500 West Big Beaver
Troy, MI 48084
troymi.gov

CITY COUNCIL AGENDA ITEM

Date: January 16, 2022

To: Mark F. Miller, City Manager

From: Robert J. Bruner, Assistant City Manager
R. Brent Savidant, Community Development Director

Subject: ANNOUNCEMENT OF PUBLIC HEARING – PLANNED UNIT DEVELOPMENT (File Number PUD 019 JPLN2022-0013) – Proposed Village of Troy PUD, South side of Long Lake, West of Rochester (Parcels 88-20-15-201-046 & 88-20-15-201-033), Section 15, Currently Zoned RT (One Family Attached Residential), R-1C (One Family Residential) and CB (Community Business) District.

The applicant Robertson Brothers Homes seeks approval of a Planned Unit Development (PUD). The subject site is 20.48 acres in area. The applicant proposes a 146-unit mixed residential development comprised of 20 detached single-family homes, 56 attached single-family homes (2 stories) and 70 attached townhomes (3 stories). Site amenities include a pedestrian path connecting Long Lake with the DPW property to the south, pocket park, multi-season hill, traffic calming measures, and enhanced landscaping along Long Lake.

PUD approval is generally a two-step process. Step one is approval of the Conceptual Development Plan (CDP), which includes approval of a concept, rezoning of the property to "PUD" and approval of the PUD Agreement. Step two is Preliminary Development Plan (PDP) approval, which approves the Preliminary Site Plan for each phase of the project. This two-step approach provides flexibility to develop the project over times as market conditions change. For this project, the applicant does not require market flexibility and seeks CDP and PDP approval concurrently. Therefore, City Council approval would have the effect of rezoning the parcel to PUD, approving the PUD Agreement and granting preliminary site plan approval.

The Planning Commission considered the application at a public hearing on December 13, 2022. The Planning Commission recommended approval of the application by a 7-1 vote.

A City Council public hearing has been scheduled for February 27, 2023.

Legal Review

This item was submitted to the City Attorney for review pursuant to City Charter Section 3.17.

Attachments:

1. Maps.
2. Minutes from December 13, 2022 Planning Commission Regular meeting.
3. Agenda packet from December 13, 2022 Planning Commission Regular meeting (includes Preliminary Site Plan).

4. Public comment.
5. PUD Agreement (draft).

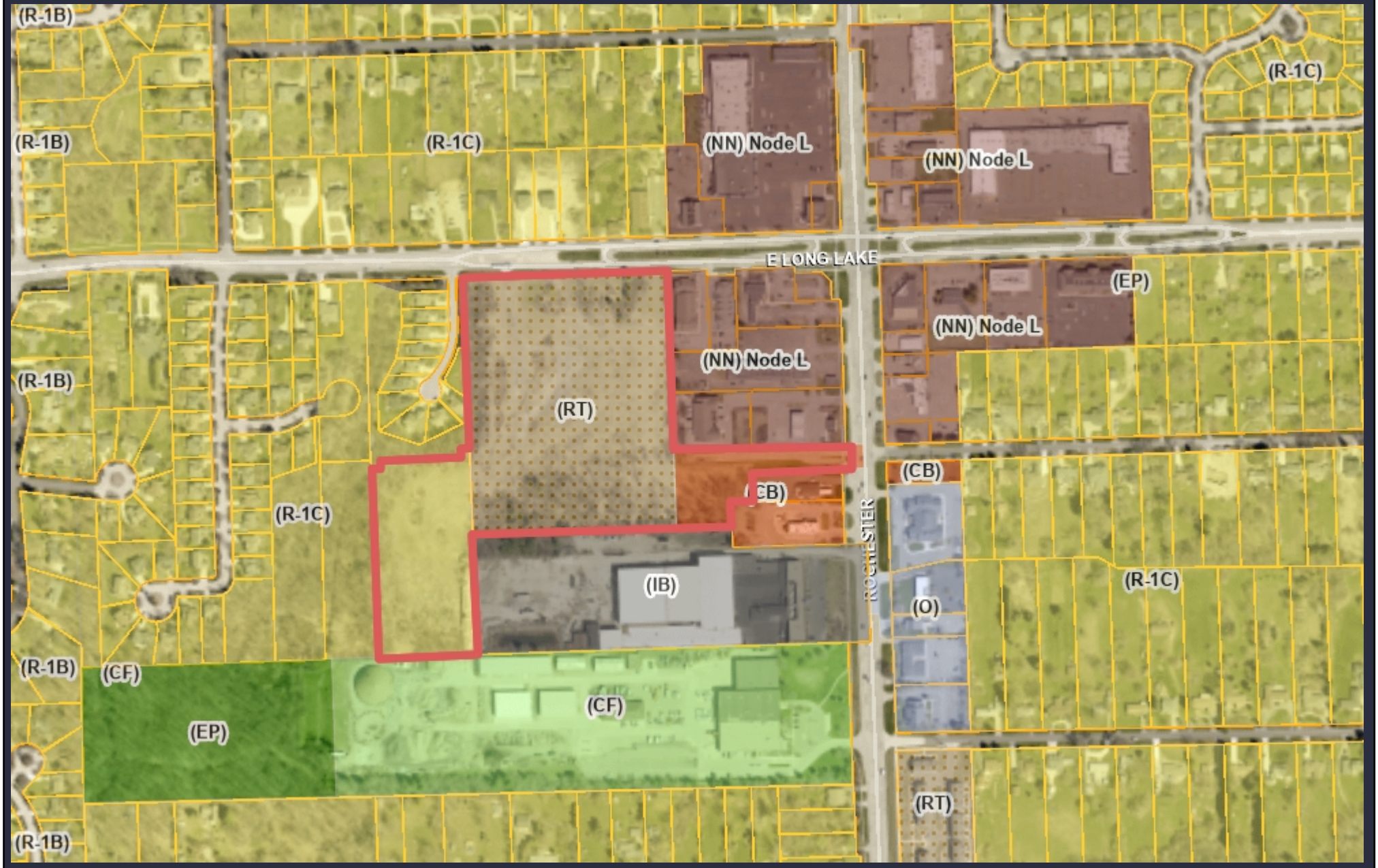
RBS, G:\PUDs\PUD 019 JPLN2022-0013 VILLAGE OF TROY\20230123 CC Memo Announce Public Hearing Village of Troy PUD.docx

GIS Online

1,189 0 595 1,189 Feet

Note: The information provided by this application has been compiled from recorded deeds, plats, tax maps, surveys, and other public records and data. It is not a legally recorded map survey. Users of this data are hereby notified that the source information represented should be consulted for verification.

GIS Online



1,189 0 595 1,189 Feet

Note: The information provided by this application has been compiled from recorded deeds, plats, tax maps, surveys, and other public records and data. It is not a legally recorded map survey. Users of this data are hereby notified that the source information represented should be consulted for verification.

PLANNED UNIT DEVELOPMENTS

8. PLANNED UNIT DEVELOPMENT (File Number PUD 019 JPLN2022-0013) – Proposed Village of Troy PUD, South side of Long Lake, West of Rochester (Parcels 88-20-15-201-046 and 88-20-15-201-033), Section 15, Currently Zoned RT (One Family Attached Residential), R-1C (One Family Residential) and CB (Community Business) District

Mr. Tagle disclosed his firm is currently working with Robertson Brothers Homes on a project that has no association with the project before the Board this evening. He assured Board members that he can act upon the project in an unbiased way.

Board members agreed there is no reason for Mr. Tagle to recuse himself.

Mr. Carlisle said the Village of Troy Planned Unit Development (PUD) application has been before the Board multiple times for review. Mr. Carlisle reviewed discussion points during the September 13, 2022 meeting and changes to the application since last reviewed by the Planning Commission. Mr. Carlisle displayed comparisons between the September 2022 site plan and the Site Plan before the Board this evening.

In summary, Mr. Carlisle said as part of the deliberation the Planning Commission should consider:

- Has the applicant sufficiently redesigned/improved plan to address comments from the Planning Commission and public?
- Has the applicant met the site plan standards?
- Has the applicant met the PUD standards?
- Has the applicant presented a project where the benefits are commensurate with requested deviations?

Tim Loughrin and Darian Neubecker of Robertson Brothers Homes were present.

Some items Mr. Loughrin addressed in a PowerPoint presentation were:

- Various revisions to the plan.
- Project renderings/drawings from different perspectives.
- Village concept, project summary, highlights, product design, housing options and pedestrian conveyance.

There was discussion, some comments related to:

- Redesign of southwest corner to offer a year-round amenity.
- Development phases/ stages.
- Establishment of Master Homeowners Association (HOA).
- Homebuyers' preferences would determine number of ranch style homes.
- Architecture, exterior building materials; consideration to adding elements to flat area.
- Energy efficiency resources; electric vehicle charging stations.
- Long Lake and Rochester Road entrances.

Mr. Neubecker of Robertson Brothers addressed energy efficiency resources proposed for the development.

Mr. Neubecker stated that development phases have not yet clearly been defined. He indicated single family homes, amenities and the regional detention pond would be most likely the first phase and the townhomes would be the second phase.

Ms. Dufrane addressed the draft PUD Agreement. She asked the applicant to flush out the development phases prior to the City Council presentation and indicated there would be forthcoming changes relating to the regional detention pond.

Chair Lambert opened the floor for public comment. Acknowledging there was no one present who wished to speak, Chair Lambert closed the floor for public comment.

City Traffic Consultant Stephen Dearing of OHM addressed:
- Rochester Road entrance in relation to imminent road widening and expansion.
- Long Lake entrance as relates to vehicular turning lanes.
- Neighborhood safety issues associated with the plan layout.
- Fire Department approval for no T-turnarounds in multi-family townhome aisles.
- Dimensions of proposed curb radii.

Resolution # PC-2022-12-064
Moved by: Faison
Seconded by: Krent

WHEREAS, The applicant Robertson Brothers Homes seeks Conceptual Development Plan (CDP) and Preliminary Development Plan (PDP) approval for the Village of Troy Planned Unit Development (PUD), located on the south side of Long Lake, west of Rochester, in Section 15, approximately 20.48 acres in area; and

WHEREAS, The Village of Troy PUD features 20 detached single-family homes, 56 attached single-family homes (2 stories) and 70 attached townhomes (3 stories); and

WHEREAS, The PUD provides a walkable urban environment that is compact, designed to human scale, and exhibits contextual integration of buildings and city spaces; and

WHEREAS, The PUD provides a compatible mix of open space, landscaped areas and pedestrian amenities, including incorporation of a regional trailway system; and

WHEREAS, The PUD proposes appropriate land use transitions between the PUD and surrounding properties, and

WHEREAS, The PUD will reasonably mitigate impacts to the transportation system and enhance non-motorized facilities and amenities; and

WHEREAS, The PUD provides a complementary variety of housing types; and

BE IT RESOLVED, That the Planning Commission recommends to City Council that Concept Development Plan Approval and Preliminary Development Plan Approval for the proposed Village of Troy, be granted.

Discussion on the motion on the floor.
Comments related to whether the Resolution should reference development phases and Fire Department approval for no T-turnarounds in multi-family aisles.

Chair Lambert thanked the applicant for working with the Planning Commission and City staff.

Vote on the motion on the floor.
Yes: All present (7)
Absent: Hutson, Perakis

MOTION CARRIED

DATE: December 8, 2022

TO: Planning Commission

FROM: R. Brent Savidant, Community Development Director

SUBJECT: PLANNED UNIT DEVELOPMENT (File Number PUD 019 JPLN2022-0013) – Proposed Village of Troy PUD, South side of Long Lake, West of Rochester (Parcels 88-20-15-201-046 & 88-20-15-201-033), Section 15, Currently Zoned RT (One Family Attached Residential), R-1C (One Family Residential) and CB (Community Business) District.

The applicant Robertson Brothers Homes seeks Conceptual Development Plan (CDP) and Preliminary Development Plan (PDP) approval for the Village of Troy Planned Unit Development (PUD). The project features 20 detached single-family homes, 56 attached single-family homes (2 stories) and 70 attached townhomes (3 stories).

The Planning Commission is a recommending body for this application. The Planning Commission held a public hearing on this item on September 13, 2022 as required by law.

The attached report prepared by Carlisle/Wortman Associates, Inc. (CWA), the City's Planning Consultant, summarizes the project as revised. CWA prepared the report with input from various City departments including Planning, Engineering, Public Works and Fire. City Management supports the findings of fact contained in the report and the recommendations included therein.

Attachments:

1. Maps
2. Minutes from September 13, 2022 Planning Commission Regular meeting.
3. Report prepared by Carlisle/Wortman Associates, Inc.
4. PUD Application/Site Plan
5. Traffic Impact Study, prepared by F&V, dated June 22, 2022.
6. Traffic Impact Study Review, memo prepared by OHM dated November 23, 2022.
7. Public comment.

G:\PUDs\PUD 019 JPLN2022-0013 VILLAGE OF TROY\PC Memo 12 13 2022.doc

PLANNED UNIT DEVELOPMENT

5. PUBLIC HEARING - PLANNED UNIT DEVELOPMENT (File Number PUD 019 JPLN2022-0013) – Proposed Village of Troy PUD, South side of Long Lake, West of Rochester (Parcels 88-20-15-201-046 and 88-20-15-201-033), Section 15, Currently Zoned RT (One Family Attached Residential), R-1C (One Family Residential) and CB (Community Business) Districts

Mr. Tagle disclosed his firm is currently working with Robertson Brothers Homes on a project that has no association with the project before the Board this evening. He assured Board members that he can act upon the project in an unbiased way.

Board members agreed there is no reason for Mr. Tagle to recuse himself.

Mr. Savidant summarized the Planned Unit Development (PUD) review and approval process. He stated the applicant this evening is bundling together the Concept Development Plan and Preliminary Site Plan applications. Mr. Savidant addressed the location, natural features, wetlands and woodlands, zoning, access and circulation, proposed residential housing, parking and how the plan relates to the Master Plan.

Mr. Savidant reviewed items discussed at the January 11, 2022 Planning Commission meeting. He noted the applicant maintained the townhome concept contrary to the Board's suggestion to consider alternative housing options. Mr. Savidant reviewed the proposed changes to the Site Plan since January 2022. He addressed dimensional deviations, benefits characterized by the applicant and the PUD Standards in Section 11.03 B of the Zoning Ordinance. Various elevations and housing types proposed by the applicant were displayed.

Mr. Savidant stated the City Traffic Engineer Consultant OHM recommends approval of the traffic impact study prepared by Fleis & Vanderbrink, dated June 22, 2022, with two exceptions as noted in the Planning Consultant report dated September 6, 2022. He announced Stephen Dearing of OHM is present in the audience should Board members have any questions.

In summary, Mr. Savidant said as part of the deliberation, the Planning Commission should consider:

- Does the applicant meet the intent and standards of a Planned Unit Development?
- Difference/distinction from attached townhomes and attached single-family homes.
- If alternatives to townhomes were considered?
- Are the proposed benefits commensurate with the relief requested?
- Materials and architectural details.
- Has the applicant sufficiently redesigned the site and provided a "villaging" concept as requested by the Planning Commission?

Mr. Savidant stated the role of the Planning Commission is to make a recommendation to City Council. He indicated another public hearing would be scheduled at the time City Council considers the application.

Tim Loughrin, Director of Land Acquisition for Robertson Brothers Homes, conducted a PowerPoint presentation. Some items addressed by Mr. Loughrin were:

- Village concept interconnecting various housing styles.
- Reduction in density; cut 40% townhomes.
- Increase of open space; 7 pocket parks, central park, pavilion.
- Parallel plan; what could be built under existing zoning.
- Elevations; design, square footage, building material, floor plans, price point.
- Sledding hill; quasi-public space located in southwest corner.
- Pedestrian pathway(s).
- Stormwater management; regional pond.
- Over 40% of site is active or passive recreational.
- Owner occupied homes.
- Surrounding zoning and area.
- PUD Standards.

Several members shared individual views on orientation of buildings, location of access drives, internal road design, public amenities and “village” concept. The applicant was encouraged to create something impactful that might attract one’s eyes within the project’s internal design such as a fountain or sculpture.

There was discussion, some comments related to:

- Quasi-public open space; liability, activity schedules.
- Orientation of homes, access drives, centrally located terminus drives.
- Screening on north and south sides; landscaping, berms, fencing.
- Stormwater management; regional pond.
- Parking; formula used to factor required number of spaces; consideration to landbank spaces if determined overparked.
- Building material; color scheme, cost, and maintenance of material.
- Board’s objection to vinyl siding.
- Potential to create additional pedestrian connections.
- Establishment of homeowners’ associations.

<u>PUBLIC HEARING OPENED</u>

- Leonard Joseph, 4909 River Bank Court; addressed concerns with screening, asked about type of screening and additional tree line if trees are removed, asked if retention pond is connected to residents on River Bank Court and if streets are private.
- Susheel Vu, 4921 River Bank Court; addressed concerns with increase in traffic, left turn lane, noise and lights.
- Gary Osak, 4919 Davis Court; addressed concerns with density, increase in traffic, stormwater management, encouraged quality building materials and screening.
- Deepan Shrivastava, 4969 River Bank Court; addressed concerns with increase in traffic, no left turn, internal road design and wetlands.

- Sendhil Damodavan, 4933 River Bank Court; addressed project design and concerns with effect on property values.

PUBLIC HEARING CLOSED

Chair Lambert stated one email communication was received from Harpreet Singh. The resident asked that a tree line for screening be maintained and addressed concerns with property values.

Questions posed during public hearing were addressed as follows:
- Applicant is receptive to address concerns with screening.
- Applicant acknowledged the streets are private.
- Applicant will work with EGLE (Environment, Great Lakes, & Energy) with respect to wetland regulations.
- Applicant addressed stormwater management; regional pond; no connection with residents on River Bank Court.
- Applicant addressed amenities that might be incorporated in pocket parks.

City Traffic Consultant Stephen Dearing of OHM addressed the proposed project's traffic impact as relates to access points, future reconfiguration of median and westbound left turn lane, crossover traffic, trip distribution analysis and planned future road improvements.

Ms. Malalahalli stated she would like to see the applicant take into consideration Planning Commission feedback and public comment expressed this evening and come back to the Board.

Resolution # PC-2022-09-051

Moved by: Malalahalli
Support by: Krent

RESOLVED, To postpone the Village of Troy PUD application to allow the developer an opportunity to take into consideration the direction given by the Board and public comment and to meet some of the PUD Standards cited in Section 11.03 B of the Zoning Ordinance that the Board feels have not been met.

Yes: All present (8)
Absent: Faison

MOTION CARRIED

Mr. Savidant clarified there would be no public hearing when the application comes back to the Planning Commission. He encouraged residents to view agendas posted on the City website to find out the meeting date the application would be considered again.

Ms. Dufrane asked the applicant to share with their attorney that revisions to the application might necessitate changes in the draft PUD agreement.

Carlisle | Wortman
ASSOCIATES, INC.

117 NORTH FIRST STREET SUITE 70 ANN ARBOR, MI 48104 734.662.2200 734.662.1935 FAX

Date: January 20, 2022
March 22, 2022
September 6, 2022
December 6, 2022

PUD and Preliminary Development Plan Approval Review For City of Troy, Michigan

Applicant: Robertson Homes

Project Name: Village of Troy PUD

Plan Date: November 7, 2022

Location: West of southwest corner of Long Lake Road and Rochester Road

Zoning: RT, R-1C, and CB

Action Requested: PUD and Preliminary Development Plan Approval

SITE DESCRIPTION

The subject site is located on the west side of the southwest corner of Long Lake Road and Rochester Road. The site is approximately 20.48 acres in area and is proposed for mixed housing type development. The applicant is proposing 146 new for-sale units. Breakout of the units include:

- 20 detached single-family homes
- 56 attached single-family homes (2 stories)
- 70 attached townhomes (3 stories)

Access is via E Long Lake Road and Rochester Road. Most of the property (approximately 15 acres) is zoned RT (residential transitional), with the remaining areas zoned R1-C (one family residential) and C-B (community business).

The applicant is seeking Planned Unit Development approval in order to allow for townhomes on currently zoned CB, Commercial Business district, and for dimensional relief. More details of dimensional relief are noted below.

Site Location:

Proposed Uses of Subject Parcel:
One hundred and forty-six (146) single-family detached homes, attached homes, and townhomes.

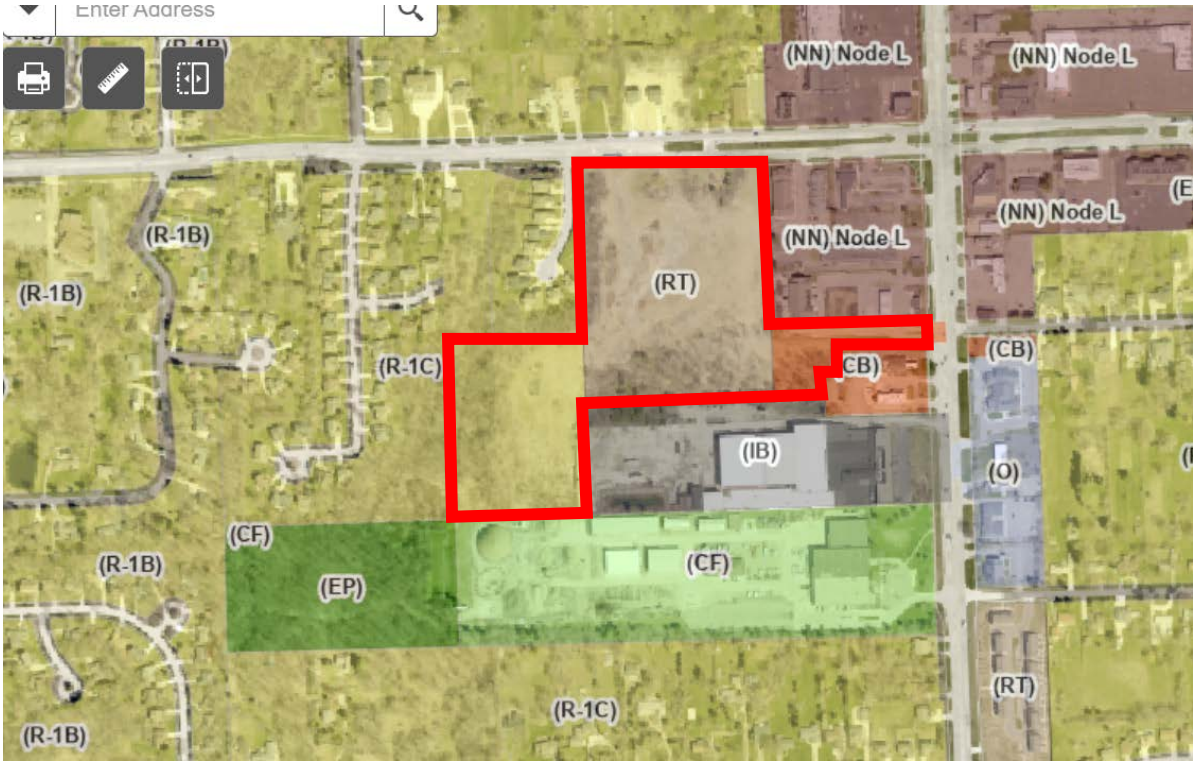
Current Use of Subject Property:
Vacant

Current Zoning:
The property is currently zoned RT (residential transitional), R1-C (one family residential), and C-B (community business).

Surrounding Property Details:

Direction	Zoning	Use
North	NN, Neighborhood Node and R1-C, Single Family	Commercial and Residential
South	IB, Industrial and Business, CB, Community Business, and CF, Community Facility	Commercial, Industrial, and DPW Yard
East	NN, Neighborhood Node	Commercial
West	R1-C, Single Family	Single Family Residential

ZONING



The site includes a mix of zoned RT (residential transitional), R1-C (one family residential) and C-B (community business) zoning.

HOUSING DETAILS

The applicant is offering the following housing types:

Detached single-family homes

- 20 Units
- 2 options
    - One-story ranches at 1,850 square feet; or
    - Two-story homes ranging from 1,900 to 3,100 square feet in size

Attached single-family homes (2 stories)

- 56 units
- 1,600 square feet that provides for the option of 2 or 3-bedrooms and includes an attached two car garage.

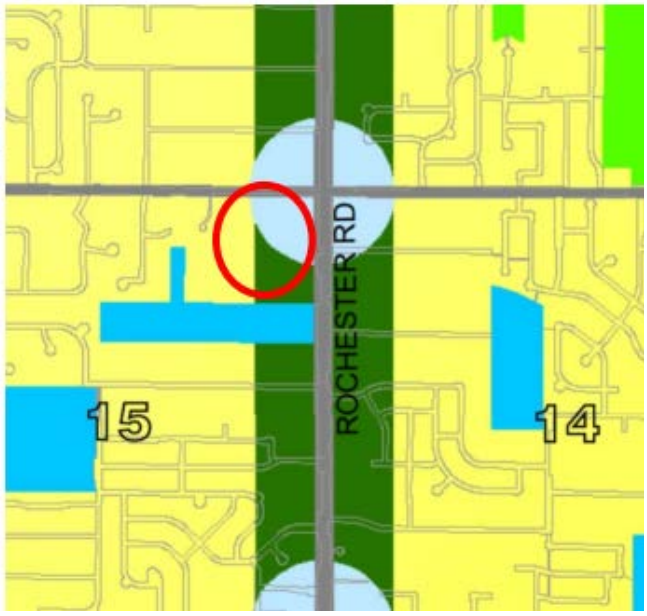
Attached townhomes (3 stories)

- 70 units
- The entry price point will consist of attached townhomes ranging between 1,200 and 1,350 square feet with private attached single car garages.

MASTER PLAN

The site is designated as a future land use of single family residential, Rochester Road, and partially neighborhood node.

The Planning Commission has spent a lot of time discussing both the neighborhood node concept and the proposed improvements and future development patterns within and adjacent to the nodes.



PUD PROCESS

A Planned Unit Development project is viewed as an integrated development concept. To that end, the provisions of this Article are not intended to be used as a device for avoiding the zoning requirements that would otherwise apply, but rather to allow flexibility and mixture of uses, and to improve the design, character and quality of new development. The use of a Planned Unit Development to permit variations from other requirements of this Ordinance shall only be

approved when such approval results in improvements to the public health, safety and welfare in the area affected, and in accordance with the intent of this Article.

The approval of a Planned Unit Development (PUD) is a three-step process:

> ***Step 1-Concept Plan:*** *The first step shall be application for and approval of a Concept Development Plan, which requires a legislative enactment amending the zoning district map so as to reclassify the property as a Planned Unit Development. A proposed Development Agreement shall be included and incorporated with the Concept Development Plan, to be agreed upon and approved coincident with said Plan. The Concept Development Plan and Development Agreement shall be approved by the City Council following the recommendation of the Planning Commission. Such action, if and when approved, shall confer upon the applicant approval of the Concept Development Plan and shall rezone the property to PUD in accordance with the terms and conditions of the Concept Development Plan approval.*

> ***Step 2- Preliminary Development Plan Approval:*** *The second step of the review and approval process shall be the application for and approval of a Preliminary Development Plan (preliminary site plan) for the entire project, or for any one or more phases of the project. City Council shall have the final authority to approve and grant Preliminary Development Plan approvals, following a recommendation by the Planning Commission.*

> ***Step 3- Final Development Plan Approval:*** *The third step of the review and approval process shall be the review and approval of a Final Development Plan (final site plan) for the entire project, or for any one or more phases of the project, and the issuance of building permits. Final Development Plans for Planned Unit Developments shall be submitted to the Zoning Administrator for administrative review, and the Zoning Administrator, with the recommendation of other appropriate City Departments, shall have final authority for approval of such Final Development Plans.*

The applicant is seeking a recommendation of approval for their Preliminary Development Plan.

PUD INTENT

As set forth in Section 11.01, the intent of the Planned Unit Development option is to permit flexibility in the design and use of residential and non-residential land which, through the implementation of an overall development plan, when applicable to the site, will:

1. Encourage developments that will result in a long-term contribution to social, environmental and economic sustainability in the City of Troy.
2. Permit development patterns that respond to changing public and private needs.

3. Encourage flexibility in design and use that will result in a higher quality of development and a better overall project than would be accomplished under conventional zoning, and which can be accommodated without sacrificing established community values.
4. Provide for the long-term protection and/or preservation of natural resources, natural features, and/or historic and cultural resources.
5. Promote the efficient use and conservation of energy.
6. Encourage the use, redevelopment and improvement of existing sites where current ordinances do not provide adequate protection and safeguards for the site or its surrounding areas, or where current ordinances do not provide the flexibility to consider redevelopment, replacement, or adaptive re-use of existing structures and sites.
7. Provide for enhanced housing, employment, recreation, and shopping opportunities for the citizens of Troy.
8. Ensure the compatibility of design and use between various components within the PUD and with neighboring properties and uses. 9. Ensure development that is consistent with the intent of the Master Plan.

SITE PLAN REVIEW STANDARDS

Site Plan review standards provide the Planning Commission with direction when reviewing the proposed site plan and design features of this development.

Section 8.06 outlines Site Plan Review Design Standards.

- *Development shall ensure compatibility to existing commercial districts and provide a transition between land uses.*
    a. *Building design shall enhance the character of the surrounding area in relation to building and parking placement, landscape and streetscape features, and architectural design.*
    b. *Street fronts shall provide a variety of architectural expression that is appropriate in its context and prevents monotony.*
    c. *Building design shall achieve a compatible transition between areas with different height, massing, scale, and architectural style.*

- *Development shall incorporate the recognized best architectural building design practices.*
    a. *Foster a lasting impact on the community through the provision of high quality design, construction, and detailing.*
    b. *Provide high quality, durable materials, such as but not limited to stone, brick, glass, and metal. E.I.F.S. or material equivalent shall only be used as an accent material.*
    c. *Develop buildings with creativity that includes balanced compositions and forms.*
    d. *Design roofs that are appropriate to the architectural style of the building and create an appropriate visual exterior mass of the building given the context of the site.*

e. *For commercial buildings, incorporate clearly defined, highly visible customer entrances using features such as canopies, porticos, arcades, arches, wing walls, ground plane elements, and/or landscape planters.*
f. *Include community amenities that add value to the development such as patio/ seating areas, water features, art work or sculpture, clock towers, pedestrian plazas with park benches or other features located in areas accessible to the public.*

- *Enhance the character, environment and safety for pedestrians and motorists.*
    a. *Provide elements that define the street and the pedestrian realm.*
    b. *Create a connection between the public right of way and ground floor activities.*
    c. *Create a safe environment by employing design features to reduce vehicular and pedestrian conflict, while not sacrificing design excellence.*
    d. *Enhance the pedestrian realm by framing the sidewalk area with trees, awnings, and other features.*
    e. *Improve safety for pedestrians through site design measures.*

PUD AGREEMENT

The applicant has submitted a PUD Agreement, which is being reviewed by the City Attorneys office.

PUD STANDARDS

When reviewing the PUD, the Planning Commission shall consider the following standards as set forth in Section 11.03:

1. *A mixture of land uses that would otherwise not be permitted without the use of the PUD provided that other objectives of this Article are also met.*
2. *A public improvement or public facility (e.g. recreational, transportation, safety and security) which will enhance, add to or replace those provided by public entities, thereby furthering the public health, safety and welfare.*
3. *A recognizable and material benefit to the ultimate users of the project and to the community, where such benefit would otherwise be infeasible or unlikely to be achieved absent these regulations.*
4. *Long-term protection and preservation of natural resources, natural features, and historic and cultural resources, of a significant quantity and/or quality in need of protection or preservation, and which would otherwise be unfeasible or unlikely to be achieved absent these regulations.*
5. *A compatible mixture of open space, landscaped areas, and/or pedestrian amenities.*
6. *Appropriate land use transitions between the PUD and surrounding properties.*
7. *Design features and techniques, such as green building and low impact design, which will promote and encourage energy conservation and sustainable development.*
8. *Innovative and creative site and building designs, solutions and materials.*
9. *The desirable qualities of a dynamic urban environment that is compact, designed to human scale, and exhibits contextual integration of buildings and city spaces.*

10. *The PUD will reasonably mitigate impacts to the transportation system and enhance non-motorized facilities and amenities.*
11. *For the appropriate assembly, use, redevelopment, replacement and/ or improvement of existing sites that are occupied by obsolete uses and/or structures.*
12. *A complementary variety of housing types that is in harmony with adjacent uses.*
13. *A reduction of the impact of a non-conformity or removal of an obsolete building or structure.*
14. *A development consistent with and meeting the intent of this Article, which will promote the intent of the Master Plan or the intent of any applicable corridor or sub-area plans. If conditions have changed since the Plan, or any applicable corridor or sub-area plans were adopted, the uses shall be consistent with recent development trends in the area.*
15. *Includes all necessary information and specifications with respect to structures, heights, setbacks, density, parking, circulation, landscaping, amenities and other design and layout features, exhibiting a due regard for the relationship of the development to the surrounding properties and uses thereon, as well as to the relationship between the various elements within the proposed Planned Unit Development. In determining whether these relationships have been appropriately addressed, consideration shall be given to the following:*
    i. *The bulk, placement, and materials of construction of the proposed structures and other site improvements.*
    ii. *The location and screening of vehicular circulation and parking areas in relation to surrounding properties and the other elements of the development.*
    iii. *The location and screening of outdoor storage, loading areas, outdoor activity or work areas, and mechanical equipment.*
    iv. *The hours of operation of the proposed uses.*
    v. *The location, amount, type and intensity of landscaping, and other site amenities.*
16. *Parking shall be provided in order to properly serve the total range of uses within the Planned Unit Development. The sharing of parking among the various uses within a Planned Unit Development may be permitted. The applicant shall provide justification to the satisfaction of the City that the shared parking proposed is sufficient for the development and will not impair the functioning of the development, and will not have a negative effect on traffic flow within the development and/or on properties adjacent to the development.*
17. *Innovative methods of stormwater management that enhance water quality shall be considered in the design of the stormwater system.*
18. *The proposed Planned Unit Development shall be in compliance with all applicable Federal, State and local laws and ordinances, and shall coordinate with existing public facilities.*

The Planning Commission should review the application considering the standards.

PREVIOUS PLANNING COMMISSION REVIEW

The Planning Commission discussed the project at the September 13th meeting. There was lengthy discussion of the following:

- Quasi-public open space; liability, activity schedules.
- Orientation of homes, access drives, centrally located terminus drives.
- Screening on north and south sides; landscaping, berms, fencing.
- Stormwater management; regional pond.
- Parking; formula used to factor required number of spaces; consideration to landbank spaces if determined overparked.
- Building material; color scheme, cost, and maintenance of material.
- Board's objection to vinyl siding.
- Potential to create additional pedestrian connections.
- Establishment of homeowners' associations.
- PUD Standards

See September 13th Planning Commission meeting minutes for more details.

The Planning Commission postponed the Village of Troy PUD application to allow the developer an opportunity to take into consideration the direction given by the Board and public comment and to meet some of the PUD Standards cited in Section 11.03 B of the Zoning Ordinance that the Board feels have not been met.

CHANGES SINCE LAST PLANNING COMMISSION REVIEW

The applicant has proposed the following changes to the Site Plan since the last submittal:

- Moved EVA to directly connect to Long Lake
- Provided dedicated pedestrian connection between detached single-family homes to attached single-family homes.
- Redesigned hill at southwest corner of project to provide a year-round amenity.
- Added traffic calming measures into development
- Added additional pedestrian crossings
- Enhanced landscaping and screening along Long Lake
- Enhanced pocket park at terminus of private road off Long Lake.

March 2022 Plan

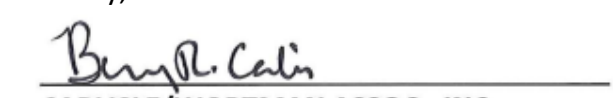
November 2022 Plan

SUMMARY

See our September review memo for a more detailed review. As part of the deliberation, the Planning Commission should consider:

- Has the applicant sufficiently redesigned/improved plan to address comments from the Planning Commission and public?
- Has the applicant met the site plan standards?
- Has the applicant met the PUD standards
- Has the applicant presented a project where the benefits are commensurate with requested deviations?

Sincerely,



CARLISLE/WORTMAN ASSOC., INC.
Benjamin R. Carlisle, LEED AP, AICP

Owner / Developer

ROBERTSON BROTHERS CO.
6905 Telegraph Road
Bloomfield Hills, MI 48301
CONTACT: Tim Loughrin
Tel. (248) 282-1428
Fax. (248) 282-1423

Architect - Townhomes

4545 ARCHITECTURE
3011 W. Grand Blvd., Suite 400
Detroit, MI 48202
CONTACT:
Tel. (313) 450-4545

Architect - Single Family Homes

TK DESIGN & ASSOCIATES
26030 Pontiac Trail
South Lyon, MI 48178
CONTACT:
Tel. (248) 446-1960

Civil Engineer

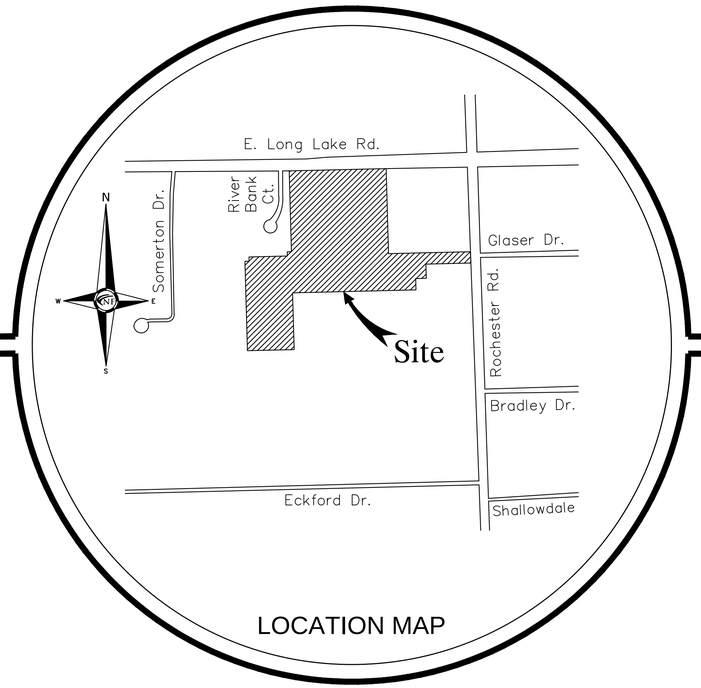
NOWAK & FRAUS ENGINEERS
46777 Woodward Ave.
Pontiac, MI 48342-5032
CONTACT: Brad W. Brickel, P.E.
Tel. (248) 332-7931
Fax. (248) 332-8257

Landscape Architect

LAND DESIGN STUDIO
750 Forest Avenue
Suite 101
Birmingham, MI 48009
CONTACT: Tad Krear
Tel. (248) 594-3220

City of Troy,
Oakland County, Michigan
PRELIMINARY SITE PLAN PACKAGE DOCUMENTS
Single & Multiple Family Residential Project
Prepared For Robertson Brothers Co.

PART OF THE NE 1/4 OF SECTION 15, T.2N., R.11E.,
CITY OF TROY,
OAKLAND COUNTY, MICHIGAN



LOCATION MAP

SHEET INDEX

LEGAL DESCRIPTION - AS SURVEYED (COMBINED)

PART OF THE NORTHEAST 1/4 OF SECTION 15, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHEAST CORNER OF SAID SECTION 15; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST ALONG THE EAST LINE OF SAID SECTION 15, 660.00 FEET; THENCE SOUTH 89 DEGREES 39 MINUTES 01 SECONDS WEST, 43.00 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 80.01 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 332.00 FEET; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 100.00 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 75.00 FEET; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 80.00 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 870.40 FEET; THENCE SOUTH 00 DEGREES 35 MINUTES 00 SECONDS EAST, 400.00 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 329.61 FEET; THENCE NORTH 00 DEGREES 36 MINUTES 00 SECONDS WEST, 630.34 FEET TO THE SOUTHWEST CORNER OF RIVER BEND OF TROY, OAKLAND COUNTY CONDOMINIUM SUBDIVISION PLAN No. 1577, ACCORDING TO THE MASTER DEED RECORDED IN LIBER 33439, PAGE 586, OAKLAND COUNTY RECORDS; THENCE ALONG THE SOUTH AND EAST LINES OF SAID RIVER BEND OF TROY THE FOLLOWING FIVE (5) COURSES: 1) NORTH 88 DEGREES 33 MINUTES 08 SECONDS EAST, 30.18 FEET AND 2) NORTH 00 DEGREES 56 MINUTES 30 SECONDS WEST, 29.66 FEET AND 3) NORTH 89 DEGREES 37 MINUTES 05 SECONDS EAST, 269.80 FEET AND 4) NORTH 00 DEGREES 11 MINUTES 35 SECONDS EAST, 29.63 FEET AND 5) NORTH 88 DEGREES 56 MINUTES 07 SECONDS EAST, 29.60 FEET; THENCE NORTH 00 DEGREES 35 MINUTES 00 SECONDS WEST ALONG THE EAST LINE OF SAID RIVER BEND OF TROY, IN PART, 570.00 FEET TO THE NORTHEAST CORNER OF SAID RIVER BEND OF TROY; THENCE NORTH 89 DEGREES 39 MINUTES 01 SECONDS EAST ALONG THE SOUTH RIGHT OF WAY LINE OF E. LONG LAKE ROAD (60 FEET 1/2 WIDTH), 684.03; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 600.00 FEET; THENCE NORTH 89 DEGREES 39 MINUTES 01 SECONDS EAST, 593.00 FEET TO THE POINT OF BEGINNING.

CONTAINING 895,001.06 SQUARE FEET OR 20.55 ACRES OF LAND.

TAX ID NUMBER: 20-15-201-046 AND 20-15-201-033

ADDRESS: VACANT

REVISIONS:
03-29-22 ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22 REVISED PER SITE PLAN REVIEW
11-07-22 REVISED PER SITE PLAN REVIEW

Project Name

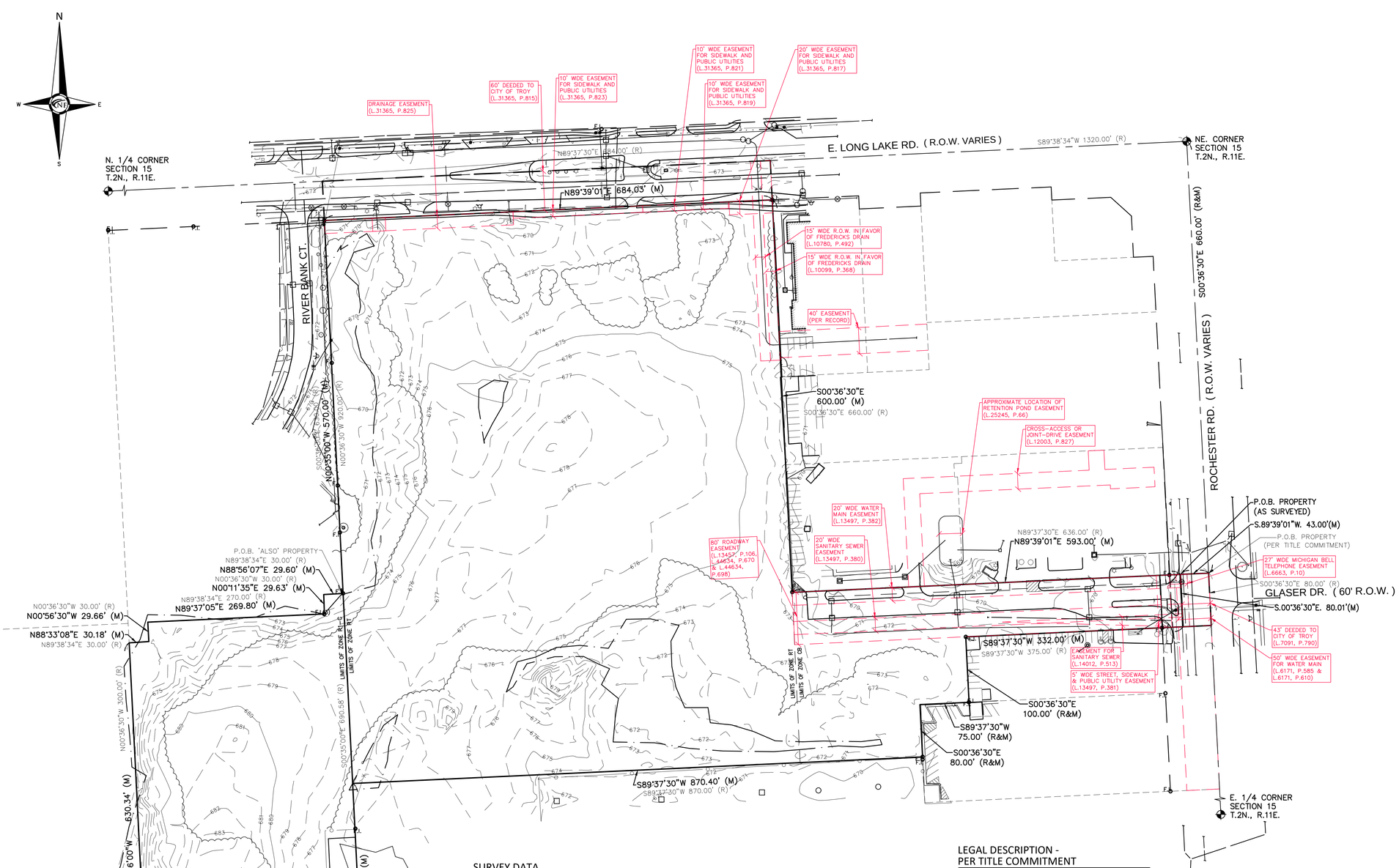
The Village of Troy

Know what's below Call before you dig.

N & F JOB #J943-01

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER
NO. 54071
LICENSED PROFESSIONAL ENGINEER
Brad Brickel

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS
NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM



SURVEY DATA

SITE AREA:
TOTAL: 895,001.06 SQUARE FEET OR 20.55 ACRES

ZONED:
R1-C, ONE FAMILY RESIDENTIAL DISTRICT,
RT, ONE FAMILY ATTACHED DISTRICT AND
CB, COMMUNITY BUSINESS DISTRICT

PARKING SPACES:
NO PARKING SPACES (VACANT)

A SURVEYOR CANNOT MAKE A CERTIFICATION ON THE BASIS OF AN INTERPRETATION OR OPINION OF ANOTHER PARTY. A ZONING ENDORSEMENT LETTER SHOULD BE OBTAINED FROM THE CITY OF TROY TO INSURE CONFORMITY AS WELL AS MAKE A FINAL DETERMINATION OF THE REQUIRED BUILDING SETBACK REQUIREMENTS.

BASIS OF BEARING NOTE

ALL BEARINGS ARE IN RELATION TO THE TITLE COMMITMENT LEGAL DESCRIPTION.

ALTA SURVEY NOTES

THERE IS NO VISIBLE EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS.

THERE IS NO PROPOSED CHANGES IN STREET RIGHT OF WAY LINES AND THERE IS NO EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIR, EXCEPT AS SHOWN.

THERE IS NO VISIBLE EVIDENCE OF SITE USE AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.

THERE IS NO VISIBLE EVIDENCE OF ANY WETLAND AREAS, EXCEPT AS SHOWN HEREON.

LOCATION OF UTILITIES EXISTING ON OR SERVING THE PROPERTY AS DETERMINED BY: OBSERVED EVIDENCE OR EVIDENCE FROM PLANS REQUESTED BY THE SURVEYOR AND OBTAINED FROM UTILITY COMPANIES.

THE SUBJECT PROPERTY HAS ACCESS TO LONG LAKE ROAD AND ROCHESTER ROAD, BOTH BEING A PUBLICLY DEDICATED ROAD.

