex pump. The cost is \$317,100.00.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

- 22. Township Board 2024-2025 Fiscal Year Meeting Dates
Motion by Negri, Seconded by Menzies, to adopt, file and publish the Regular Board Meeting schedule dates for the 24/25 fiscal year, as proposed in the packet.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

- 23. DPW Technician - On call
Motion by Hohl, Seconded by Hahn, to approve the hiring of a part-time, on-call DPW Tech as outlined in Tony Randazzo's memo dated May 30, 2024, contingent upon all pre-employment prerequisites.
Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

CALL TO THE PUBLIC

Bob Langan, 128 North Center St, Northville, partner at Elevate Property Partners, thanked the Board and Planning Committee for their work on the townhome and apartment complex. He said Elevate Property Partners is a market driven company with no intention of ever having any subsidies or government grants for this or any developments. They intend to increase the buffers for the community.

BOARD COMMENTS

Updated sound system for the boardroom is targeted to be done by Labor Day.

May 4, 2024

ADJOURNMENT

Motion by Negri, Seconded by Menzies, to adjourn the meeting.

Voting Yea: Hohl, Hahn, Menzies, Michniewicz, Negri, Hughes

The meeting was adjourned at 3:47 pm.

Respectfully submitted,



Jennifer Daniels
Recording Secretary



Mike Dolan
Township Clerk