LEGAL DESCRIPTION - AS SURVEYED (COMBINED)

PART OF THE NORTHEAST 1/4 OF SECTION 15, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHEAST CORNER OF SAID SECTION 15; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST ALONG THE EAST LINE OF SAID SECTION 15, 660.00 FEET; THENCE SOUTH 89 DEGREES 39 MINUTES 01 SECONDS WEST, 43.00 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 80.01 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 332.00 FEET; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 100.00 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 75.00 FEET; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 80.00 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 870.40 FEET; THENCE SOUTH 00 DEGREES 35 MINUTES 00 SECONDS EAST, 400.00 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 329.61 FEET; THENCE NORTH 00 DEGREES 36 MINUTES 00 SECONDS WEST, 630.34 FEET TO THE SOUTHWEST CORNER OF RIVER BEND OF TROY, OAKLAND COUNTY CONDOMINIUM SUBDIVISION PLAN No. 1577, ACCORDING TO THE MASTER DEED RECORDED IN LIBER 33439, PAGE 586, OAKLAND COUNTY RECORDS; THENCE ALONG THE SOUTH AND EAST LINES OF SAID RIVER BEND OF TROY THE FOLLOWING FIVE (5) COURSES: 1) NORTH 88 DEGREES 33 MINUTES 08 SECONDS EAST, 30.18 FEET AND 2) NORTH 00 DEGREES 56 MINUTES 30 SECONDS WEST, 29.66 FEET AND 3) NORTH 89 DEGREES 37 MINUTES 05 SECONDS EAST, 269.80 FEET AND 4) NORTH 00 DEGREES 11 MINUTES 35 SECONDS EAST, 29.63 FEET AND 5) NORTH 88 DEGREES 56 MINUTES 07 SECONDS EAST, 29.60 FEET; THENCE NORTH 00 DEGREES 35 MINUTES 00 SECONDS WEST ALONG THE EAST LINE OF SAID RIVER BEND OF TROY, IN PART, 570.00 FEET TO THE NORTHEAST CORNER OF SAID RIVER BEND OF TROY; THENCE NORTH 89 DEGREES 39 MINUTES 01 SECONDS EAST ALONG THE SOUTH RIGHT OF WAY LINE OF E. LONG LAKE ROAD (60 FEET 1/2 WIDTH), 684.03; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 600.00 FEET; THENCE NORTH 89 DEGREES 39 MINUTES 01 SECONDS EAST, 593.00 FEET TO THE POINT OF BEGINNING.

CONTAINING 895,001.06 SQUARE FEET OR 20.55 ACRES OF LAND.

TAX ID NUMBER: 20-15-201-046 AND 20-15-201-033

ADDRESS: VACANT

LEGAL DESCRIPTION - PER TITLE COMMITMENT

LAND IN THE CITY OF TROY, OAKLAND COUNTY, MI, DESCRIBED AS FOLLOWS:

PART OF THE NORTHEAST 1/4 OF SECTION 15, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN DESCRIBED AS: BEGINNING AT A POINT DISTANT SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST 660 FEET FROM THE NORTHEAST SECTION CORNER; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST 80 FEET (RECORDED) AND 84 FEET (MEASURED); THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST 375 FEET; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST 100 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 WEST 75 FEET; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST 80 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST 870 FEET; THENCE NORTH 00 DEGREES 36 MINUTES 30 SECONDS WEST 920 FEET (RECORDED) AND 924 FEET (MEASURED); THENCE NORTH 89 DEGREES 37 MINUTES 30 SECONDS EAST 684 FEET; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST 660 FEET; THENCE NORTH 89 DEGREES 37 MINUTES 30 SECONDS EAST 636 FEET TO THE POINT OF BEGINNING, EXCEPT THE EAST 43 FEET DEEDED TO THE CITY OF TROY IN LIBER 7010, PAGE 98 AND IN LIBER 7091, PAGE 790, OAKLAND COUNTY RECORDS AND EXCEPT THE NORTH 60 FEET DEEDED TO THE CITY OF TROY IN LIBER 31365, PAGE 815, OAKLAND COUNTY RECORDS.

ALSO

PART OF THE NORTHEAST 1/4 OF SECTION 15, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN DESCRIBED AS: BEGINNING AT A POINT DISTANCE THENCE SOUTH 89 DEGREES 38 MINUTES 34 SECONDS WEST 1,320 FEET AND SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST 630 FEET FROM THE NORTHEAST SECTION CORNER; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST 360 FEET; THENCE SOUTH 01 DEGREE 08 MINUTES 30 SECONDS EAST 330 FEET; THENCE SOUTH 89 DEGREES 10 MINUTES 30 SECONDS WEST 330 FEET; THENCE NORTH 01 DEGREE 08 MINUTES 30 SECONDS WEST 330 FEET; THENCE NORTH 00 DEGREES 36 MINUTES 30 SECONDS WEST 300 FEET; THENCE NORTH 89 DEGREES 38 MINUTES 34 SECONDS EAST 330 FEET; THENCE NORTH 00 DEGREES 36 MINUTES 30 SECONDS WEST 30 FEET; THENCE NORTH 89 DEGREES 38 MINUTES 34 SECONDS EAST 270 FEET; THENCE NORTH 00 DEGREES 36 MINUTES 30 SECONDS WEST 30 FEET; THENCE NORTH 89 DEGREES 38 MINUTES 34 SECONDS EAST 30 FEET TO THE POINT OF BEGINNING.

TAX ID NUMBER: 20-15-201-046 AND 20-15-201-033

ADDRESS: VACANT

MISS DIG / UTILITY DISCLAIMER NOTE

A MISS DIG TICKET NUMBER A010670149, PURSUANT TO MICHIGAN PUBLIC ACT 174 WAS ENTERED FOR THE SURVEYED PROPERTY. DUE TO THE EXTENDED REPORTING PERIOD FOR UNDERGROUND FACILITY OWNERS TO PROVIDE THEIR RECORDS, THE SURVEY MAY NOT REFLECT ALL THE UTILITIES AT THE TIME THE SURVEY WAS ISSUED ON APRIL 14, 2021. THE SURVEY ONLY REFLECTS THOSE UTILITIES WHICH COULD BE OBSERVED BY THE SURVEYOR IN THE FIELD OR AS DEPICTED BY THE UTILITY COMPANY RECORDS FURNISH PRIOR TO THE DATE THIS SURVEY WAS ISSUED. THE CLIENT AND/OR THEIR AUTHORIZED AGENT SHALL VERIFY WITH THE FACILITY OWNERS AND/OR THEIR AUTHORIZED AGENTS, THE COMPLETENESS AND EXACTNESS OF THE UTILITIES LOCATION.

TOPOGRAPHIC SURVEY NOTES

ALL ELEVATIONS ARE EXISTING ELEVATIONS, UNLESS OTHERWISE NOTED.

UTILITY LOCATIONS WERE OBTAINED FROM MUNICIPAL OFFICIALS AND RECORDS OF UTILITY COMPANIES, AND NO GUARANTEE CAN BE MADE TO THE COMPLETENESS, OR EXACTNESS OF LOCATION.

CERTIFICATE OF SURVEY

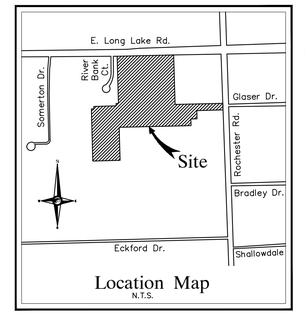
CERTIFIED TO:

–ROBERTSON BROTHERS CO., OR ITS/THEIR NOMINEE OR ASSIGNEE
–GOOD DEVELOPMENT HOLDINGS, LLC, A MICHIGAN LIMITED LIABILITY COMPANY
–FIRST AMERICAN TITLE INSURANCE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDE ITEMS 1, 2, 3, 4, 6(a), 6(b), 7(a), 7(b)(1), 7(c), 8, 9, 11(a), 13, 14, 16, 17, 18 AND 19 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON APRIL 9, 2021.

4-14-2021

KEVIN NAVAROLI, P.S. NO. 4001053503 DATE



Location Map
N.T.S.

TITLE REPORT NOTES

REFERENCE FIRST AMERICAN TITLE INSURANCE COMPANY, COMMITMENT NUMBER: 919508, DATED: FEBRUARY 2, 2021.

SCHEDULE B, PART II – EXCEPTIONS:

EXCEPTIONS: 1, 4, 5, 6, 7, 25 AND 27 REFER TO THE OWNERSHIP OF THE PROPERTY AND/OR ARE NOT PLOTTABLE.

2. ANY FACTS, RIGHTS, INTERESTS, OR CLAIMS THAT ARE NOT SHOWN BY THE PUBLIC RECORDS BUT THAT COULD BE ASCERTAINED BY MAKING INQUIRY OF PERSONS IN POSSESSION OF THE LAND.

3. EASEMENTS, ENCUMBRANCES, OR CLAIMS THEREOF, NOT SHOWN BY THE PUBLIC RECORDS.

8. EASEMENT IN FAVOR OF THE COUNTY OF OAKLAND AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 6171, PAGE 585 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN], LIBER 6171, PAGE 610 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN] AND IN LIBER 6187, PAGE 693 [EASEMENT IS NOT WITHIN AND DOES NOT TOUCH THE SURVEYED LAND AND ITS LOCATION IS NOT SHOWN].

9. RIGHT OF WAY IN FAVOR OF THE MICHIGAN BELL TELEPHONE COMPANY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 6663, PAGE 10 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

10. RIGHT OF WAY IN FAVOR OF FREDERICKS DRAIN DRAINAGE DISTRICT AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 10099, PAGE 368 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

11. TERMS AND CONDITIONS CONTAINED IN ORDER DETERMINING NECESSITY AND GRANTING RIGHT OF ENTRY AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 10780, PAGE 492 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

12. TERMS AND CONDITIONS CONTAINED IN CROSS–ACCESS OR JOINT–DRIVE EASEMENT AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 12003, PAGE 827 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

13. TERMS AND CONDITIONS CONTAINED IN DECLARATION OF NON–EXCLUSIVE EASEMENT AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 13457, PAGE 106 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

FIRST AMENDMENT TO DECLARATION OF NON–EXCLUSIVE EASEMENT RECORDED IN LIBER 44634, PAGE 670 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

14. PERMANENT EASEMENT IN FAVOR OF THE CITY OF TROY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 13497, PAGE 380 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

15. PERMANENT EASEMENT IN FAVOR OF THE CITY OF TROY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 13497, PAGE 381 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

16. PERMANENT EASEMENT IN FAVOR OF THE CITY OF TROY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 13497, PAGE 382 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

17. PERMANENT EASEMENT IN FAVOR OF THE CITY OF TROY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 14012, PAGE 513 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

18. TERMS AND CONDITIONS CONTAINED IN DECLARATION OF RETENTION POND EASEMENT AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 25245, PAGE 66 [DOCUMENT DOES NOT DESCRIBE ANY PLOTTABLE EASEMENTS OR PLOTTABLE RESTRICTIONS; THE SURVEYED LAND IS WITHIN THE PROPERTY DESCRIBED IN SAID DOCUMENT, APPROXIMATE LOCATION OF RETENTION POND EASEMENT IS SHOWN].

19. PERMANENT EASEMENT IN FAVOR OF THE CITY OF TROY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 31365, PAGE 817, LIBER 31365, PAGE 819, LIBER 31365, PAGE 821 AND IN LIBER 31365, PAGE 823 [EASEMENTS ARE WITHIN THE SURVEYED LAND AND ITS LOCATIONS ARE SHOWN].

20. PERMANENT EASEMENT IN FAVOR OF THE CITY OF TROY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 31365, PAGE 825 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

21. TERMS AND CONDITIONS CONTAINED IN SIDE AGREEMENT REGARDING DECLARATION OF NON–EXCLUSIVE EASEMENT AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 44634, PAGE 698 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN].

22. MATTERS REFERENCED BY SURVEY RECORDED IN LIBER 10867, PAGE 747 AND IN LIBER 10867, PAGE 749 [DOCUMENTS DO NOT DESCRIBE ANY PLOTTABLE EASEMENTS OR PLOTTABLE RESTRICTIONS; THE SURVEYED LAND IS WITHIN THE PROPERTY DESCRIBED IN SAID DOCUMENTS].

23. ANY RIGHTS, TITLE INTEREST OR CLAIM THEREOF TO THAT PORTION OF THE LAND TAKEN, USED OR GRANTED FOR STREETS, ROADS OR HIGHWAYS.

24. RIGHTS OF OTHER RIPARIAN OWNERS AND TO THE PUBLIC TRUST IN AND TO THE WATERS OF THE DRAIN CROSSING SUBJECT PROPERTY.

26. RIGHTS OF TENANTS, IF ANY, UNDER ANY UNRECORDED LEASES.

FLOOD HAZARD NOTE

THE PROPERTY DESCRIBED ON THIS SURVEY DOES NOT LIE WITHIN A SPECIAL FLOOD HAZARD AREA AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY; THE PROPERTY LIES WITHIN ZONE X OF THE FLOOD INSURANCE RATE MAP IDENTIFIED AS MAP NO. 26125C0534F BEARING AN EFFECTIVE DATE OF 09-29-2006.

DTE DISCLAIMER NOTE

PLEASE NOTE THAT DTE HAS NEW REGULATIONS THAT MAY IMPACT DEVELOPMENT OUTSIDE THEIR EASEMENT OR THE PUBLIC RIGHT OF WAY. CLIENT SHALL CONTACT DTE TO DETERMINE THE "NEW STRUCTURES AND POWER LINE" REQUIREMENTS AS THEY MAY APPLY TO ANY FUTURE BUILDING OR RENOVATION OF A STRUCTURE. DTE ENERGY CAN BE CONTACTED AT 800-477-4747

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
KEVIN CHRISTOPHER NAVAROLI
License No. 4001053503
REGISTERED PROFESSIONAL SURVEYOR

PROJECT
Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Overall Boundary Survey

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
M. Carnaghi

DESIGNED BY:

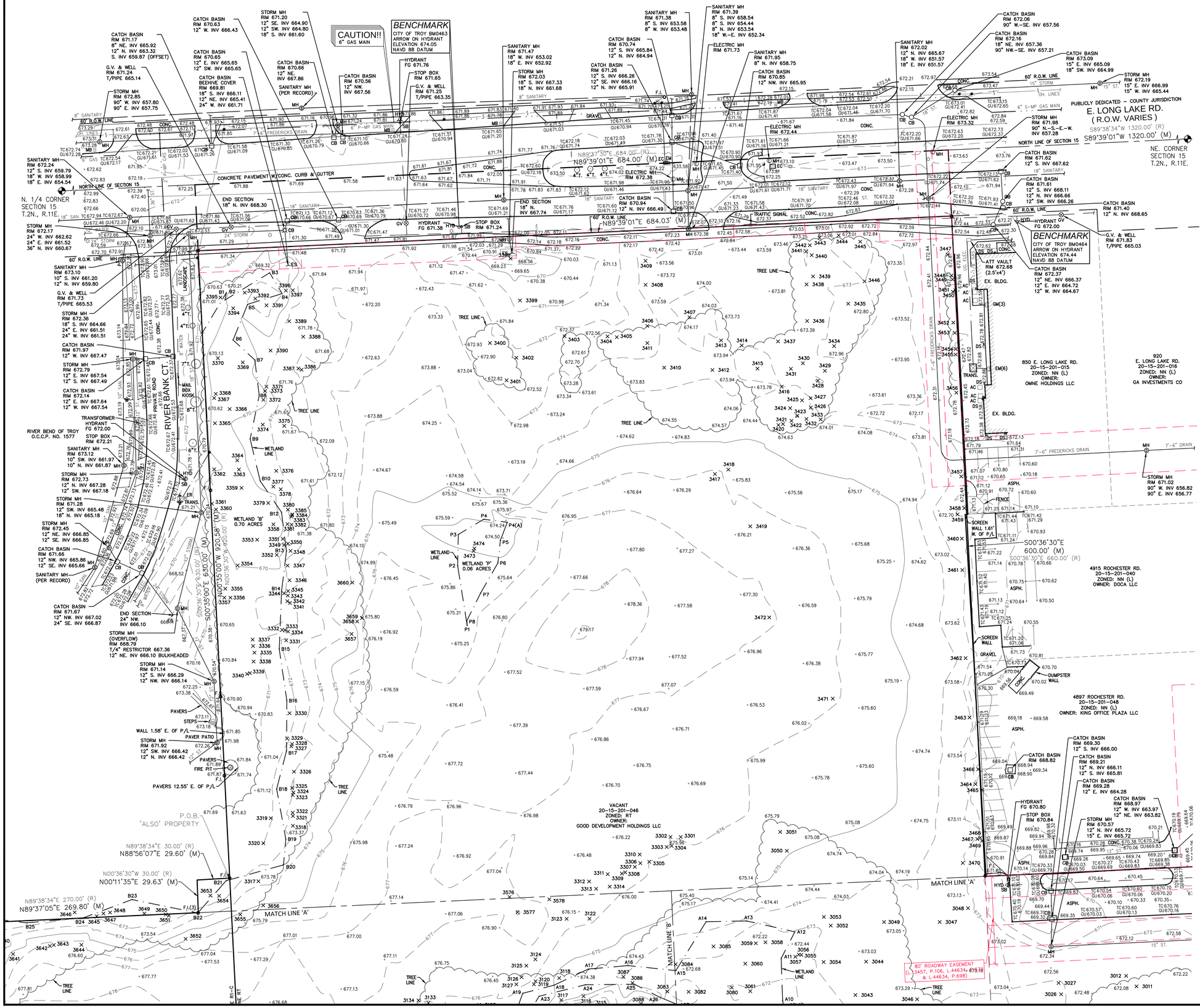
APPROVED BY:
K. Navaroli

DATE:
April 14, 2021

SCALE: 1" = 80'
80 40 0 40 80 120

NFE JOB NO. J943-01

SHEET NO. SP01



Location Map
N.T.S.

NF
ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

PROJECT
Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
ALTA/NSPS Land Title /
Topographic / Tree Survey

811
Know what's below
Call before you dig.

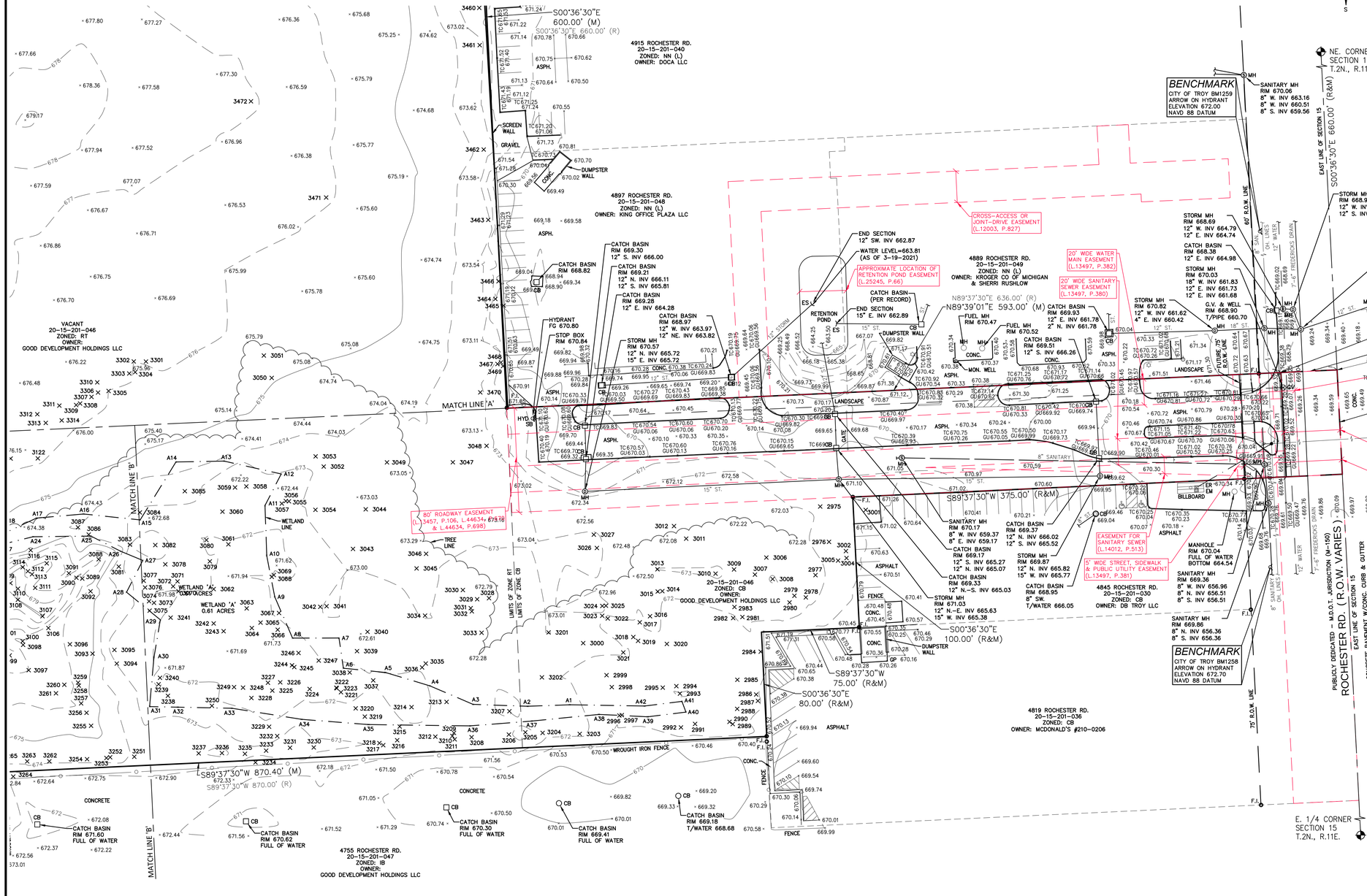
DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

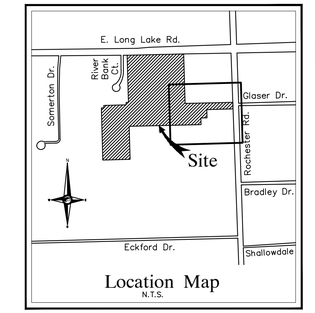
DRAWN BY: M. Carnaghi
DESIGNED BY:
APPROVED BY: K. Navaroli
DATE: April 14, 2021
SCALE: 1" = 40'
40 20 0 20 40 60

NFE JOB NO. J943-01
SHEET NO. SP02

LEGEND

MANHOLE(MH)	EXISTING SANITARY SEWER
CO	EXISTING SAN. CLEAN OUT
HYDRANT(HYD) GATE VALVE(GVW)	EXISTING WATER MAIN
MANHOLE(MH) CATCH BASIN(CB)	EXISTING STORM SEWER
CBB	EX. BEEHIVE CATCH BASIN
	EX. UNDERGROUND (UG.) CABLE
UTILITY POLE UP GUY POLE GUY WIRE	OVERHEAD (OH.) LINES
LP	LIGHT POLE
	SIGN
	EXISTING GAS MAIN
ASPH.	ASPHALT
CONC.	CONCRETE
F.I.	FOUND IRON
RET. WALL	RETAINING WALL
R.O.W.	RIGHT-OF-WAY
SPK	SET PK NAIL
(TYP)	TYPICAL
(R)	RECORD
(M)	MEASURED
C/L	CENTERLINE
P/L	PROPERTY LINE
GM	GAS METER
EM	ELECTRIC METER
EC	ELECTRIC CABINET
ER	ELECTRIC RISER
AC	AIR CONDITIONING UNIT
DS	DOWNSPOUT
MB	MAIL BOX





NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

PROJECT
Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
ALTA/NSPS Land Title /
Topographic / Tree Survey

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

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
M. Carnaghi

DESIGNED BY:

APPROVED BY:
K. Navaroli

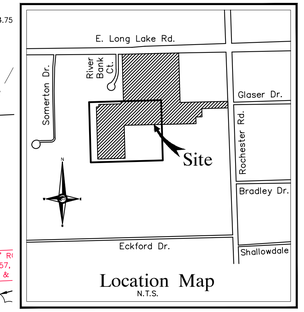
DATE:
April 14, 2021

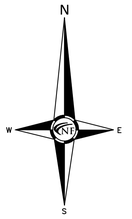
SCALE: 1" = 40'
40 20 0 20 40 60

NFE JOB NO. **J943-01**
SHEET NO. **SP03**

LEGEND

MANHOLE(MH)	EXISTING SANITARY SEWER
CO	EXISTING SAN. CLEAN OUT
HYDRANT(HYD) GATE_VALVE(GVW)	EXISTING WATER MAIN
MANHOLE(MH) CATCH_BASIN(CB)	EXISTING STORM SEWER
CBB	EX. BEEHIVE CATCH BASIN
UTILITY POLE GUY POLE	EX. UNDERGROUND (UG.) CABLE
UP GUY WIRE	OVERHEAD (OH.) LINES
LP	LIGHT POLE
	SIGN
	EXISTING GAS MAIN
ASPH.	ASPHALT
CONC.	CONCRETE
F.I.	FOUND IRON
RET. WALL	RETAINING WALL
R.O.W.	RIGHT-OF-WAY
SPK	SET PK NAIL
(TYP)	TYPICAL
(R)	RECORD
(M)	MEASURED
C/L	CENTERLINE
P/L	PROPERTY LINE
GM	GAS METER
EM	ELECTRIC METER
EC	ELECTRIC CABINET
ER	ELECTRIC RISER
AC	AIR CONDITIONING UNIT
DS	DOWNSPOUT
MB	MAIL BOX





LEGEND

MANHOLE(MH)	EXISTING SANITARY SEWER
CO	EXISTING SAN. CLEAN OUT
HYDRANT(HYD) GATE VALVE(GVW)	EXISTING WATER MAIN
MANHOLE(MH) CATCH BASIN(CB)	EXISTING STORM SEWER
CBB	EX. BEEHIVE CATCH BASIN
	EX. UNDERGROUND (UG.) CABLE
UTILITY POLE GUY POLE GUY WIRE UP	OVERHEAD (OH.) LINES
LP	LIGHT POLE
	SIGN
	EXISTING GAS MAIN
ASPH.	ASPHALT
CONC.	CONCRETE
F.I.	FOUND IRON
RET. WALL	RETAINING WALL
R.O.W.	RIGHT-OF-WAY
SPK	SET PK NAIL
(TYP)	TYPICAL
(R)	RECORD
(M)	MEASURED
C/L	CENTERLINE
P/L	PROPERTY LINE
GM	GAS METER
EM	ELECTRIC METER
EC	ELECTRIC CABINET
ER	ELECTRIC RISER
AC	AIR CONDITIONING UNIT
DS	DOWNSPOUT
MB	MAIL BOX

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

PROJECT
Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
ALTA/NSPS Land Title /
Topographic / Tree Survey

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
M. Carnaghi

DESIGNED BY:

APPROVED BY:
K. Navaroli

DATE:
April 14, 2021

SCALE: 1" = 40'
40 20 0 20 40 60

NFE JOB NO. J943-01
SHEET NO. SP04

			Diameter at Breast Height (DBH)				
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)
2975	Acer negundo	Box elder	7.2	7.1	6.6	Fair	
2976	Acer negundo	Box elder	14.1	8.8		Fair	
2977	Acer negundo	Box elder	10.6			Fair	
2978	Acer negundo	Box elder	10.5			Fair	
2979	Populus deltoides	Cottonwood	27.4			Fair	X
2980	Populus deltoides	Cottonwood	15.8	13.4		Fair	
2981	Populus deltoides	Cottonwood	13.2			Fair	
2982	Populus deltoides	Cottonwood	17.5	12.9		Fair	
2983	Populus deltoides	Cottonwood	12.4	10.1		Fair	
2984	Acer platanoides	Norway Maple	6.8			Fair	
2985	Ulmus americana	American elm	7.2			Fair	
2986	Populus deltoides	Cottonwood	10.9			Fair	
2987	Ulmus americana	American elm	11.5			Fair	
2988	Acer negundo	Box elder	11.1			Fair	
2989	Acer negundo	Box elder	8.4			Fair	
2990	Pseudotsuga menziesii	Douglas fir	8.6	6.8		Fair	
2991	Ulmus americana	American elm	11.0			Fair	
2992	Ulmus americana	American elm	6.9			Fair	
2993	Populus deltoides	Cottonwood	29.2	14.0		Fair	X
2994	Populus deltoides	Cottonwood	16.7			Fair	
2995	Populus deltoides	Cottonwood	13.7	11.5		Fair	
2996	Populus deltoides	Cottonwood	10.1			Fair	
2997	Ulmus americana	American elm	7.3			Fair	
2998	Populus deltoides	Cottonwood	15.4			Fair	
2999	Populus deltoides	Cottonwood	12.1			Fair	
3000	Populus deltoides	Cottonwood	16.8			Fair	
3001	Gleditsia triacanthos	Honey locust	13.7	12.0		Fair	
3002	Acer negundo	Box elder	11.4			Fair	
3004	Acer negundo	Box elder	7.4			Fair	
3005	Acer negundo	Box elder	7.6			Fair	
3006	Salix amygdaloides	Peachleaf willow	7.6	6.2		Fair	
3007	Populus deltoides	Cottonwood	13.7			Fair	
3008	Populus deltoides	Cottonwood	15.1			Fair	
3009	Populus deltoides	Cottonwood	18.2	12.0		Fair	
3010	Populus deltoides	Cottonwood	18.1			Fair	
3011	Pyrus communis	Common pear	8.7			Fair	
3012	Populus deltoides	Cottonwood	8.8			Fair	
3013	Populus deltoides	Cottonwood	15.6			Fair	
3014	Populus deltoides	Cottonwood	13.4			Fair	
3015	Pyrus calleryana	Callery pear	6.2			Fair	
3016	Populus deltoides	Cottonwood	14.7			Fair	
3017	Populus deltoides	Cottonwood	11.4			Fair	
3018	Populus deltoides	Cottonwood	12.7			Poor	
3019	Populus deltoides	Cottonwood	11.1			Fair	
3020	Populus deltoides	Cottonwood	7.6			Fair	
3021	Populus deltoides	Cottonwood	11.0			Fair	
3022	Populus deltoides	Cottonwood	14.1			Fair	
3023	Populus deltoides	Cottonwood	15.9			Fair	
3024	Populus deltoides	Cottonwood	9.8			Poor	
3025	Populus deltoides	Cottonwood	13.1			Fair	
3026	Acer negundo	Box elder	8.1	6.4		Fair	
3027	Acer negundo	Box elder	8.5			Fair	
3028	Robinia pseudoacacia	Black locust	10.3			Fair	
3029	Ulmus americana	American elm	7.3			Fair	
3030	Populus deltoides	Cottonwood	13.1			Fair	
3031	Populus deltoides	Cottonwood	9.7			Fair	
3032	Ulmus americana	American elm	10.0			Fair	
3033	Ulmus americana	American elm	11.4			Fair	
3034	Populus deltoides	Cottonwood	17.3			Very Poor	
3035	Populus deltoides	Cottonwood	21.8			Fair	
3036	Ulmus americana	American elm	9.2	7.8		Fair	
3037	Ulmus americana	American elm	7.1			Fair	
3038	Ulmus americana	American elm	6.7			Fair	
3039	Populus grandidentata	Big-tooth aspen	8.7			Fair	
3040	Populus grandidentata	Big-tooth aspen	10.1			Fair	
3041	Populus grandidentata	Big-tooth aspen	16.0			Fair	
3042	Populus grandidentata	Big-tooth aspen	11.2			Fair	
3043	Populus deltoides	Cottonwood	20.8			Fair	
3044	Acer negundo	Box elder	7.7			Fair	
3045	Ulmus americana	American elm	9.0			Fair	
3046	Ulmus americana	American elm	9.0	8.1		Fair	
3047	Populus deltoides	Cottonwood	23.6			Fair	
3048	Populus deltoides	Cottonwood	22.2			Fair	
3049	Populus deltoides	Cottonwood	19.6			Fair	
3050	Pyrus calleryana	Callery pear	6.1			Fair	
3051	Pyrus calleryana	Callery pear	6.1			Fair	
3052	Populus deltoides	Cottonwood	21.2			Fair	
3053	Populus deltoides	Cottonwood	16.0			Fair	
3054	Populus deltoides	Cottonwood	14.2			Fair	
3055	Populus deltoides	Cottonwood	11.4			Fair	
3056	Populus deltoides	Cottonwood	7.3			Fair	
3057	Populus deltoides	Cottonwood	7.3			Fair	
3058	Ulmus americana	American elm	8.4			Fair	
3059	Acer negundo	Box elder	8.7			Fair	
3060	Populus deltoides	Cottonwood	13.5			Fair	
3061	Populus deltoides	Cottonwood	14.5			Fair	
3062	Populus deltoides	Cottonwood	10.7			Fair	
3063	Populus deltoides	Cottonwood	9.7			Fair	
3064	Populus deltoides	Cottonwood	8.2			Fair	
3065	Populus deltoides	Cottonwood	11.4			Fair	
3066	Populus deltoides	Cottonwood	6.3			Fair	
3067	Populus deltoides	Cottonwood	12.7			Fair	
3068	Ulmus americana	American elm	7.1			Fair	
3069	Ulmus americana	American elm	9.3			Fair	
3070	Populus deltoides	Cottonwood	15.2			Fair	
3071	Populus grandidentata	Big-tooth aspen	7.8			Fair	
3072	Ulmus americana	American elm	6.2			Fair	
3073	Populus deltoides	Cottonwood	14.4			Fair	
3074	Ulmus americana	American elm	7.2			Fair	
3075	Populus deltoides	Cottonwood	11.0			Fair	
3076	Ulmus americana	American elm	9.1			Fair	
3077	Populus deltoides	Cottonwood	7.2			Fair	
3078	Acer negundo	Box elder	7.8			Fair	
3079	Populus deltoides	Cottonwood	10.2			Fair	
3080	Populus grandidentata	Big-tooth aspen	12.3			Fair	
3081	Robinia pseudoacacia	Black locust	8.7			Fair	
3082	Ulmus americana	American elm	12.2	6.0		Fair	
3083	Populus deltoides	Cottonwood	9.7			Fair	
3084	Populus deltoides	Cottonwood	16.6			Fair	
3085	Populus deltoides	Cottonwood	26.1			Fair	X
3086	Populus deltoides	Cottonwood	12.2			Fair	

			Diameter at Breast Height (DBH)				
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)
3087	Populus deltoides	Cottonwood	14.1			Fair	
3088	Salix amygdaloides	Peachleaf willow	10.1	9.8		Fair	
3089	Robinia pseudoacacia	Black locust	7.1			Fair	
3090	Acer negundo	Box elder	7.8			Fair	
3091	Populus deltoides	Cottonwood	15.2			Fair	
3092	Robinia pseudoacacia	Black locust	8.8			Fair	
3093	Acer negundo	Box elder	6.3			Fair	
3094	Rhamnus cathartica	European buckthorn	8.1			Fair	
3095	Populus deltoides	Cottonwood	19.2			Fair	
3096	Acer negundo	Box elder	6.1			Fair	
3097	Robinia pseudoacacia	Black locust	7.7			Fair	
3098	Acer negundo	Box elder	8.8			Fair	
3099	Acer negundo	Box elder	8.6	7.3	6.2	Fair	
3100	Acer negundo	Box elder	6.2			Fair	
3101	Acer negundo	Box elder	10.4	8.1		Fair	
3102	Acer negundo	Box elder	8.1			Fair	
3103	Acer negundo	Box elder	8.6			Fair	
3104	Acer negundo	Box elder	8.3			Fair	
3105	Acer negundo	Box elder	8.6			Fair	
3106	Acer negundo	Box elder	17.3			Fair	
3107	Acer negundo	Box elder	12.4			Fair	
3108	Acer negundo	Box elder	9.0	5.8		Fair	
3109	Acer negundo	Box elder	9.0			Fair	
3110	Robinia pseudoacacia	Black locust	9.8			Fair	
3111	Robinia pseudoacacia	Black locust	6.1			Fair	
3112	Robinia pseudoacacia	Black locust	10.0			Fair	
3113	Robinia pseudoacacia	Black locust	11.4			Fair	
3114	Robinia pseudoacacia	Black locust	6.1			Fair	
3115	Robinia pseudoacacia	Black locust	9.1	8.7		Fair	
3116	Ulmus americana	American elm	7.1			Fair	
3117	Acer negundo	Box elder	14.8			Fair	
3118	Crataegus sp.	Hawthorn	6.0			Fair	
3119	Acer negundo	Box elder	7.1			Fair	
3120	Prunus avium	Sweet cherry	6.2			Fair	
3121	Acer negundo	Box elder	11.4			Fair	
3122	Acer negundo	Box elder	8.8			Fair	
3123	Acer negundo	Box elder	6.4			Fair	
3124	Acer negundo	Box elder	6.4			Fair	
3125	Ulmus americana	American elm	8.4			Fair	
3126	Acer negundo	Box elder	6.0	5.5		Fair	
3127	Acer negundo	Box elder	7.6	6.3		Fair	
3128	Pinus sylvestris	Scots pine	12.7			Fair	
3129	Pinus sylvestris	Scots pine	12.6			Fair	
3130	Pinus sylvestris	Scots pine	11.4			Fair	
3131	Pinus sylvestris	Scots pine	12.2	9.1		Fair	
3132	Ulmus americana	American elm	6.2			Fair	
3133	Populus tremuloides	Quaking aspen	7.1			Fair	
3134	Populus tremuloides	Quaking aspen	7.0			Fair	
3135	Populus tremuloides	Quaking aspen	9.3			Fair	
3136	Populus tremuloides	Quaking aspen	7.4			Fair	
3137	Acer negundo	Box elder	7.8			Very Poor	
3138	Pinus sylvestris	Scots pine	11.2			Fair	
3139	Prunus avium	Sweet cherry	6.0			Fair	
3140	Pinus resinosa	Red pine	26.0			Fair	X
3141	Populus tremuloides	Quaking aspen	15.3			Fair	
3142	Acer negundo	Box elder	13.6			Fair	
3143	Tilia americana	Basswood	9.2			Fair	
3144	Acer negundo	Box elder	10.6			Fair	
3145	Populus tremuloides	Quaking aspen	8.2			Fair	
3146	Populus tremuloides	Quaking aspen	7.1			Fair	
3147	Populus deltoides	Cottonwood	11.1			Fair	
3148	Ulmus americana	American elm	7.1			Fair	
3149	Tilia americana	Basswood	19.2	12.4	11.5	Fair	X
3150	Acer saccharinum	Silver maple	15.1			Fair	
3151	Acer saccharinum	Silver maple	8.2			Fair	
3152	Populus deltoides	Cottonwood	13.0			Fair	
3153	Populus deltoides	Cottonwood	15.1			Fair	
3154	Populus deltoides	Cottonwood	14.4			Fair	
3155	Acer negundo	Box elder	6.1			Fair	
3156	Populus deltoides	Cottonwood	13.6			Fair	
3157	Populus deltoides	Cottonwood	12.8			Fair	
3158	Populus deltoides	Cottonwood	10.5			Fair	
3159	Ulmus americana	American elm	6.0			Fair	
3160	Populus deltoides	Cottonwood	10.1			Fair	
3161	Populus deltoides	Cottonwood	18.7			Fair	
3162	Acer rubrum	Red maple	6.3			Fair	
3163	Populus deltoides	Cottonwood	7.5			Fair	
3164	Populus deltoides	Cottonwood	9.0			Fair	
3165	Acer saccharinum	Silver maple	7.1			Fair	
3166	Robinia pseudoacacia	Black locust	12.8			Fair	
3167	Populus deltoides	Cottonwood	13.6			Fair	
3168	Populus deltoides	Cottonwood	11.9			Fair	
3169	Acer saccharinum	Silver maple	6.2			Fair	
3170	Quercus alba	White oak	12.3	10.0		Fair	
3171	Quercus macrocarpa	Bur oak	18.5			Fair	X
3172	Populus deltoides	Cottonwood	7.8			Fair	
3173	Populus deltoides	Cottonwood	10.2			Fair	
3174	Acer saccharinum	Silver maple	7.5			Fair	
3175	Populus deltoides	Cottonwood	13.1			Fair	
3176	Populus deltoides	Cottonwood	6.7			Fair	
3177	Populus deltoides	Cottonwood	0.0	6.7		Fair	
3178	Populus deltoides	Cottonwood	9.0			Fair	
3179	Populus deltoides	Cottonwood	8.4			Fair	
3180	Populus deltoides	Cottonwood	14.7			Fair	
3181	Populus deltoides	Cottonwood	9.7			Fair	
3182	Populus deltoides	Cottonwood	9.2			Fair	
3182	Populus deltoides	Cottonwood	6.3			Fair	
3183	Populus deltoides	Cottonwood	7.3			Fair	
3184	Populus deltoides	Cottonwood	8.4			Fair	
3186	Populus deltoides	Cottonwood	6.4			Fair	
3187	Populus deltoides	Cottonwood	6.4			Fair	
3188	Populus deltoides	Cottonwood	12.3	8.9		Fair	
3189	Populus deltoides	Cottonwood	8.1			Fair	
3190	Populus deltoides	Cottonwood	7.1			Fair	
3191	Populus deltoides	Cottonwood	14.0			Fair	
3192	Populus deltoides	Cottonwood	13.1			Fair	
3193	Populus deltoides	Cottonwood	8.6			Fair	
3194	Populus deltoides	Cottonwood	11.2	10.4		Fair	
3195	Populus deltoides	Cottonwood	6.0			Fair	
3196	Populus deltoides	Cottonwood	9.0			Fair	
3197	Populus deltoides	Cottonwood	8.4			Fair	

			Diameter at Breast Height (DBH)				
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)
3198	Populus deltoides	Cottonwood	7.6			Fair	
3199	Populus deltoides	Cottonwood	6.3			Fair	
3200	Populus deltoides	Cottonwood	10.8			Fair	
3201	Acer negundo	Box elder	6.8			Fair	
3202	Populus deltoides	Cottonwood	22.1			Fair	
3203	Fraxinus americana	White ash	6.9	6.6	6.6	Very Poor	
3204	Pinus nigra	Black pine	11.8			Fair	
3205	Pinus sylvestris	Scots pine	14.3			Fair	
3206	Pinus sylvestris	Scots pine	14.5			Fair	
3207	Populus deltoides	Cottonwood	21.5			Fair	
3208	Pinus nigra	Black pine	11.6			Fair	
3209	Acer negundo	Box elder	6.3			Fair	
3210	Pinus nigra	Black pine	11.6			Fair	
3211	Rhamnus cathartica	European buckthorn	6.1			Fair	
3212	Pinus nigra	Black pine	9.2	8.5		Fair	
3213	Ulmus americana	American elm	10.3			Fair	
3214	Populus deltoides	Cottonwood	7.3			Fair	
3215	Populus deltoides	Cottonwood	13.7	13.6	12.5	Fair	
3216	Pinus sylvestris	Scots pine	11.1			Fair	
3217	Acer saccharinum	Silver maple	9.2	7.0	6.3	Fair	
3218	Pinus nigra	Black pine	14.9			Fair	
3219	Ulmus americana	American elm	8.8			Fair	
3220	Ulmus americana	American elm	8.5			Fair	
3221	Ulmus americana	American elm	7.0			Fair	
3222	Populus deltoides	Cottonwood	18.6			Fair	
3223	Ulmus americana	American elm	6.2			Fair	
3224	Populus deltoides	Cottonwood	13.6			Fair	
3225	Populus deltoides	Cottonwood	7.2			Fair	
3226	Ulmus americana	American elm	6.5			Fair	
3227	Populus deltoides	Cottonwood	14.8			Fair	
3228	Populus deltoides	Cottonwood	14.3			Fair	
3229	Populus deltoides	Cottonwood	17.2			Fair	
3230	Pinus sylvestris	Scots pine	13.0			Fair	
3231	Pinus sylvestris	Scots pine	13.8			Fair	
3232	Acer negundo	Box elder	8.2	7.3		Fair	
3233	Pinus sylvestris	Scots pine	13.7			Fair	
3234	Acer negundo	Box elder	7.4			Fair	
3235	Acer saccharinum	Silver maple	28.7	8.0		Fair	X
3236	Pinus sylvestris	Scots pine	14.7			Fair	
3237	Pinus sylvestris	Scots pine	12.7			Fair	
3238	Populus deltoides	Cottonwood	16.6			Fair	
3239	Ulmus americana	American elm	7.6			Fair	
3240	Ulmus americana	American elm	8.0			Fair	
3241	Populus deltoides	Cottonwood	11.5			Fair	
3242	Populus deltoides	Cottonwood	9.3			Fair	
3243	Acer saccharinum	Silver maple	10.5			Fair	
3244	Populus deltoides	Cottonwood	14.1			Fair	
3245	Populus deltoides	Cottonwood	8.9			Fair	
3246	Populus deltoides	Cottonwood	12.2			Fair	
3247	Populus deltoides	Cottonwood	9.6			Fair	
3248	Populus deltoides	Cottonwood	11.8			Fair	
3249	Populus deltoides	Cottonwood	7.7			Fair	
3250	Acer negundo	Box elder	6.1			Fair	
3251	Tsuga canadensis	Eastern hemlock	8.0			Fair	
3252	Tsuga canadensis	Eastern hemlock	9.0			Poor	
3253	Acer saccharinum	Silver maple	9.1	7.5		Fair	
3254	Tsuga canadensis	Eastern hemlock	8.5			Fair	
3255	Acer negundo	Box elder	7.5			Fair	
3256	Acer negundo	Box elder	10.3	9.6		Fair	
3257	Acer negundo	Box elder	7.7			Fair	
3258	Acer negundo	Box elder	7.1			Fair	
3259	Acer negundo	Box elder	10.9			Fair	
3260	Acer negundo	Box elder	8.0			Fair	
3261	Acer negundo	Box elder	10.7			Fair	
3262	Pinus sylvestris	Scots pine	16.5			Fair	
3263	Pinus sylvestris	Scots pine	17.6			Fair	
3264	Salix amygdaloides	Peachleaf willow	10.4			Fair	
3265	Pinus sylvestris	Scots pine	15.9			Fair	
3266	Pinus sylvestris	Scots pine	7.7			Fair	
3267	Pinus sylvestris	Scots pine	9.4			Fair	
3268	Pinus sylvestris	Scots pine	8.0			Fair	
3269	Pinus sylvestris	Scots pine	9.5			Fair	
3270	Pinus sylvestris	Scots pine	9.3			Fair	
3271	Pinus sylvestris	Scots pine	8.8			Fair	
3272	Tilia americana	Basswood	11.1			Fair	
3273	Pinus sylvestris	Scots pine	13.3			Fair	
3274	Pinus sylvestris	Scots pine	14.1			Fair	
3275	Pinus sylvestris	Scots pine	16.1			Fair	
3276	Pinus sylvestris	Scots pine	18.0			Fair	X
3277	Prunus serotina	Black cherry	7.5			Fair	
3278	Acer saccharinum	Silver maple	6.5			Fair	
3279	Ulmus americana	American elm	11.3			Fair	
3280	Acer saccharinum	Silver maple	7.0			Fair	
3281	Acer saccharinum	Silver maple	6.5			Fair	
3282	Ulmus americana	American elm	6.0			Fair	
3283	Populus tremuloides	Quaking aspen	6.8			Fair	
3284	Populus tremuloides	Quaking aspen	8.3			Fair	
3285	Acer saccharinum	Silver maple	6.8			Fair	
3286	Populus tremuloides	Quaking aspen	7.2			Fair	
3287	Populus tremuloides	Quaking aspen	7.4			Fair	
3288	Populus tremuloides	Quaking aspen	7.8			Fair	
3289	Malus pumila	Common apple	7.7			Fair	
3290	Populus tremuloides	Quaking aspen	8.7			Fair	
3291	Ulmus americana	American elm	8.3			Fair	
3292	Acer negundo	Box elder	12.7			Fair	
3293	Pinus nigra	Black pine	21.1			Fair	X
3294	Pinus nigra	Black pine	14.4			Fair	
3295	Pinus nigra	Black pine	17.5	16.9	6.5	Fair	
3296	Ulmus americana	American elm	7.1			Fair	
3297	Pinus nigra	Black pine	16.3			Fair	
3298	Pinus nigra	Black pine	20.7			Fair	X
3299	Pinus sylvestris	Scots pine	21.4			Fair	X
3300	Tilia americana	Basswood	12.9			Fair	
3301	Populus deltoides	Cottonwood	11.4			Fair	
3302	Populus deltoides	Cottonwood	7.4			Fair	
3303	Populus deltoides	Cottonwood	6.8			Fair	
3304	Populus deltoides	Cottonwood	8.9			Fair	
3305	Populus deltoides	Cottonwood	10.1			Fair	
3306	Populus deltoides	Cottonwood	7.3	6.5		Fair	
3307	Populus deltoides	Cottonwood	6.1			Fair	
3308	Populus deltoides	Cottonwood	6.4			Fair	

NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

PROJECT
Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Tree List

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

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
M. Carnaghi

DESIGNED BY:

APPROVED BY:
K. Navaroli

DATE:
April 14, 2021

SCALE: 1" = 40'
40 20 0 20 40 60

NFE JOB NO. **J943-01**

SHEET NO. **SP05**

			Diameter at Breast Height (DBH)				
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)
3309	Populus deltoides	Cottonwood	9.1			Fair	
3310	Populus deltoides	Cottonwood	8.3			Fair	
3311	Populus deltoides	Cottonwood	7.1			Fair	
3312	Populus deltoides	Cottonwood	7.4			Fair	
3313	Populus deltoides	Cottonwood	6.8			Fair	
3314	Populus deltoides	Cottonwood	9.2			Fair	
3315	Populus deltoides	Cottonwood	9.3			Fair	
3316	Populus deltoides	Cottonwood	12.3			Fair	
3317	Populus deltoides	Cottonwood	18.1			Fair	
3318	Populus deltoides	Cottonwood	22.0			Fair	
3319	Acer saccharinum	Silver maple	8.4			Fair	
3320	Acer saccharinum	Silver maple	14.8	6.2		Fair	
3321	Populus deltoides	Cottonwood	11.2			Fair	
3322	Populus deltoides	Cottonwood	18.9			Fair	
3323	Populus deltoides	Cottonwood	9.9			Fair	
3324	Populus deltoides	Cottonwood	21.3			Fair	
3325	Populus deltoides	Cottonwood	11.3			Fair	
3326	Populus deltoides	Cottonwood	15.4			Fair	
3327	Populus deltoides	Cottonwood	9.1			Fair	
3328	Populus deltoides	Cottonwood	8.2			Fair	
3329	Populus deltoides	Cottonwood	13.2	11.8		Fair	
3330	Ulmus americana	American elm	6.2			Fair	
3331	Populus deltoides	Cottonwood	11.8			Fair	
3332	Populus deltoides	Cottonwood	9.3			Fair	
3333	Populus deltoides	Cottonwood	17.0			Fair	
3334	Ulmus americana	American elm	6.2			Fair	
3335	Ulmus americana	American elm	7.1			Fair	
3336	Acer saccharinum	Silver maple	8.6			Fair	
3337	Acer saccharinum	Silver maple	12.9			Fair	
3338	Acer saccharinum	Silver maple	8.8	6.7		Fair	
3339	Ulmus americana	American elm	6.2			Fair	
3340	Acer saccharinum	Silver maple	9.7	6.2		Fair	
3341	Populus deltoides	Cottonwood	8.4			Fair	
3342	Populus deltoides	Cottonwood	8.1			Fair	
3343	Populus deltoides	Cottonwood	7.4			Fair	
3344	Populus deltoides	Cottonwood	7.6			Fair	
3345	Populus deltoides	Cottonwood	12.1			Fair	
3346	Populus deltoides	Cottonwood	6.7			Fair	
3347	Populus deltoides	Cottonwood	6.7			Fair	
3348	Populus deltoides	Cottonwood	8.0			Fair	
3349	Populus deltoides	Cottonwood	7.6			Fair	
3350	Populus deltoides	Cottonwood	11.1			Fair	
3351	Ulmus americana	American elm	6.7			Fair	
3352	Acer saccharinum	Silver maple	6.3			Fair	
3353	Acer saccharinum	Silver maple	10.1			Fair	
3354	Quercus macrocarpa	Bur oak	8.5			Fair	
3355	Juglans nigra	Black walnut	7.8			Fair	
3356	Juglans nigra	Black walnut	7.2			Fair	
3357	Malus pumila	Common apple	10.7			Very Poor	
3358	Ulmus americana	American elm	10.8			Fair	
3359	Acer saccharinum	Silver maple	14.4	11.0		Fair	
3360	Ulmus americana	American elm	14.0			Fair	
3361	Ulmus americana	American elm	10.3			Fair	
3362	Acer negundo	Box elder	8.4			Fair	
3363	Ulmus americana	American elm	9.4			Fair	
3364	Ulmus americana	American elm	9.3			Fair	
3365	Ulmus americana	American elm	10.4			Fair	
3366	Ulmus americana	American elm	7.4			Fair	
3367	Ulmus americana	American elm	7.6			Fair	
3368	Ulmus americana	American elm	8.3			Fair	
3369	Ulmus americana	American elm	8.0			Fair	
3370	Acer saccharinum	Silver maple	8.0			Fair	
3371	Ulmus americana	American elm	6.6			Fair	
3372	Ulmus americana	American elm	9.2	9.0	6.0	Fair	
3373	Ulmus americana	American elm	7.7			Fair	
3374	Populus deltoides	Cottonwood	15.4			Fair	
3375	Populus deltoides	Cottonwood	10.5			Fair	
3376	Acer negundo	Box elder	13.5			Fair	
3377	Acer saccharinum	Silver maple	11.1			Fair	
3378	Acer negundo	Box elder	7.8			Fair	
3379	Ulmus americana	American elm	7.4			Fair	
3380	Ulmus americana	American elm	11.3			Fair	
3381	Ulmus americana	American elm	6.2			Fair	
3382	Populus deltoides	Cottonwood	8.0			Fair	
3383	Populus deltoides	Cottonwood	9.0			Fair	
3384	Populus deltoides	Cottonwood	6.8			Fair	
3385	Populus deltoides	Cottonwood	15.1			Fair	
3386	Robinia pseudoacacia	Black locust	6.2	6.0		Poor	
3387	Acer negundo	Box elder	6.3			Poor	
3388	Robinia pseudoacacia	Black locust	11.4			Fair	
3389	Acer negundo	Box elder	6.3			Fair	
3390	Ulmus americana	American elm	10.5	9.7		Fair	
3391	Ulmus americana	American elm	12.6	11.5		Fair	
3392	Ulmus americana	American elm	9.9			Fair	
3393	Ulmus americana	American elm	6.8			Fair	
3394	Ulmus americana	American elm	10.9			Fair	
3395	Ulmus americana	American elm	6.2			Fair	
3396	Ulmus americana	American elm	6.6			Fair	
3397	Ulmus americana	American elm	8.4			Fair	
3398	Populus deltoides	Cottonwood	14.3			Fair	
3399	Salix alba	White willow	45.0			Very Poor	
3400	Populus deltoides	Cottonwood	9.7			Fair	
3401	Robinia pseudoacacia	Black locust	9.4			Fair	
3402	Robinia pseudoacacia	Black locust	8.1			Fair	
3403	Populus deltoides	Cottonwood	10.9			Fair	
3404	Populus deltoides	Cottonwood	7.2			Fair	
3405	Populus deltoides	Cottonwood	7.5			Fair	
3406	Acer saccharinum	Silver maple	12.1			Fair	
3407	Acer platanoides	Norway Maple	18.4			Fair	
3408	Acer saccharinum	Silver maple	36.0			Fair	X
3409	Acer saccharinum	Silver maple	27.6			Fair	X
3410	Acer saccharinum	Silver maple	33.7			Very Poor	
3411	Acer saccharinum	Silver maple	36.2			Fair	X
3412	Populus deltoides	Cottonwood	9.5			Fair	
3413	Populus deltoides	Cottonwood	7.9			Fair	
3414	Picea pungens	Blue spruce	17.0			Fair	
3415	Acer saccharinum	Silver maple	22.5			Very Poor	
3416	Pinus sylvestris	Scots pine	19.6			Fair	X
3417	Populus deltoides	Cottonwood	8.6			Fair	
3418	Populus deltoides	Cottonwood	10.9			Fair	
3419	Populus deltoides	Cottonwood	7.9	7.4		Fair	

			Diameter at Breast Height (DBH)				
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)
3420	Populus deltoides	Cottonwood	7.1			Fair	
3421	Populus deltoides	Cottonwood	8.5			Fair	
3422	Populus deltoides	Cottonwood	10.8			Fair	
3423	Populus deltoides	Cottonwood	7.7			Fair	
3424	Populus deltoides	Cottonwood	8.2			Fair	
3425	Populus deltoides	Cottonwood	6.1			Fair	
3426	Populus deltoides	Cottonwood	9.1			Fair	
3427	Populus deltoides	Cottonwood	6.1			Fair	
3428	Populus deltoides	Cottonwood	9.5			Fair	
3429	Populus deltoides	Cottonwood	13.6			Fair	
3430	Acer saccharinum	Silver maple	20.6			Fair	
3431	Acer saccharinum	Silver maple	17.3			Fair	
3432	Populus deltoides	Cottonwood	11.7			Fair	
3433	Populus deltoides	Cottonwood	9.2			Fair	
3434	Populus deltoides	Cottonwood	7.6			Fair	
3435	Populus deltoides	Cottonwood	12.4			Fair	
3436	Pinus sylvestris	Scots pine	17.9			Good	
3437	Pinus sylvestris	Scots pine	7.0			Fair	
3438	Pinus sylvestris	Scots pine	12.5			Fair	
3439	Acer negundo	Box elder	9.0			Poor	
3440	Acer platanoides	Norway Maple	6.9			Fair	
3441	Pinus sylvestris	Scots pine	25.0			Good	X
3442	Acer platanoides	Norway Maple	9.4			Fair	
3443	Ulmus americana	American elm	8.7			Fair	
3444	Acer saccharinum	Silver maple	9.9			Fair	
3445	Acer negundo	Box elder	6.5	6.0		Fair	
3446	Acer platanoides	Norway Maple	7.5			Fair	
3447	Ulmus americana	American elm	11.5			Fair	
3448	Ulmus americana	American elm	8.9			Fair	
3449	Ulmus americana	American elm	8.3			Fair	
3450	Ulmus americana	American elm	10.1			Fair	
3451	Pyrus communis	Common pear	8.8			Fair	
3452	Ulmus americana	American elm	8.3			Fair	
3453	Ulmus americana	American elm	12.5			Fair	
3454	Ulmus americana	American elm	8.1			Fair	
3455	Populus deltoides	Cottonwood	18.4			Fair	
3456	Acer negundo	Box elder	11.0			Fair	
3457	Ulmus americana	American elm	6.3			Fair	
3458	Populus deltoides	Cottonwood	21.0			Fair	
3459	Acer saccharinum	Silver maple	7.3			Fair	
3460	Populus deltoides	Cottonwood	13.0			Fair	
3461	Salix amygdaloides	Peachleaf willow	13.8			Fair	
3462	Quercus macrocarpa	Bur oak	19.1			Fair	X
3463	Populus deltoides	Cottonwood	17.3	15.1		Fair	
3464	Populus deltoides	Cottonwood	13.2			Fair	
3465	Populus deltoides	Cottonwood	20.1			Fair	
3466	Ulmus americana	American elm	6.7			Fair	
3467	Ulmus americana	American elm	7.1			Fair	
3468	Ulmus americana	American elm	6.4			Fair	
3469	Ulmus americana	American elm	7.9			Fair	
3470	Robinia pseudoacacia	Black locust	11.4			Fair	
3471	Populus deltoides	Cottonwood	6.1			Fair	
3472	Populus deltoides	Cottonwood	7.1			Fair	
3473	Populus deltoides	Cottonwood	7.1			Fair	
3474	Populus deltoides	Cottonwood	7.2			Fair	
3501	Populus deltoides	Cottonwood	15.3			Fair	
3502	Populus deltoides	Cottonwood	7.3			Fair	
3503	Populus deltoides	Cottonwood	10.4	9.4		Fair	
3504	Fraxinus americana	White ash	7.2			Very Poor	
3505	Acer platanoides	Norway Maple	6.0			Fair	
3506	Acer platanoides	Norway Maple	7.4			Fair	
3507	Tilia americana	Basswood	7.9			Fair	
3508	Acer saccharum	Sugar maple	18.3			Fair	X
3509	Ulmus americana	American elm	6.8			Fair	
3510	Ulmus americana	American elm	17.2			Fair	
3511	Ulmus americana	American elm	14.5			Fair	
3512	Ulmus americana	American elm	10.0			Fair	
3513	Populus deltoides	Cottonwood	10.0	9.6		Fair	
3514	Ulmus americana	American elm	9.0			Fair	
3515	Acer negundo	Box elder	7.2			Fair	
3516	Acer negundo	Box elder	9.2	6.3		Fair	
3517	Prunus serotina	Black cherry	8.1			Fair	
3518	Malus pumila	Common apple	7.1			Fair	
3519	Populus deltoides	Cottonwood	15.2			Fair	
3520	Ulmus americana	American elm	6.3			Fair	
3521	Populus deltoides	Cottonwood	11.0			Fair	
3522	Populus deltoides	Cottonwood	8.4			Fair	
3523	Robinia pseudoacacia	Black locust	7.5			Fair	
3524	Ulmus americana	American elm	18.0			Fair	
3525	Robinia pseudoacacia	Black locust	9.0			Fair	
3526	Robinia pseudoacacia	Black locust	7.4			Fair	
3527	Populus tremuloides	Quaking aspen	6.0			Fair	
3528	Robinia pseudoacacia	Black locust	8.1	7.2		Fair	
3529	Robinia pseudoacacia	Black locust	9.0			Fair	
3530	Robinia pseudoacacia	Black locust	6.5			Fair	
3531	Populus tremuloides	Quaking aspen	6.1			Fair	
3532	Robinia pseudoacacia	Black locust	6.4			Fair	
3533	Robinia pseudoacacia	Black locust	7.1	6.8		Fair	
3534	Acer negundo	Box elder	6.5			Fair	
3535	Populus deltoides	Cottonwood	8.4			Fair	
3536	Populus deltoides	Cottonwood	15.8			Fair	
3537	Populus deltoides	Cottonwood	9.6	7.4		Fair	
3538	Populus deltoides	Cottonwood	9.0			Fair	
3539	Juglans nigra	Black walnut	6.2			Fair	
3540	Robinia pseudoacacia	Black locust	8.6			Fair	
3541	Robinia pseudoacacia	Black locust	9.0	8.2		Fair	
3542	Robinia pseudoacacia	Black locust	6.8			Fair	
3543	Robinia pseudoacacia	Black locust	8.0			Fair	
3544	Populus deltoides	Cottonwood	11.7			Very Poor	
3545	Ulmus americana	American elm	9.8			Fair	
3546	Acer negundo	Box elder	8.6			Fair	
3547	Prunus avium	Sweet cherry	7.2			Fair	
3548	Acer negundo	Box elder	9.4			Fair	
3549	Populus deltoides	Cottonwood	24.3			Fair	X
3550	Acer negundo	Box elder	6.7	6.4		Fair	
3551	Populus deltoides	Cottonwood	15.0			Fair	
3552	Populus deltoides	Cottonwood	10.2			Fair	
3553	Populus deltoides	Cottonwood	12.4			Fair	
3554	Populus deltoides	Cottonwood	16.4			Fair	
3555	Populus deltoides	Cottonwood	13.0			Fair	
3556	Ulmus rubra	Slippery elm	6.8			Fair	

			Diameter at Breast Height (DBH)				
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)
3557	Populus deltoides	Cottonwood	13.4	10.4		Fair	
3558	Populus deltoides	Cottonwood	6.4			Fair	
3559	Ulmus americana	American elm	9.8			Fair	
3560	Ulmus americana	American elm	6.0			Fair	
3561	Ulmus americana	American elm	8.4			Fair	
3562	Populus deltoides	Cottonwood	11.0			Fair	
3563	Acer negundo	Box elder	8.0			Fair	
3564	Acer negundo	Box elder	8.0			Fair	
3565	Acer negundo	Box elder	6.0			Fair	
3566	Acer negundo	Box elder	6.0			Fair	
3567	Acer negundo	Box elder	6.0			Fair	
3568	Acer negundo	Box elder	6.1			Fair	
3569	Acer negundo	Box elder	8.1			Fair	
3570	Acer negundo	Box elder	10.0			Fair	
3571	Acer negundo	Box elder	7.1			Fair	
3572	Acer negundo	Box elder	15.5	14.4		Fair	
3573	Acer negundo	Box elder	7.6	7.1		Fair	
3574	Acer negundo	Box elder	13.6	7.5		Fair	
3575	Acer negundo	Box elder	17.0			Fair	
3576	Populus deltoides	Cottonwood	8.5			Fair	
3577	Acer negundo	Box elder	6.5			Fair	
3578	Acer negundo	Box elder	6.0	5.8		Fair	
3579	Populus deltoides	Cottonwood	9.9			Fair	
3580	Acer negundo	Box elder	6.4			Fair	
3581	Populus deltoides	Cottonwood	19.2			Fair	
3582	Acer negundo	Box elder	9.4			Fair	
3582	Prunus avium	Sweet cherry	8.1			Fair	
3584	Populus deltoides	Cottonwood	18.6			Fair	
3586	Robinia pseudoacacia	Black locust	8.4	8.0		Fair	
3587	Populus deltoides	Cottonwood	13.2			Fair	
3588	Acer negundo	Box elder	9.2			Fair	
3589	Acer negundo	Box elder	6.2			Fair	
3590	Acer negundo	Box elder	7.1			Fair	
3591	Acer negundo	Box elder	9.3	6.7		Fair	
3592	Acer negundo	Box elder	8.3			Fair	
3593	Acer negundo	Box elder	7.7			Fair	
3594	Acer negundo	Box elder	9.0			Fair	
3595	Acer negundo	Box elder	7.4	6.5	5.8	Fair	
3596	Ulmus americana	American elm	9.6			Fair	
3597	Acer saccharinum	Silver maple	12.0			Fair	
3598	Populus deltoides	Cottonwood	17.2			Fair	
3599	Acer negundo	Box elder	9.7			Fair	
3600	Acer negundo	Box elder	6.7			Fair	
3601	Acer negundo	Box elder	7.4			Fair	
3602	Acer negundo	Box elder	6.5			Fair	
3603	Robinia pseudoacacia	Black locust	6.8			Fair	
3604	Robinia pseudoacacia	Black locust	7.5	7.1		Fair	
3605	Ulmus americana	American elm	6.8			Fair	
3606	Populus deltoides	Cottonwood	14.5	14.0		Fair	
3607	Populus deltoides	Cottonwood	13.3	11.2		Fair	
3608	Populus deltoides	Cottonwood	8.6			Fair	
3609	Ulmus americana	American elm	6.4			Fair	
3610	Robinia pseudoacacia	Black locust	13.2	10.1		Fair	
3611	Populus deltoides	Cottonwood	9.2			Fair	
3612	Populus deltoides	Cottonwood	6.0			Fair	
3613	Populus deltoides	Cottonwood	16.8	12.4	8.8	Fair	
3614	Populus deltoides	Cottonwood	6.6			Fair	
3615	Populus deltoides	Cottonwood	10.4			Fair	
3616	Populus deltoides	Cottonwood	9.4			Fair	
3617	Populus deltoides	Cottonwood	6.4			Fair	
3618	Populus deltoides	Cottonwood	6.2			Fair	
3619	Ulmus americana	American elm	7.0			Fair	
3620	Salix matsudana	Corkscrew willow	13.0			Fair	
3621	Populus deltoides	Cottonwood	11.3			Fair	
3622	Robinia pseudoacacia	Black locust	7.2			Fair	
3623	Robinia pseudoacacia	Black locust	7.7			Fair	
3624	Populus deltoides	Cottonwood	7.7			Fair	
3625	Populus deltoides	Cottonwood	10.4			Fair	
3626	Populus deltoides	Cottonwood	6.6			Fair	
3627	Populus deltoides	Cottonwood	7.4			Fair	
3628	Populus deltoides	Cottonwood	9.4			Fair	
3629	Populus deltoides	Cottonwood	11.3			Fair	
3630	Populus deltoides	Cottonwood	6.7			Fair	
3631	Robinia pseudoacacia	Black locust	8.7	6.2	5.7	Fair	
3632	Acer rubrum	Red maple	6.7			Fair	
3633	Populus deltoides	Cottonwood	7.8			Fair	
3634	Populus deltoides	Cottonwood	6.5			Fair	
3635	Populus deltoides	Cottonwood	7.3			Fair	
3636	Populus deltoides	Cottonwood	7.3			Fair	
3637	Populus deltoides	Cottonwood	10.0			Fair	
3638	Populus deltoides	Cottonwood	12.4			Fair	
3639	Populus deltoides	Cottonwood	17.3			Fair	
3640	Populus deltoides	Cottonwood	8.6			Fair	
3641	Acer negundo	Box elder	0.0			Fair	
3642	Acer negundo	Box elder	7.3	7.0		Fair	
3643	Acer negundo	Box elder	6.5			Fair	
3644	Robinia pseudoacacia	Black locust	6.1			Fair	
3645	Robinia pseudoacacia	Black locust	9.4			Fair	
3646	Acer rubrum	Red maple	20.0	7.4		Fair	X
3647	Robinia pseudoacacia	Black locust	6.0			Fair	
3648	Robinia pseudoacacia	Black locust	11.4			Fair	
3649	Acer rubrum	Red maple	13.3	11.2		Fair	
3650	Populus deltoides	Cottonwood	13.6			Fair	
3651	Populus deltoides	Cottonwood	6.7			Fair	
3652	Robinia pseudoacacia	Black locust	8.0			Fair	
3653	Populus deltoides	Cottonwood	14.6			Fair	
3654	Robinia pseudoacacia	Black locust	9.1	7.0		Fair	
3655	Robinia pseudoacacia	Black locust	8.0			Fair	
3656	Robinia pseudoacacia	Black locust	6.7	6.0	5.8	Fair	
3657	Robinia pseudoacacia	Black locust	7.0			Fair	
3658	Robinia pseudoacacia	Black locust	6.3			Fair	
3659	Robinia pseudoacacia	Black locust	6.0			Fair	
3660	Ulmus parvifolia	Chinese elm	6.1			Fair	

(1) Conditon as per ISA Health Ratings, 9th Edition.
(2) Landmark as per City of Troy Zoning Ordinance, Section 13.07 Woodland Protection (C)(1)

Tree List provided by Barr Engineering Company on March 26, 2021.

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

PROJECT
Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Tree List

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY: M. Carnaghi
DESIGNED BY:
APPROVED BY: K. Navaroli
DATE: April 14, 2021
SCALE: 1" = 40'
40 20 0 20 40 60

NFE JOB NO. J943-01
SHEET NO. SP06

E. LONG LAKE RD.
(R.O.W. VARIES)

RIVER BANK CT.

ROCHESTER RD. (R.O.W. VARIES)

BENCHMARK
CITY OF TROY BM0464
ARROW ON HYDRANT
ELEVATION: 674.44
NAVD 88 DATUM

BENCHMARK
CITY OF TROY BM1259
ARROW ON HYDRANT
ELEVATION: 673.00
NAVD 88 DATUM

BENCHMARK
CITY OF TROY BM1258
ARROW ON HYDRANT
ELEVATION: 672.70
NAVD 88 DATUM

BUILDING #1: 135 136 137 138 139 140
BUILDING #2: 141 142 143 144 145 146
BUILDING #3: 134 133 132 131 130
BUILDING #4: 129 128 127 126 125 124
BUILDING #5: 113 114 115 116 117
BUILDING #6: 118 119 120 121 122 123
BUILDING #7: 112 111 110 109 108
BUILDING #8: 107 106 105 104 103 102
BUILDING #9: 91 92 93 94 95
BUILDING #10: 96 97 98 99 100 101
BUILDING #11: 1 2 3 4 5
BUILDING #12: 6 7 8 9 10
BUILDING #13: 11 12 13
BUILDING #14: 14 15 16 17 18 19
BUILDING #15: 23 22 21 20
BUILDING #16: 26 25 24
BUILDING #17: 27 28 29
BUILDING #18: 35 34 33 32 31 30
BUILDING #19: 39 38 37 36
BUILDING #20: 45 44 43 42 41 40
BUILDING #21: 48 47 46
BUILDING #22: 49 50 51
BUILDING #23: 58 57 56 55 54 53 52
BUILDING #24: 63 62 61 60
BUILDING #25: 70 69 68 67
BUILDING #26: 66 65 64
80 79 78 77 76 75 74 73 72 71
81 82 83 84 85 86 87 88 89 90

FIRE DEPARTMENT NOTE

THE FOUR (4) INCH STEAMER CPAS ON ALL HYDRANTS WILL BE PAINTED ACCORDING TO THE FOLLOWING:

WHITE ON 4.00 INCH MAINS
RED ON 6.00 INCH MAINS
ORANGE ON 8.00 INCH MAINS
GREEN ON 12.00 INCH MAINS
BLUE ON 16.00 INCH OR LARGER MAINS

NO PARKING SHALL BE PERMITTED AND/OR NO OBSTRUCTIONS SHALL BE PLACE OR CONSTRUCTED WITHIN FIFTEEN (15) FEET OF ANY FIRE HYDRANT OR FIRE DEPARTMENT CONNECTION, PUBLIC OR PRIVATE.

THE FIRE DEPARTMENT CONNECTION MUST BE LOCATED WITHIN ONE HUNDRED (100) FEET OF A FIRE HYDRANT AND WITHIN FIFTY (50) FEET OF A MINIMUM EIGHTEEN (18) FOOT WIDE PAVED DRIVEWAY OR STREET.

GAS METER, PROPANE TANKS, OVERHEAD ELECTRICAL SERVICE, AND TRANSFORMERS MUST NOT BE LOCATED ON THE SAME SIDE OF THE BUILDING OR STRUCTURE AS THE FIRE DEPARTMENT CONNECTION UNLESS A CLEAR DISTANCE OF ONE HUNDRED FIFTY (150) FEET CAN BE MAINTAINED BETWEEN UTILITIES AND THE FIRE DEPARTMENT CONNECTION.

ALL DRIVE AREAS MUST BE POSTED AS FIRE LANES WITH UNIFORM SIGNS IN KEEPING WITH THE STANDARD ESTABLISHED IN THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. SIGNS MUST BE ERECTED ON BOTH SIDES OF THE FIRE LANES WITH SPACING BETWEEN SIGNS NOT TO EXCEED ONE HUNDRED (100) FEET.

DESIGNATED EXIT DOORS ONTO DRIVES OR PARKING AREAS MUST BE PROTECTED WITH GUARD POSTS OR PARKING BLOCKS.

A WHITE HIGH VISIBILITY STRIPE SHALL BE PAINTED ON THE UPPER FLANGE OF ALL FIRE HYDRANTS.

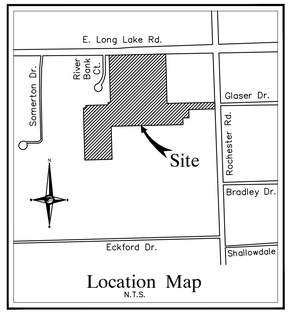
FIRE LANE SIGNAGE NOTE

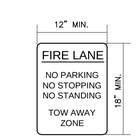
WHERE REQUIRED, FIRE LANES SHALL BE ESTABLISHED AS INDICATED AND POSTED WITH THE APPROPRIATE SIGNS. FIRE LANES SHALL BE A MINIMUM OF 18 FEET IN WIDTH AND HAVE A MINIMUM OVERHEAD CLEARANCE OF 14 FEET IN HEIGHT. FIRE LANES MUST SUPPORT THE FIRE TRUCK WEIGHT OF 56,000 POUNDS. ALL TURNS IN FIRE LANES MUST ACCOMMODATE THE FIRE TRUCK MINIMUM INSIDE TURNING RADIUS OF 37 FEET WITH A MINIMUM OUTSIDE TURNING RADIUS OF 52 FEET OR AS OTHERWISE DETERMINED ACCEPTABLE BY THE FIRE OFFICIAL (TROY CITY CODE CHAPTER 93)

APPROVED "NO PARKING FIRE LANE" SIGNS MUST BE INSTALLED AND MAINTAINED IN COMPLIANCE WITH THE CRITERIA SET FORTH IN THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. SOME OF THE CRITERIA IS AS FOLLOWS (TROY CITY CODE CHAPTER 106):

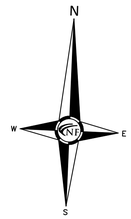
- SIGNS SHALL BE RED LETTERING ON WHITE BACKGROUND AND SHALL READ, **"FIRE LANE. NO PARKING. NO STOPPING. NO STANDING. TOW AWAY ZONE"**
- SIGNS SHALL BE SPACED NO FURTHER THAN 100 FEET APART.
- SIGNS SHALL BE INSTALLED AT A RIGHT ANGLE OR 90° TO CURB
- SIGNS SHALL BE DOUBLE FACED WHERE THE POSSIBILITY EXISTING FOR LEFT WHEEL TO CURB PARKING
- SIGNS SHALL BE 12 INCHES IN WIDTH AND 18 INCHES IN HEIGHT

A COPY OF THE SITE PLAN SHOWING FIRE LANE LOCATIONS AS PRESCRIBED SHALL BE SUBMITTED TO THE FIRE PREVENTION DIVISION DURING FINAL SITE PLAN APPROVAL ON 8½"x11" PRINTED FORMAT FOR TRAFFIC SAFETY COMMITTEE REVIEW AND RECOMMENDATION TO CITY COUNCIL FOR FINAL APPROVAL OF FIRE LANE LOCATIONS.





FIRE LANE SIGN DETAIL



STORM DRAINAGE NOTE

ON-SITE STORM DRAINAGE SYSTEM SHALL OUT LET TO CITY OF TROY REGIONAL DETENTION BASIN.

SITE DATA

SITE AREA
GROSS/NET: 895,158.00 SFT. OR 20.55 ACRES

PROPOSED UNITS:	146
SINGLE FAMILY:	20 LOTS
2 STORY TOWNHOMES:	56 UNITS
3 STORY TOWNHOMES:	70 UNITS
PROPOSED DENSITY:	7.10 DU./AC.
RT DENSITY:	8.71 DU./AC.
RT LOT SETBACKS (LOTS 1-10 & 11-20):	
TYPICAL SIZE:	58'x125' MIN. (WEST) 53'x125' (EAST)
FRONT YARD:	20'
SIDE YARD:	5'/8' (15' TOTAL)-(WEST)
SIDE YARD:	5'/8' (13' TOTAL)-(EAST)
REAR YARD:	35'
2 STORY TOWNHOME SETBACKS:	
FRONT YARD (TO CURB):	20' MIN
BUILDING SEPARATION:	40' MIN.
SIDE YARD:	15'/30'TOTAL
3 STORY TOWNHOME SETBACKS:	
SIDE YARD:	8' MIN.
BUILDING SEPARATION:	15' MIN.
2 STORY TOWNHOME PARKING:	
GARAGE PARKING:	112 SPACES
GUEST PARKING:	116 SPACES
N/S STREET PARKING:	12 SPACES
PARKING DISTRIBUTION:	4.29 SPACE/DU.
3 STORY TOWNHOME PARKING:	
GARAGE PARKING:	113 SPACES
GUEST PARKING:	65 SPACES
PARKING DISTRIBUTION:	2.54 SPACE/DU.
PARK AREA PARKING:	12 SPACES

UTILITY NOTE

CONTRACTOR TO EXPOSE FIBER/ ELECTRIC/ TELEPHONE CONDUIT PRIOR TO COMMENCING CONSTRUCTION. UTILITY OWNER TO BE PRESENT. CONTRACTOR SHALL NOTIFY CIVIL ENGINEER OF RECORD FOLLOWING EXPOSURE TO COORDINATE.

PAVING LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

LEGEND

EXISTING SANITARY SEWER
SAN. CLEAN OUT
EXISTING WATERMAIN
EXISTING STORM SEWER
EX. R. Y. CATCH BASIN
EXISTING BURIED CABLES
OVERHEAD LINES
LIGHT POLE
SIGN
EXISTING GAS MAIN
PR. SANITARY SEWER
PR. WATER MAIN
PR. STORM SEWER
PR. R. Y. CATCH BASIN
PROPOSED LIGHT POLE

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER
Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

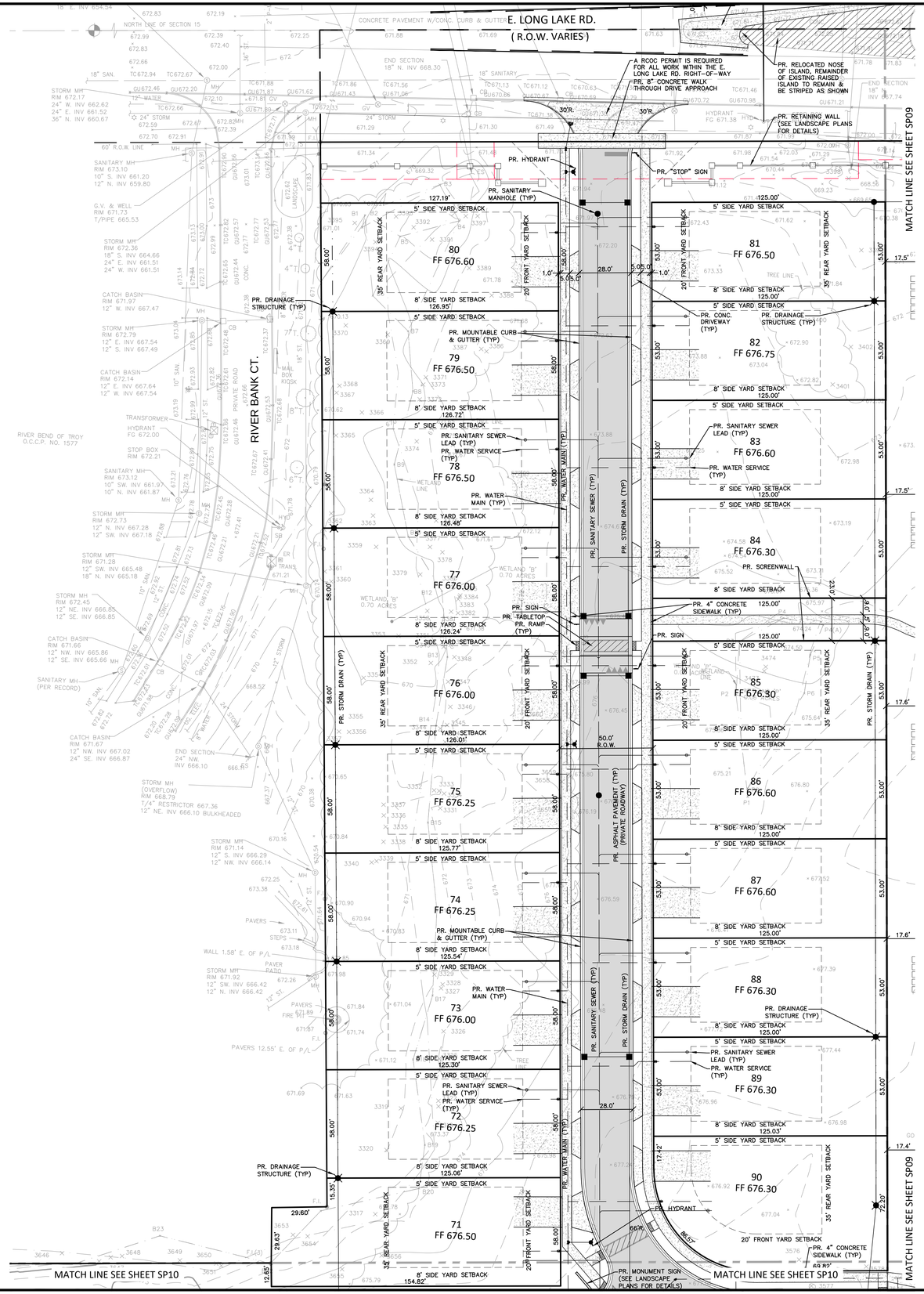
SHEET
Overall Site Plan

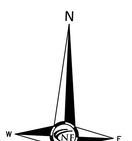
811 Know what's below Call before you dig.

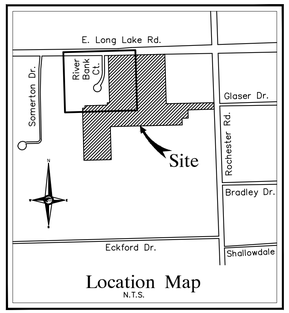
DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey
DESIGNED BY:
B. Brickel
APPROVED BY:
B. Brickel
DATE:
April 14, 2021
SCALE: 1" = 60'
60 30 0 30 60 90

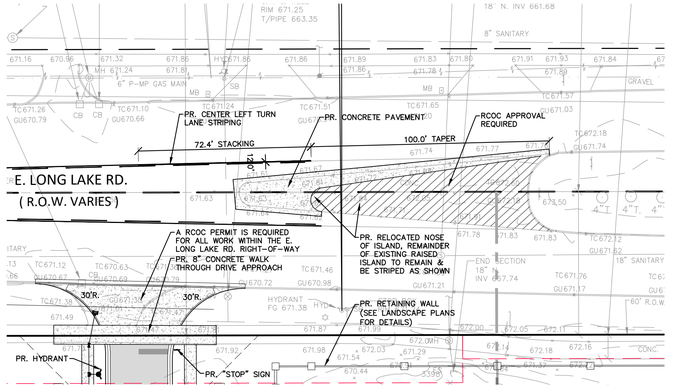
NFE JOB NO. J943-01
SHEET NO. SP07



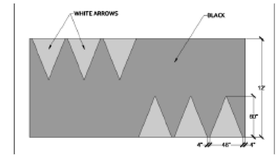




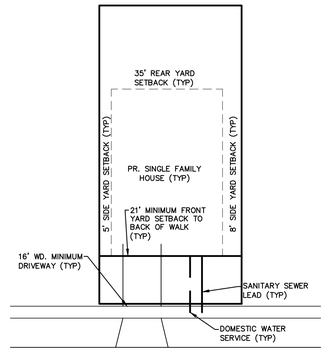
Location Map
N.T.S.



E. LONG LAKE ENTRANCE DETAIL
SCALE 1"=30'



PG-15
20'-0" wide
Pavement graphics- large speed bump.
Use to control speed at outlying drive aisles.
White thermal applied white arrows.
Removable heavy-duty rubber speed humps not allowed.



TYPICAL UNIT
SCALE 1"=30'

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT — GATE VALVE — SAN. CLEAN OUT
- MANHOLE — CATCH BASIN — EXISTING WATERMAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- UTILITY POLE — GUY POLE — EXISTING BURIED CABLES
- GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O. — MANHOLE — PR. SANITARY SEWER
- HYDRANT — GATE VALVE — PR. WATER MAIN
- INLET — C.B. — MANHOLE — PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN — BRAD W. BRICKEL — ENGINEER NO. 54071 — LICENSED PROFESSIONAL ENGINEER
Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

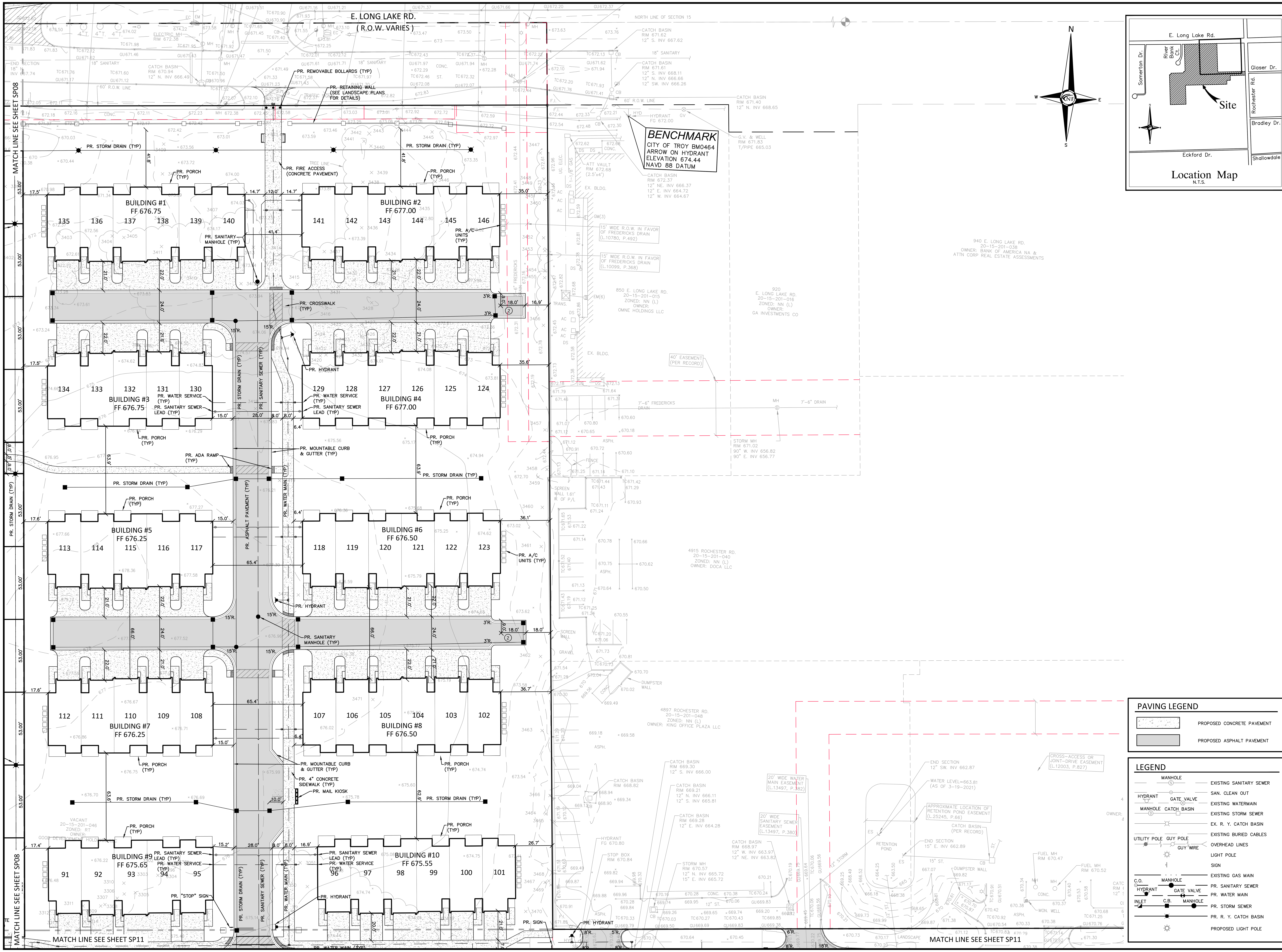
SHEET
Preliminary Site Plan
(1 of 4)

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey
DESIGNED BY:
B. Brickel
APPROVED BY:
B. Brickel
DATE:
April 14, 2021
SCALE: 1" = 30'
30 15 0 15 30 45

NFE JOB NO. J943-01
SHEET NO. SP08



NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

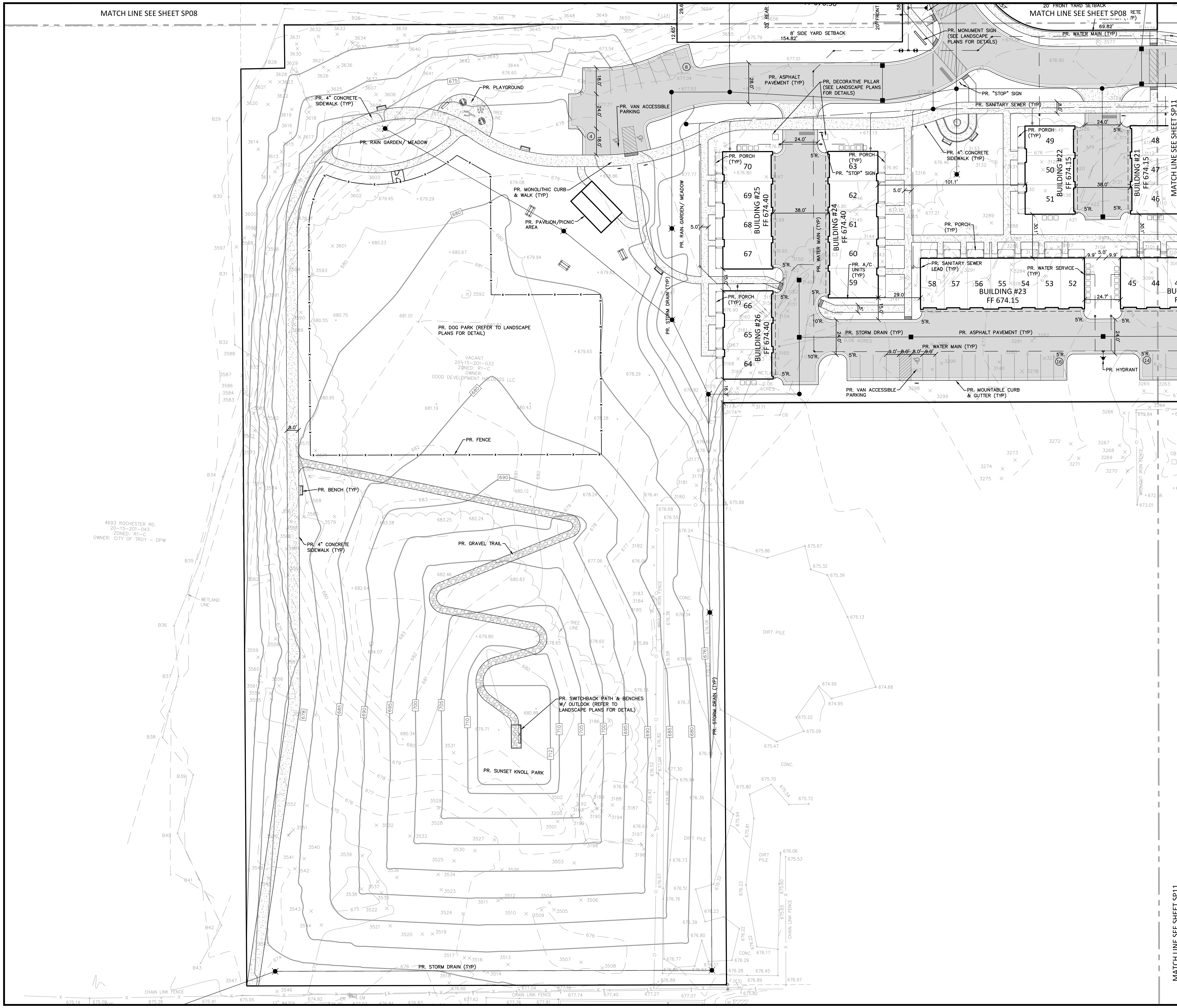
SHEET
Preliminary Site Plan
(2 of 4)

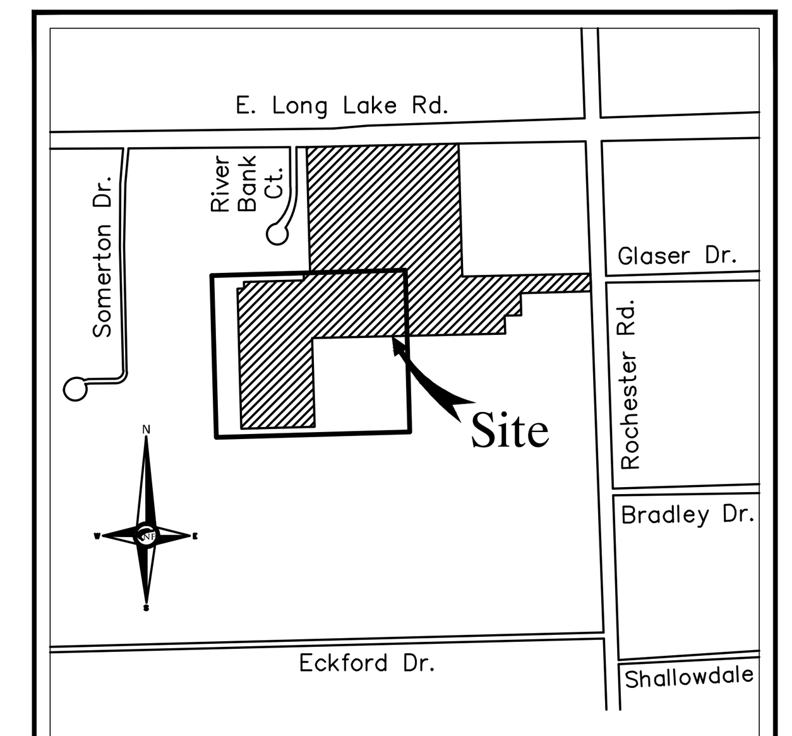
811
Know what's below
Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey
DESIGNED BY:
B. Brickel
APPROVED BY:
B. Brickel
DATE:
April 14, 2021
SCALE: 1" = 30'

NFE JOB NO. J943-01
SHEET NO. SP09





Location Map
N.T.S.

NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Site Plan
(3 of 4)

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

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY: J. Lawrey
DESIGNED BY: B. Brickel
APPROVED BY: B. Brickel
DATE: April 14, 2021
SCALE: 1" = 30'
30 15 0 15 30 45

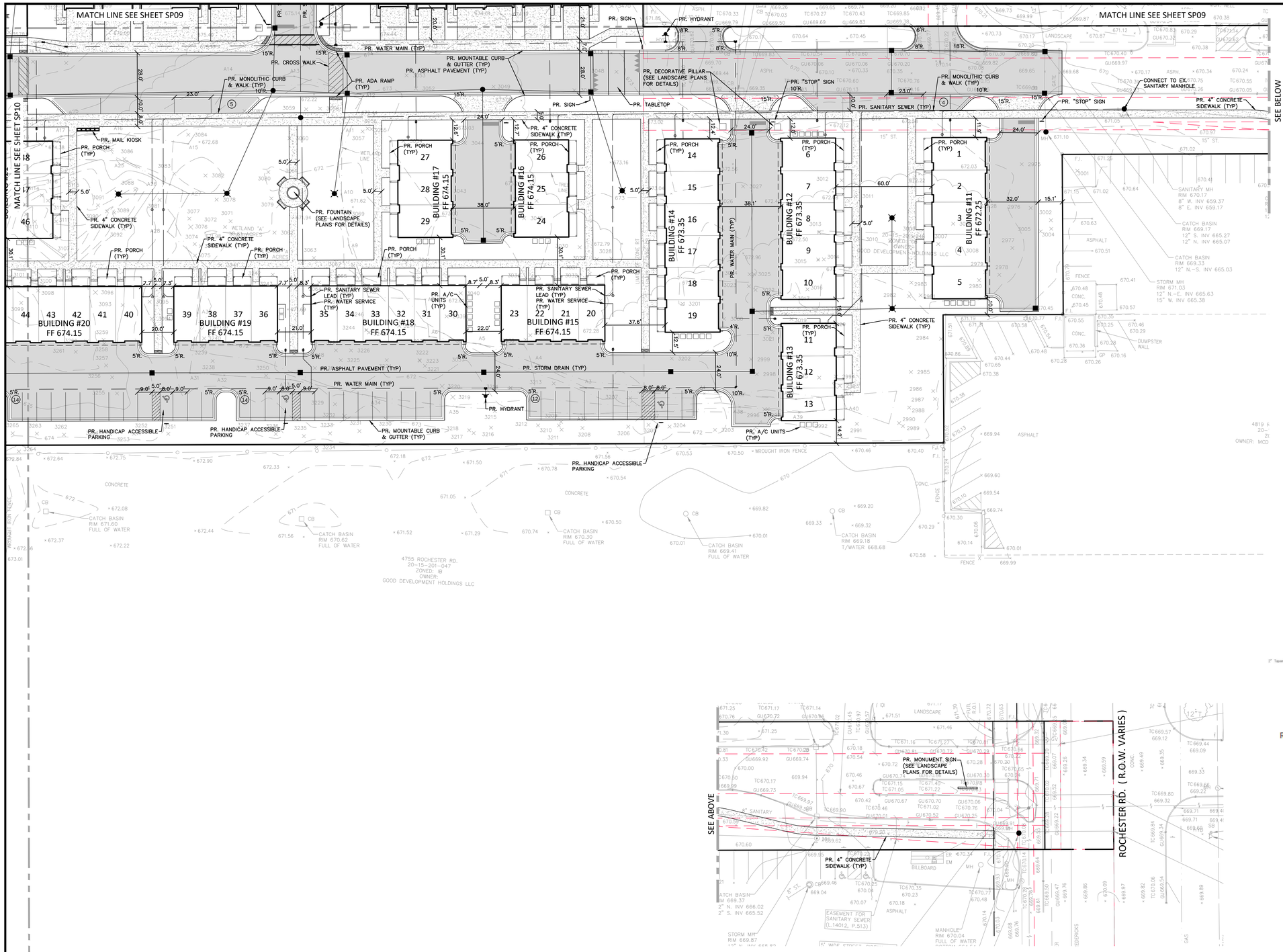
NFE JOB NO. J943-01
SHEET NO. SP10

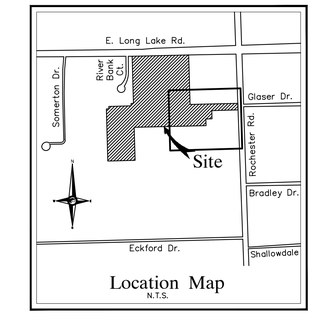
PAVING LEGEND

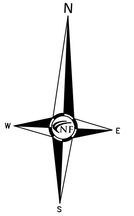
PROPOSED CONCRETE PAVEMENT
PROPOSED ASPHALT PAVEMENT

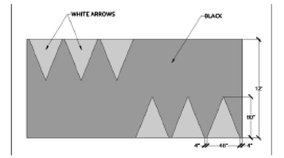
LEGEND

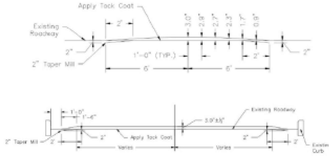
EXISTING SANITARY SEWER (MANHOLE)
SAN. CLEAN OUT
EXISTING WATERMAIN (HYDRANT, GATE VALVE)
EXISTING STORM SEWER (MANHOLE, CATCH BASIN)
EX. R. Y. CATCH BASIN
EXISTING BURIED CABLES
OVERHEAD LINES (UTILITY POLE, GUY POLE, GUY WIRE)
LIGHT POLE
SIGN
EXISTING GAS MAIN
PR. SANITARY SEWER (C.O., MANHOLE)
PR. WATER MAIN (HYDRANT, GATE VALVE)
PR. STORM SEWER (INLET, C.B., MANHOLE)
PR. R. Y. CATCH BASIN
PROPOSED LIGHT POLE











PG-15
20'-0" wide
Pavement graphics- large speed bump.
Use to control speed at outlying drive aisles.
White thermal applied white arrows.
Removable heavy-duty rubber speed humps not allowed.

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- MANHOLE CATCH BASIN
- UTILITY POLE
- GUY POLE
- GUY WIRE
- C.O.
- INLET
- C.B.
- EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- EXISTING WATERMAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- PR. SANITARY SEWER
- PR. WATER MAIN
- PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER
Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Site Plan
(4 of 4)

Know what's below
Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

APPROVED BY:
B. Brickel

DATE:
April 14, 2021

SCALE: 1" = 30'
30 15 0 15 30 45

NFE JOB NO. J943-01
SHEET NO. SP11

GENERAL PAVING NOTES

PAVEMENT SHALL BE OF THE TYPE, THICKNESS AND CROSS SECTION AS INDICATED ON THE PLANS AND AS FOLLOWS:

CONCRETE: PORTLAND CEMENT TYPE IA (AIR-ENTRAINED) WITH A MINIMUM CEMENT CONTENT OF SIX SACKS PER CUBIC YARD, MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,500 PSI AND A SLUMP OF 1 1/2 TO 3 INCHES.

ASPHALT: BASE COURSE – MDOT BITUMINOUS MIXTURE NO. 1100L, 20AA; SURFACE COURSE – MDOT BITUMINOUS MIXTURE NO. 1100T, 20AA; ASPHALT CEMENT PENETRATION GRADE 85-100, BOND COAT – MDOT SS-1H EMULSION AT 0.10 GALLON PER SQUARE YARD; MAXIMUM 2 INCH LIFT.

PAVEMENT BASE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY (MODIFIED PROCTOR) PRIOR TO PLACEMENT OF PROPOSED PAVEMENT. EXISTING SUB-BASE SHALL BE PROOF-ROLLED IN THE PRESENCE OF THE ENGINEER TO DETERMINE STABILITY.

ALL CONCRETE PAVEMENT, DRIVEWAYS, CURB & GUTTER, ETC., SHALL BE SPRAY CURED WITH WHITE MEMBRANE CURING COMPOUND IMMEDIATELY FOLLOWING FINISHING OPERATION.

ALL CONCRETE PAVEMENT JOINTS SHALL BE FILLED WITH HOT POURED RUBBERIZED ASPHALT JOINT SEALING COMPOUND IMMEDIATELY AFTER SAWCUT OPERATION. FEDERAL SPECIFICATION SS-S164.

ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY AND THE MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, CURRENT EDITION.

ALL TOP OF CURB ELEVATIONS, AS SHOWN ON THE PLANS, ARE CALCULATED FOR A 6" CONCRETE CURB UNLESS OTHERWISE NOTED.

ALL SIDEWALK RAMPS, CONFORMING TO PUBLIC ACT NO. 8, 1993, SHALL BE INSTALLED AS INDICATED ON THE PLANS.

CONSTRUCTION OF A NEW OR RECONSTRUCTED DRIVE APPROACH CONNECTING TO AN EXISTING STATE OR COUNTY ROADWAY SHALL BE ALLOWED ONLY AFTER AN APPROVED PERMIT HAS BEEN SECURED FROM THE AGENCY HAVING JURISDICTION OVER SAID ROADWAY.

FOR ANY WORK WITHIN THE PUBLIC RIGHT-OF-WAY, THE CONTRACTOR SHALL PAY FOR AND SECURE ALL NECESSARY PERMITS AND LIKEWISE ARRANGE FOR ALL INSPECTION.

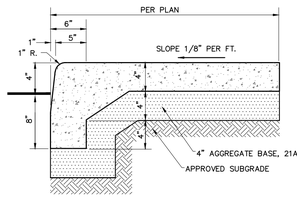
EXISTING TOPSOIL, VEGETATION AND ORGANIC MATERIALS SHALL BE STRIPPED AND REMOVED FROM PROPOSED PAVEMENT AREA PRIOR TO PLACEMENT OF BASE MATERIALS.

EXPANSION JOINTS SHOULD BE INSTALLED AT THE END OF ALL INTERSECTION RADII.

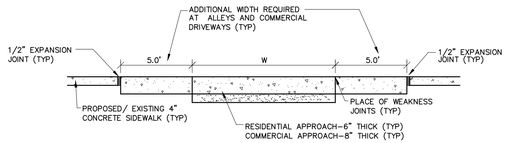
SIDEWALK RAMPS, CONFORMING TO PUBLIC ACT NO. 8, 1973, SHALL BE INSTALLED AS SHOWN AT ALL STREET INTERSECTIONS AND AT ALL BARRIER FREE PARKING AREAS AS INDICATED ON THE PLANS.

ALL PAVEMENT AREAS SHALL BE PROOF-ROLLED UNDER THE SUPERVISION OF A GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF BASE MATERIALS AND PAVING MATERIALS.

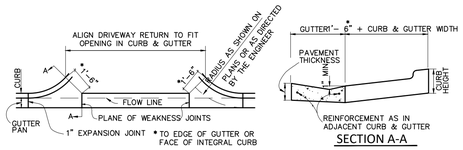
FILL AREAS SHALL BE MACHINE COMPACTED IN UNIFORM LIFTS NOT EXCEEDING 9 INCHES THICK TO 98% OF THE MAXIMUM DENSITY (MODIFIED PROCTOR) PRIOR TO PLACEMENT OF PROPOSED PAVEMENT.



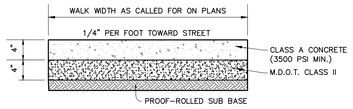
4" MONOLITHIC CURB AND WALK
N.T.S.



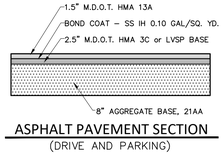
COMMERCIAL CONCRETE SIDEWALK DETAIL
N.T.S.



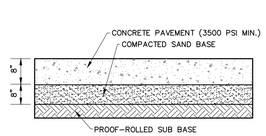
MDOT DRIVEWAY OPENING DETAIL 'M'
N.T.S.



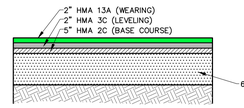
CONCRETE SIDEWALK SECTION
N.T.S.



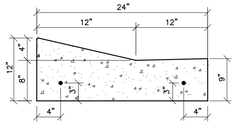
ASPHALT PAVEMENT SECTION
(DRIVE AND PARKING)



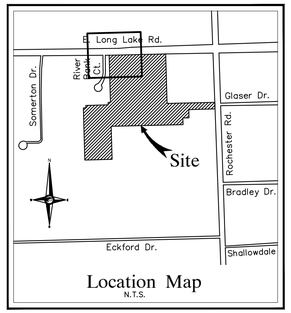
8" CONCRETE SECTION
N.T.S.



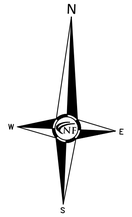
9" ASPHALT SECTION
(ROADWAY)



MOUNTABLE CURB AND GUTTER DETAIL
N.T.S.



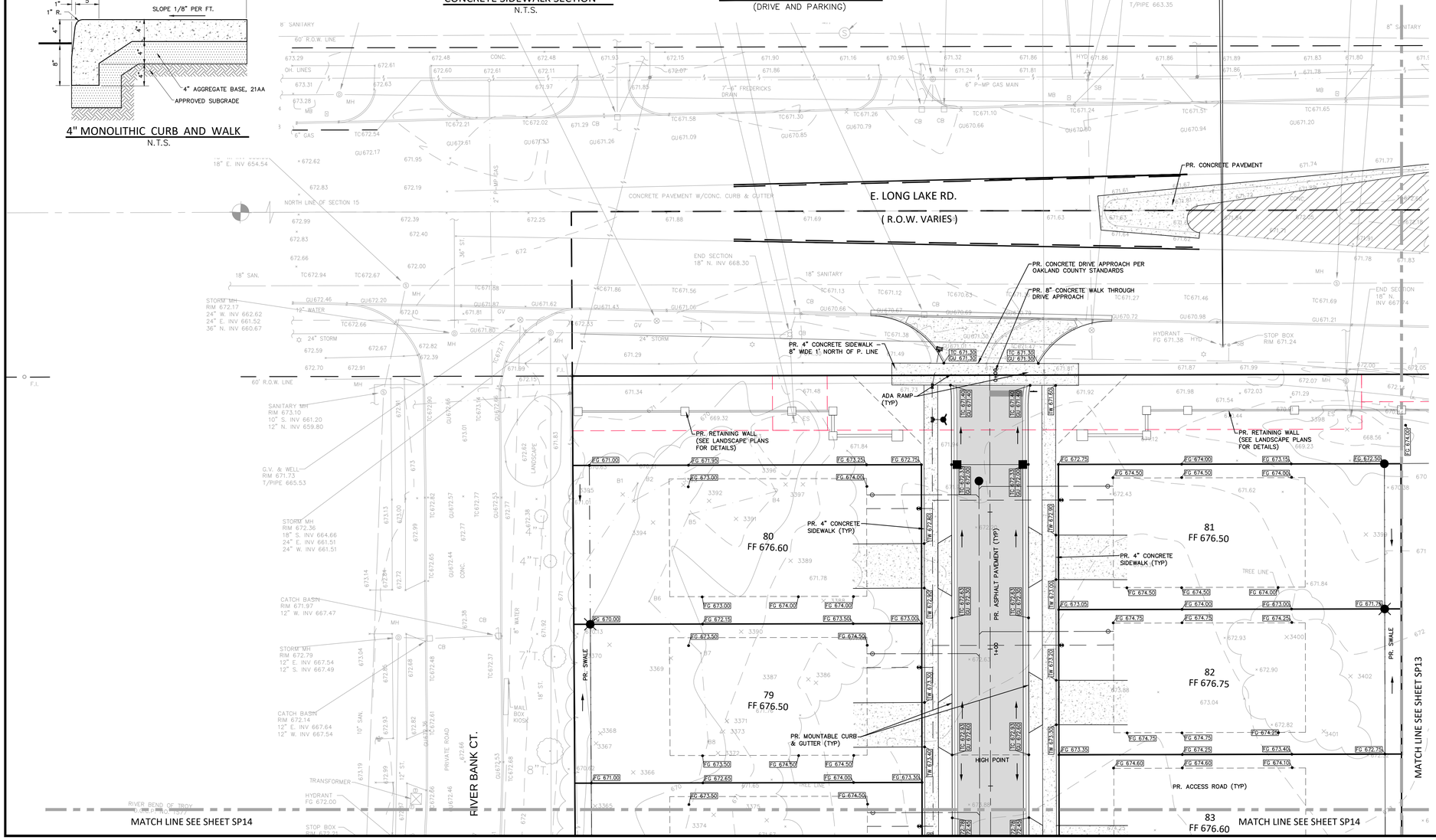
Location Map
N.T.S.



CAUTION!!
6" GAS MAIN

BENCHMARK
CITY OF TROY BM0463
ARROW ON HYDRANT
ELEVATION 674.05
NAVD 88 DATUM

MATCH LINE SEE SHEET SP13



PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- HYDRANT, GATE VALVE — EXISTING WATERMAIN
- MANHOLE, CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- UTILITY POLE, GUY POLE, GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O., MANHOLE — PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- FG 600.00 — FINISH GRADE ELEVATION

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER
Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Paving & Grading Plan (1 of 8)

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY: J. Lawrey
DESIGNED BY: B. Brickel
APPROVED BY: B. Brickel
DATE: April 14, 2021
SCALE: 1" = 20'
20 10 0 10 20 30

NFE JOB NO. J943-01
SHEET NO. SP12

MATCH LINE SEE SHEET SP12

MATCH LINE SEE SHEET SP12 - SWALE

MATCH LINE SEE SHEET SP15

MATCH LINE SEE SHEET SP15

E. LONG LAKE RD.

(R.O.W. VARIES)

BUILDING #1
FF 676.75

BUILDING #2
FF 677.00

135 136 137 138 139 140

141 142 143 144 145 146

PR. MOUNTABLE CURB & GUTTER (TYP)

PR. ASPHALT PAVEMENT (TYP)

ADA RAMP (TYP)

PR. RETAINING WALL (SEE LANDSCAPE PLANS FOR DETAILS)

PR. FIRE ACCESS

PR. A/C UNITS (TYP)

60' DEEDED TO CITY OF TROY (L.31365, P.815)

10' WIDE EASEMENT FOR SIDEWALK AND PUBLIC UTILITIES (L.31365, P.823)

10' WIDE EASEMENT FOR SIDEWALK AND PUBLIC UTILITIES (L.31365, P.821)

10' WIDE EASEMENT FOR SIDEWALK AND PUBLIC UTILITIES (L.31365, P.819)

20' WIDE EASEMENT FOR SIDEWALK AND PUBLIC UTILITIES (L.31365, P.817)

15' WIDE R.O.W. IN FAVOR OF FREDERICKS DRAIN (L.10780, P.492)

15' WIDE R.O.W. IN FAVOR OF FREDERICKS DRAIN (L.10099, P.368)

850 E. LONG LAKE RD.
20-15-201-015
OWNER:
OMNE HOLDINGS LLC

BENCHMARK
CITY OF TROY BM0464
ARROW ON HYDRANT
ELEVATION 674.44
NAVD 88 DATUM

Location Map
N.T.S.

E. Long Lake Rd.
Somerton Dr.
River Bend Ct.
Glaser Dr.
Rochester Rd.
Bradley Dr.
Shallowdale
Eckford Dr.
Site

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- HYDRANT, GATE VALVE — EXISTING WATERMAIN
- MANHOLE, CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- UTILITY POLE, GUY POLE, GUY WIRE — EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O., MANHOLE — PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- FG 600.00 — FINISH GRADE ELEVATION

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER
Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Paving &
Grading Plan (2 of 8)

Know what's below
Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

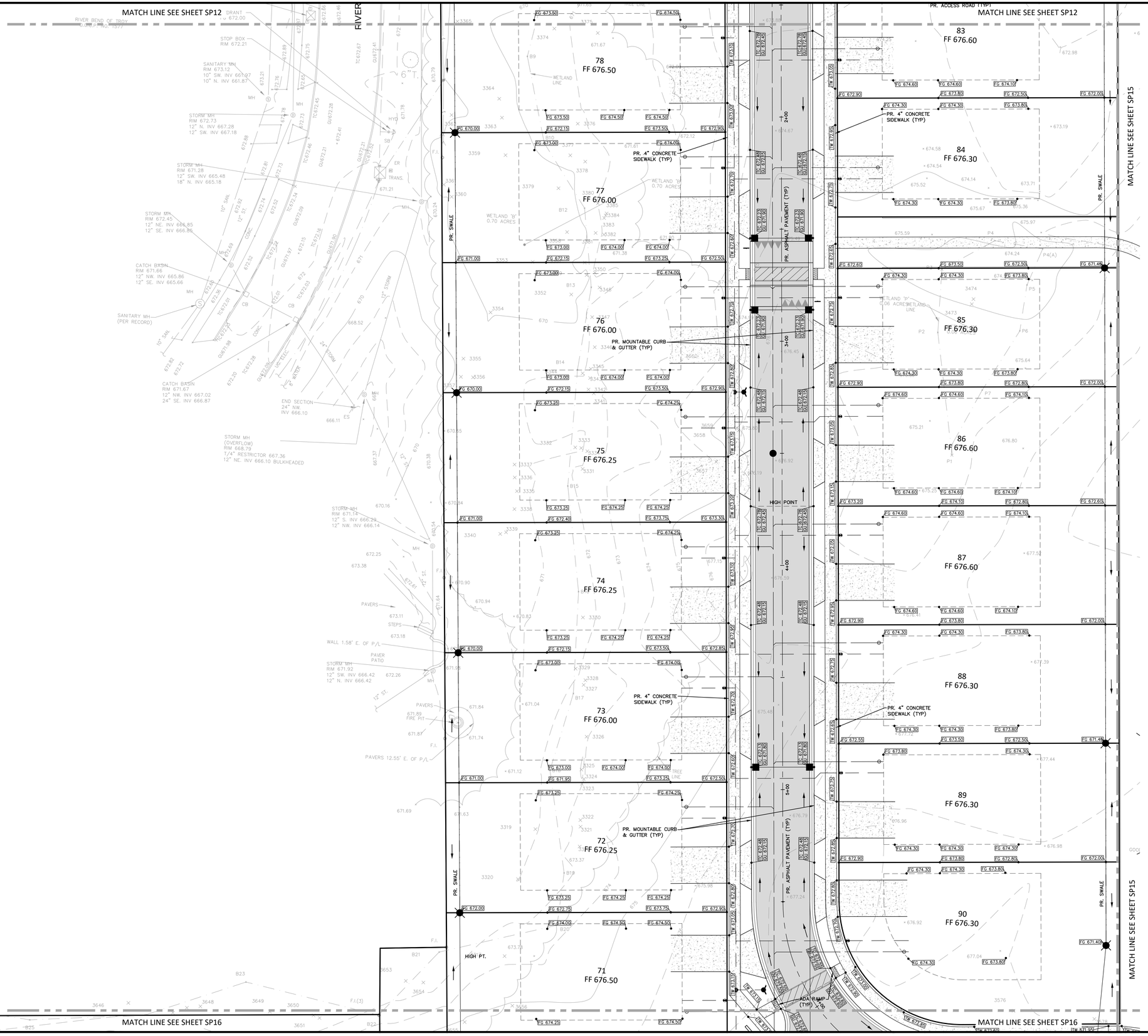
APPROVED BY:
B. Brickel

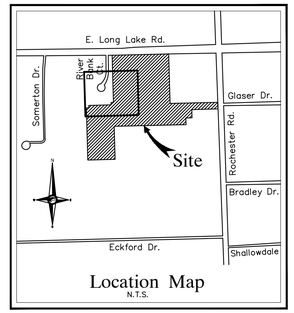
DATE:
April 14, 2021

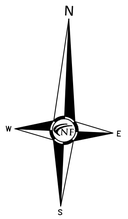
SCALE: 1" = 20'
20 10 0 10 20 30

NFE JOB NO.
J943-01

SHEET NO.
SP13







PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- HYDRANT, GATE VALVE — EXISTING WATERMAIN
- MANHOLE, CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- UTILITY POLE, GUY POLE, GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O., MANHOLE — PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- FG 600.00 — FINISH GRADE ELEVATION

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN — BRAD W. BRICKEL — ENGINEER NO. 54071 — LICENSED PROFESSIONAL ENGINEER

Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Paving & Grading Plan (3 of 8)

Know what's below Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

APPROVED BY:
B. Brickel

DATE:
April 14, 2021

SCALE: 1" = 20'

20 10 0 10 20 30

NFE JOB NO. **J943-01**

SHEET NO. **SP14**

MATCH LINE SEE SHEET SP13

MATCH LINE SEE SHEET SP14

MATCH LINE SEE SHEET SP16

MATCH LINE SEE SHEET SP17

BUILDING #3
FF 676.75
134 133 132 131 130

BUILDING #4
FF 677.00
129 128 127 126 125 124

BUILDING #5
FF 676.25
113 114 115 116 117

BUILDING #6
FF 676.50
118 119 120 121 122 123

BUILDING #7
FF 676.25
112 111 110 109 108

BUILDING #8
FF 676.50
107 106 105 104 103 102

BUILDING #9
FF 675.65
91 92 93 94 95

BUILDING #10
FF 675.55
96 97 98 99 100 101

PR. A/C UNITS (TYP)

PR. 4" CONCRETE SIDEWALK (TYP)

PR. MOUNTABLE CURB & GUTTER (TYP)

ADA RAMP (TYP)

HIGH POINT

PR. ASPHALT PAVEMENT (TYP)

0+00 1+00 2+00 3+00 3+28 4+00

VACANT
20-15-201-046
ZONED: RT
OWNER:
GOOR DEVELOPMENT HOLDINGS LLC

EX. BLDG.

40' EASEMENT (PER RECORD)

7'-6" FREDERICKS DRAIN

4915 ROCHESTER RD.
20-15-201-040
ZONED: NN (L)
OWNER: DOCA LLC

4897 ROCHESTER RD.
20-15-201-048
ZONED: NN (L)
OWNER: KING OFFICE PLAZA LLC

SCREEN WALL 1.61' W. OF P/L

SCREEN WALL

GRAVEL

DUMPSTER WALL

CONC.

ASPH.

FENCE

CATCH BASIN RIM 669.30 12" S. INV 666.00

CATCH BASIN RIM 668.82

CATCH BASIN RIM 669.21 12" N. INV 666.11 12" S. INV 665.81

CATCH BASIN RIM 669.28 12" E. INV 664.28

STORM MH RIM 670.57 12" N. INV 665.72 15" E. INV 665.72

HYDRANT FG 670.80

STOP BOX RIM 670.84

12" ST.

Location Map
N.T.S.
E. Long Lake Rd.
Somerton Dr.
River Bend Ct.
Glaser Dr.
Rochester Rd.
Bradley Dr.
Site
Eckford Dr.
Shallowdale

N
W E
S

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- HYDRANT, GATE VALVE — EXISTING WATERMAIN
- MANHOLE, CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- UTILITY POLE, GUY POLE, GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O., MANHOLE — PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- FG 600.00 — FINISH GRADE ELEVATION

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER
Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Paving & Grading Plan (4 of 8)

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

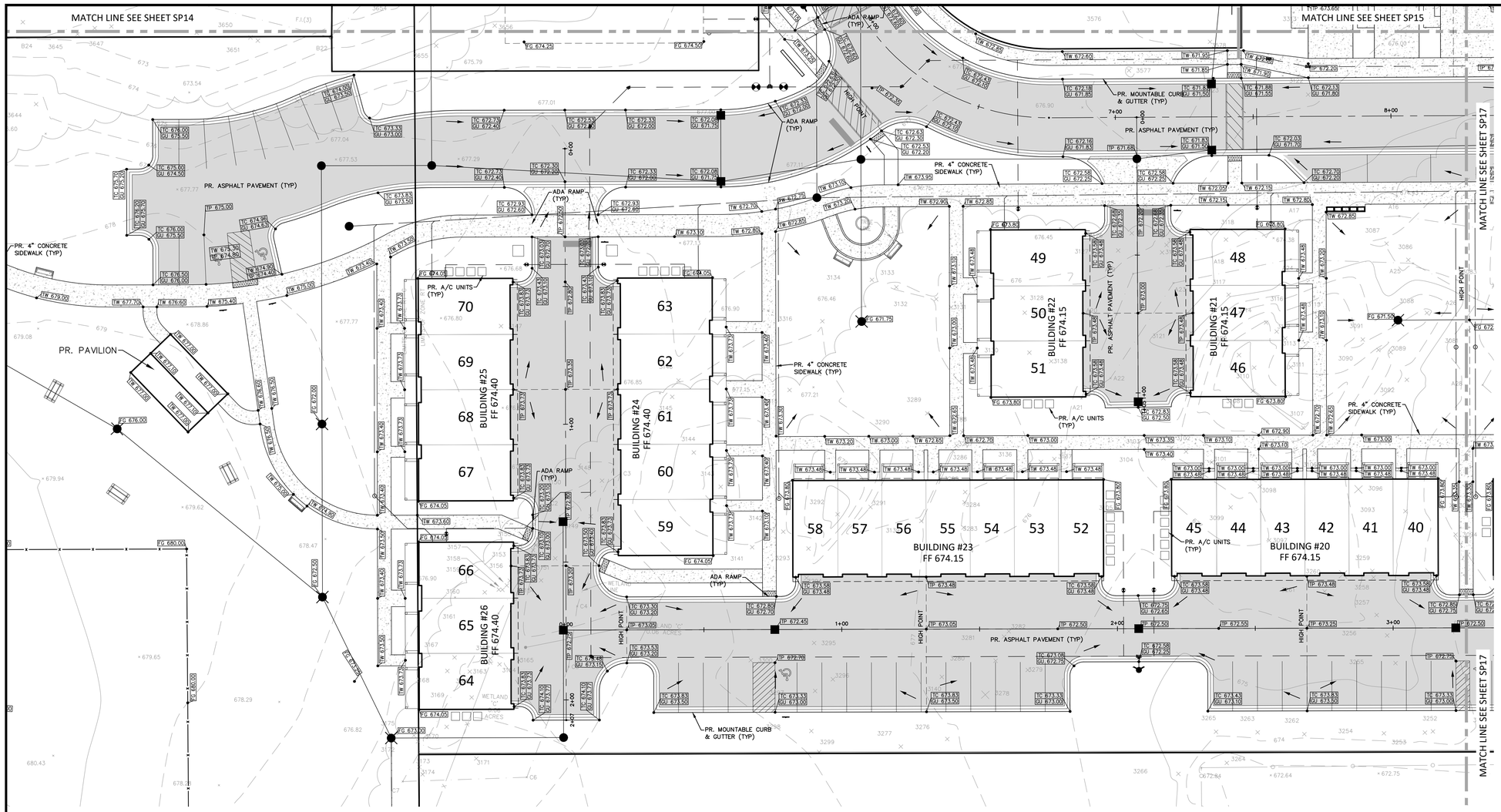
APPROVED BY:
B. Brickel

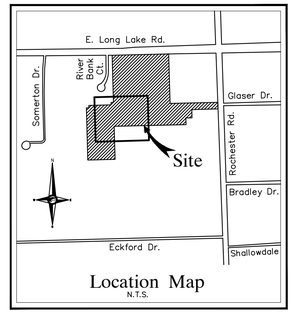
DATE:
April 14, 2021

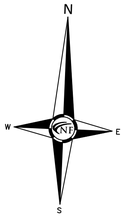
SCALE: 1" = 20'
20 10 0 10 20 30

NFE JOB NO. J943-01

SHEET NO. SP15







PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- MANHOLE CATCH BASIN
- UTILITY POLE
- GUY POLE
- GUY WIRE
- C.O.
- INLET
- C.B.
- EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- EXISTING WATERMAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- PR. SANITARY SEWER
- PR. WATER MAIN
- PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- FG 600.00 — FINISH GRADE ELEVATION

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER
Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Paving &
Grading Plan (5 of 8)

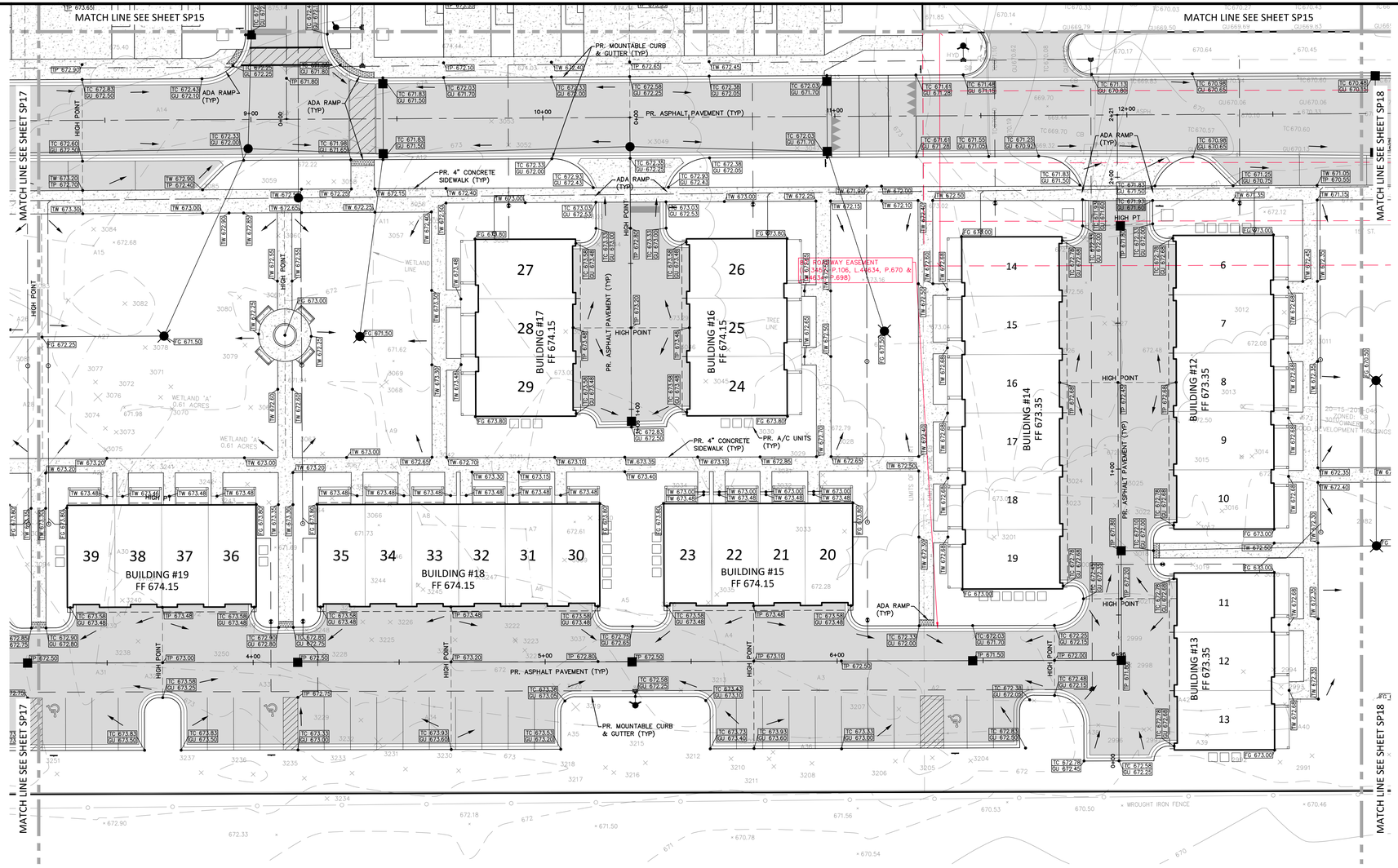
811
Know what's **below**
Call before you dig.

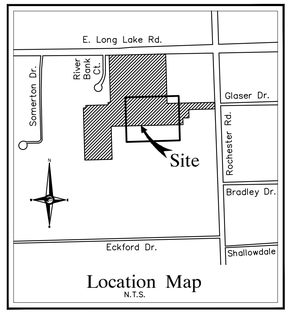
DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY: J. Lawrey
DESIGNED BY: B. Brickel
APPROVED BY: B. Brickel
DATE: April 14, 2021
SCALE: 1" = 20'

20 10 0 10 20 30

NFE JOB NO. **J943-01**
SHEET NO. **SP16**





NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Paving &
Grading Plan (6 of 8)

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

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

APPROVED BY:
B. Brickel

DATE:
April 14, 2021

SCALE: 1" = 20'
20 10 0 10 20 30

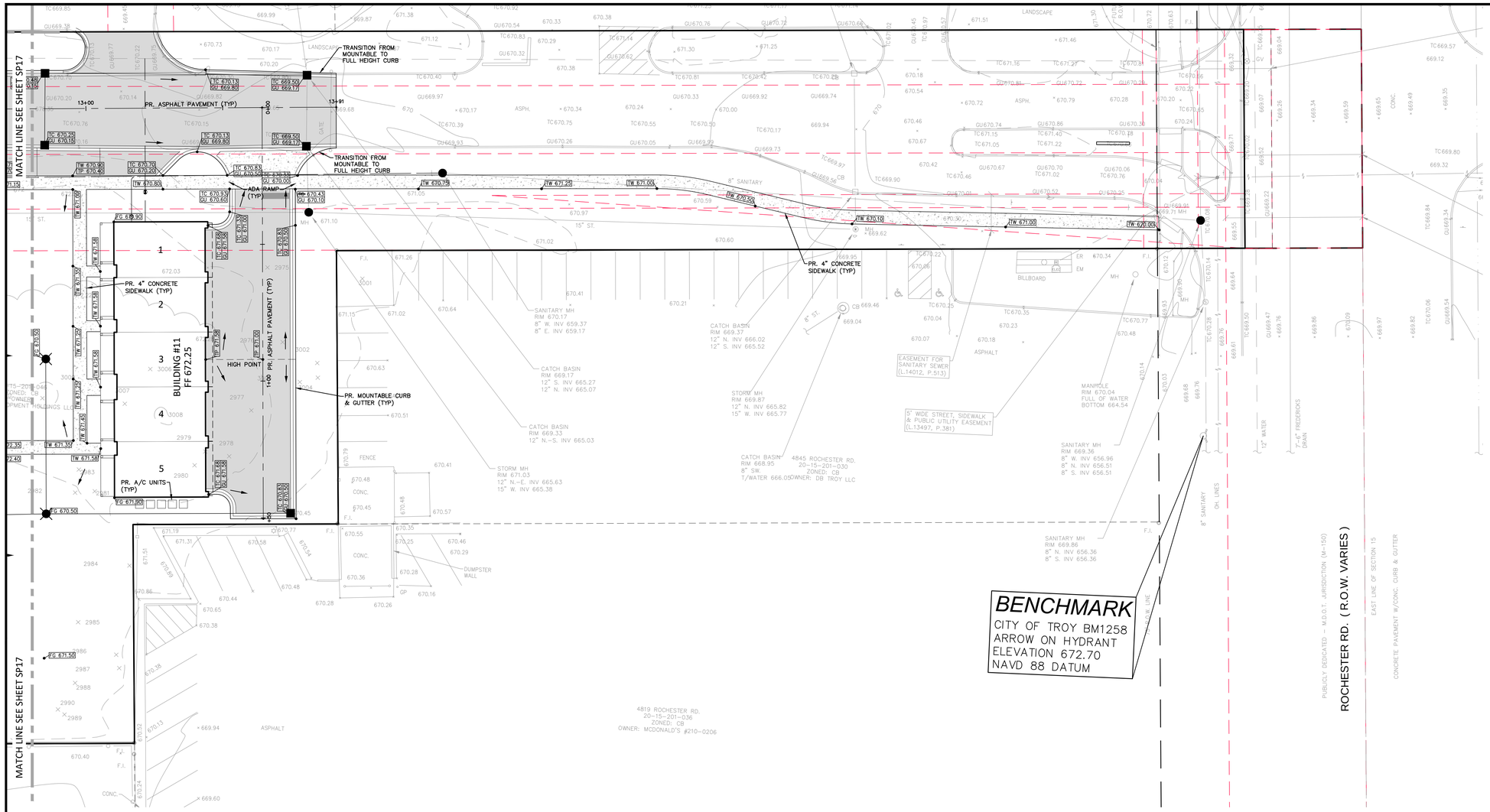
NFE JOB NO. **J943-01**
SHEET NO. **SP17**

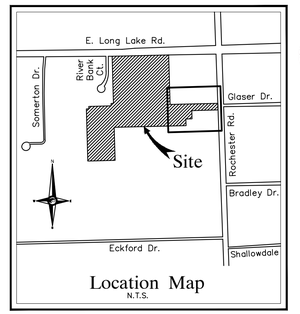
PAVING LEGEND

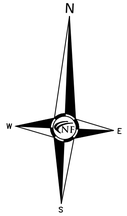
- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- MANHOLE CATCH BASIN
- UTILITY POLE
- GUY POLE
- GUY WIRE
- C.O.
- INLET
- C.B.
- EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- EXISTING WATERMAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- PR. SANITARY SEWER
- PR. WATER MAIN
- PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- FG 600.00 — FINISH GRADE ELEVATION







NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Paving & Grading Plan (7 of 8)

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

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY: J. Lawrey
DESIGNED BY: B. Brickel
APPROVED BY: B. Brickel
DATE: April 14, 2021
SCALE: 1" = 20'

20 10 0 10 20 30

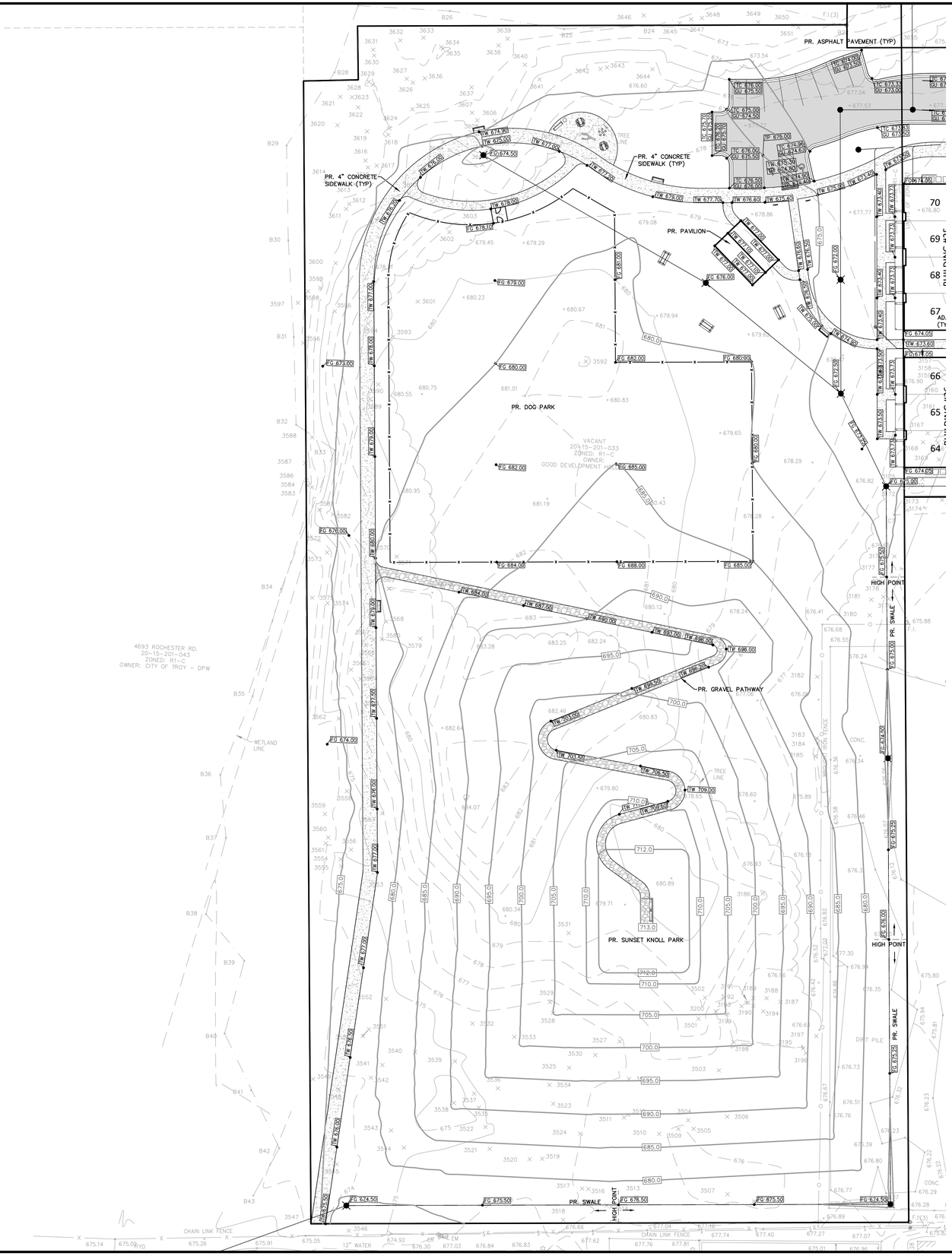
NFE JOB NO. **J943-01**
SHEET NO. **SP18**

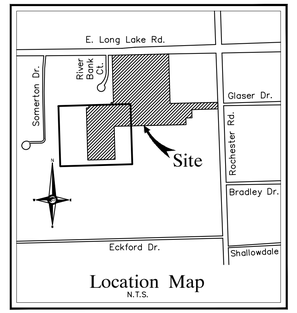
PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

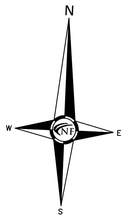
LEGEND

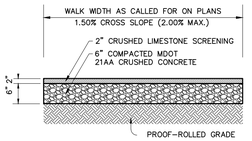
- MANHOLE — EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- HYDRANT, GATE VALVE — EXISTING WATERMAIN
- MANHOLE, CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- UTILITY POLE, GUY POLE, GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O., MANHOLE — PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- FG 600.00 — FINISH GRADE ELEVATION





Location Map
N.T.S.





AGGREGATE PATHWAY SECTION
N.T.S.

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- HYDRANT, GATE VALVE — EXISTING WATERMAIN
- MANHOLE, CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- UTILITY POLE, GUY POLE, GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O., MANHOLE — PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- FG 600.00 — FINISH GRADE ELEVATION

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER
Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Paving & Grading Plan (8 of 8)

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey

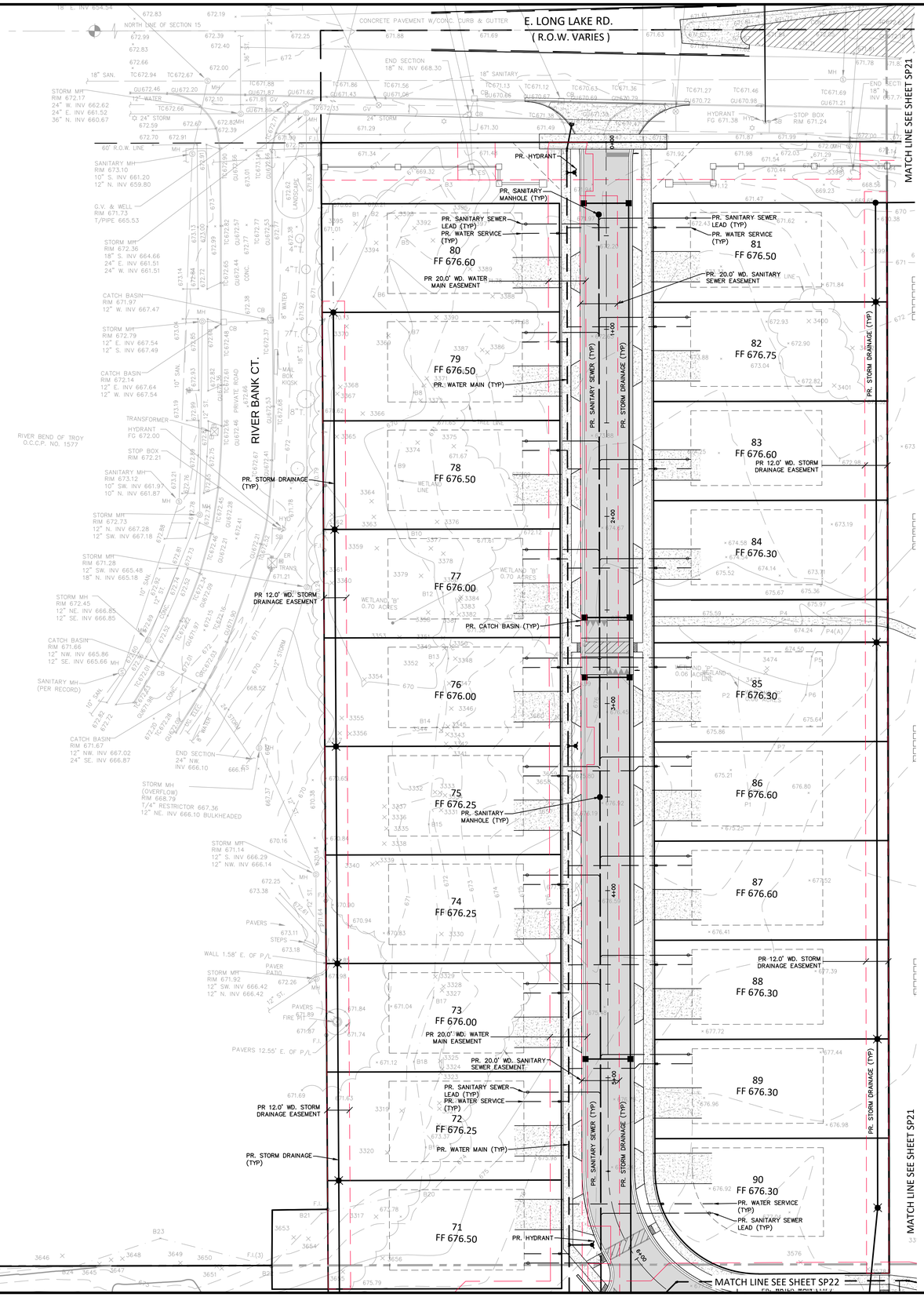
DESIGNED BY:
B. Brickel

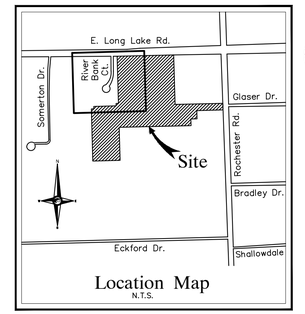
APPROVED BY:
B. Brickel

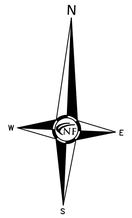
DATE:
April 14, 2021

SCALE: 1" = 30'
30 15 0 15 30 45

NFE JOB NO. **J943-01**
SHEET NO. **SP19**







NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Utility
Plan (1 of 4)

Know what's below
Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

APPROVED BY:
B. Brickel

DATE:
April 14, 2021

SCALE: 1" = 30'
30 15 0 15 30 45

NFE JOB NO. J943-01

SHEET NO. SP20

LEGEND

- EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- PR. SANITARY SEWER
- PR. WATER MAIN
- PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- SAND BACKFILL (95 % DENSITY)
- PROPOSED LIGHT POLE

E. LONG LAKE RD.
(R.O.W. VARIES)

NORTH LINE OF SECTION 15

MATCH LINE SEE SHEET SP20

MATCH LINE SEE SHEET SP23

PR. STORM DRAINAGE (TYP)

PR. STORM DRAIN (TYP)

PR. SANITARY SEWER (TYP)

PR. WATER MAIN (TYP)

PR. 20.0' WD. SANITARY SEWER EASEMENT

PR. 20.0' WD. WATER MAIN EASEMENT

BUILDING #1
FF 676.75
135 136 137 138 139 140

BUILDING #2
FF 677.00
141 142 143 144 145 146

BUILDING #3
FF 676.75
134 133 132 131 130

BUILDING #4
FF 677.00
129 128 127 126 125 124

BUILDING #5
FF 676.25
113 114 115 116 117

BUILDING #6
FF 676.50
118 119 120 121 122 123

BUILDING #7
FF 676.25
112 111 110 109 108

BUILDING #8
FF 676.50
107 106 105 104 103 102

BUILDING #9
FF 675.65
91 92 93 94 95

BUILDING #10
FF 675.55
96 97 98 99 100 101

PR. SANITARY SEWER LEAD (TYP)
PR. WATER SERVICE (TYP)
PR. HYDRANT

0+00 1+00 1+83 2+00 3+00 3+28 4+00

BENCHMARK
CITY OF TROY BM0464
ARROW ON HYDRANT
ELEVATION 674.44
NAVD 88 DATUM

CATCH BASIN
RIM 671.62
12" S. INV 667.62

CATCH BASIN
RIM 671.61
12" S. INV 668.11
12" N. INV 666.66
12" SW. INV 666.26

CATCH BASIN
RIM 671.40
12" N. INV 668.65

CATCH BASIN
RIM 672.37
12" NE. INV 666.37
12" E. INV 664.72
12" W. INV 664.67

HYDRANT
FG 672.00

G.V. & WELL
RIM 671.83
T/PIPE 665.03

ATT VAULT
RIM 672.68
(2.5'x4')

EX. BLDG.

15' WIDE R.O.W. IN FAVOR OF FREDERICKS DRAIN (L.10780, P.492)

15' WIDE R.O.W. IN FAVOR OF FREDERICKS DRAIN (L.10099, P.368)

940 E. LONG LAKE RD.
OWNER: BANK OF AMERICA NA &
ATTN CORP REAL ESTATE ASSESSMENTS

850 E. LONG LAKE RD.
20-15-201-015
ZONED: NN (L)
OWNER:
OMNE HOLDINGS LLC

920
E. LONG LAKE RD.
20-15-201-016
ZONED: NN (L)
OWNER:
GA INVESTMENTS CO.

40' EASEMENT (PER RECORD)

7'-6" FREDERICKS DRAIN

MH

7'-6" DRAIN

STORM MH
RIM 671.02
90° W. INV 656.82
90° E. INV 656.77

4915 ROCHESTER RD.
20-15-201-040
ZONED: NN (L)
OWNER: DOCA LLC

4897 ROCHESTER RD.
20-15-201-048
ZONED: NN (L)
OWNER: KING OFFICE PLAZA LLC

VACANT
20-15-201-046
ZONED: RT
OWNER:
GOOD DEVELOPMENT HOLDINGS

SCREEN WALL 1.61' W. OF P/L

SCREEN WALL

GRAVEL

DUMPSTER WALL

CATCH BASIN
RIM 669.30
12" S. INV 666.00

CATCH BASIN
RIM 668.82

CATCH BASIN
RIM 669.21
12" N. INV 666.11
12" S. INV 665.81

CATCH BASIN
RIM 669.28
12" E. INV 664.28

CATCH BASIN
RIM 668.97
12" W. INV 663.97
12" NE. INV 663.82

HYDRANT
FG 670.80

STOP BOX
RIM 670.84

STORM MH
RIM 670.57
12" N. INV 665.72
15" E. INV 665.72

END SECTION
12" SW. INV 662.87

WATER LEVEL=663.81
(AS OF 3-19-2021)

APPROXIMATE LOCATION OF RETENTION POND EASEMENT (L.25245, P.66)

CATCH BASIN
(PER RECORD)

END SECTION
15" E. INV 662.89

RETENTION POND

DUMPSTER WALL

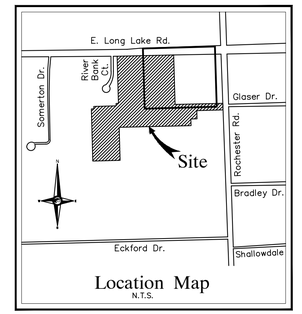
FUEL MH
RIM 670.47

CROSS-ACCESS EASEMENT
JOINT-DRIVE EASEMENT
(L.12003, P.827)

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT, GATE VALVE — SAN. CLEAN OUT
- MANHOLE, CATCH BASIN — EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- UTILITY POLE, GUY POLE, GUY WIRE — EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O., MANHOLE — PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- SAND BACKFILL (95 % DENSITY)
- PROPOSED LIGHT POLE

N
W KNF E
S



Location Map
N.T.S.

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL
STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER
Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Utility
Plan (2 of 4)

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

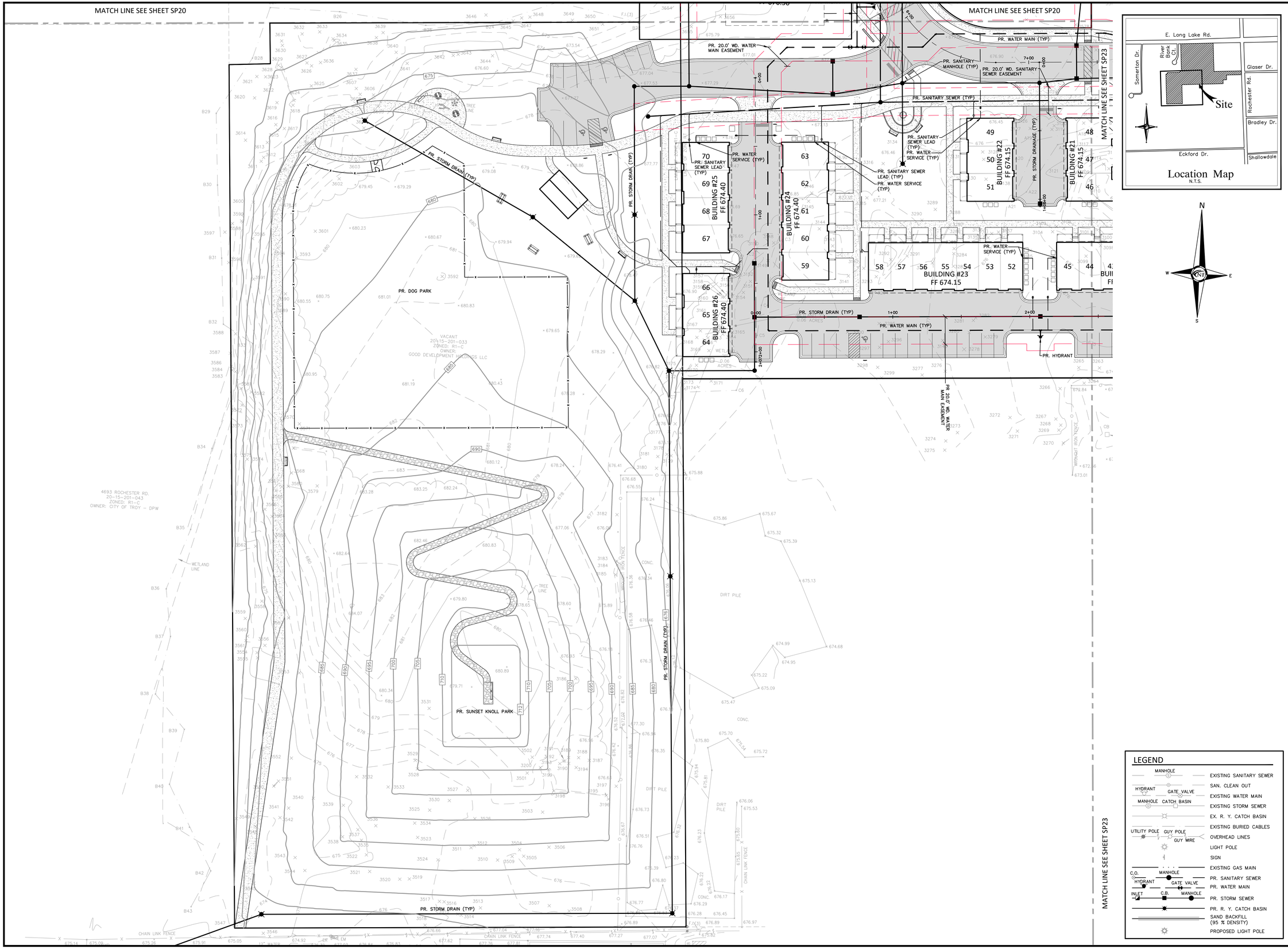
DRAWN BY:
J. Lawrey
DESIGNED BY:
B. Brickel
APPROVED BY:
B. Brickel
DATE:
April 14, 2021
SCALE: 1" = 30'
30 15 0 15 30 45

NFE JOB NO. J943-01
SHEET NO. SP21

MATCH LINE SEE SHEET SP20

MATCH LINE SEE SHEET SP20

MATCH LINE SEE SHEET SP23



LEGEND

- EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- PR. SANITARY SEWER
- PR. WATER MAIN
- PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- SAND BACKFILL (95 % DENSITY)
- PROPOSED LIGHT POLE

NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Utility
Plan (3 of 4)

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

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

APPROVED BY:
B. Brickel

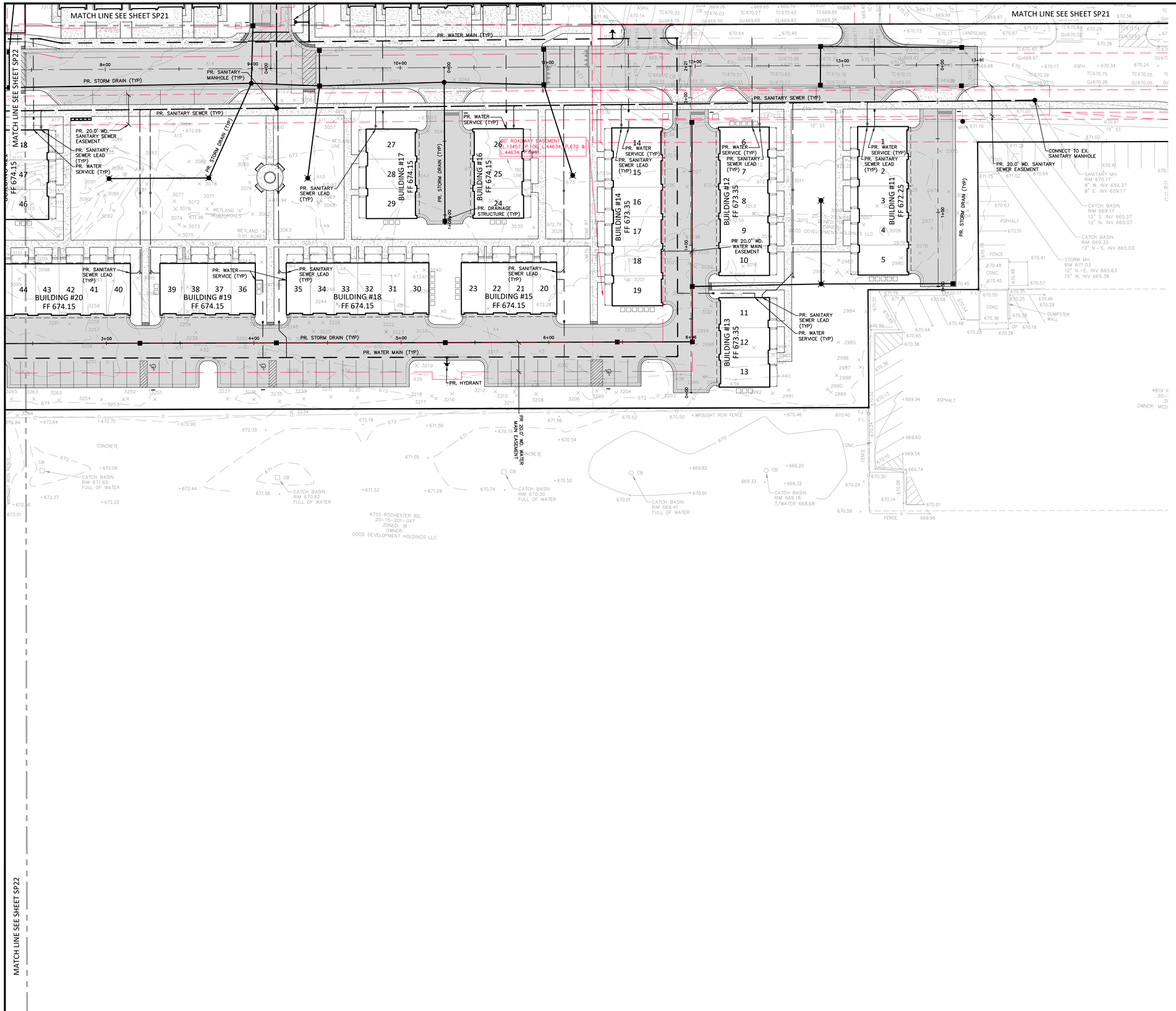
DATE:
April 14, 2021

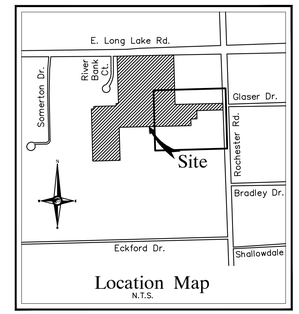
SCALE: 1" = 30'

30 15 0 15 30 45

NFE JOB NO. **J943-01**

SHEET NO. **SP22**





LEGEND

- EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- PR. SANITARY SEWER
- PR. WATER MAIN
- PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- SAND BACKFILL (95 % DENSITY)
- PROPOSED LIGHT POLE

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER
Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Utility
Plan (4 of 4)

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

APPROVED BY:
B. Brickel

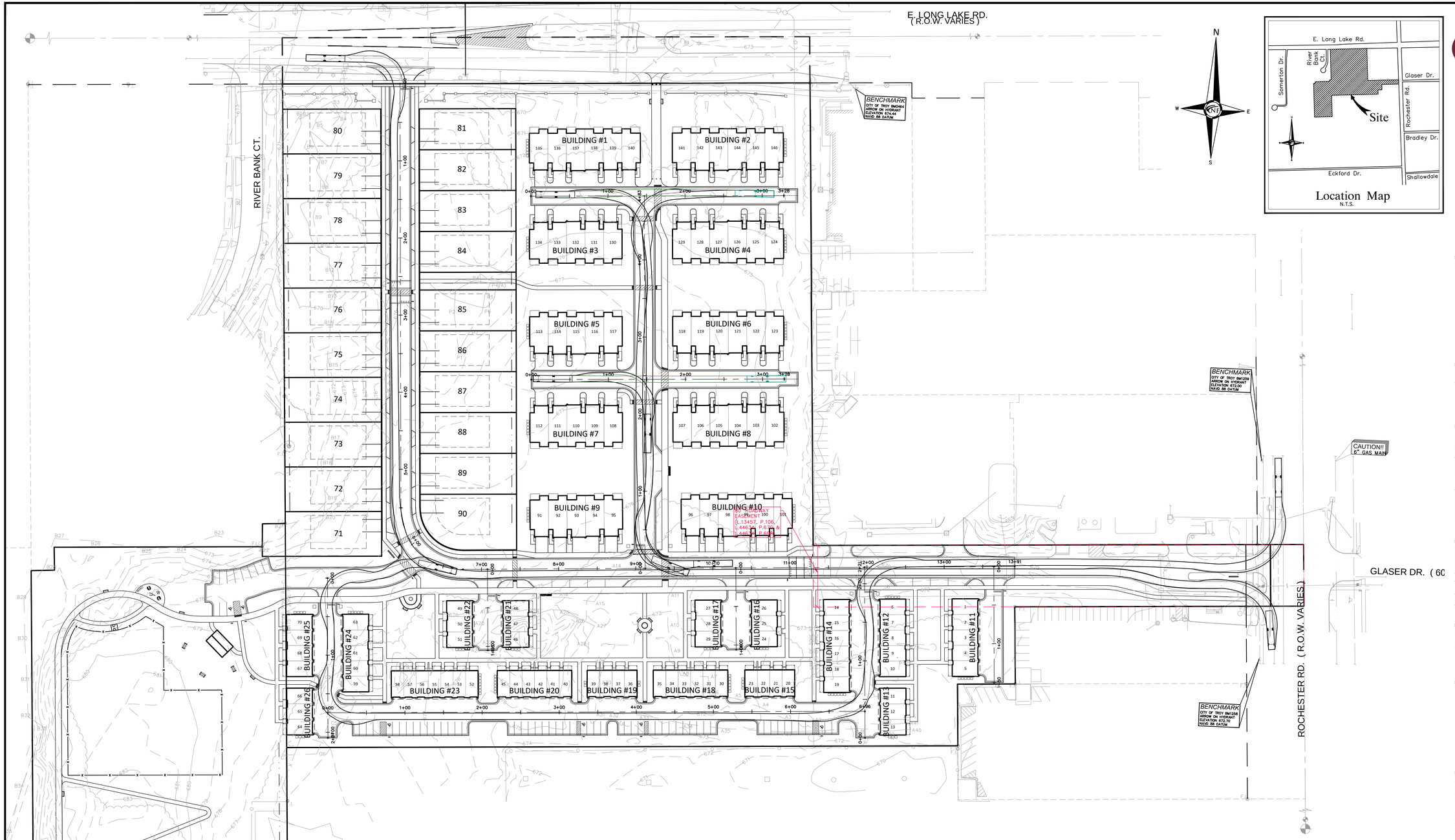
DATE:
April 14, 2021

SCALE: 1" = 30'

30 15 0 15 30 45

NFE JOB NO. **J943-01**

SHEET NO. **SP23**



Location Map
N.T.S.

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
BRAD W. BRICKEL
ENGINEER NO. 54071
LICENSED PROFESSIONAL ENGINEER
Brad Brickel

PROJECT
The Village of Troy

CLIENT
Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
tloughrin@robertsonhomes.com

PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Fire Truck Turning Plan

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

DATE	ISSUED/REVISED
04-14-21	SURVEY ISSUED
03-29-22	ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22	REVISED PER SITE PLAN REVIEW
11-07-22	REVISED PER SITE PLAN REVIEW

DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

APPROVED BY:
B. Brickel

DATE:
April 14, 2021

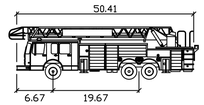
SCALE: 1" = 60'

60 30 0 30 60 90

NFE JOB NO. **J943-01**

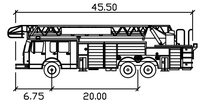
SHEET NO. **SP24**

FIRE LANE SIGN DETAIL



Tower Truck

	feet
Width	: 8.33
Track	: 8.33
Lock to Lock Time	: 6.0
Steering Angle	: 33.3



Fire Truck

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 33.3

FIRE DEPARTMENT NOTE

THE FOUR (4) INCH STEAMER CPAS ON ALL HYDRANTS WILL BE PAINTED ACCORDING TO THE FOLLOWING:

WHITE ON 4.00 INCH MAINS
RED ON 6.00 INCH MAINS
ORANGE ON 8.00 INCH MAINS
GREEN ON 12.00 INCH MAINS
BLUE ON 16.00 INCH OR LARGER MAINS

NO PARKING SHALL BE PERMITTED AND/OR NO OBSTRUCTIONS SHALL BE PLACE OR CONSTRUCTED WITHIN FIFTEEN (15) FEET OF ANY FIRE HYDRANT OR FIRE DEPARTMENT CONNECTION, PUBLIC OR PRIVATE.

THE FIRE DEPARTMENT CONNECTION MUST BE LOCATED WITHIN ONE HUNDRED (100) FEET OF A FIRE HYDRANT AND WITHIN FIFTY (50) FEET OF A MINIMUM EIGHTEEN (18) FOOT WIDE PAVED DRIVEWAY OR STREET.

GAS METER, PROPANE TANKS, OVERHEAD ELECTRICAL SERVICE, AND TRANSFORMERS MUST NOT BE LOCATED ON THE SAME SIDE OF THE BUILDING OR STRUCTURE AS THE FIRE DEPARTMENT CONNECTION UNLESS A CLEAR DISTANCE OF ONE HUNDRED FIFTY (150) FEET CAN BE MAINTAINED BETWEEN UTILITIES AND THE FIRE DEPARTMENT CONNECTION.

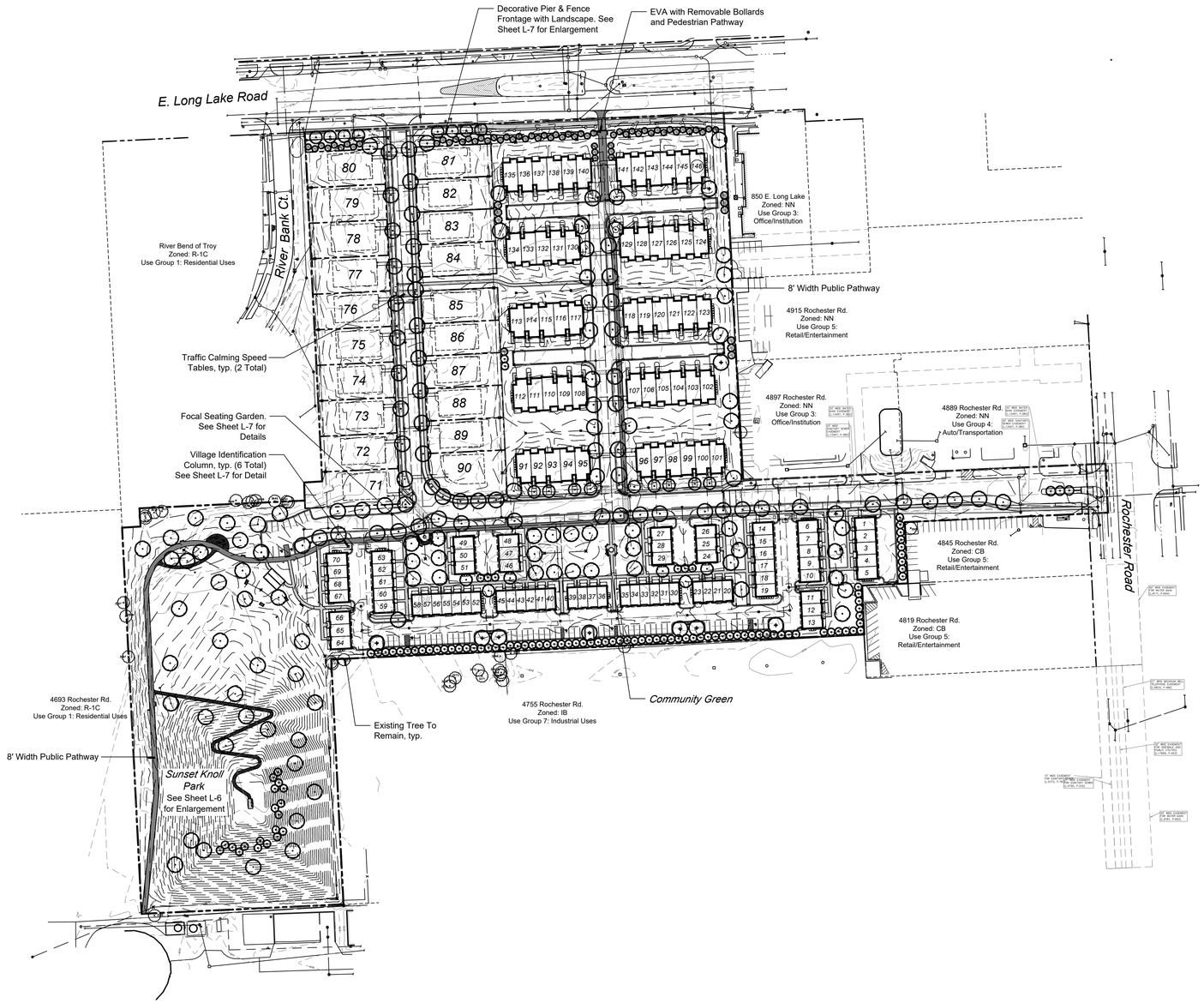
ALL DRIVE AREAS MUST BE POSTED AS FIRE LANES WITH UNIFORM SIGNS IN KEEPING WITH THE STANDARD ESTABLISHED IN THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. SIGNS MUST BE ERECTED ON BOTH SIDES OF THE FIRE LANES WITH SPACING BETWEEN SIGNS NOT TO EXCEED ONE HUNDRED (100) FEET.

DESIGNATED EXIT DOORS ONTO DRIVES OR PARKING AREAS MUST BE PROTECTED WITH GUARD POSTS OR PARKING BLOCKS.

A WHITE HIGH VISIBILITY STRIPE SHALL BE PAINTED ON THE UPPER FLANGE OF ALL FIRE HYDRANTS.

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- HYDRANT, GATE VALVE — EXISTING WATERMAIN
- MANHOLE, CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- UTILITY POLE, GUY POLE, GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O., MANHOLE — PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE



design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

Landscape Summary

Use of Native Plant Material
Required: 50% of the total trees and shrubs planted are native
Proposed: Final percentage to be determined during final site plan approval

Screening of Adjoining Uses
Required: Per Table 13.02-B in Article 13 of the Troy Zoning Ordinance, no screening is required between Use Group 1: Residential Uses, Use Group 2: Residential/Lodging Uses, and the surrounding land uses in these specific situations. See Plan for Zoning relationships

Parking Lot Landscape
Required: 1 Tree / 8 Parking Spaces
Proposed: 77 spaces
Required: 10 Trees
Provided: 10 Trees

Greenbelts along Public Streets
Required: 10' Greenbelt along public street right-of-ways
1 Tree / 30 LF
E. Long Lake Road
Length of Frontage: 684.03 LF
Required: 10' Greenbelt & 23 Trees
Provided: 10' Greenbelt & 13 Trees
Rochester Road
Length of Frontage: 80.00 LF
Required: 10' Greenbelt & 3 Trees
Provided: 10' Greenbelt & 3 Trees

Internal Street Trees
Required: 1 Tree / 50 LF of internal public & private streets
Road Length: 4,311.37 LF
Required: 87 Trees
Proposed: 87 Trees

R.O.W. Screening
Required: Screening Alternative 2 when site abuts a R.O.W. of 120' or 150'
Required: 1 Large Evergreen / 10 LF of frontage
Length of Frontage: 684.03 LF
Required: 68 Trees
Provided: 68 Trees

Tree Replacement Summary

Total Trees Surveyed: 658
- Total Trees Offsite: 26

Total Onsite Trees: 632
- Total Landmark Trees: 10

Total Trees Saved: 6
- Total Landmark Trees: 0

Total Trees Removed: 626
- Exempt Trees: 562 (These trees include prohibited species & Poor Quality)
- Total Woodland DBH Removed: 640.60"
- Total Landmark DBH Removed: 232.30"

Replacement Requirements:
Required: 100% Landmark DBH + 50% Woodland DBH
Required Replacement DBH Total: 552.60" (185 - 3" trees or equivalent)
Proposed Replacement DBH Total: 555.00" (185 - 3" trees or equivalent)

■ sheet title:
Concept Landscape Plan - Overall

■ project title:
Village of Troy
City of Troy, Michigan

■ prepared for:
Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

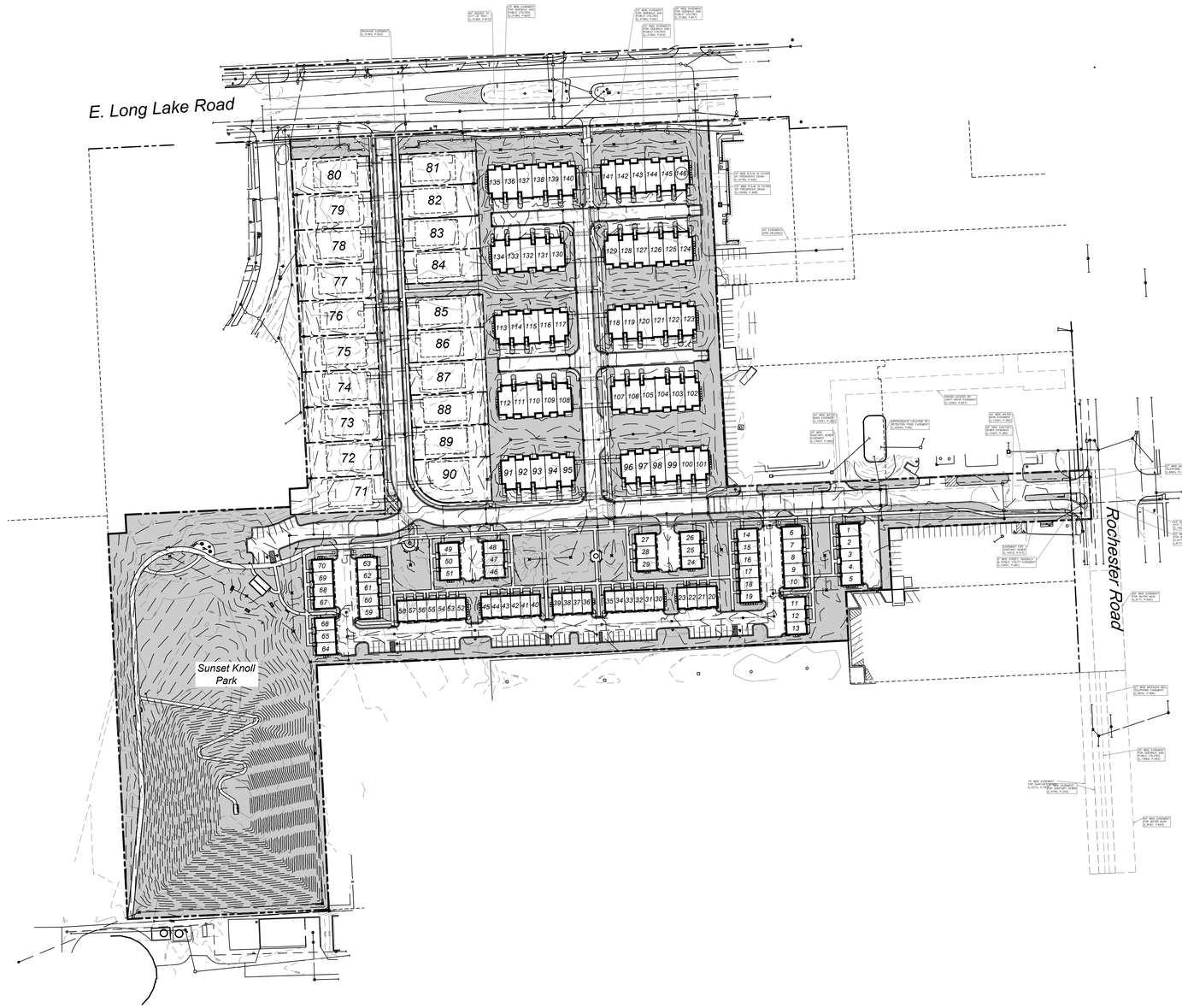
■ job number:	■ date:
19017	03.29.2022
■ drawn by:	■ checked by:
EMJ	WTK

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

■ revisions:
10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

0 50' 100' 200' 300' 400'
1"= 100'
North

sheet no.
L-1



Landscape Area Summary

Site Landscaping

Required:	Min. 20% of site area shall be landscape material
Site Area:	20.49 Ac.
Required:	4.01 Ac.
Provided:	9.24 Ac. (45.09%)

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

STATE OF MICHIGAN
WILLIAM T. KREAD
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Landscape Area Calculations

■ project title:

Village of Troy

City of Troy, Michigan

■ prepared for:

Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

■ job number:	■ date:
19017	03.29.2022

■ drawn by:	■ checked by:
EMJ	WTK

■ revisions:

10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

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

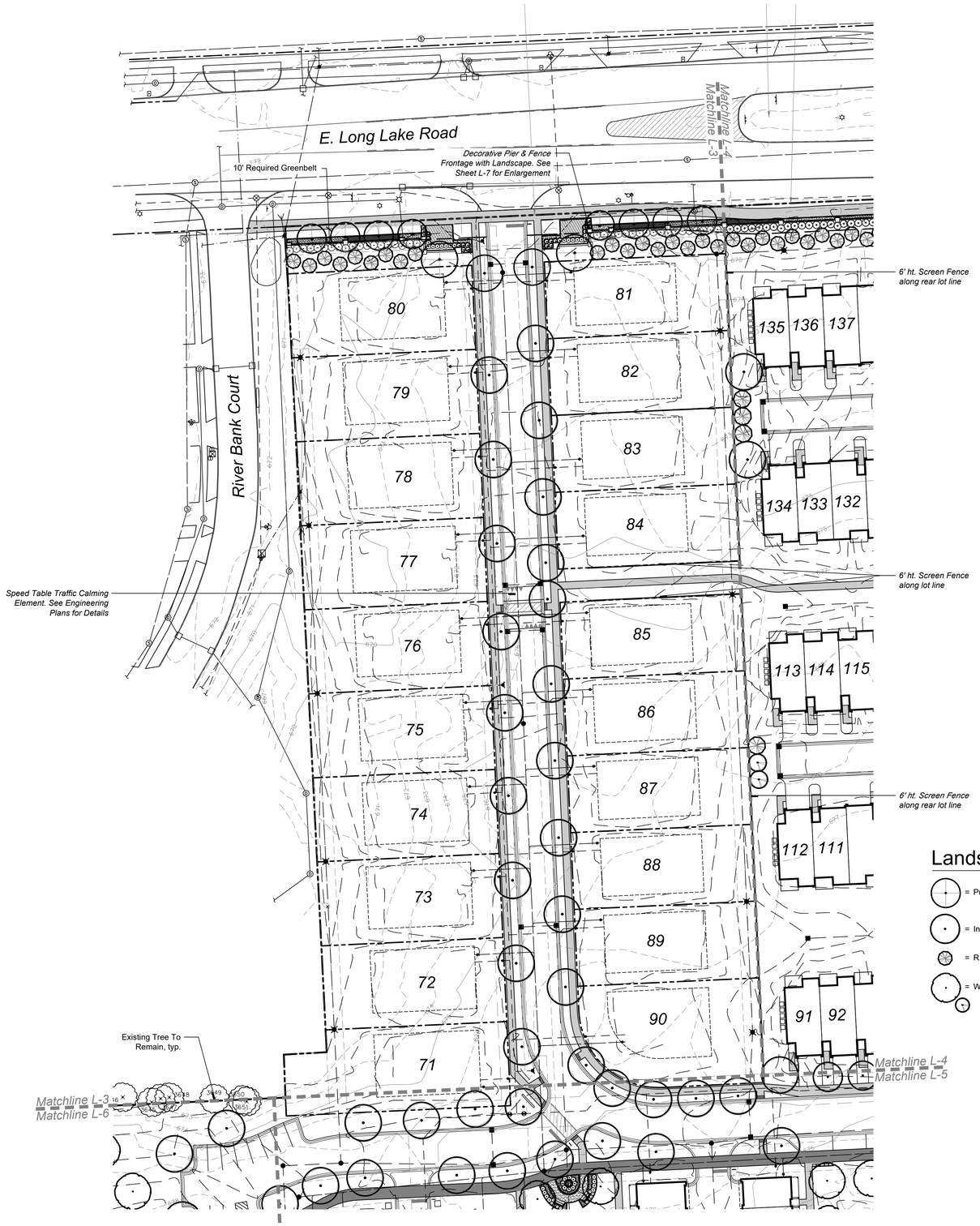
1"= 100'

0 50' 100' 200' 300' 400'

North

sheet no.

L-2



Landscape Legend

= Public Road Greenbelt Tree

= Internal Street Tree

= R.O.W. Screening Tree

= Woodland Replacement Trees

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

STATE OF MICHIGAN
WILLIAM T. KREAD
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Enlargement Plans - Single Family Lots

■ project title:

Village of Troy

City of Troy, Michigan

■ prepared for:

Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

■ job number:	■ date:
19017	03.29.2022

■ drawn by:	■ checked by:
EMJ	WTK

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

■ revisions:

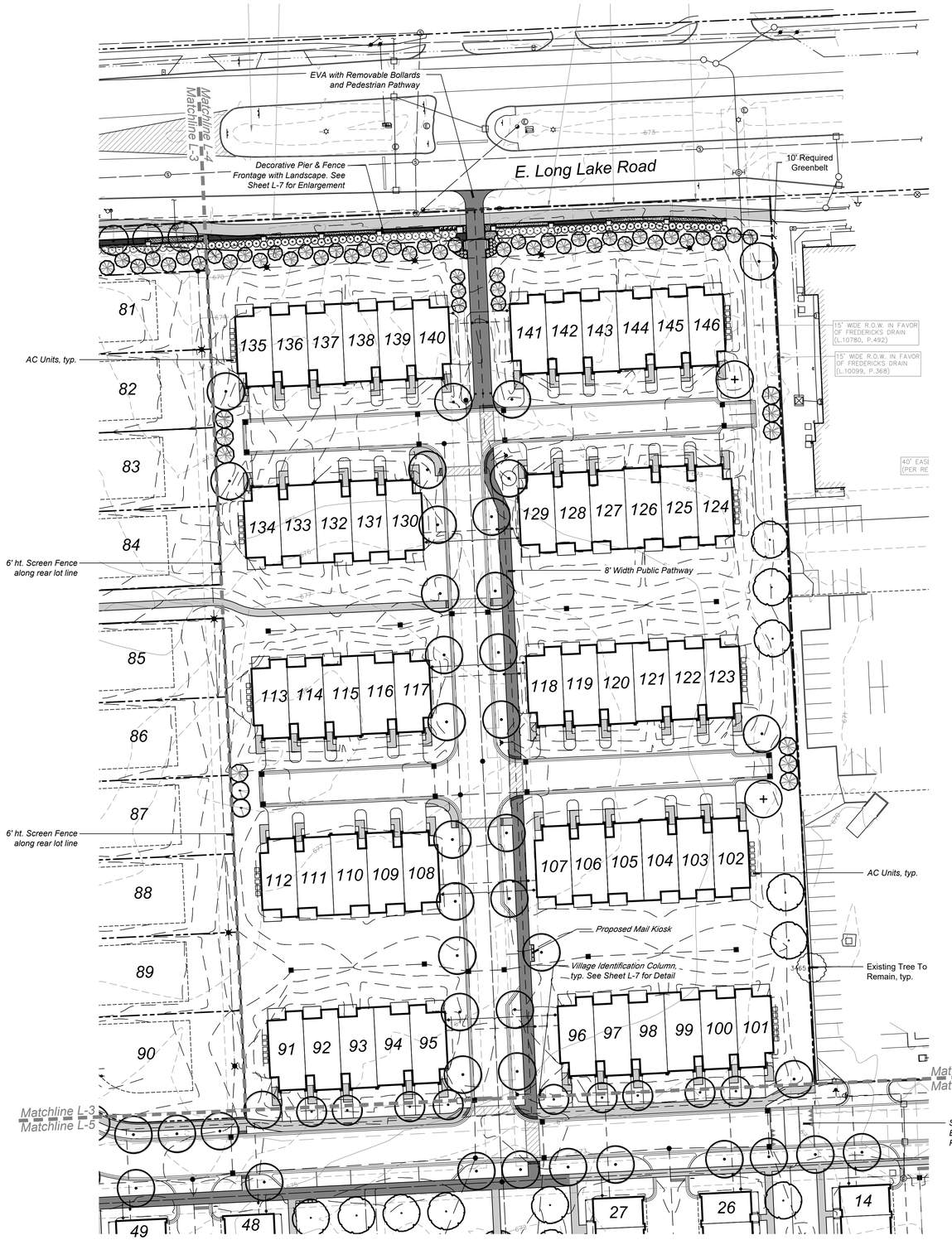
10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

0 20' 40' 80' 120' 160'
1"= 40'

North

sheet no.

L-3



Landscape Legend

- = Parking Lot Landscape Tree
- = Internal Street Tree
- = R.O.W. Screening Tree
- = Woodland Replacement Trees

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

STATE OF MICHIGAN
WILLIAM T. KREAD
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Enlargement Plans - Townhomes North

■ project title:

Village of Troy

City of Troy, Michigan

■ prepared for:

Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

■ job number:	■ date:
19017	03.29.2022

■ drawn by:	■ checked by:
EMJ	WTK

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

■ revisions:

10.21.2022	Per Plan Revisions
11.07.2022	Per Plan Revisions

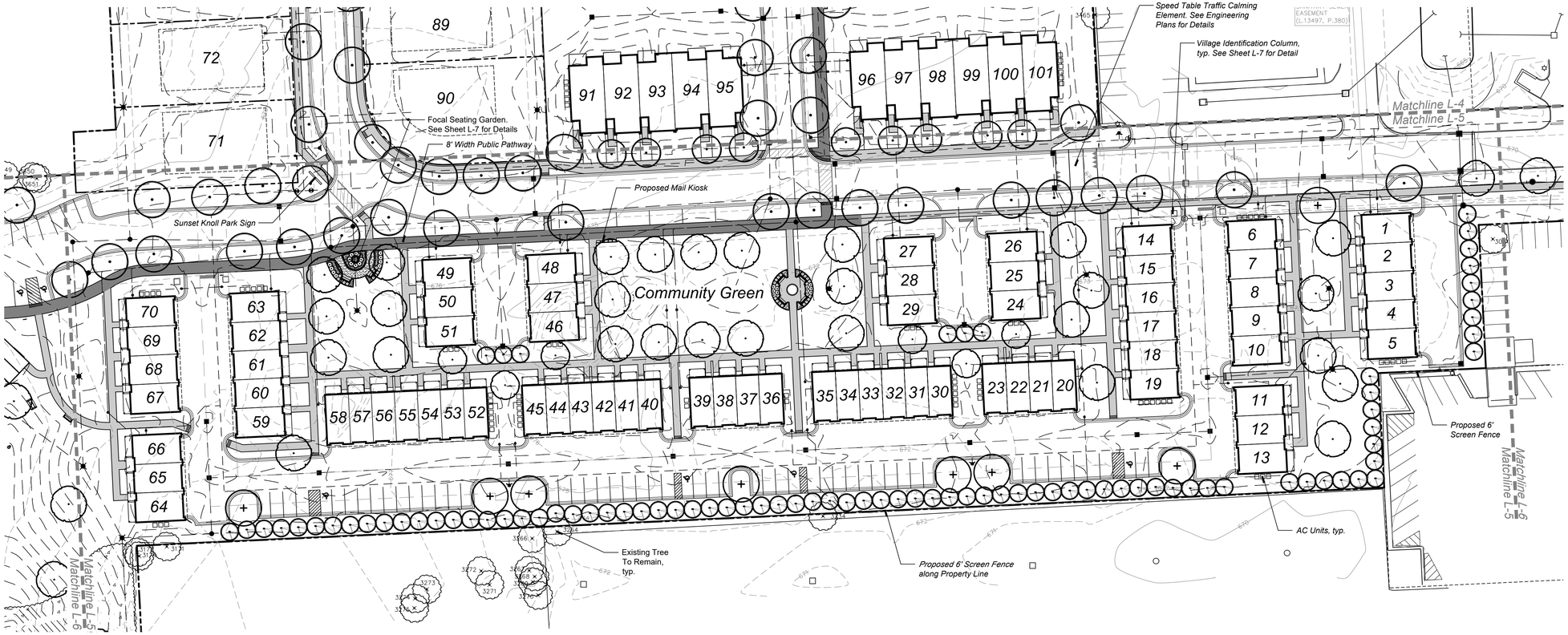
1"= 40'

0 20' 40' 80' 120' 160'

North

sheet no.

L-4



Landscape Legend

+ = Parking Lot Landscape Tree

• = Internal Street Tree

• + = Woodland Replacement Trees

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

0 20' 40' 80' 120' 160' 1"= 40'

North

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

STATE OF MICHIGAN — WILLIAM T. KREAD — LANDSCAPE ARCHITECT — No. 1177 — LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Enlargement Plans - Townhomes South

■ project title:

Village of Troy

City of Troy, Michigan

■ prepared for:

Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

■ job number:	■ date:
19017	03.29.2022

■ drawn by:	■ checked by:
EMJ	WTK

■ revisions:

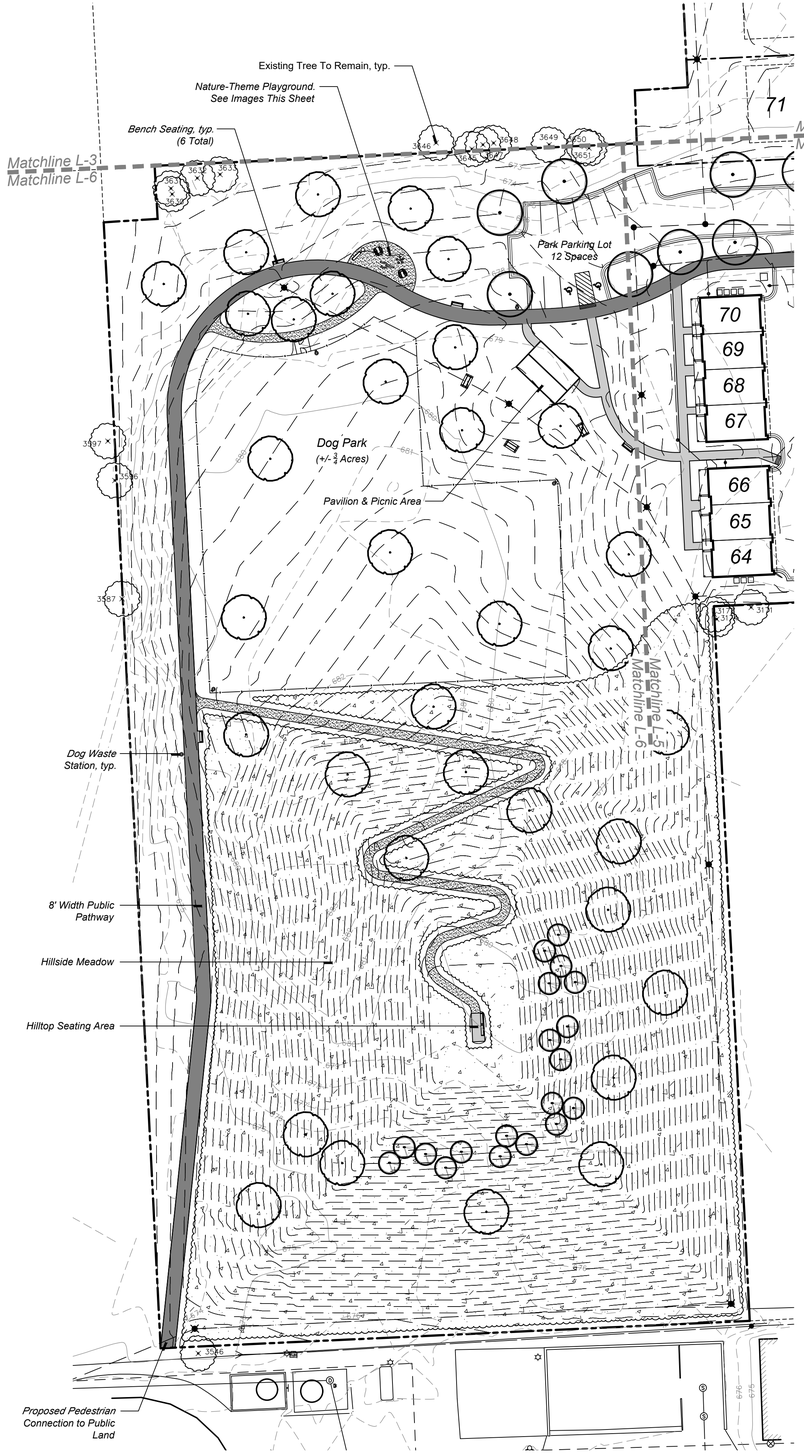
10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

sheet no.

L-5

Nature Playground Imagery

Dog Waste Station

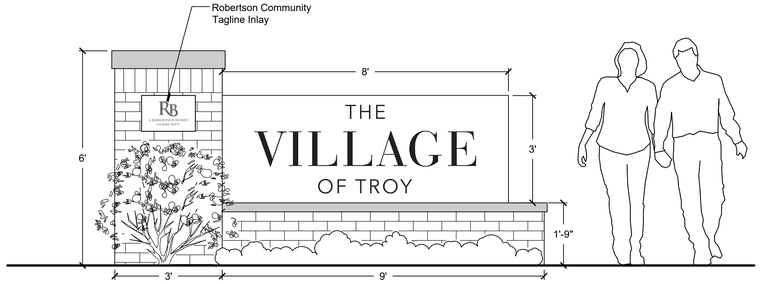


Sunset Knoll Park Enlargement Plan

Scale: 1" = 40'

Landscape Legend

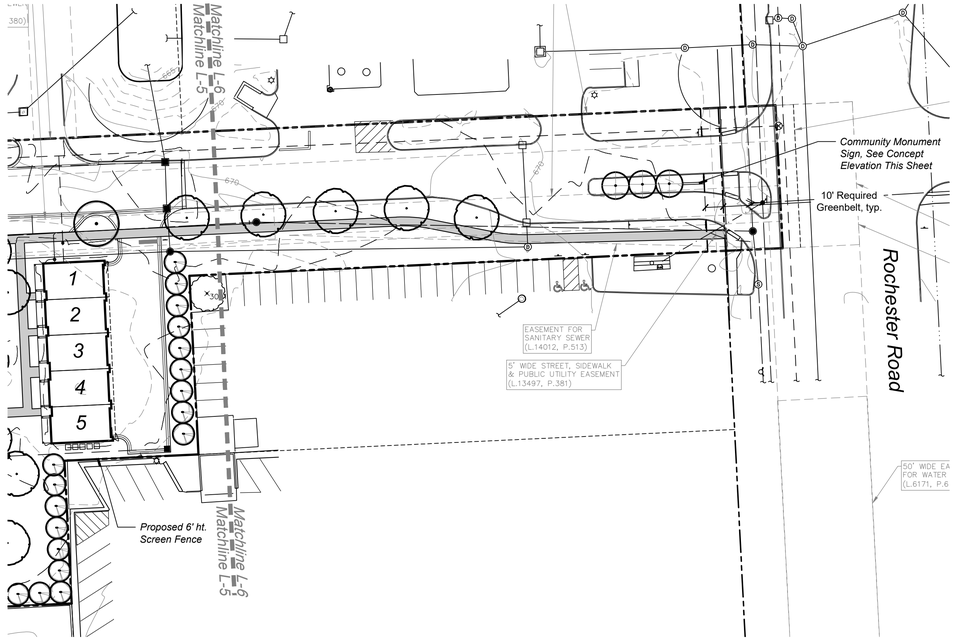
- = Parking Lot Landscape Tree
- = Public Road Greenbelt Tree
- = Internal Street Tree
- = Woodland Replacement Trees
- = Concrete/Asphalt Sidewalk
- = Stone Aggregate Pathway



Rochester Road Community Monument Sign Concept

Note: This Sign Detail is to be considered conceptual. Final sign details shall be developed for Sign Permit application.

Scale: 1/2" = 1'



East Community Entrance Enlargement Plan

Scale: 1" = 40'

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

STATE OF MICHIGAN
WILLIAM T. KREAD
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Enlargement Plans - Park & East Entry

■ project title:

Village of Troy

City of Troy, Michigan

■ prepared for:

Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

■ job number:	■ date:
19017	03.29.2022
■ drawn by:	■ checked by:
EMJ	WTK

■ revisions:

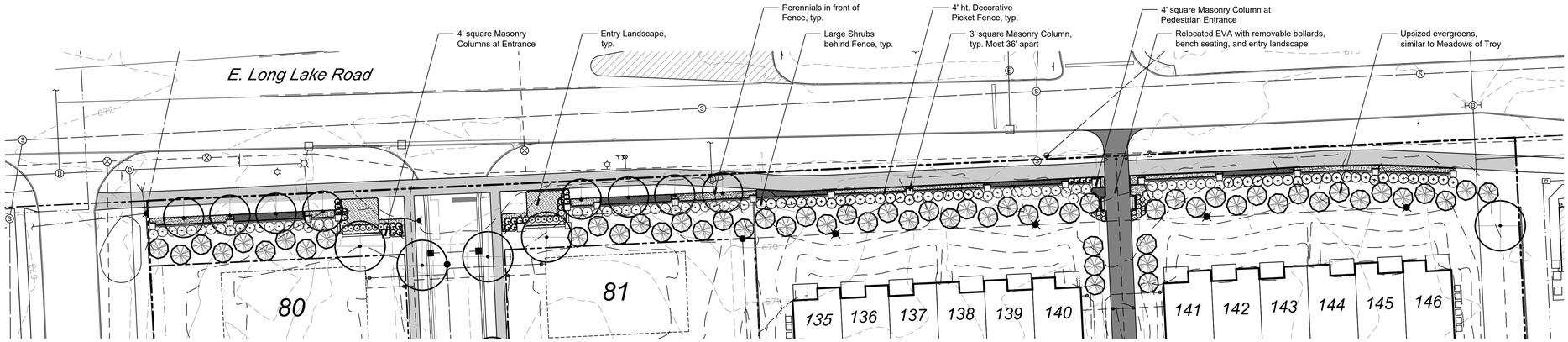
10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

Know what's below. Call before you dig.

North

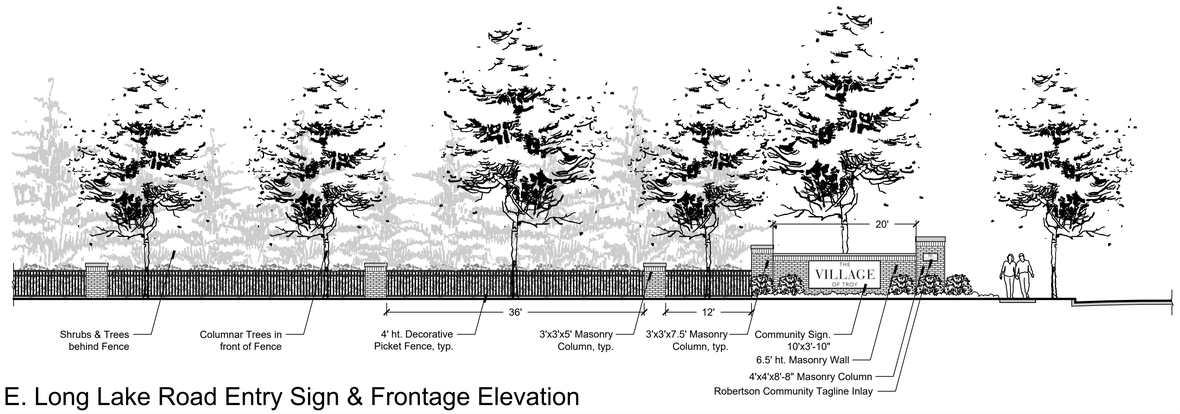
sheet no.

L-6



East Long Lake Road Frontage Enlargement Plan

Scale: 1" = 30'



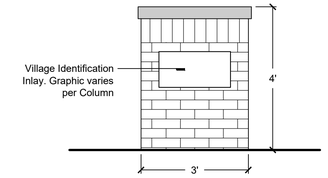
E. Long Lake Road Entry Sign & Frontage Elevation

Scale: 1" = 10'

Sign Ordinance

	Allowed	Proposed
- Sign Area:	100 sf*	24 sf & 38.33 sf
- Sign Height:	12' ht. max	5'-4" ht.
- Sign Setback:	10' min.	21'-6"

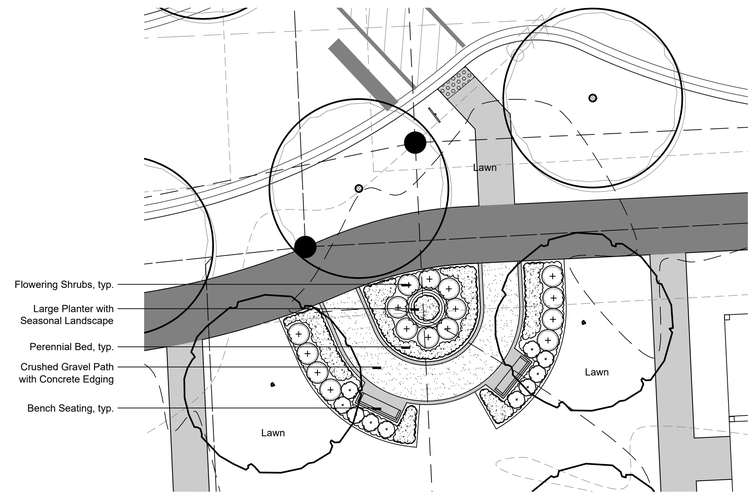
*Note: Allowable Sign Area takes into consideration 2 entry signs where the combined sign areas cannot exceed 100 sf



Village Identification Column Detail

Scale: 1/2" = 1'

Dune Planter from Landscape Forms
60" dia. with 40" ht.



Focal Garden Enlargement Concept

Scale: 1" = 10'

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

STATE OF MICHIGAN
WILLIAM T. KREAD
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Long Lake Frontage & Focal Park

■ project title:

Village of Troy

City of Troy, Michigan

■ prepared for:

Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

■ job number:	■ date:
19017	10.20.2022

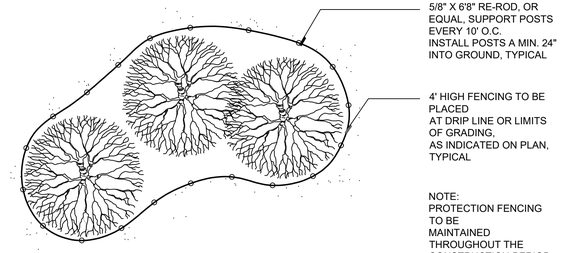
■ drawn by:	■ checked by:
EMJ	WTK

■ revisions:
11.07.2022 Per Plan Revisions

Know what's below. Call before you dig.

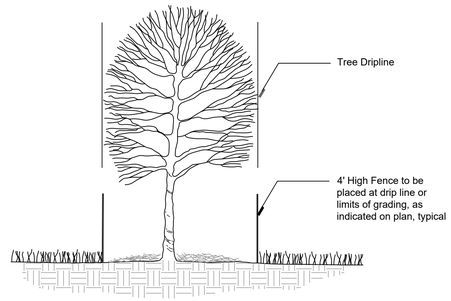
North

sheet no.
L-7



Tree Protection Detail - Plan

Scale: NTS



Tree Protection Detail - Section

Scale: NTS

Tree Protection Notes

1. Approved tree protection shall be erected prior to the start of construction activities, and shall remain in place until construction is complete.
2. No person may conduct any activity within the drip line, or protected area, of any designated tree to remain, including, but not limited to, placing solvents, building materials, construction equipment, etc.
3. Grade changes may not occur within the drip line of protected trees.
4. During construction, no person shall attach any device or wire to any remaining tree.
5. All utility service requests must include notification to the installer that protected trees must be avoided. All trenching shall occur outside of the protective fencing.
6. Swales shall be routed to avoid the area within the drip lines of protected trees.
7. Trees located on adjacent properties that may be affected by construction activities must be protected.
8. Trees to be removed shall be flagged by the Owner Representative prior to site grading.
9. Root zones of protected trees should be well marked with bright colors and surrounded with rigidly staked fencing.
10. The parking of idle and running equipment shall be prohibited under the drip line of protected trees.
11. The stripping of topsoil from around protected trees shall be prohibited.
12. Trees to be removed shall be fell away from trees to be saved.
13. Grubbing of understory vegetation in construction areas should be cleared by cutting vegetation at ground level with a chain saw or minimally with a hydro-axe.
14. The Landscape Architect shall be notified immediately if any protected tree is damaged or removed.

LEGEND

= Approx. Location of Tree Protection Fence

= Existing Tree To Remain

= Existing Tree To Be Removed

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

STATE OF MICHIGAN
WILLIAM T. KREAGER
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Tree Preservation / Removal Plan North

■ project title:

Village of Troy

City of Troy, Michigan

■ prepared for:

Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

■ job number:	■ date:
19017	03.29.2022
■ drawn by:	■ checked by:
EMJ	WTK

■ revisions:

10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

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

0 30' 60' 120' 180' 240'
1"= 60'
North

sheet no.
L-8

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

LEGEND

= Approx. Location of Tree Protection Fence

= Existing Tree To Remain

= Existing Tree To Be Removed

STATE OF MICHIGAN
WILLIAM T. KREAD
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Tree Preservation / Removal Plan South

■ project title:

Village of Troy

City of Troy, Michigan

■ prepared for:

Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

■ job number:	■ date:
19017	03.29.2022

■ drawn by:	■ checked by:
EMJ	WTK

■ revisions:

- 10.21.2022 Per Plan Revisions
- 11.07.2022 Per Plan Revisions

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

0 30' 60' 120' 180' 240'
1"= 60'

North

sheet no.
L-9

			Diameter at Breast Height (DBH)						
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)	Exempt	Save/Remove
2975	Acer negundo	Box elder	7.2	7.1	6.6	Fair		X	Remove
2976	Acer negundo	Box elder	14.1	8.8		Fair		X	Remove
2977	Acer negundo	Box elder	10.6			Fair		X	Remove
2978	Acer negundo	Box elder	10.5			Fair		X	Remove
2979	Populus deltoides	Cottonwood	27.4			Fair		X	Remove
2980	Populus deltoides	Cottonwood	15.8	13.4		Fair		X	Remove
2981	Populus deltoides	Cottonwood	13.2			Fair		X	Remove
2982	Populus deltoides	Cottonwood	17.5	12.9		Fair		X	Remove
2983	Populus deltoides	Cottonwood	12.4	10.1		Fair		X	Remove
2984	Acer platanoides	Norway Maple	6.8			Fair		X	Remove
2985	Ulmus americana	American elm	7.2			Fair		X	Remove
2986	Populus deltoides	Cottonwood	10.9			Fair		X	Remove
2987	Ulmus americana	American elm	11.5			Fair		X	Remove
2988	Acer negundo	Box elder	11.1			Fair		X	Remove
2989	Acer negundo	Box elder	8.4			Fair		X	Remove
2990	Pseudotsuga menziesii	Douglas fir	8.6	6.8		Fair			Remove
2991	Ulmus americana	American elm	11.0			Fair		X	Remove
2992	Ulmus americana	American elm	6.9			Fair		X	Remove
2993	Populus deltoides	Cottonwood	29.2	14.0		Fair		X	Remove
2994	Populus deltoides	Cottonwood	16.7			Fair		X	Remove
2995	Populus deltoides	Cottonwood	13.7	11.5		Fair		X	Remove
2996	Populus deltoides	Cottonwood	10.1			Fair		X	Remove
2997	Ulmus americana	American elm	7.3			Fair		X	Remove
2998	Populus deltoides	Cottonwood	15.4			Fair		X	Remove
2999	Populus deltoides	Cottonwood	12.1			Fair		X	Remove
3000	Populus deltoides	Cottonwood	16.8			Fair		X	Remove
3001	Gleditsia triacanthos	Honey locust	13.7	12.0		Fair			Offsite
3002	Acer negundo	Box elder	11.4			Fair		X	Remove
3004	Acer negundo	Box elder	7.4			Fair		X	Remove
3005	Acer negundo	Box elder	7.6			Fair		X	Remove
3006	Salix amygdaloides	Peachleaf willow	7.6	6.2		Fair		X	Remove
3007	Populus deltoides	Cottonwood	13.7			Fair		X	Remove
3008	Populus deltoides	Cottonwood	15.1			Fair		X	Remove
3009	Populus deltoides	Cottonwood	18.2	12.0		Fair		X	Remove
3010	Populus deltoides	Cottonwood	18.1			Fair		X	Remove
3011	Pyrus communis	Common pear	8.7			Fair			Remove
3012	Populus deltoides	Cottonwood	8.8			Fair		X	Remove
3013	Populus deltoides	Cottonwood	15.6			Fair		X	Remove
3014	Populus deltoides	Cottonwood	13.4			Fair		X	Remove
3015	Pyrus calleryana	Callery pear	6.2			Fair			Remove
3016	Populus deltoides	Cottonwood	14.7			Fair		X	Remove
3017	Populus deltoides	Cottonwood	11.4			Fair		X	Remove
3018	Populus deltoides	Cottonwood	12.7			Poor		X	Remove
3019	Populus deltoides	Cottonwood	11.1			Fair		X	Remove
3020	Populus deltoides	Cottonwood	7.6			Fair		X	Remove
3021	Populus deltoides	Cottonwood	11.0			Fair		X	Remove
3022	Populus deltoides	Cottonwood	14.1			Fair		X	Remove
3023	Populus deltoides	Cottonwood	15.9			Fair		X	Remove
3024	Populus deltoides	Cottonwood	9.8			Poor		X	Remove
3025	Populus deltoides	Cottonwood	13.1			Fair		X	Remove
3026	Acer negundo	Box elder	8.1	6.4		Fair		X	Remove
3027	Acer negundo	Box elder	8.5			Fair		X	Remove
3028	Robinia pseudoacacia	Black locust	10.3			Fair		X	Remove
3029	Ulmus americana	American elm	7.3			Fair		X	Remove
3030	Populus deltoides	Cottonwood	13.1			Fair		X	Remove
3031	Populus deltoides	Cottonwood	9.7			Fair		X	Remove
3032	Ulmus americana	American elm	10.0			Fair		X	Remove
3033	Ulmus americana	American elm	11.4			Fair		X	Remove
3034	Populus deltoides	Cottonwood	17.3			Very Poor		X	Remove
3035	Populus deltoides	Cottonwood	21.8			Fair		X	Remove
3036	Ulmus americana	American elm	9.2	7.8		Fair		X	Remove
3037	Ulmus americana	American elm	7.1			Fair		X	Remove
3038	Ulmus americana	American elm	6.7			Fair		X	Remove
3039	Populus grandidentata	Big-tooth aspen	8.7			Fair		X	Remove
3040	Populus grandidentata	Big-tooth aspen	10.1			Fair		X	Remove
3041	Populus grandidentata	Big-tooth aspen	16.0			Fair		X	Remove
3042	Populus grandidentata	Big-tooth aspen	11.2			Fair		X	Remove
3043	Populus deltoides	Cottonwood	20.8			Fair		X	Remove
3044	Acer negundo	Box elder	7.7			Fair		X	Remove
3045	Ulmus americana	American elm	9.0			Fair		X	Remove
3046	Ulmus americana	American elm	9.0	8.1		Fair		X	Remove
3047	Populus deltoides	Cottonwood	23.6			Fair		X	Remove
3048	Populus deltoides	Cottonwood	22.2			Fair		X	Remove
3049	Populus deltoides	Cottonwood	19.6			Fair		X	Remove
3050	Pyrus calleryana	Callery pear	6.1			Fair			Remove
3051	Pyrus calleryana	Callery pear	6.1			Fair			Remove
3052	Populus deltoides	Cottonwood	21.2			Fair		X	Remove
3053	Populus deltoides	Cottonwood	16.0			Fair		X	Remove
3054	Populus deltoides	Cottonwood	14.2			Fair		X	Remove
3055	Populus deltoides	Cottonwood	11.4			Fair		X	Remove
3056	Populus deltoides	Cottonwood	7.3			Fair		X	Remove
3057	Populus deltoides	Cottonwood	7.3			Fair		X	Remove
3058	Ulmus americana	American elm	8.4			Fair		X	Remove
3059	Acer negundo	Box elder	8.7			Fair		X	Remove
3060	Populus deltoides	Cottonwood	13.5			Fair		X	Remove
3061	Populus deltoides	Cottonwood	14.5			Fair		X	Remove
3062	Populus deltoides	Cottonwood	10.7			Fair		X	Remove
3063	Populus deltoides	Cottonwood	9.7			Fair		X	Remove
3064	Populus deltoides	Cottonwood	8.2			Fair		X	Remove
3065	Populus deltoides	Cottonwood	11.4			Fair		X	Remove
3066	Populus deltoides	Cottonwood	6.3			Fair		X	Remove
3067	Populus deltoides	Cottonwood	12.7			Fair		X	Remove
3068	Ulmus americana	American elm	7.1			Fair		X	Remove
3069	Ulmus americana	American elm	9.3			Fair		X	Remove
3070	Populus deltoides	Cottonwood	15.2			Fair		X	Remove
3071	Populus grandidentata	Big-tooth aspen	7.8			Fair		X	Remove
3072	Ulmus americana	American elm	6.2			Fair		X	Remove
3073	Populus deltoides	Cottonwood	14.4			Fair		X	Remove
3074	Ulmus americana	American elm	7.2			Fair		X	Remove
3075	Populus deltoides	Cottonwood	11.0			Fair		X	Remove
3076	Ulmus americana	American elm	9.1			Fair		X	Remove
3077	Populus deltoides	Cottonwood	7.2			Fair		X	Remove

			Diameter at Breast Height (DBH)						
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)	Exempt	Save/Remove
3078	Acer negundo	Box elder	7.8			Fair		X	Remove
3079	Populus deltoides	Cottonwood	10.2			Fair		X	Remove
3080	Populus grandidentata	Big-tooth aspen	12.3			Fair		X	Remove
3081	Robinia pseudoacacia	Black locust	8.7			Fair		X	Remove
3082	Ulmus americana	American elm	12.2	6.0		Fair		X	Remove
3083	Populus deltoides	Cottonwood	9.7			Fair		X	Remove
3084	Populus deltoides	Cottonwood	16.6			Fair		X	Remove
3085	Populus deltoides	Cottonwood	26.1			Fair		X	Remove
3086	Populus deltoides	Cottonwood	12.2			Fair		X	Remove
3087	Populus deltoides	Cottonwood	14.1			Fair		X	Remove
3088	Salix amygdaloides	Peachleaf willow	10.1	9.8		Fair		X	Remove
3089	Robinia pseudoacacia	Black locust	7.1			Fair		X	Remove
3090	Acer negundo	Box elder	7.8			Fair		X	Remove
3091	Populus deltoides	Cottonwood	15.2			Fair		X	Remove
3092	Robinia pseudoacacia	Black locust	8.8			Fair		X	Remove
3093	Acer negundo	Box elder	6.3			Fair		X	Remove
3094	Rhamnus cathartica	European buckthorn	8.1			Fair		X	Remove
3095	Populus deltoides	Cottonwood	19.2			Fair		X	Remove
3096	Acer negundo	Box elder	6.1			Fair		X	Remove
3097	Robinia pseudoacacia	Black locust	7.7			Fair		X	Remove
3098	Acer negundo	Box elder	8.8			Fair		X	Remove
3099	Acer negundo	Box elder	8.6	7.3	6.2	Fair		X	Remove
3100	Acer negundo	Box elder	6.2			Fair		X	Remove
3101	Acer negundo	Box elder	10.4	8.1		Fair		X	Remove
3102	Acer negundo	Box elder	8.1			Fair		X	Remove
3103	Acer negundo	Box elder	8.6			Fair		X	Remove
3104	Acer negundo	Box elder	8.3			Fair		X	Remove
3105	Acer negundo	Box elder	8.6			Fair		X	Remove
3106	Acer negundo	Box elder	17.3			Fair		X	Remove
3107	Acer negundo	Box elder	12.4			Fair		X	Remove
3108	Acer negundo	Box elder	9.0	5.8		Fair		X	Remove
3109	Acer negundo	Box elder	9.0			Fair		X	Remove
3110	Robinia pseudoacacia	Black locust	9.8			Fair		X	Remove
3111	Robinia pseudoacacia	Black locust	6.1			Fair		X	Remove
3112	Robinia pseudoacacia	Black locust	10.0			Fair		X	Remove
3113	Robinia pseudoacacia	Black locust	11.4			Fair		X	Remove
3114	Robinia pseudoacacia	Black locust	6.1			Fair		X	Remove
3115	Robinia pseudoacacia	Black locust	9.1	8.7		Fair		X	Remove
3116	Ulmus americana	American elm	7.1			Fair		X	Remove
3117	Acer negundo	Box elder	14.8			Fair		X	Remove
3118	Crataegus sp.	Hawthorn	6.0			Fair			Remove
3119	Acer negundo	Box elder	7.1			Fair		X	Remove
3120	Prunus avium	Sweet cherry	6.2			Fair			Remove
3121	Acer negundo	Box elder	11.4			Fair		X	Remove
3122	Acer negundo	Box elder	8.8			Fair		X	Remove
3123	Acer negundo	Box elder	6.4			Fair		X	Remove
3124	Acer negundo	Box elder	6.4			Fair		X	Remove
3125	Ulmus americana	American elm	8.4			Fair		X	Remove
3126	Acer negundo	Box elder	6.0	5.5		Fair		X	Remove
3127	Acer negundo	Box elder	7.6	6.3		Fair		X	Remove
3128	Pinus sylvestris	Scots pine	12.7			Fair			Remove
3129	Pinus sylvestris	Scots pine	12.6			Fair			Remove
3130	Pinus sylvestris	Scots pine	11.4			Fair			Remove
3131	Pinus sylvestris	Scots pine	12.2	9.1		Fair			Remove
3132	Ulmus americana	American elm	6.2			Fair		X	Remove
3133	Populus tremuloides	Quaking aspen	7.1			Fair		X	Remove
3134	Populus tremuloides	Quaking aspen	7.0			Fair		X	Remove
3135	Populus tremuloides	Quaking aspen	9.3			Fair		X	Remove
3136	Populus tremuloides	Quaking aspen	7.4			Fair		X	Remove
3137	Acer negundo	Box elder	7.8			Very Poor		X	Remove
3138	Pinus sylvestris	Scots pine	11.2			Fair			Remove
3139	Prunus avium	Sweet cherry	6.0			Fair			Remove
3140	Pinus resinosa	Red pine	26.0			Fair	X		Remove
3141	Populus tremuloides	Quaking aspen	15.3			Fair		X	Remove
3142	Acer negundo	Box elder	13.6			Fair		X	Remove
3143	Tilia americana	Basswood	9.2			Fair			Remove
3144	Acer negundo	Box elder	10.6			Fair		X	Remove
3145	Populus tremuloides	Quaking aspen	8.2			Fair		X	Remove
3146	Populus tremuloides	Quaking aspen	7.1			Fair		X	Remove
3147	Populus deltoides	Cottonwood	11.1			Fair		X	Remove
3148	Ulmus americana	American elm	7.1			Fair		X	Remove
3149	Tilia americana	Basswood	19.2	12.4	11.5	Fair	X		Remove
3150	Acer saccharinum	Silver maple	15.1			Fair		X	Remove
3151	Acer saccharinum	Silver maple	8.2			Fair		X	Remove
3152	Populus deltoides	Cottonwood	13.0			Fair		X	Remove
3153	Populus deltoides	Cottonwood	15.1			Fair		X	Remove
3154	Populus deltoides	Cottonwood	14.4			Fair		X	Remove
3155	Acer negundo	Box elder	6.1			Fair		X	Remove
3156	Populus deltoides	Cottonwood	13.6			Fair		X	Remove
3157	Populus deltoides	Cottonwood	12.8			Fair		X	Remove
3158	Populus deltoides	Cottonwood	10.5			Fair		X	Remove
3159	Ulmus americana	American elm	6.0			Fair		X	Remove
3160	Populus deltoides	Cottonwood	10.1			Fair		X	Remove
3161	Populus deltoides	Cottonwood	18.7			Fair		X	Remove
3162	Acer rubrum	Red maple	6.3			Fair			Remove
3163	Populus deltoides	Cottonwood	7.5			Fair		X	Remove
3164	Populus deltoides	Cottonwood	9.0			Fair		X	Remove
3165	Acer saccharinum	Silver maple	7.1			Fair		X	Remove
3166	Robinia pseudoacacia	Black locust	12.8			Fair		X	Remove
3167	Populus deltoides	Cottonwood	13.6			Fair		X	Remove
3168	Populus deltoides	Cottonwood	11.9			Fair		X	Remove
3169	Acer saccharinum	Silver maple	6.2			Fair		X	Remove
3170	Quercus alba	White oak	12.3	10.0		Fair			Remove
3171	Quercus macrocarpa	Bur oak	18.5			Fair	X		Offsite
3172	Populus deltoides	Cottonwood	7.8			Fair		X	Remove
3173	Populus deltoides	Cottonwood	10.2			Fair		X	Offsite
3174	Acer saccharinum	Silver maple	7.5			Fair		X	Offsite
3175	Populus deltoides	Cottonwood	13.1			Fair		X	Remove
3176	Populus deltoides	Cottonwood	6.7			Fair		X	Remove
3177	Populus deltoides	Cottonwood	0.0	6.7		Fair		X	Remove
3178	Populus deltoides	Cottonwood	9.0			Fair		X	Remove
3179	Populus deltoides	Cottonwood	8.4			Fair		X	Remove

			Diameter at Breast Height (DBH)						
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)	Exempt	Save/Remove
3180	Populus deltoides	Cottonwood	14.7			Fair		X	Remove
3181	Populus deltoides	Cottonwood	9.7			Fair		X	Remove
3182	Populus deltoides	Cottonwood	9.2			Fair		X	Remove
3182	Populus deltoides	Cottonwood	6.3			Fair		X	Remove
3183	Populus deltoides	Cottonwood	7.3			Fair		X	Remove
3184	Populus deltoides	Cottonwood	8.4			Fair		X	Remove
3186	Populus deltoides	Cottonwood	6.4			Fair		X	Remove
3187	Populus deltoides	Cottonwood	6.4			Fair		X	Remove
3188	Populus deltoides	Cottonwood	12.3	8.9		Fair		X	Remove
3189	Populus deltoides	Cottonwood	8.1			Fair		X	Remove
3190	Populus deltoides	Cottonwood	7.1			Fair		X	Remove
3191	Populus deltoides	Cottonwood	14.0			Fair		X	Remove
3192	Populus deltoides	Cottonwood	13.1			Fair		X	Remove
3193	Populus deltoides	Cottonwood	8.6			Fair		X	Remove
3194	Populus deltoides	Cottonwood	11.2	10.4		Fair		X	Remove
3195	Populus deltoides	Cottonwood	6.0			Fair		X	Remove
3196	Populus deltoides	Cottonwood	9.0			Fair		X	Remove
3197	Populus deltoides	Cottonwood	8.4			Fair		X	Remove
3198	Populus deltoides	Cottonwood	7.6			Fair		X	Remove
3199	Populus deltoides	Cottonwood	6.3			Fair		X	Remove
3200	Populus deltoides	Cottonwood	10.8			Fair		X	Remove
3201	Acer negundo	Box elder	6.8			Fair		X	Remove
3202	Populus deltoides	Cottonwood	22.1			Fair		X	Remove
3203	Fraxinus americana	White ash	6.9	6.6	6.6	Very Poor		X	Remove
3204	Pinus nigra	Black pine	11.8			Fair			Remove
3205	Pinus sylvestris	Scots pine	14.3			Fair			Remove
3206	Pinus sylvestris	Scots pine	14.5			Fair			Remove
3207	Populus deltoides	Cottonwood	21.5			Fair		X	Remove
3208	Pinus nigra	Black pine	11.6			Fair			Remove
3209	Acer negundo	Box elder	6.3			Fair		X	Remove
3210	Pinus nigra	Black pine	11.6			Fair			Remove
3211	Rhamnus cathartica	European buckthorn	6.1			Fair		X	Remove
3212	Pinus nigra	Black pine	9.2	8.5		Fair			Remove
3213	Ulmus americana	American elm	10.3			Fair		X	Remove
3214	Populus deltoides	Cottonwood	7.3			Fair		X	Remove
3215	Populus deltoides	Cottonwood	13.7	13.6	12.5	Fair		X	Remove
3216	Pinus sylvestris	Scots pine	11.1			Fair			Remove
3217	Acer saccharinum	Silver maple	9.2	7.0	6.3	Fair			Remove
3218	Pinus nigra	Black pine	14.9			Fair			Remove
3219	Ulmus americana	American elm	8.8			Fair		X	Remove
3220	Ulmus americana	American elm	8.5			Fair		X	Remove
3221	Ulmus americana	American elm	7.0			Fair		X	Remove
3222	Populus deltoides	Cottonwood	18.6			Fair		X	Remove
3223	Ulmus americana	American elm	6.2			Fair		X	Remove
3224	Populus deltoides	Cottonwood	13.6			Fair		X	Remove
3225	Populus deltoides	Cottonwood	7.2			Fair		X	Remove
3226	Ulmus americana	American elm	6.5			Fair		X	Remove
3227	Populus deltoides	Cottonwood	14.8			Fair		X	Remove
3228	Populus deltoides	Cottonwood	14.3			Fair		X	Remove
3229	Populus deltoides	Cottonwood	17.2			Fair		X	Remove
3230	Pinus sylvestris	Scots pine	13.0			Fair			Remove
3231	Pinus sylvestris	Scots pine	13.8			Fair			Remove
3232	Acer negundo	Box elder	8.2	7.3		Fair		X	Remove
3233	Pinus sylvestris	Scots pine	13.7			Fair			Remove
3234	Acer negundo	Box elder	7.4			Fair		X	Offsite
3235	Acer saccharinum	Silver maple	28.7	8.0		Fair		X	Remove
3236	Pinus sylvestris	Scots pine	14.7			Fair			Remove
3237	Pinus sylvestris	Scots pine	12.7			Fair			Remove
3238	Populus deltoides	Cottonwood	16.6			Fair		X	Remove
3239	Ulmus americana	American elm	7.6			Fair		X	Remove
3240	Ulmus americana	American elm	8.0			Fair		X	Remove
3241	Populus deltoides	Cottonwood	11.5			Fair		X	Remove
3242	Populus deltoides	Cottonwood	9.3			Fair		X	Remove
3243	Acer saccharinum	Silver maple	10.5			Fair		X	Remove
3244	Populus deltoides	Cottonwood	14.1			Fair		X	Remove
3245	Populus deltoides	Cottonwood	8.9			Fair		X	Remove
3246	Populus deltoides	Cottonwood	12.2			Fair		X	Remove
3247	Populus deltoides	Cottonwood	9.6			Fair		X	Remove
3248	Populus deltoides	Cottonwood	11.8			Fair		X	Remove
3249	Populus deltoides	Cottonwood	7.7			Fair		X	Remove
3250	Acer negundo	Box elder	6.1			Fair		X	Remove
3251	Tsuga canadensis	Eastern hemlock	8.0			Fair			Remove
3252	Tsuga canadensis	Eastern hemlock	9.0			Poor		X	Remove
3253	Acer saccharinum	Silver maple	9.1	7.5		Fair		X	Remove
3254	Tsuga canadensis	Eastern hemlock	8.5			Fair			Remove
3255	Acer negundo	Box elder	7.5			Fair		X	Remove
3256	Acer negundo	Box elder	10.3	9.6		Fair		X	Remove
3257	Acer negundo	Box elder	7.7			Fair		X	Remove
3258	Acer negundo	Box elder	7.1			Fair		X	Remove
3259	Acer negundo	Box elder	10.9			Fair		X	Remove
3260	Acer negundo	Box elder	8.0			Fair		X	Remove
3261	Acer negundo	Box elder	10.7			Fair		X	Remove
3262	Pinus sylvestris	Scots pine	16.5			Fair			Remove
3263	Pinus sylvestris	Scots pine	17.6			Fair			Remove
3264	Salix amygdaloides	Peachleaf willow	10.4			Fair		X	Offsite
3265	Pinus sylvestris	Scots pine	15.9			Fair			Remove
3266	Pinus sylvestris	Scots pine	7.7			Fair			Offsite
3267	Pinus sylvestris	Scots pine	9.4			Fair			Offsite
3268	Pinus sylvestris	Scots pine	8.0			Fair			Offsite
3269	Pinus sylvestris	Scots pine	9.5			Fair			Offsite
3270	Pinus sylvestris	Scots pine	9.3			Fair			Offsite
3271	Pinus sylvestris	Scots pine	8.8			Fair			Offsite
3272	Tilia americana	Basswood	11.1			Fair			Offsite
3273	Pinus sylvestris	Scots pine	13.3			Fair			Offsite
3274	Pinus sylvestris	Scots pine	14.1			Fair			Offsite
3275	Pinus sylvestris	Scots pine	16.1			Fair			Offsite
3276	Pinus sylvestris	Scots pine	18.0			Fair	X		Remove
3277	Prunus serotina	Black cherry	7.5			Fair			Remove
3278	Acer saccharinum	Silver maple	6.5			Fair		X	Remove
3279	Ulmus americana	American elm	11.3			Fair		X	Remove
3280	Acer saccharinum	Silver maple	7.0			Fair		X	Remove
3281	Acer saccharinum	Silver maple	6.5			Fair		X	Remove

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

Notes

Tree Survey prepared by Barr Engineering Company on March 26, 2021

(1) Condition as per ISA Health Ratings, 9th Edition.
(2) Landmark as per City of Troy Zoning Ordinance, Section 13.07 Woodland Protection (C)(1)

STATE OF MICHIGAN
WILLIAM T. KREAG
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Tree Survey
1 of 3

■ project title:

Village of Troy

City of Troy, Michigan

■ prepared for:

Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

■ job number:	■ date:
19017	03.29.2022

■ drawn by:	■ checked by:
EMJ	WTK

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

■ revisions:

10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

sheet no.

L-10

			Diameter at Breast Height (DBH)						
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)	Exempt	Save/Remove
3282	Ulmus americana	American elm	6.0			Fair		X	Remove
3283	Populus tremuloides	Quaking aspen	6.8			Fair		X	Remove
3284	Populus tremuloides	Quaking aspen	8.3			Fair		X	Remove
3285	Acer saccharinum	Silver maple	6.8			Fair		X	Remove
3286	Populus tremuloides	Quaking aspen	7.2			Fair		X	Remove
3287	Populus tremuloides	Quaking aspen	7.4			Fair		X	Remove
3288	Populus tremuloides	Quaking aspen	7.8			Fair		X	Remove
3289	Malus pumila	Common apple	7.7			Fair			Remove
3290	Populus tremuloides	Quaking aspen	8.7			Fair		X	Remove
3291	Ulmus americana	American elm	8.3			Fair		X	Remove
3292	Acer negundo	Box elder	12.7			Fair		X	Remove
3293	Pinus nigra	Black pine	21.1			Fair	X		Remove
3294	Pinus nigra	Black pine	14.4			Fair			Remove
3295	Pinus nigra	Black pine	17.5	16.9	6.5	Fair			Remove
3296	Ulmus americana	American elm	7.1			Fair		X	Remove
3297	Pinus nigra	Black pine	16.3			Fair			Remove
3298	Pinus nigra	Black pine	20.7			Fair	X		Remove
3299	Pinus sylvestris	Scots pine	21.4			Fair	X		Remove
3300	Tilia americana	Basswood	12.9			Fair			Remove
3301	Populus deltoides	Cottonwood	11.4			Fair		X	Remove
3302	Populus deltoides	Cottonwood	7.4			Fair		X	Remove
3303	Populus deltoides	Cottonwood	6.8			Fair		X	Remove
3304	Populus deltoides	Cottonwood	8.9			Fair		X	Remove
3305	Populus deltoides	Cottonwood	10.1			Fair		X	Remove
3306	Populus deltoides	Cottonwood	7.3	6.5		Fair		X	Remove
3307	Populus deltoides	Cottonwood	6.1			Fair		X	Remove
3308	Populus deltoides	Cottonwood	6.4			Fair		X	Remove
3309	Populus deltoides	Cottonwood	9.1			Fair		X	Remove
3310	Populus deltoides	Cottonwood	8.3			Fair		X	Remove
3311	Populus deltoides	Cottonwood	7.1			Fair		X	Remove
3312	Populus deltoides	Cottonwood	7.4			Fair		X	Remove
3313	Populus deltoides	Cottonwood	6.8			Fair		X	Remove
3314	Populus deltoides	Cottonwood	9.2			Fair		X	Remove
3315	Populus deltoides	Cottonwood	9.3			Fair		X	Remove
3316	Populus deltoides	Cottonwood	12.3			Fair		X	Remove
3317	Populus deltoides	Cottonwood	18.1			Fair		X	Remove
3318	Populus deltoides	Cottonwood	22.0			Fair		X	Remove
3319	Acer saccharinum	Silver maple	8.4			Fair		X	Remove
3320	Acer saccharinum	Silver maple	14.8	6.2		Fair		X	Remove
3321	Populus deltoides	Cottonwood	11.2			Fair		X	Remove
3322	Populus deltoides	Cottonwood	18.9			Fair		X	Remove
3323	Populus deltoides	Cottonwood	9.9			Fair		X	Remove
3324	Populus deltoides	Cottonwood	21.3			Fair		X	Remove
3325	Populus deltoides	Cottonwood	11.3			Fair		X	Remove
3326	Populus deltoides	Cottonwood	15.4			Fair		X	Remove
3327	Populus deltoides	Cottonwood	9.1			Fair		X	Remove
3328	Populus deltoides	Cottonwood	8.2			Fair		X	Remove
3329	Populus deltoides	Cottonwood	13.2	11.8		Fair		X	Remove
3330	Ulmus americana	American elm	6.2			Fair		X	Remove
3331	Populus deltoides	Cottonwood	11.8			Fair		X	Remove
3332	Populus deltoides	Cottonwood	9.3			Fair		X	Remove
3333	Populus deltoides	Cottonwood	17.0			Fair		X	Remove
3334	Ulmus americana	American elm	6.2			Fair		X	Remove
3335	Ulmus americana	American elm	7.1			Fair		X	Remove
3336	Acer saccharinum	Silver maple	8.6			Fair		X	Remove
3337	Acer saccharinum	Silver maple	12.9			Fair		X	Remove
3338	Acer saccharinum	Silver maple	8.8	6.7		Fair		X	Remove
3339	Ulmus americana	American elm	6.2			Fair		X	Remove
3340	Acer saccharinum	Silver maple	9.7	6.2		Fair		X	Remove
3341	Populus deltoides	Cottonwood	8.4			Fair		X	Remove
3342	Populus deltoides	Cottonwood	8.1			Fair		X	Remove
3343	Populus deltoides	Cottonwood	7.4			Fair		X	Remove
3344	Populus deltoides	Cottonwood	7.6			Fair		X	Remove
3345	Populus deltoides	Cottonwood	12.1			Fair		X	Remove
3346	Populus deltoides	Cottonwood	6.7			Fair		X	Remove
3347	Populus deltoides	Cottonwood	6.7			Fair		X	Remove
3348	Populus deltoides	Cottonwood	8.0			Fair		X	Remove
3349	Populus deltoides	Cottonwood	7.6			Fair		X	Remove
3350	Populus deltoides	Cottonwood	11.1			Fair		X	Remove
3351	Ulmus americana	American elm	6.7			Fair		X	Remove
3352	Acer saccharinum	Silver maple	6.3			Fair		X	Remove
3353	Acer saccharinum	Silver maple	10.1			Fair		X	Remove
3354	Quercus macrocarpa	Bur oak	8.5			Fair			Remove
3355	Juglans nigra	Black walnut	7.8			Fair			Remove
3356	Juglans nigra	Black walnut	7.2			Fair			Remove
3357	Malus pumila	Common apple	10.7			Very Poor		X	Remove
3358	Ulmus americana	American elm	10.8			Fair		X	Remove
3359	Acer saccharinum	Silver maple	14.4	11.0		Fair		X	Remove
3360	Ulmus americana	American elm	14.0			Fair		X	Remove
3361	Ulmus americana	American elm	10.3			Fair		X	Remove
3362	Acer negundo	Box elder	8.4			Fair		X	Remove
3363	Ulmus americana	American elm	9.4			Fair		X	Remove
3364	Ulmus americana	American elm	9.3			Fair		X	Remove
3365	Ulmus americana	American elm	10.4			Fair		X	Remove
3366	Ulmus americana	American elm	7.4			Fair		X	Remove
3367	Ulmus americana	American elm	7.6			Fair		X	Remove
3368	Ulmus americana	American elm	8.3			Fair		X	Remove
3369	Ulmus americana	American elm	8.0			Fair		X	Remove
3370	Acer saccharinum	Silver maple	8.0			Fair		X	Remove
3371	Ulmus americana	American elm	6.6			Fair		X	Remove
3372	Ulmus americana	American elm	9.2	9.0	6.0	Fair		X	Remove
3373	Ulmus americana	American elm	7.7			Fair		X	Remove
3374	Populus deltoides	Cottonwood	15.4			Fair		X	Remove
3375	Populus deltoides	Cottonwood	10.5			Fair		X	Remove
3376	Acer negundo	Box elder	13.5			Fair		X	Remove
3377	Acer saccharinum	Silver maple	11.1			Fair		X	Remove
3378	Acer negundo	Box elder	7.8			Fair		X	Remove
3379	Ulmus americana	American elm	7.4			Fair		X	Remove
3380	Ulmus americana	American elm	11.3			Fair		X	Remove
3381	Ulmus americana	American elm	6.2			Fair		X	Remove
3382	Populus deltoides	Cottonwood	8.0			Fair		X	Remove
3383	Populus deltoides	Cottonwood	9.0			Fair		X	Remove

			Diameter at Breast Height (DBH)						
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)	Exempt	Save/Remove
3384	Populus deltoides	Cottonwood	6.8			Fair		X	Remove
3385	Populus deltoides	Cottonwood	15.1			Fair		X	Remove
3386	Robinia pseudoacacia	Black locust	6.2	6.0		Poor		X	Remove
3387	Acer negundo	Box elder	6.3			Poor		X	Remove
3388	Robinia pseudoacacia	Black locust	11.4			Fair		X	Remove
3389	Acer negundo	Box elder	6.3			Fair		X	Remove
3390	Ulmus americana	American elm	10.5	9.7		Fair		X	Remove
3391	Ulmus americana	American elm	12.6	11.5		Fair		X	Remove
3392	Ulmus americana	American elm	9.9			Fair		X	Remove
3393	Ulmus americana	American elm	6.8			Fair		X	Remove
3394	Ulmus americana	American elm	10.9			Fair		X	Remove
3395	Ulmus americana	American elm	6.2			Fair		X	Remove
3396	Ulmus americana	American elm	6.6			Fair		X	Remove
3397	Ulmus americana	American elm	8.4			Fair		X	Remove
3398	Populus deltoides	Cottonwood	14.3			Fair		X	Remove
3399	Salix alba	White willow	45.0			Very Poor		X	Remove
3400	Populus deltoides	Cottonwood	9.7			Fair		X	Remove
3401	Robinia pseudoacacia	Black locust	9.4			Fair		X	Remove
3402	Robinia pseudoacacia	Black locust	8.1			Fair		X	Remove
3403	Populus deltoides	Cottonwood	10.9			Fair		X	Remove
3404	Populus deltoides	Cottonwood	7.2			Fair		X	Remove
3405	Populus deltoides	Cottonwood	7.5			Fair		X	Remove
3406	Acer saccharinum	Silver maple	12.1			Fair		X	Remove
3407	Acer platanoides	Norway Maple	18.4			Fair		X	Remove
3408	Acer saccharinum	Silver maple	36.0			Fair		X	Remove
3409	Acer saccharinum	Silver maple	27.6			Fair		X	Remove
3410	Acer saccharinum	Silver maple	33.7			Very Poor		X	Remove
3411	Acer saccharinum	Silver maple	36.2			Fair		X	Remove
3412	Populus deltoides	Cottonwood	9.5			Fair		X	Remove
3413	Populus deltoides	Cottonwood	7.9			Fair		X	Remove
3414	Picea pungens	Blue spruce	17.0			Fair			Remove
3415	Acer saccharinum	Silver maple	22.5			Very Poor		X	Remove
3416	Pinus sylvestris	Scots pine	19.6			Fair	X		Remove
3417	Populus deltoides	Cottonwood	8.6			Fair		X	Remove
3418	Populus deltoides	Cottonwood	10.9			Fair		X	Remove
3419	Populus deltoides	Cottonwood	7.9	7.4		Fair		X	Remove
3420	Populus deltoides	Cottonwood	7.1			Fair		X	Remove
3421	Populus deltoides	Cottonwood	8.5			Fair		X	Remove
3422	Populus deltoides	Cottonwood	10.8			Fair		X	Remove
3423	Populus deltoides	Cottonwood	7.7			Fair		X	Remove
3424	Populus deltoides	Cottonwood	8.2			Fair		X	Remove
3425	Populus deltoides	Cottonwood	6.1			Fair		X	Remove
3426	Populus deltoides	Cottonwood	9.1			Fair		X	Remove
3427	Populus deltoides	Cottonwood	6.1			Fair		X	Remove
3428	Populus deltoides	Cottonwood	9.5			Fair		X	Remove
3429	Populus deltoides	Cottonwood	13.6			Fair		X	Remove
3430	Acer saccharinum	Silver maple	20.6			Fair		X	Remove
3431	Acer saccharinum	Silver maple	17.3			Fair		X	Remove
3432	Populus deltoides	Cottonwood	11.7			Fair		X	Remove
3433	Populus deltoides	Cottonwood	9.2			Fair		X	Remove
3434	Populus deltoides	Cottonwood	7.6			Fair		X	Remove
3435	Populus deltoides	Cottonwood	12.4			Fair		X	Remove
3436	Pinus sylvestris	Scots pine	17.9			Good			Remove
3437	Pinus sylvestris	Scots pine	7.0			Fair			Remove
3438	Pinus sylvestris	Scots pine	12.5			Fair			Remove
3439	Acer negundo	Box elder	9.0			Poor		X	Remove
3440	Acer platanoides	Norway Maple	6.9			Fair		X	Remove
3441	Pinus sylvestris	Scots pine	25.0			Good	X		Remove
3442	Acer platanoides	Norway Maple	9.4			Fair		X	Remove
3443	Ulmus americana	American elm	8.7			Fair		X	Remove
3444	Acer saccharinum	Silver maple	9.9			Fair		X	Remove
3445	Acer negundo	Box elder	6.5	6.0		Fair		X	Remove
3446	Acer platanoides	Norway Maple	7.5			Fair		X	Remove
3447	Ulmus americana	American elm	11.5			Fair		X	Remove
3448	Ulmus americana	American elm	8.9			Fair		X	Remove
3449	Ulmus americana	American elm	8.3			Fair		X	Remove
3450	Ulmus americana	American elm	10.1			Fair		X	Remove
3451	Pyrus communis	Common pear	8.8			Fair			Remove
3452	Ulmus americana	American elm	8.3			Fair		X	Remove
3453	Ulmus americana	American elm	12.5			Fair		X	Remove
3454	Ulmus americana	American elm	8.1			Fair		X	Remove
3455	Populus deltoides	Cottonwood	18.4			Fair		X	Remove
3456	Acer negundo	Box elder	11.0			Fair		X	Remove
3457	Ulmus americana	American elm	6.3			Fair		X	Remove
3458	Populus deltoides	Cottonwood	21.0			Fair		X	Remove
3459	Acer saccharinum	Silver maple	7.3			Fair		X	Remove
3460	Populus deltoides	Cottonwood	13.0			Fair		X	Remove
3461	Salix amygdaloides	Peachleaf willow	13.8			Fair		X	Remove
3462	Quercus macrocarpa	Bur oak	19.1			Fair	X		Remove
3463	Populus deltoides	Cottonwood	17.3	15.1		Fair		X	Remove
3464	Populus deltoides	Cottonwood	13.2			Fair		X	Remove
3465	Populus deltoides	Cottonwood	20.1			Fair		X	Offsite
3466	Ulmus americana	American elm	6.7			Fair		X	Remove
3467	Ulmus americana	American elm	7.1			Fair		X	Remove
3468	Ulmus americana	American elm	6.4			Fair		X	Remove
3469	Ulmus americana	American elm	7.9			Fair		X	Remove
3470	Robinia pseudoacacia	Black locust	11.4			Fair		X	Remove
3471	Populus deltoides	Cottonwood	6.1			Fair		X	Remove
3472	Populus deltoides	Cottonwood	7.1			Fair		X	Remove
3473	Populus deltoides	Cottonwood	7.1			Fair		X	Remove
3474	Populus deltoides	Cottonwood	7.2			Fair		X	Remove
3501	Populus deltoides	Cottonwood	15.3			Fair		X	Remove
3502	Populus deltoides	Cottonwood	7.3			Fair		X	Remove
3503	Populus deltoides	Cottonwood	10.4	9.4		Fair		X	Remove
3504	Fraxinus americana	White ash	7.2			Very Poor		X	Remove
3505	Acer platanoides	Norway Maple	6.0			Fair		X	Remove
3506	Acer platanoides	Norway Maple	7.4			Fair		X	Remove
3507	Tilia americana	Basswood	7.9			Fair			Remove
3508	Acer saccharum	Sugar maple	18.3			Fair	X		Remove
3509	Ulmus americana	American elm	6.8			Fair		X	Remove
3510	Ulmus americana	American elm	17.2			Fair		X	Remove
3511	Ulmus americana	American elm	14.5			Fair		X	Remove

			Diameter at Breast Height (DBH)						
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)	Exempt	Save/Remove
3512	Ulmus americana	American elm	10.0			Fair		X	Remove
3513	Populus deltoides	Cottonwood	10.0	9.6		Fair		X	Remove
3514	Ulmus americana	American elm	9.0			Fair		X	Remove
3515	Acer negundo	Box elder	7.2			Fair		X	Remove
3516	Acer negundo	Box elder	9.2	6.3		Fair		X	Remove
3517	Prunus serotina	Black cherry	8.1			Fair			Remove
3518	Malus pumila	Common apple	7.1			Fair			Remove
3519	Populus deltoides	Cottonwood	15.2			Fair		X	Remove
3520	Ulmus americana	American elm	6.3			Fair		X	Remove
3521	Populus deltoides	Cottonwood	11.0			Fair		X	Remove
3522	Populus deltoides	Cottonwood	8.4			Fair		X	Remove
3523	Robinia pseudoacacia	Black locust	7.5			Fair		X	Remove
3524	Ulmus americana	American elm	18.0			Fair		X	Remove
3525	Robinia pseudoacacia	Black locust	9.0			Fair		X	Remove
3526	Robinia pseudoacacia	Black locust	7.4			Fair		X	Remove
3527	Populus tremuloides	Quaking aspen	6.0			Fair		X	Remove
3528	Robinia pseudoacacia	Black locust	8.1	7.2		Fair		X	Remove
3529	Robinia pseudoacacia	Black locust	9.0			Fair		X	Remove
3530	Robinia pseudoacacia	Black locust	6.5			Fair		X	Remove
3531	Populus tremuloides	Quaking aspen	6.1			Fair		X	Remove
3532	Robinia pseudoacacia	Black locust	6.4			Fair		X	Remove
3533	Robinia pseudoacacia	Black locust	7.1	6.8		Fair		X	Remove
3534	Acer negundo	Box elder	6.5			Fair		X	Remove
3535	Populus deltoides	Cottonwood	8.4			Fair		X	Remove
3536	Populus deltoides	Cottonwood	15.8			Fair		X	Remove
3537	Populus deltoides	Cottonwood	9.6	7.4		Fair		X	Remove
3538	Populus deltoides	Cottonwood	9.0			Fair		X	Remove
3539	Juglans nigra	Black walnut	6.2			Fair			Remove
3540	Robinia pseudoacacia	Black locust	8.6			Fair		X	Remove
3541	Robinia pseudoacacia	Black locust	9.0	8.2		Fair		X	Remove
3542	Robinia pseudoacacia	Black locust	6.8			Fair		X	Remove
3543	Robinia pseudoacacia	Black locust	8.0			Fair		X	Remove
3544	Populus deltoides	Cottonwood	11.7			Very Poor		X	Remove
3545	Ulmus americana	American elm	9.8			Fair		X	Remove
3546	Acer negundo	Box elder	8.6			Fair		X	Offsite
3547	Prunus avium	Sweet cherry	7.2			Fair			Remove
3548	Acer negundo	Box elder	9.4			Fair		X	Remove
3549	Populus deltoides	Cottonwood	24.3			Fair		X	Remove
3550	Acer negundo	Box elder	6.7	6.4		Fair		X	Remove
3551	Populus deltoides	Cottonwood	15.0			Fair		X	Remove
3552	Populus deltoides	Cottonwood	10.2			Fair		X	Remove
3553	Populus deltoides	Cottonwood	12.4			Fair		X	Remove
3554	Populus deltoides	Cottonwood	16.4			Fair		X	Remove
3555	Populus deltoides	Cottonwood	13.0			Fair		X	Remove
3556	Ulmus rubra	Slippery elm	6.8			Fair		X	Remove
3557	Populus deltoides	Cottonwood	13.4	10.4		Fair		X	Remove
3558	Populus deltoides	Cottonwood	6.4			Fair		X	Remove
3559	Ulmus americana	American elm	9.8			Fair		X	Remove
3560	Ulmus americana	American elm	6.0			Fair		X	Remove
3561	Ulmus americana	American elm	8.4			Fair		X	Remove
3562	Populus deltoides	Cottonwood	11.0			Fair		X	Remove
3563	Acer negundo	Box elder	8.0			Fair		X	Remove
3564	Acer negundo	Box elder	8.0			Fair		X	Remove
3565	Acer negundo	Box elder	6.0			Fair		X	Remove
3566	Acer negundo	Box elder	6.0			Fair		X	Remove
3567	Acer negundo	Box elder	6.0			Fair		X	Remove
3568	Acer negundo	Box elder	6.1			Fair		X	Remove
3569	Acer negundo	Box elder	8.1			Fair		X	Remove
3570	Acer negundo	Box elder	10.0			Fair		X	Remove
3571	Acer negundo	Box elder	7.1			Fair		X	Remove
3572	Acer negundo	Box elder	15.5	14.4		Fair		X	Remove
3573	Acer negundo	Box elder	7.6	7.1		Fair		X	Remove
3574	Acer negundo	Box elder	13.6	7.5		Fair		X	Remove
3575	Acer negundo	Box elder	17.0			Fair		X	Remove
3576	Populus deltoides	Cottonwood	8.5			Fair		X	Remove
3577	Acer negundo	Box elder	6.5			Fair		X	Remove
3578	Acer negundo	Box elder	6.0	5.8		Fair		X	Remove
3579	Populus deltoides	Cottonwood	9.9			Fair		X	Remove
3580	Acer negundo	Box elder	6.4			Fair		X	Remove
3581	Populus deltoides	Cottonwood	19.2			Fair		X	Remove
3582	Acer negundo	Box elder	9.4			Fair		X	Remove
3582	Prunus avium	Sweet cherry	8.1			Fair			Remove
3584	Populus deltoides	Cottonwood	18.6			Fair		X	Remove
3586	Robinia pseudoacacia	Black locust	8.4	8.0		Fair		X	Remove
3587	Populus deltoides	Cottonwood	13.2			Fair		X	Offsite
3588	Acer negundo	Box elder	9.2			Fair		X	Remove
3589	Acer negundo	Box elder	6.2			Fair		X	Remove
3590	Acer negundo	Box elder	7.1			Fair		X	Remove
3591	Acer negundo	Box elder	9.3	6.7		Fair		X	Remove
3592	Acer negundo	Box elder	8.3			Fair		X	Remove
3593	Acer negundo	Box elder	7.7			Fair		X	Remove
3594	Acer negundo	Box elder	9.0			Fair		X	Remove
3595	Acer negundo	Box elder	7.4	6.5	5.8	Fair		X	Remove
3596	Ulmus americana	American elm	9.6			Fair		X	Offsite
3597	Acer saccharinum	Silver maple	12.0			Fair		X	Offsite
3598	Populus deltoides	Cottonwood	17.2			Fair		X	Remove
3599	Acer negundo	Box elder	9.7			Fair		X	Remove
3600	Acer negundo	Box elder	6.7			Fair		X	Remove
3601	Acer negundo	Box elder	7.4			Fair		X	Remove
3602	Acer negundo	Box elder	6.5			Fair		X	Remove
3603	Robinia pseudoacacia	Black locust	6.8			Fair		X	Remove
3604	Robinia pseudoacacia	Black locust	7.5	7.1		Fair		X	Remove
3605	Ulmus americana	American elm	6.8			Fair		X	Remove
3606	Populus deltoides	Cottonwood	14.5	14.0		Fair		X	Remove
3607	Populus deltoides	Cottonwood	13.3	11.2		Fair		X	Remove
3608	Populus deltoides	Cottonwood	8.6			Fair		X	Remove
3609	Ulmus americana	American elm	6.4			Fair		X	Remove
3610	Robinia pseudoacacia	Black locust	13.2	10.1		Fair		X	Remove
3611	Populus deltoides	Cottonwood	9.2			Fair		X	Remove
3612	Populus deltoides	Cottonwood	6.0			Fair		X	Remove
3613	Populus deltoides	Cottonwood	16.8	12.4	8.8	Fair		X	Remove
3614	Populus deltoides	Cottonwood	6.6			Fair		X	Remove

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

Notes

Tree Survey prepared by Barr Engineering Company on March 26, 2021

(1) Condition as per ISA Health Ratings, 9th Edition.
(2) Landmark as per City of Troy Zoning Ordinance, Section 13.07 Woodland Protection (C)(1)

STATE OF MICHIGAN
WILLIAM T. KREAG
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Tree Survey 2 of 3

■ project title:

Village of Troy

City of Troy, Michigan

■ prepared for:

Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

■ job number:	■ date:
19017	03.29.2022

■ drawn by:	■ checked by:
EMJ	WTK

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

■ revisions:

10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

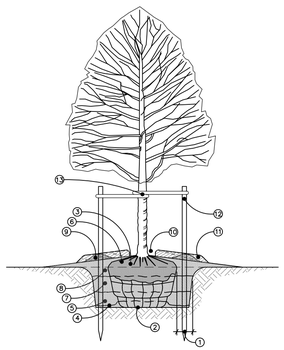
sheet no.

L-11

			Diameter at Breast Height (DBH)						
Tag	Scientific Name	Common Name	Trunk 1	Trunk 2	Trunk 3	Condition (1)	Landmark (2)	Exempt	Save/Remove
3615	Populus deltoides	Cottonwood	10.4			Fair		X	Remove
3616	Populus deltoides	Cottonwood	9.4			Fair		X	Remove
3617	Populus deltoides	Cottonwood	6.4			Fair		X	Remove
3618	Populus deltoides	Cottonwood	6.2			Fair		X	Remove
3619	Ulmus americana	American elm	7.0			Fair		X	Remove
3620	Salix matsudana	Corkscrew willow	13.0			Fair		X	Remove
3621	Populus deltoides	Cottonwood	11.3			Fair		X	Remove
3622	Robinia pseudoacacia	Black locust	7.2			Fair		X	Remove
3623	Robinia pseudoacacia	Black locust	7.7			Fair		X	Remove
3624	Populus deltoides	Cottonwood	7.7			Fair		X	Remove
3625	Populus deltoides	Cottonwood	10.4			Fair		X	Remove
3626	Populus deltoides	Cottonwood	6.6			Fair		X	Remove
3627	Populus deltoides	Cottonwood	7.4			Fair		X	Remove
3628	Populus deltoides	Cottonwood	9.4			Fair		X	Remove
3629	Populus deltoides	Cottonwood	11.3			Fair		X	Remove
3630	Populus deltoides	Cottonwood	6.7			Fair		X	Save
3631	Robinia pseudoacacia	Black locust	8.7	6.2	5.7	Fair		X	Save
3632	Acer rubrum	Red maple	6.7			Fair			Save
3633	Populus deltoides	Cottonwood	7.8			Fair		X	Save
3634	Populus deltoides	Cottonwood	6.5			Fair		X	Remove
3635	Populus deltoides	Cottonwood	7.3			Fair		X	Remove
3636	Populus deltoides	Cottonwood	7.3			Fair		X	Remove
3637	Populus deltoides	Cottonwood	10.0			Fair		X	Remove
3638	Populus deltoides	Cottonwood	12.4			Fair		X	Remove
3639	Populus deltoides	Cottonwood	17.3			Fair		X	Remove
3640	Populus deltoides	Cottonwood	8.6			Fair		X	Remove
3641	Acer negundo	Box elder	0.0			Fair		X	Remove
3642	Acer negundo	Box elder	7.3	7.0		Fair		X	Remove
3643	Acer negundo	Box elder	6.5			Fair		X	Remove
3644	Robinia pseudoacacia	Black locust	6.1			Fair		X	Remove
3645	Robinia pseudoacacia	Black locust	9.4			Fair		X	Offsite
3646	Acer rubrum	Red maple	20.0	7.4		Fair	X		Offsite
3647	Robinia pseudoacacia	Black locust	6.0			Fair		X	Offsite
3648	Robinia pseudoacacia	Black locust	11.4			Fair		X	Offsite
3649	Acer rubrum	Red maple	13.3	11.2		Fair			Offsite
3650	Populus deltoides	Cottonwood	13.6			Fair		X	Save
3651	Populus deltoides	Cottonwood	6.7			Fair		X	Save
3652	Robinia pseudoacacia	Black locust	8.0			Fair		X	Remove
3653	Populus deltoides	Cottonwood	14.6			Fair		X	Remove
3654	Robinia pseudoacacia	Black locust	9.1	7.0		Fair		X	Remove
3655	Robinia pseudoacacia	Black locust	8.0			Fair		X	Remove
3656	Robinia pseudoacacia	Black locust	6.7	6.0	5.8	Fair		X	Remove
3657	Robinia pseudoacacia	Black locust	7.0			Fair		X	Remove
3658	Robinia pseudoacacia	Black locust	6.3			Fair		X	Remove
3659	Robinia pseudoacacia	Black locust	6.0			Fair		X	Remove
3660	Ulmus parvifolia	Chinese elm	6.1			Fair		X	Remove

Notes

Tree Survey prepared by Barr Engineering Company on March 26, 2021
(1) Condition as per ISA Health Ratings, 9th Edition.
(2) Landmark as per City of Troy Zoning Ordinance, Section 13.07 Woodland Protection (C)(1)



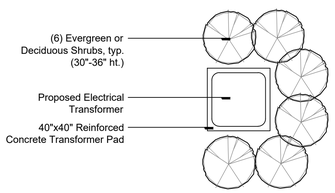
INSTALLATION NOTES:

1. DIG PLANT POCKET 12" WIDER THAN EDGE OF ROOTBALL.
2. THOROUGHLY COMPACT BOTTOM OF PLANT POCKET.
3. REMOVE ALL TWINE FROM TOP OF ROOTBALL. EXAMINE TRUNK COLLAR & REMOVE EXCESS SOIL FROM TOP OF ROOTBALL DOWN TO THE UPPER LEVEL OF THE ROOT SYSTEM. SET ROOTBALL WITH TOP 1/8 OF BALL ABOVE FINISH GRADE.
4. PLACE BACKFILL UNDER & ALONGSIDE BASE OF BALL TO STRAIGHTEN TREE. THOROUGHLY COMPACT TO FILL ALL VOIDS.
5. BACKFILL PLANT POCKET 1/3 WITH PLANTING MIX CONSISTING OF 50 % TOPSOIL & 50 % NATIVE SOIL & COMPACT THOROUGHLY, ASSURING TREE IS STILL STRAIGHT.
6. BEFORE CONTINUING WITH BACKFILL, REMOVE TOP WIRE LOOPS, OR BEND DOWN UNTIL THEY TOUCH SIDE OF BALL. REMOVE EXCESS BURLAP.
7. BACKFILL PLANT POCKET SECOND 1/3 WITH PLANTING MIX & COMPACT THOROUGHLY, ASSURING TREE IS STILL STRAIGHT.
8. BACKFILL PLANT POCKET LAST 1/3 WITH PLANTING MIX & COMPACT THOROUGHLY, ASSURING TREE IS STILL STRAIGHT. SLOPE GRADE AWAY FROM TREE.
9. IF PLANTED IN NON-IRRIGATED AREAS, FORM A SAUCER WITH SOIL AT OUTSIDE EDGE OF ROOTBALL.
10. SHREDDED BARK MULCH, 3" DEPTH. MULCH TO BE NATURAL IN COLOR. LEAVE 2-3" RING EXPOSED AT BASE OF TRUNK.
11. MULCH RINGS TO BE CONSISTENT WITH PLANT TYPE/SIZE THROUGHOUT PROJECT & SHOULD NOT EXTEND BEYOND PLANT POCKET.
12. MINIMUM 2"x2"x60" HARDWOOD STAKES TO EXTEND INTO UNDISTURBED SOIL UNDER PLANT POCKET. STAKE LOCATIONS PER TREE TO BE CONSISTENT THROUGHOUT PROJECT.
13. 1" WIDE BELT LIKE NYLON, PLASTIC, OR OTHER ACCEPTABLE MATERIAL, NO WIRE OR HOSE TO BE USE TO GUY TREES. TWO (2) GUYS PER TREE.

Deciduous Tree Planting Detail - 4" Cal. and Under

©2022 LANDSCAPE MANAGEMENT SOLUTIONS

Scale: NTS



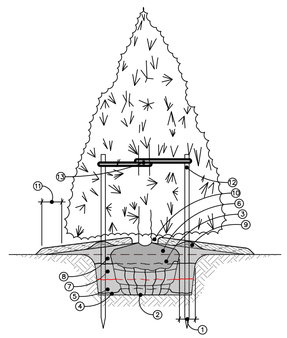
*Notes:
- Transformer Pad shall be screened on a minimum of three sides
- Actual Pad and Plant Locations shall be determined in the field, based on actual construction, orientation, and desired screening

Optional Transformer Screening Detail

Scale: ¼" = 1'

Landscape Notes

1. All plant material shall be true to name and free from physical damage and wind burn.
2. Plants shall be full, well-branched, and in a healthy, vigorous growing condition.
3. Plants shall be watered before and after planting is complete.
4. All trees must be staked, fertilized, and mulched and shall be guaranteed to exhibit a normal growth cycle for at least one (1) full year following planting.
5. All material shall conform to the guidelines established in the most recent edition of the American Standard for Nursery Stock.
6. Provide clean backfill soil, using material stockpiled on site. Soil shall be screened and free of any debris, foreign material, or stone.
7. "Agriform" tabs or similar slow-release fertilizer shall be added to the planting pits before being backfilled.
8. Amended planting mix shall consist of 1/3 screened topsoil, 1/3 sand, and 1/3 peat.
9. All plantings shall be mulched with shredded hardwood bark, spread to a minimum depth of 3". Mulch is to be free from debris and foreign material and shall contain no pieces of inconsistent size.
10. The Landscape Contractor shall be responsible for all work shown on the landscape drawings and specifications.
11. No substitutions or changes of location, or plant types shall be made without the approval of the Landscape Architect or Owner's representative.
12. The Landscape Architect shall be notified of any discrepancies between the plans and field conditions prior to installation.
13. The Landscape Contractor shall be responsible for maintaining all plant material in a vertical condition throughout the guaranteed period.
14. The Landscape Architect shall have the right at any stage of the installation to reject any work or material that does not meet the requirements of the plane and specifications, if requested by the owner.
15. The Contractor shall be responsible for checking plant quantities to ensure quantities on drawings and plant list are the same. In the event of a discrepancy, the quantities on the plans shall prevail.
16. The Landscape Contractor shall seed and mulch or sod (as indicated on plans) all areas disturbed during construction, throughout the contract limits.
17. A pre-emergent weed control agent, "Preen" or equal, shall be applied uniformly to all planting beds prior to mulching.
18. All lawn areas to be irrigated.
19. The Developer and Landscape Architect reserve the right to change location of plant material and alter plant species/variety at the time of installation based upon availability and quantity of material as well as site conditions. Materials will be of similar size, appearance and growth habit.
20. All Lawn areas shall be Seeded or Sodded
21. All Landscape Areas shall be irrigated by an automatic irrigation system with separate zones for Lawn and Plants.



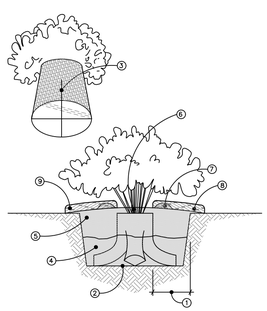
INSTALLATION NOTES:

1. DIG PLANT POCKET 12" WIDER THAN EDGE OF ROOTBALL.
2. THOROUGHLY COMPACT BOTTOM OF PLANT POCKET.
3. REMOVE ALL TWINE FROM TOP OF ROOTBALL. EXAMINE TRUNK COLLAR & REMOVE EXCESS SOIL FROM TOP OF ROOTBALL DOWN TO THE UPPER LEVEL OF THE ROOT SYSTEM. SET ROOTBALL WITH TOP 1/8 OF BALL ABOVE FINISH GRADE.
4. PLACE BACKFILL UNDER & ALONGSIDE BASE OF BALL TO STRAIGHTEN TREE. THOROUGHLY COMPACT TO FILL ALL VOIDS.
5. BACKFILL PLANT POCKET 1/3 WITH PLANTING MIX CONSISTING OF 50 % TOPSOIL & 50 % NATIVE SOIL & COMPACT THOROUGHLY, ASSURING TREE IS STILL STRAIGHT.
6. BEFORE CONTINUING WITH BACKFILL, REMOVE TOP WIRE LOOPS, OR BEND DOWN UNTIL THEY TOUCH SIDE OF BALL. REMOVE EXCESS BURLAP.
7. BACKFILL PLANT POCKET SECOND 1/3 WITH PLANTING MIX & COMPACT THOROUGHLY, ASSURING TREE IS STILL STRAIGHT.
8. BACKFILL PLANT POCKET LAST 1/3 WITH PLANTING MIX & COMPACT THOROUGHLY, ASSURING TREE IS STILL STRAIGHT. SLOPE GRADE AWAY FROM TREE.
9. IF PLANTED IN NON-IRRIGATED AREAS, FORM A SAUCER WITH SOIL AT OUTSIDE EDGE OF ROOTBALL.
10. SHREDDED BARK MULCH, 3" DEPTH. MULCH TO BE NATURAL IN COLOR. LEAVE 2-3" RING EXPOSED AT BASE OF TRUNK.
11. MULCH RINGS TO BE CONSISTENT WITH PLANT TYPE/SIZE THROUGHOUT PROJECT & SHOULD EXTEND 6" BEYOND LOWEST BRANCH OF EVERGREEN TREES.
12. MINIMUM 2"x2"x60" HARDWOOD STAKES TO EXTEND INTO UNDISTURBED SOIL UNDER PLANT POCKET. STAKE LOCATIONS PER TREE TO BE CONSISTENT THROUGHOUT PROJECT.
13. 1" WIDE BELT LIKE NYLON, PLASTIC, OR OTHER ACCEPTABLE MATERIAL, NO WIRE OR HOSE TO BE USE TO GUY TREES. TWO (2) GUYS PER TREE.

Evergreen Tree Planting Detail - 10' Ht. and Under

©2022 LANDSCAPE MANAGEMENT SOLUTIONS

Scale: NTS



INSTALLATION NOTES:

1. DIG PLANT POCKET 6" WIDER THAN EDGE OF ROOTBALL.
2. THOROUGHLY COMPACT BOTTOM OF PLANT POCKET.
3. REMOVE PLANT FROM CONTAINER AND EXAMINE ROOTMASS. IF ROOTMASS IS LOOSE, INTEGRATE PLANT ROOTS & POTTING MEDIA WITH PLANTING MIX. IF A ROOTBOUND CONDITIONS EXISTS, DISRUPT THE ROOTMASS BY CUTTING THROUGH BOTTOM HALF OF ROOTMASS. ROTATE ROOTMASS 90° AND CUT AGAIN, FORMING FOUR (4) LOBES. SPREAD THE FOUR LOBES DISTRIUPTING ROOTMASS AND INTEGRATE PLANT ROOTS & POTTING MEADIA WITH PLANTING MIX. PLACE PLANT IN POCKET SLIGHTLY ABOVE GRADE.
4. BACKFILL PLANT POCKET 1/2 WITH PLANTING MIX CONSISTING OF 50 % TOPSOIL & 50 % NATIVE SOIL, ASSURING SHRUB IS STRAIGHT.
5. BACK FILL REMAINING 1/2 OF PLANT POCKET WITH PLANTING MIX & COMPACT THOROUGHLY, ASSURING SHRUB IS STILL STRAIGHT.
6. SPREAD 1" OF PLANTING MIX OVER TOP OF CONTAINER ROOTBALL. SLOPE GRADE AWAY FROM SHRUB.
7. IF PLANTED IN NON-IRRIGATED AREAS, FORM A SAUCER WITH SOIL AT OUTSIDE EDGE OF ROOTBALL.
8. SHREDDED BARK MULCH, 3" DEPTH. MULCH TO BE NATURAL IN COLOR. LEAVE 1-2" RING EXPOSED AT BASE OF PLANT.
9. IF NOT PLANTED WITHIN A LANDSCAPE BED, MULCH RINGS TO BE CONSISTENT IN SIZE WITH PLANT TYPE/SIZE THROUGHOUT PROJECT.

Shrub Planting Detail - Container

©2022 LANDSCAPE MANAGEMENT SOLUTIONS

Scale: NTS

Landscape Maintenance Notes

All Landscape Maintenance shall be performed by Owner or Owner's desired Landscape Contractor or Landscape Maintenance Company.

Overall
- **All diseased, damaged, or dead materials shall be replaced in accordance with the standards of the City of Troy Zoning Ordinance.**

Lawn & Turf
- **Lawn shall not be irrigated the prior to scheduled mowing**
- **Maintain a lawn height or 2-1/2" to 3-1/2"**
- **Lawn shall be mowed with a mulching mower or mower affixed with a mulching blade. Grass clippings shall be left on the lawn to decompose and release nutrients back into the soil**
- **Inspect Irrigation system after mowing to ensure no damage has been done to the components**
- **Maintenance Contractor shall maintain clean equipment to prevent potential spread of unwanted seeds, pests, and pathogens**

Shrubs
- **Prune shrubs on an as-needed basis and only to maintain the plant's natural appearance**
- **Allow shrubs to mature and fill planting areas as designed**
- **Allow designed hedges to grow together prior to pruning into a uniform shape**

Groundcovers
- **Keep free of weeds, grass, and refuse**
- **Prune lightly to maintain natural appearance**
- **Allow groundcovers to fill the intended planting area**

Perennials
- **Prune dead flower stalks that emerge during the summer to encourage foliage growth**
- **Perform seasonal pruning, weeding, and dead-heading as necessary to maintain a neat appearance and encourage flowering**

Trees
- **Remove weeds and suckers from around the base of trees**
- **Prune trees for safety, health, or structural clearance. Remove crossing and damaged branches**
- **Do not top trees for any reason**
- **Check on tree staking on a regular basis to ensure that ties and stakes are not damaging the trees. Maintain tree stakes until the tree can stand on its own. Upon reaching this point, remove and properly dispose of all tree stakes, ties, and wiring**

Mulch
- **Maintain hardwood mulch at a 3" depth and replenish as needed**
- **Keep mulch at least 3" away from plant stems and tree trunks**
- **Maintain clean-cut mulch edges and tree rings that match the designed edges**

Weed Management
- **Remove and properly dispose of any weeds and tree suckers that appear in planting beds. Use the least destructive methods possible**

Fertilization
When fertilizing, use organic or non-chemical alternatives whenever possible to reduce the runoff into the Paint Creek

Pest Control
- **When using pesticides, use organic or non-chemical alternatives whenever possible to reduce the runoff into the Paint Creek**

Bed Edging
- **Maintain Spade Cut Edges as designed, as necessary**

All Aluminum Construction SALSBURY INDUSTRIES

Decorative Mailbox - 16 Gang CBU

Scale: NTS

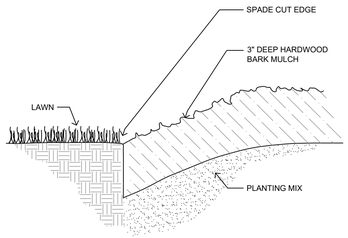
Manufacturer: Salsbury Industries
1010 E. 62nd St.
Los Angeles, CA 90001
www.mailboxes.com
Model: Regency Decorative CBU
#3316R
Black
Quantity: 1

All Aluminum Construction SALSBURY INDUSTRIES

Decorative Mailbox - 12 Gang CBU

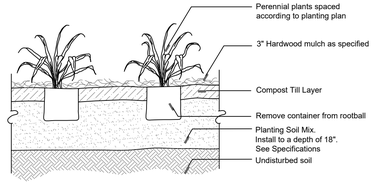
Scale: NTS

Manufacturer: Salsbury Industries
1010 E. 62nd St.
Los Angeles, CA 90001
www.mailboxes.com
Model: Regency Decorative CBU
#3312R
Black
Quantity: 1



Spade Cut Edging Detail

NTS



Perennial Planting Detail

NTS

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220

LEGEND

STATE OF MICHIGAN
WILLIAM T. KREAG
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Tree Survey 3 of 3 & Details

■ project title:

Village of Troy

City of Troy, Michigan

■ prepared for:

Robertson Brothers Homes
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

■ job number:	■ date:
19017	03.29.2022

■ drawn by:	■ checked by:
EMJ	WTK

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

■ revisions:

10.21.2022	Per Plan Revisions
11.07.2022	Per Plan Revisions

sheet no.

L-11

Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Lumens Per Lamp	Light Loss Factor	Wattage
○	A	198	Generation Lighting	8338701-12	Small one light downlight outdoor wall lantern	LED	901	0.9	7.93

Statistics

Description	Symbol	Avg	Max	Min	Avg/Min	Max/Min
Grade @ 0'	+	0.0 fc	1.0 fc	0.0 fc	N/A	N/A

Lighting for Single Family Lots will vary depending upon product style selected.

General Note

1. LUMINAIRE MOUNTING HEIGHT 8' - 0"
2. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0"
3. LIGHTING ALTERNATES REQUIRE NEW PHOTOMETRIC CALCULATION AND RESUBMISSION TO CITY FOR APPROVAL.

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.

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

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

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

Plan View
Scale - 1" = 60ft

GOODMAN
PHOTOMETRIC PLAN
PREPARED FOR: LAND DESIGN STUDIO
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

Designer
DS
Date
03/31/2022
Scale
Not to Scale
Drawing No.
#22-74064 V1
1 of 1

Village of Troy

Rendered Site Plan
City of Troy, Michigan

October 2022

ROBERTSON BROTHERS HOMES 70 Years

design studio LAND landscape architecture / land planning

"Defining community, lifestyle and place"

0 30' 60' 120' 180' 300'

North

E. Long Lake Road

River Bank Ct.

Emergency Vehicle Access

Community Green

Sunset Knoll Park

Hillside Meadow

Rochester Road

Village of Troy

Rendered Site Plan
City of Troy, Michigan

October 2022

ROBERTSON BROTHERS HOMES 70 Years

design studio LAND landscape architecture / land planning

"Defining community, lifestyle and place"

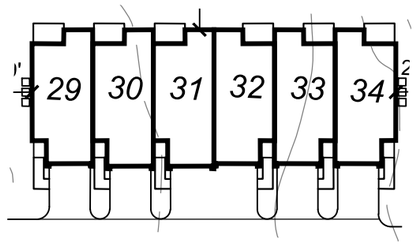
0 30' 60' 120' 180' 300'

North

ROBERTSON BROTHERS HOMES

"D" "E" "B" "C" "F"

5 UNIT BUILDING ELEVATION



"D" "C" "B" "C" "E" "F"

6 UNIT BUILDING ELEVATION

FOUNDATION NOTES

NOTE:
ALL FOOTINGS ARE DESIGNED FOR 3000 P.S.F. SOIL BRG. CAPACITY 4 30 P.S.F. ROOF SNOW LOAD. FOR VARYING CONDITIONS REFER TO TABLE R403.1(1), R403.1(2), & R403.1(3) OF THE 2015 IRC.

1. ALL COLUMNS SHOWN SHALL BE 3" DIA. SCHEDULE 40 STANDARD STEEL PIPE COLUMN ON 30" X 30" X 8" DEEP CONC. FTG. TOP OF CONCRETE FTG. TO BE 4" BELOW FINISH BASEMENT SLAB. (TYPICAL UNLESS NOTED OTHERWISE)
2. WHERE STEEL BEAMS REST ON FOUNDATION WALLS, SIZE BEAM POCKET APPROPRIATELY AND SHIM AS REQUIRED.
3. VERIFY ALL UTILITY LOCATIONS W/ BUILDER.
4. PROVIDE LADDERING UNDER ANY WALL RUNNING PARALLEL W/ JOIST THAT DOES NOT LAND DIRECTLY ON A JOIST
5. PROVIDE SQUASH BLOCKS UNDER ALL BEARING CONDITIONS.
6. GROUT SOLID 4 BEARING CONDITIONS WHERE BLOCK IS USED.
7. PROVIDE 2" X 24" (MIN. R-10) RIGID PERIMETER INSULATION AT ALL BASEMENT SLABS THAT ARE LESS THAN 42" BELOW EXTERIOR FINISHED GRADE
8. GAS LINES SHALL RUN UNDER SLAB

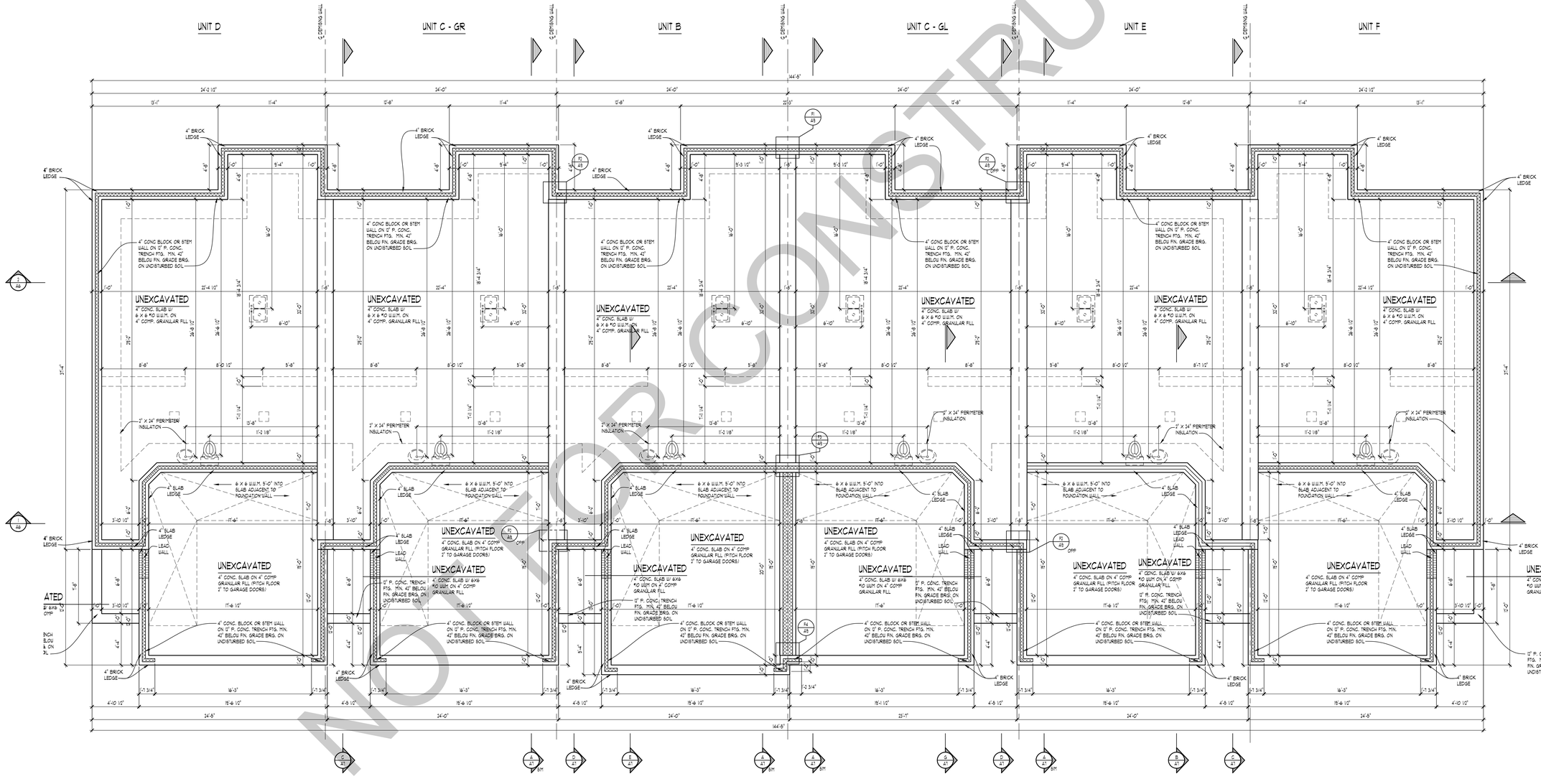
NOTE:
PROVIDE MIN. (2) 2 X 4 HEADER AT ALL INTERIOR & EXTERIOR DOOR & WINDOW OPENINGS (UNLESS NOTED OTHERWISE).

NOTE:
PROVIDE MIN. (1) JACK STUD & (1) KING STUD AT EACH END OF ALL HEADERS (UNLESS NOTED OTHERWISE).

NOTE:
PROVIDE MIN. (1) JOIST OR LADDER FRAMING UNDER ALL UPPER FLOOR PARALLEL PARTITIONS

NOTE:
GROUT ALL CONCRETE BLOCK CORES SOLID THAT SUPPORT POINT LOADS FROM ABOVE (TYPICAL)

NOTE:
____ WOOD BEAM
____ STEEL BEAM
BRG. WALL
BRG. WALL ABOVE
BRG. WALL & BRG. WALL ABOVE
■ POINT LOAD
⊙ POINT LOAD FROM ABOVE



FOUNDATION PLAN

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

TK DESIGN
CREATIVE COLLABORATIVE
WWW.TKHOMEDESIGN.COM
26030 PONTIAC TRAIL
SOUTH LYON, MI. 48178
PHONE: (248)-446-1960
FAX: (248)-446-1961

CLIENT / PROJECT
ROBERTSON BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
6 UNIT

JOB No.	WO 1370-22
DRAWN:	AG
CHECKED:	-
REVIEW	3-18-22
FINAL:	

SCALE:
PER PLAN

SHEET #
A-1

PLAN NOTES

INTERIOR WALLS:
1/2" GYPSUM WALL BOARD ON EACH SIDE OF 2x4 WOOD STUDS @ 16" O.C. 3 1/2" THICK TYPICAL (UNLESS NOTED OTHERWISE). ALL DIMENSION TAKEN FROM STUD EDGES

EXTERIOR WALLS:
SIDING WITH AIRSPACE, MOISTURE BARRIER PAPER (HOUSE WRAP) ON 7/16" O.S.B. SHEATHING ON 2X4 WOOD STUDS @ 16" O.C. OR AS NOTED, MIN. R-13 WALL CONSTRUCTION, 1/2" GYPSUM WALL BOARD (GLUE & SCREW). WALL TO BE 4" THICK WITH SIDING (TYPICAL UNLESS NOTED OTHERWISE). ALL DIMENSION TAKEN FROM FRAMING (FLOOR PLANS) OR FOUNDATION CORNERS (FOUNDATION PLAN)

1. OPENINGS BETWEEN THE GARAGE AND RESIDENCE SHALL BE EQUIPPED WITH 20-MINUTE FIRE RATED DOORS (OR EQUIVALENT PER 2015 MRC SECTION R302.5.1).
2. VENT ALL EXHAUST FANS TO EXTERIOR.
3. WHEN POSSIBLE DIRECT ALL FLUES AND VENTS THAT PENETRATE ROOF BEHIND MAIN RIDGE.
4. INSTALL WATER SUPPLY AND DRAIN BOX (GREY BOX) AT WASHING MACHINE LOCATION.
5. USE MOISTURE RESISTANT DRYWALL AT ALL AREAS SUSCEPTIBLE TO MOISTURE.
6. ALL FIRST FLOOR INTERIOR DOORS TO BE FRAMED 8'-0" TALL, ALL SECOND FLOOR INTERIOR DOORS TO BE FRAMED 6'-8" UNLESS NOTED OTHERWISE. VERIFY W/ BUILDER
7. PROVIDE GUARDRAIL AT STAIRS DURING CONSTRUCTION.
8. PROVIDE SQUASH BLOCKS UNDER ALL BEARING CONDITIONS.
9. GARAGE WALLS TO BE 2X6 STUDS IF OVER 10'-0" TALL.
10. PIPING INSTALLED DOWNSTREAM OF THE POINT OF DELIVERY SHALL NOT EXTEND THROUGH ANY TOWNHOUSE UNIT OTHER THAN UNIT SERVED PER SECTION G2415.3

NOTE:
PROVIDE MIN. (2) 2 X 4 HEADER AT ALL INTERIOR & EXTERIOR DOOR & WINDOW OPENINGS (UNLESS NOTED OTHERWISE).

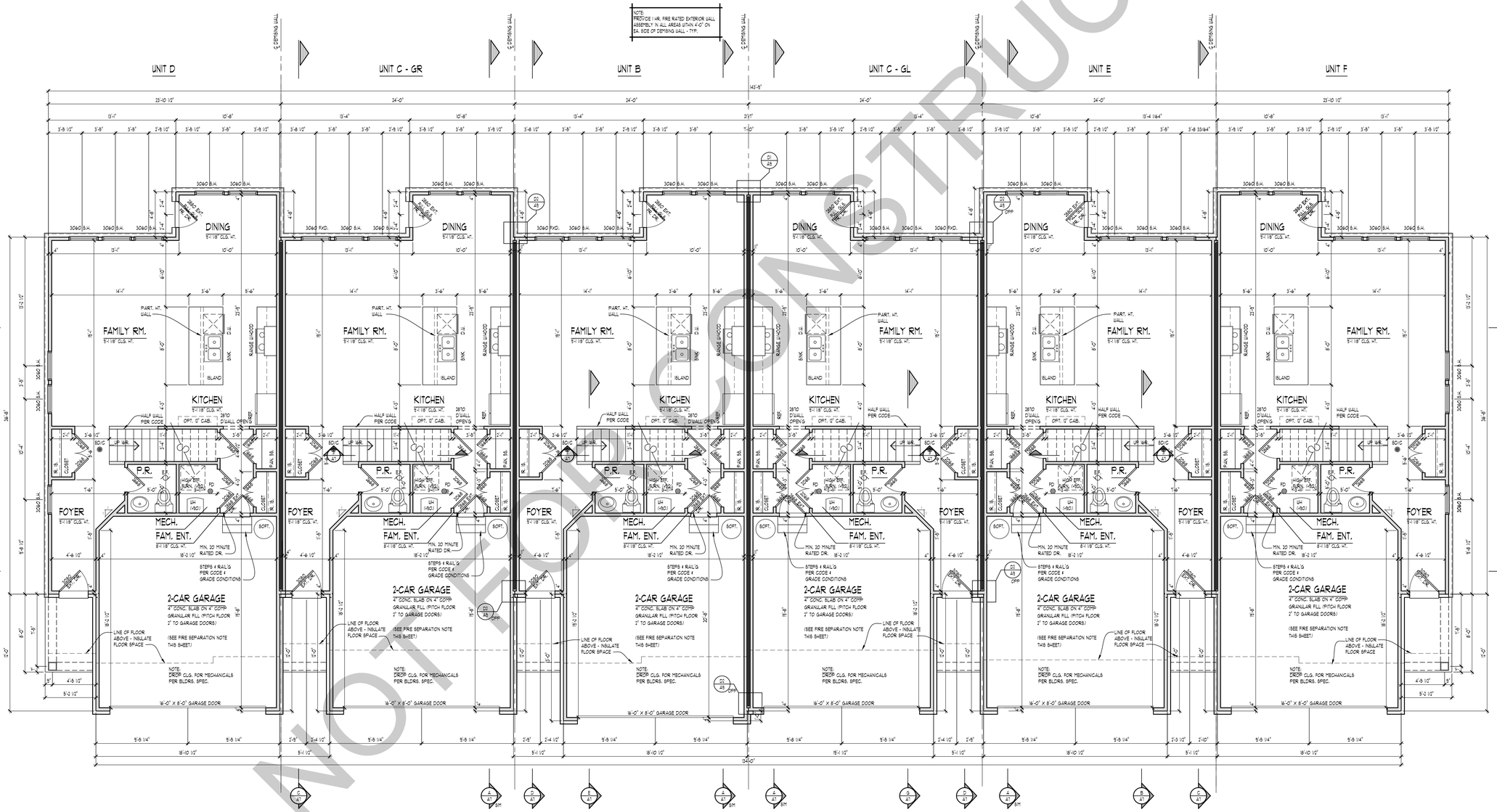
NOTE:
PROVIDE MIN. (1) JACK STUD & (1) KING STUD AT EACH END OF ALL HEADERS (UNLESS NOTED OTHERWISE).

NOTE:
PROVIDE MIN. (1) JOIST OR LADDER FRAMING UNDER ALL UPPER FLOOR PARALLEL PARTITIONS

NOTE:
S.D. ⊙
SD/C ◎
ALL SMOKE & CARBON MONOXIDE DETECTORS INTERCONNECTED W/ BATTERY BACK-UP PER CODE.

NOTE:
DOOR & WINDOW LOCATIONS:

ALL DOORS & WINDOWS ARE ASSUMED TO BE EITHER IN THE CENTER OF THE WALL MASS OR MIN. 4 INCHES FROM PERPENDICULAR WALL FOR CASING UNLESS NOTED OTHERWISE



NOTE:
PROVIDE 1 HR. FIRE RATED EXTERIOR WALL ASSEMBLY IN ALL AREAS WITHIN 4'-0" ON EA. SIDE OF DEMISING WALL - TYP.

FIRST FLOOR PLAN

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

NOTE:
DROP CLG. TO 8'-0" IN FAMILY ENTRY & MECH. RM. (STAIRS ABOVE)

TK
DESIGN
CREATIVE COLLABORATIVE

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

-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 DIG AT 680-482-7271 3 DAYS PRIOR TO ANY EXCAVATION
-CONSTRUCTION IS THE SOLE RESPONSIBILITY OF THE PERMIT HOLDER

CLIENT / PROJECT

ROBERTSON
BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
6 UNIT

JOB No. WO 1370-22
DRAWN: AG
CHECKED: -
REVIEW 3-18-22
FINAL:

SCALE:
PER PLAN

SHEET #
A-2

PLAN NOTES

INTERIOR WALLS:
1/2" GYPSUM WALL BOARD ON EACH SIDE OF 2x4 WOOD STUDS @ 16" O.C. 3 1/2" THICK TYPICAL (UNLESS NOTED OTHERWISE). ALL DIMENSION TAKEN FROM STUD EDGES

EXTERIOR WALLS:
SIDING WITH AIRSPACE, MOISTURE BARRIER PAPER (HOUSE WRAP) ON 7/16" O.S.B. SHEATHING ON 2X4 WOOD STUDS @ 16" O.C. OR AS NOTED, MIN. R-13 WALL CONSTRUCTION, 1/2" GYPSUM WALL BOARD (GLUE & SCREW). WALL TO BE 4" THICK WITH SIDING (TYPICAL UNLESS NOTED OTHERWISE). ALL DIMENSION TAKEN FROM FRAMING (FLOOR PLANS) OR FOUNDATION CORNERS (FOUNDATION PLAN)

1. OPENINGS BETWEEN THE GARAGE AND RESIDENCE SHALL BE EQUIPPED WITH 20-MINUTE FIRE RATED DOORS (OR EQUIVALENT PER 2015 MRC SECTION R302.5.1).
2. VENT ALL EXHAUST FANS TO EXTERIOR.
3. WHEN POSSIBLE DIRECT ALL FLUES AND VENTS THAT PENETRATE ROOF BEHIND MAIN RIDGE.
4. INSTALL WATER SUPPLY AND DRAIN BOX (GREY BOX) AT WASHING MACHINE LOCATION.
5. USE MOISTURE RESISTANT DRYWALL AT ALL AREAS SUSCEPTIBLE TO MOISTURE.
6. ALL FIRST FLOOR INTERIOR DOORS TO BE FRAMED 8'-0" TALL, ALL SECOND FLOOR INTERIOR DOORS TO BE FRAMED 6'-8" UNLESS NOTED OTHERWISE. VERIFY W/ BUILDER
7. PROVIDE GUARDRAIL AT STAIRS DURING CONSTRUCTION.
8. PROVIDE SQUASH BLOCKS UNDER ALL BEARING CONDITIONS.
9. GARAGE WALLS TO BE 2X6 STUDS IF OVER 10'-0" TALL.
10. PIPING INSTALLED DOWNSTREAM OF THE POINT OF DELIVERY SHALL NOT EXTEND THROUGH ANY TOWNHOUSE UNIT OTHER THAN UNIT SERVED PER SECTION G2415.3

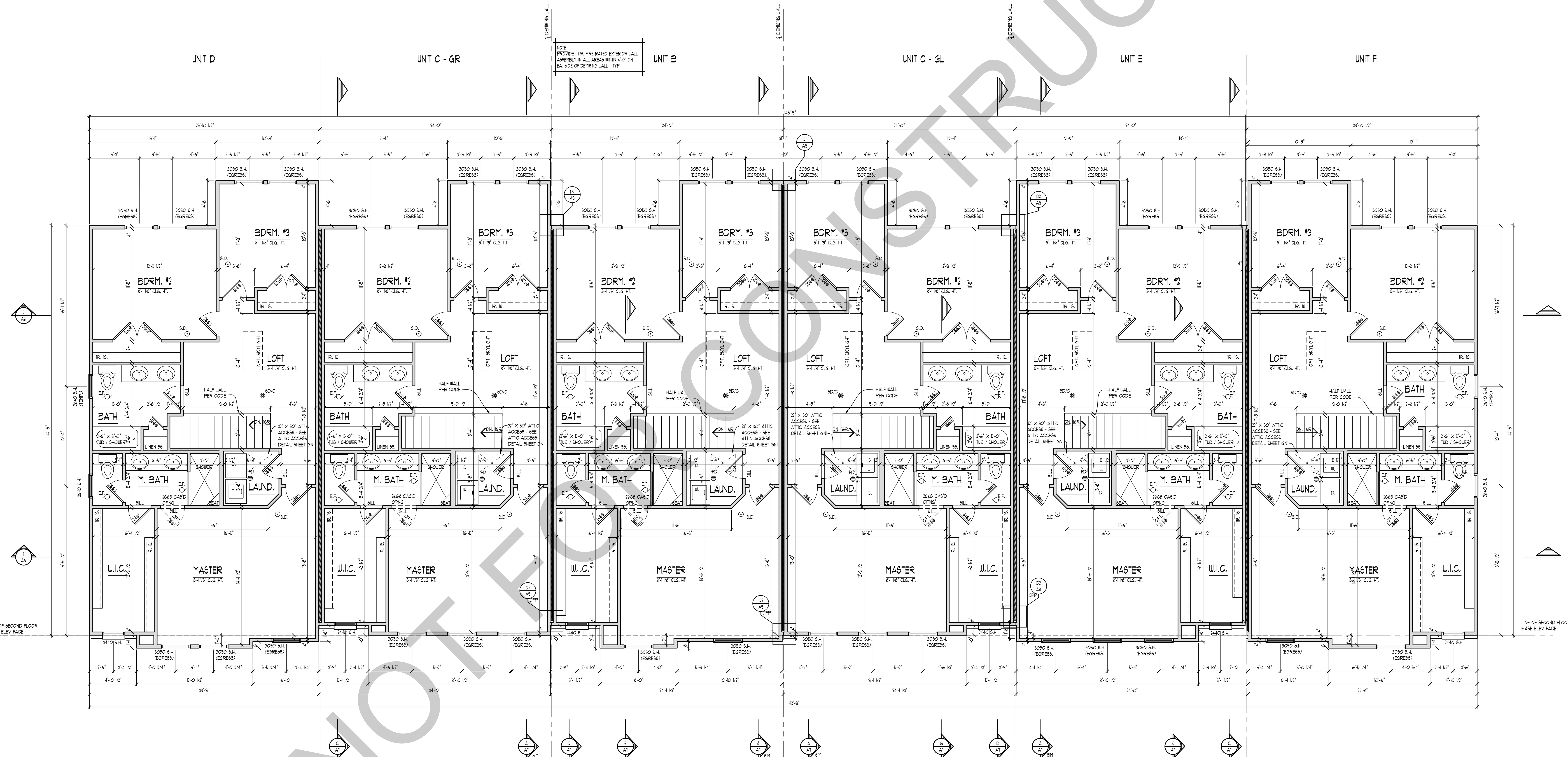
NOTE:
PROVIDE MIN. (2) 2 X 4 HEADER AT ALL INTERIOR & EXTERIOR DOOR & WINDOW OPENINGS (UNLESS NOTED OTHERWISE).

NOTE:
PROVIDE MIN. (1) JACK STUD & (1) KING STUD AT EACH END OF ALL HEADERS (UNLESS NOTED OTHERWISE).

NOTE:
PROVIDE MIN. (1) JOIST OR LADDER FRAMING UNDER ALL UPPER FLOOR PARALLEL PARTITIONS

NOTE:
S.D.
SD/C
ALL SMOKE & CARBON MONOXIDE DETECTORS INTERCONNECTED W/ BATTERY BACK-UP PER CODE.

NOTE:
DOOR & WINDOW LOCATIONS:
ALL DOORS & WINDOWS ARE ASSUMED TO BE EITHER IN THE CENTER OF THE WALL MASS OR MIN. 4 INCHES FROM PERPENDICULAR WALL FOR CASING UNLESS NOTED OTHERWISE



SECOND FLOOR PLAN

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

DESIGN
CREATIVE COLLABORATIVE

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

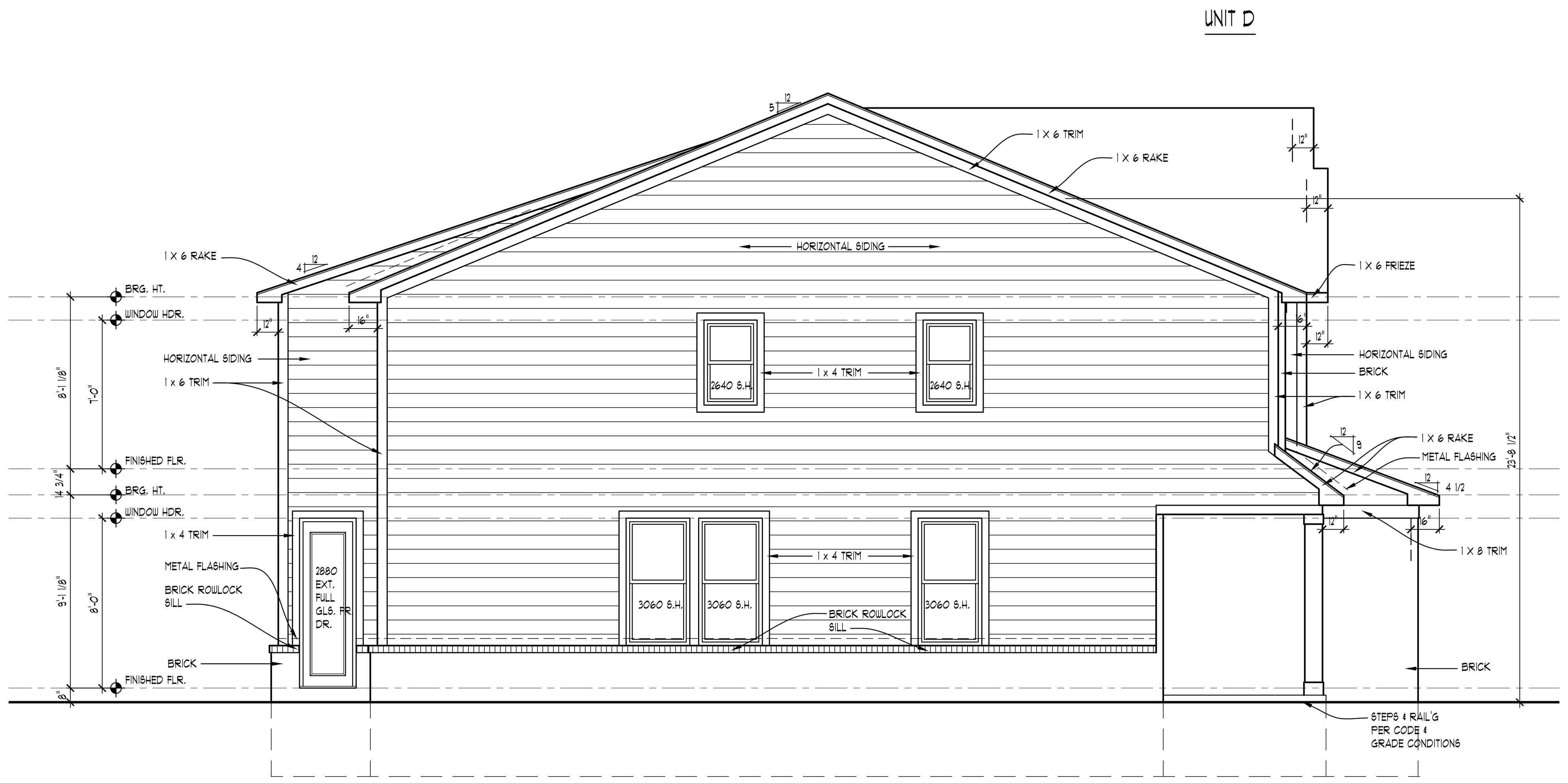
CLIENT / PROJECT
ROBERTSON BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
6 UNIT

JOB No. WO 1370-22
DRAWN: AG
CHECKED: -
REVIEW 3-18-22
FINAL:

SCALE:
PER PLAN

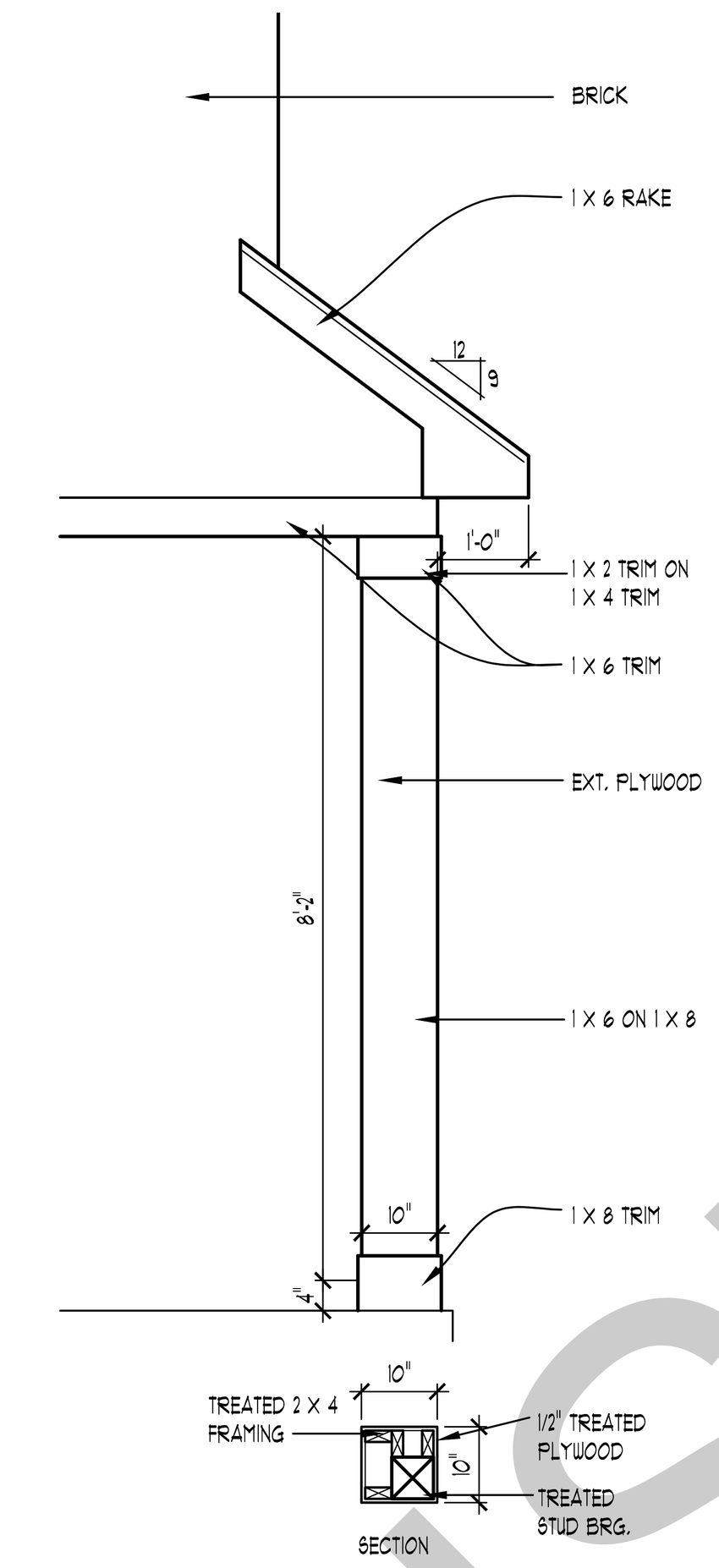
SHEET #
A-3

UNIT D



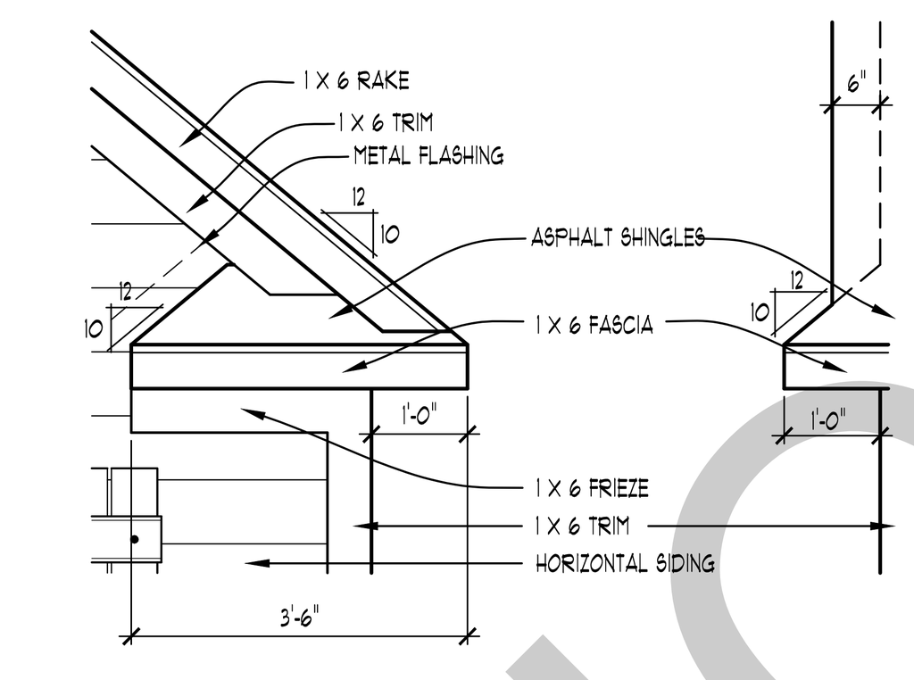
LEFT ELEVATION

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



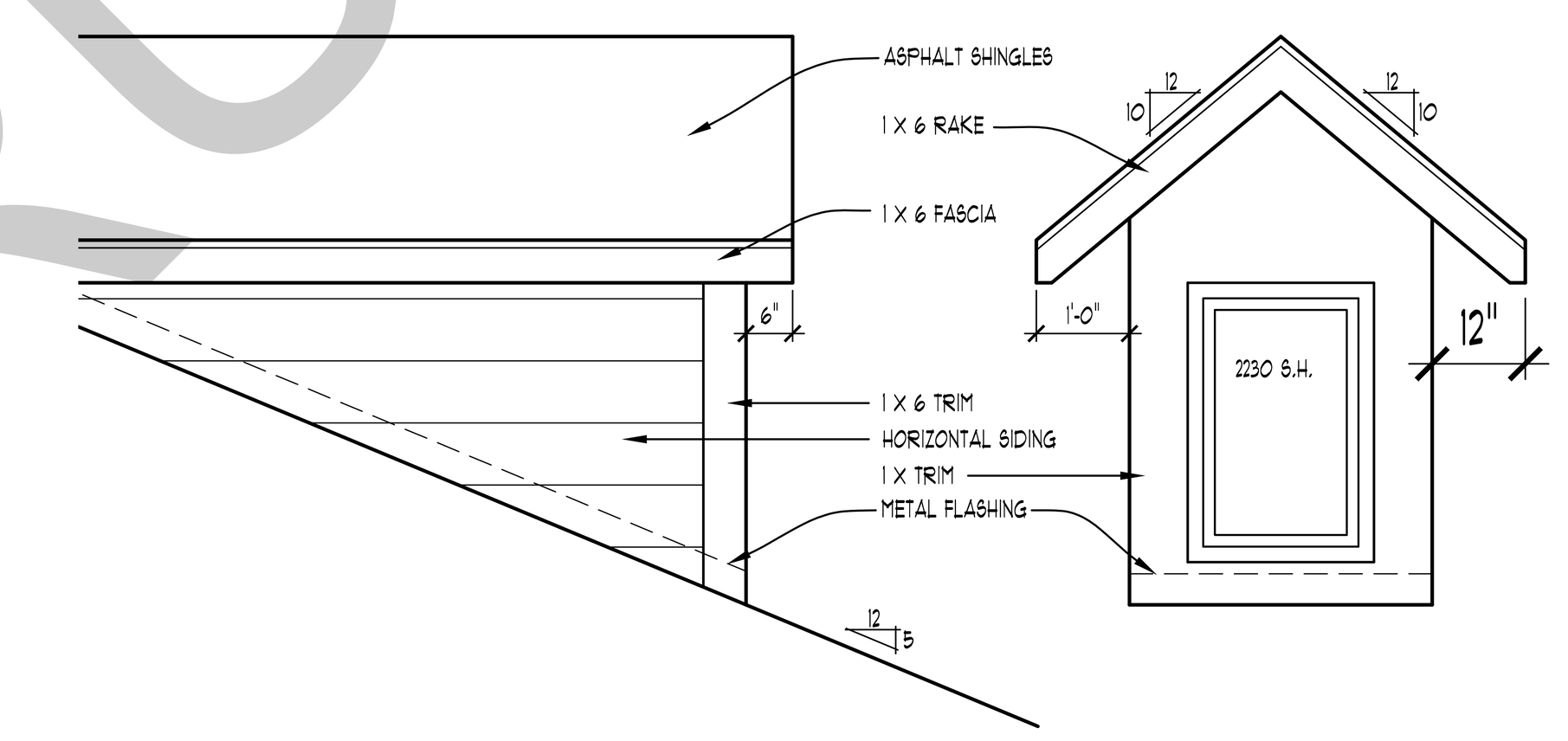
PORCH COLUMN DETAIL

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



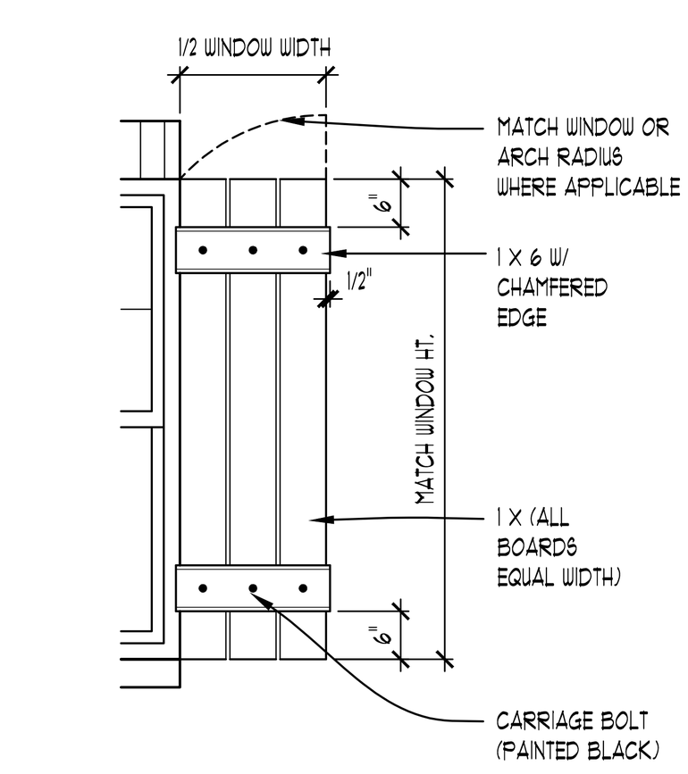
QUEEN ANNE DETAIL

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



DORMER DETAIL

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



SHUTTER DETAIL

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

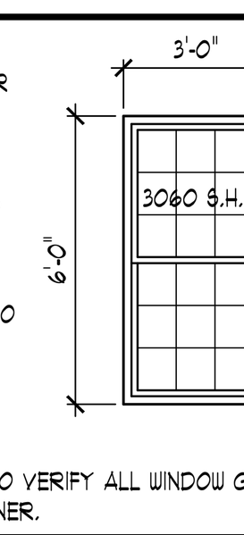
ELEVATION NOTES

1. ALL ROOF SADDLES TO BE O.S.B. SHEATHED WITH ICE & WATER SHIELD AND SHINGLES.
2. PROVIDE ICE & WATER SHIELD MIN. 6'-0" COVERAGE AT ALL VALLEYS
3. FIREPLACE FLUE TO BE DETERMINED PER MANUFACTURER'S SPECIFICATION
4. METAL FLASHING AS REQUIRED BY CODE.
5. ROOF & SOFFIT VENTS AS REQUIRED BY CODE.
6. PROVIDE GUTTERS & DOWNSPOUTS FOR DRAINAGE OF ROOF WATER. DOWNSPOUTS ARE TO BE LOCATED SO THAT THE DISCHARGE WILL NOT SPILL ON OR FLOW ACROSS ANY PORCHES, WALKS OR DRIVES.
7. CARPENTER TO VERIFY THICKNESS OF MASONRY PRIOR TO BUILDING BRICK RACK

TYPICAL WINDOW DESIGNATION

NOTE:
GENERAL REFERENCE FOR ROUGH OPENING SIZES ONLY. CONSULT WITH WINDOW MANUFACTURER FOR EXACT WINDOW SIZES & REQUIREMENTS.

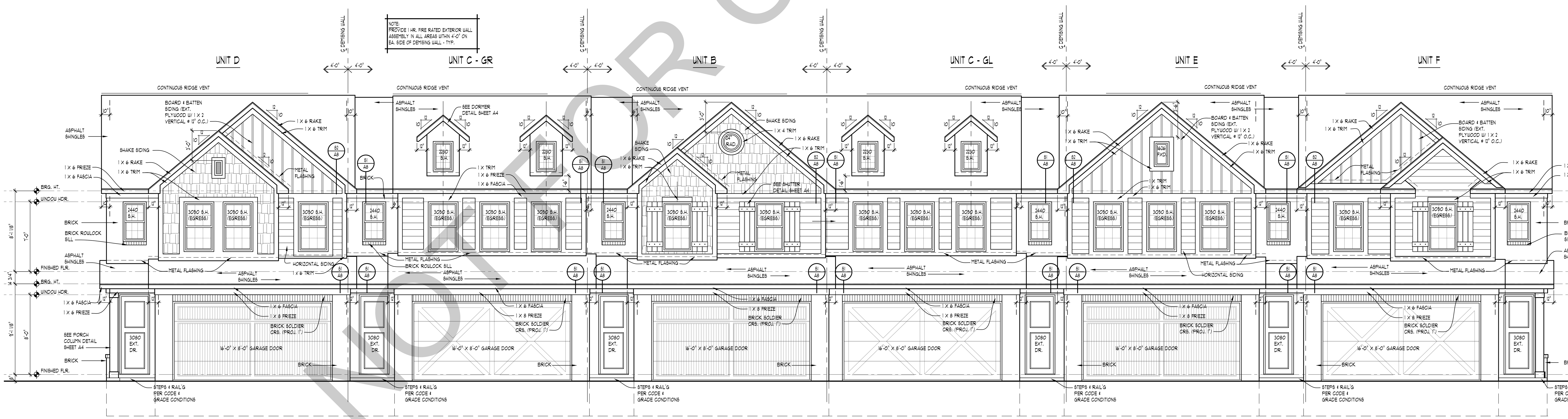
NOTE:
ALL CASEMENT VENTING TO BE VERIFIED W/ BUILDER/ HOMEOWNER PRIOR TO ORDERING WINDOWS



NOTE:
WINDOW MANUFACTURER TO VERIFY ALL WINDOW GRID PATTERNS WITH HOME OWNER.

NOTE:
OVERHANG DIMENSIONS (O.H.) ARE FROM SHEATHING U.N.O.

NOTE:
ALL WINDOW SILLS OVER 6'-0" ABOVE EXTERIOR GRADE OR SURFACE BELOW TO BE MINIMUM 24" ABOVE FINISHED FLOOR OR HAVE SASH LIMITERS PER CODE REQUIRMENTS



FRONT ELEVATION

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

DESIGN
CREATIVE COLLABORATIVE

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

-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 DIG AT 680-482-7271 3 DAYS PRIOR TO ANY EXCAVATION
-CONSTRUCTION IS THE SOLE RESPONSIBILITY OF THE PERMIT HOLDER

CLIENT / PROJECT

ROBERTSON
BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
6 UNIT

JOB No.	WO 1370-22
DRAWN:	AG
CHECKED:	-
REVIEW	3-18-22
FINAL:	

SCALE:
PER PLAN

SHEET #
A-4

UNIT F

RIGHT ELEVATION

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

ELEVATION NOTES

1. ALL ROOF SADDLES TO BE O.S.B. SHEATHED WITH ICE & WATER SHIELD AND SHINGLES.
2. PROVIDE ICE & WATER SHIELD MIN. 6'-0" COVERAGE AT ALL VALLEYS
3. FIREPLACE FLUE TO BE DETERMINED PER MANUFACTURER'S SPECIFICATION
4. METAL FLASHING AS REQUIRED BY CODE.
5. ROOF & SOFFIT VENTS AS REQUIRED BY CODE.
6. PROVIDE GUTTERS & DOWNSPOUTS FOR DRAINAGE OF ROOF WATER. DOWNSPOUTS ARE TO BE LOCATED SO THAT THE DISCHARGE WILL NOT SPILL ON OR FLOW ACROSS ANY PORCHES, WALKS OR DRIVES.
7. CARPENTER TO VERIFY THICKNESS OF MASONRY PRIOR TO BUILDING BRICK RACK

TYPICAL WINDOW DESIGNATION

NOTE:
GENERAL REFERENCE FOR ROUGH OPENING SIZES ONLY. CONSULT WITH WINDOW MANUFACTURER FOR EXACT WINDOW SIZES & REQUIREMENTS.

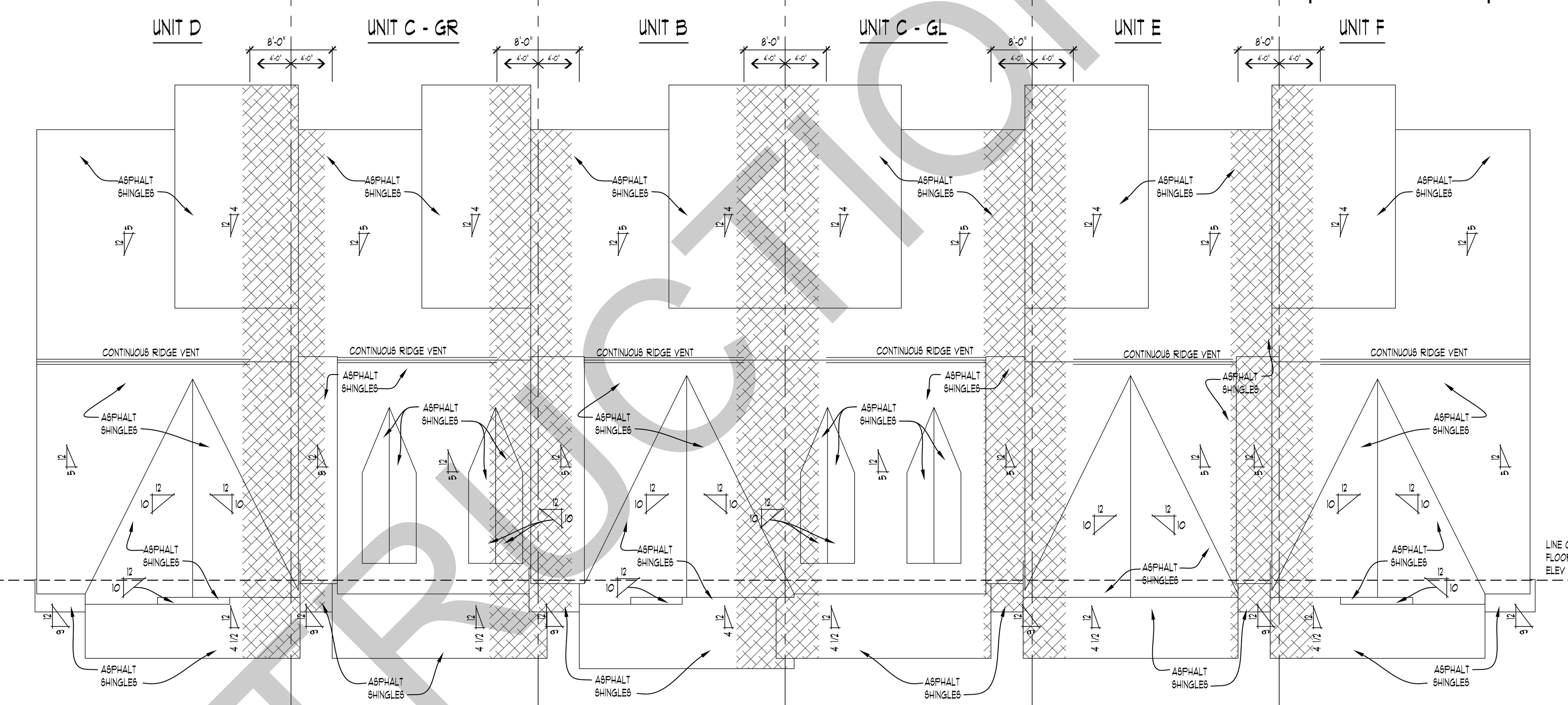
NOTE:
ALL CASEMENT VENTING TO BE VERIFIED W/ BUILDER/ HOMEOWNER PRIOR TO ORDERING WINDOWS

NOTE:
WINDOW MANUFACTURER TO VERIFY ALL WINDOW GRID PATTERNS WITH HOME OWNER.

3'-0" | 6'-0" | 3060 S.H.

NOTE:
OVERHANG DIMENSIONS (O.H.) ARE FROM SHEATHING U.N.O.

NOTE:
ALL WINDOW SILLS OVER 6'-0" ABOVE EXTERIOR GRADE OR SURFACE BELOW TO BE MINIMUM 24" ABOVE FINISHED FLOOR OR HAVE SASH LIMITERS PER CODE REQUIRMENTS



ROOF PLAN

SCALE: 1/8" = 1'-0"

ATTIC VENTILATION CALCULATIONS:

AREA OF ATTIC OVER HEATED SPACE = 4360 SQ. FT.
4360/150 = 29 (SQ. FT. REQ'D)
29' X 144" = 4186" (SQ. INCH CONVERSION)
RIDGE VENTING:
4186" X 0.45 = 1884" (SQ. INCHES REQ'D)
1884" / 18 = 105' (LINEAR FT. OF RIDGE VENT REQ'D)
EAVE OR CORNICE VENTING:
4186" X 0.55 = 2303" (SQ. INCHES REQ'D)

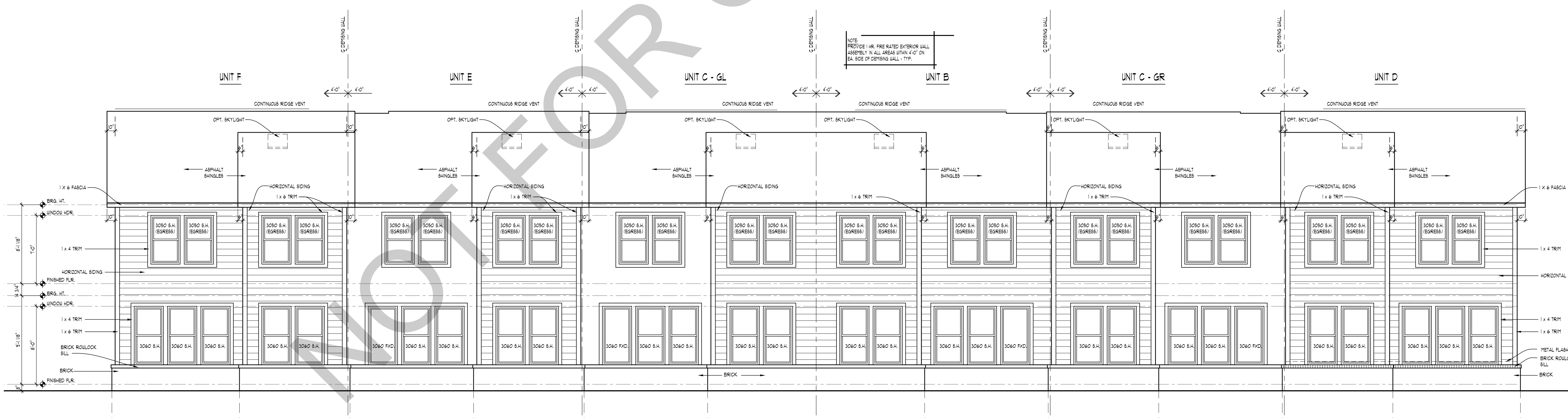
NOTE:
PROVIDE 1 HR. FIRE RATED EXTERIOR WALL ASSEMBLY IN ALL AREAS WITHIN 4'-0" ON EA. SIDE OF DEMISING WALL - TYP.

PROVIDE FIRE RETARDANT ROOF SHEATHING WITHIN 4'-0" ON EA. SIDE OF DEMISING WALL - TYP.

NOTE:
DO NOT INSTALL ANY ROOF VENTILATION W/IN 8'-0" OF DIMENSION WALL/FIRE RATED SHEATHING

DO NOT INSTALL ANY SOFFIT VENTILATION W/IN 4'-0" OF EA. SIDE OF DIMENSION WALL

NOTE:
PROVIDE 1 HR. FIRE RATED EXTERIOR WALL ASSEMBLY IN ALL AREAS WITHIN 4'-0" ON EA. SIDE OF DEMISING WALL - TYP.



REAR ELEVATION

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

DESIGN
CREATIVE COLLABORATIVE

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

-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 DIG AT 680-482-7271 3 DAYS PRIOR TO ANY EXCAVATION
-CONSTRUCTION IS THE SOLE RESPONSIBILITY OF THE PERMIT HOLDER

CLIENT / PROJECT

ROBERTSON
BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
6 UNIT

JOB No.	WO 1370-22
DRAWN:	AG
CHECKED:	-
REVIEW	3-18-22
FINAL:	

SCALE:
PER PLAN

SHEET #
A-5

TROY GOODMAN

5 UNIT TOWNHOME

PLAN DRAWING INDEX

REV. DATE	CIVIL	
		SITE PLAN
	ARCHITECTURAL BUILDING COMPOSITION	
	GN1	GENERAL NOTES & DETAILS
	GN2I	GENERAL NOTES & DETAILS
	A1	FOUNDATION PLAN
	A2	FIRST FLOOR PLAN
	A3	SECOND FLOOR PLAN
	A4	FRONT & LEFT ELEVATION
	A5	RIGHT & REAR ELEVATION / ROOF PLAN
	A6	BUILDING SECTIONS
	A7	BUILDING SECTIONS
	A8	WALL SECTIONS
	A9	DETAILS
	OPT 1	OPT. BASEMENT FOUNDATION PLAN
	OPT 1.1	OPT BASEMENT FIRST FLOOR PLAN
	OPT 2	OPT OUTDOOR LIVING PATIO ON SLAB FND.
	OPT 3	OPT. RAISED SLAB ON BASEMENT FND.
	S1	FOUNDATION STRUCTURE PLAN
	S2	FIRST FLOOR STRUCTURE PLAN
	S3	SECOND FLOOR STRUCTURE PLAN

CODES

MICHIGAN RESIDENTIAL CODE (MRC) - 2015
MICHIGAN MECHANICAL CODE (MMC) - 2015
MICHIGAN PLUMBING CODE (MPC) - 2015
NFPA 70 NATIONAL ELECTRICAL CODE - 2017

IRC BUILDING CODE DATA

ZONING:	
TYPE OF CONSTRUCTION:	WOOD FRAME ON POURED FND.
NUMBER OF STORIES:	2
BUILDING HEIGHT:	23'-11 5/8" (GRADE TO MEDIAN)
FIRE RATING:	WALLS & PARTITIONS:
SEPARATION WALL (PER R302.2):	2 HR
EXTERIOR WALL @ SEPARATION WALL	1 HR
SPRINKLER SYSTEM:	NOT SPRINKLED
NOTES:	
1. REFER TO GENERAL SHEETS FOR FIRE RATED WALL DETAILS	

PLUMBING FIXTURES:

UNIT IDENTITY	STANDARD FIXTURES			
	BATHROOMS	KITCHEN SINK	DISHWASHER	MOP SINK
UNIT D	2.5	1	1	0
UNIT E	2.5	1	1	0
UNIT B	2.5	1	1	0
UNIT C	2.5	1	1	0
UNIT F	2.5	1	1	0
BLDG TOTAL =	12.5	5	5	0

SQUARE FOOTAGE:

UNIT IDENTITY	SQUARE FOOTAGE		TOTAL HEATED S.F.		
	FIRST FLOOR	SECOND FLOOR		GARAGE	OUTDOOR LIVING
UNIT D	802	1063	1865	389	37
UNIT E	795	1041	1836	389	36
UNIT B	793	1042	1835	406	36
UNIT C	793	1030	1823	386	36
UNIT F	802	1063	1865	389	37
BLDG TOTAL SF. F.T =			9,224	1,959	182

TK DESIGN
CREATIVE COLLABORATIVE

WWW.TKHOMEDESIGN.COM

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

CLIENT / PROJECT

ROBERTSON BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
5 UNIT

JOB No.	WO 2331-21
DRAWN:	AG
CHECKED:	BF
REVIEW	11-1-21
FINAL:	12-6-21

⚠ R VALUE REV. 1-10-22

SCALE:
PER PLAN

SHEET #
COVER

FOUNDATION NOTES

NOTE:

ALL FOOTINGS ARE DESIGNED FOR 3000 P.S.F. SOIL BRG. CAPACITY & 30 P.S.F. ROOF SNOW LOAD. FOR VARYING CONDITIONS REFER TO TABLE R403.1(1), R403.1(2), & R403.1(3) OF THE 2015 IRC.

1. ALL COLUMNS SHOWN SHALL BE 3" DIA. SCHEDULE 40 STANDARD STEEL PIPE COLUMN ON 30" X 30" X 18" DEEP CONC. FTG. TOP OF CONCRETE FTG. TO BE 4" BELOW FINISH BASEMENT SLAB. (TYPICAL UNLESS NOTED OTHERWISE)
2. WHERE STEEL BEAMS REST ON FOUNDATION WALLS, SIZE BEAM POCKET APPROPRIATELY AND SHIM AS REQUIRED.
3. VERIFY ALL UTILITY LOCATIONS W/ BUILDER.
4. PROVIDE LADDERING UNDER ANY WALL RUNNING PARALLEL W/ JOIST THAT DOES NOT LAND DIRECTLY ON A JOIST
5. PROVIDE SQUASH BLOCKS UNDER ALL BEARING CONDITIONS.
6. GROUT SOLID @ BEARING CONDITIONS WHERE BLOCK IS USED.
7. PROVIDE 2" X 24" (MIN. R-10) RIGID PERIMETER INSULATION AT ALL BASEMENT SLABS THAT ARE LESS THAN 42" BELOW EXTERIOR FINISHED GRADE
8. GAS LINES SHALL RUN UNDER SLAB

NOTE:

PROVIDE MIN. (2) 2 X 4 HEADER AT ALL INTERIOR & EXTERIOR DOOR & WINDOW OPENINGS (UNLESS NOTED OTHERWISE).

NOTE:

PROVIDE MIN. (1) JACK STUD & (1) KING STUD AT EACH END OF ALL HEADERS (UNLESS NOTED OTHERWISE).

NOTE:

PROVIDE MIN. (1) JOIST OR LADDER FRAMING UNDER ALL UPPER FLOOR PARALLEL PARTITIONS

NOTE:

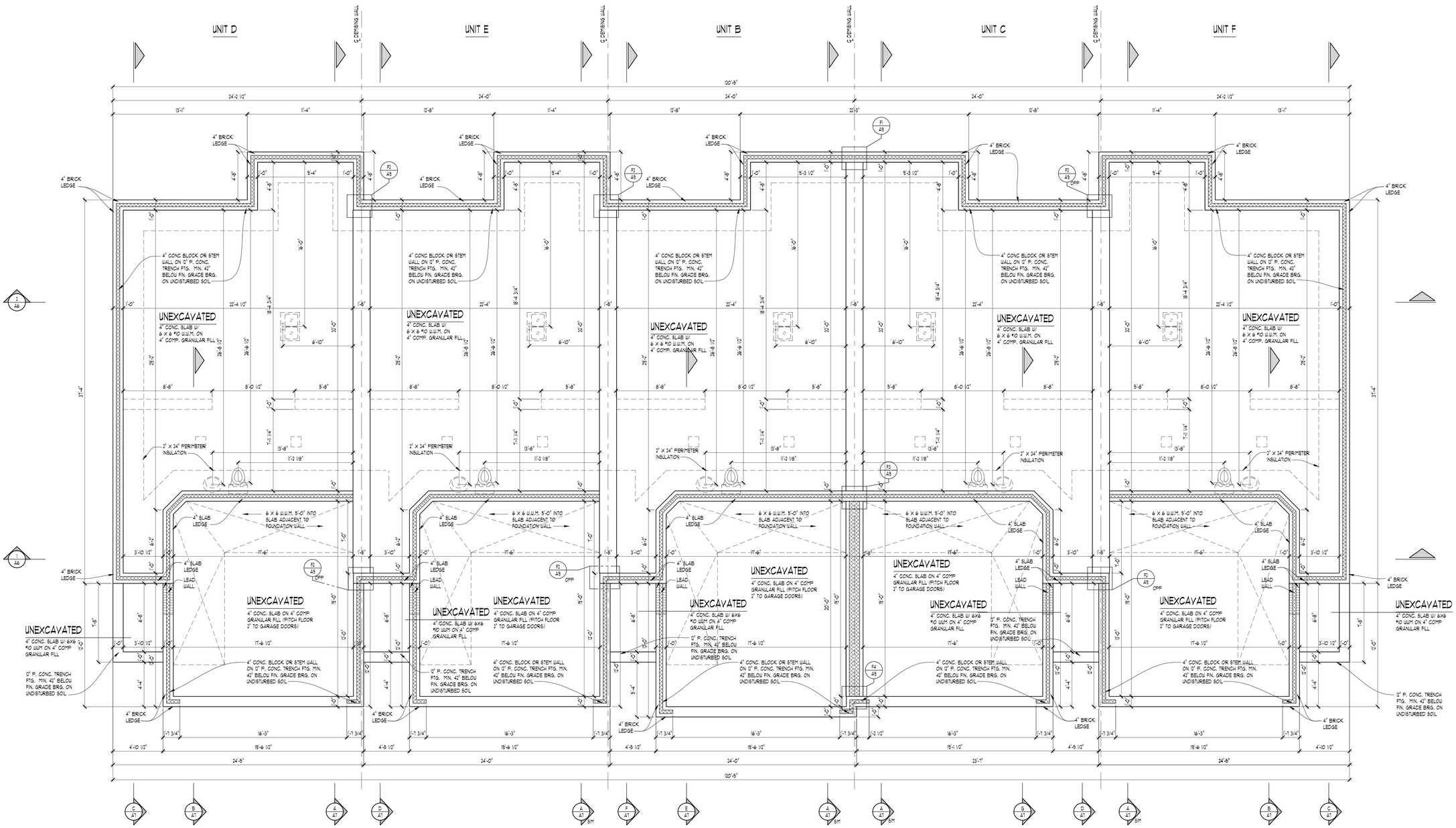
GROUT ALL CONCRETE BLOCK CORES SOLID THAT SUPPORT POINT LOADS FROM ABOVE (TYPICAL)

NOTE:

____ WOOD BEAM
____ STEEL BEAM

BRG. WALL
BRG. WALL ABOVE
BRG. WALL & BRG. WALL ABOVE

POINT LOAD
POINT LOAD FROM ABOVE



FOUNDATION PLAN

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

TK DESIGN
CREATIVE COLLABORATIVE

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

CLIENT / PROJECT

ROBERTSON BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
5 UNIT

JOB No.	WO 2331-21
DRAWN:	AG
CHECKED:	BF
REVIEW	11-1-21
FINAL:	12-6-21

R VALUE REV. 1-10-22

SCALE:
PER PLAN

SHEET #
A-1

PLAN NOTES

INTERIOR WALLS:
1/2" GYPSUM WALL BOARD ON EACH SIDE OF 2x4 WOOD STUDS @ 16" O.C. 3 1/2" THICK TYPICAL (UNLESS NOTED OTHERWISE). ALL DIMENSION TAKEN FROM STUD EDGES

EXTERIOR WALLS:
SIDING WITH AIRSPACE, MOISTURE BARRIER PAPER (HOUSE WRAP) ON 7/16" O.S.B. SHEATHING ON 2X4 WOOD STUDS @ 16" O.C. OR AS NOTED, MIN. R-13 WALL CONSTRUCTION. 1/2" GYPSUM WALL BOARD (GLUE & SCREW). WALL TO BE 4" THICK WITH SIDING (TYPICAL UNLESS NOTED OTHERWISE). ALL DIMENSION TAKEN FROM FRAMING (FLOOR PLANS) OR FOUNDATION CORNERS (FOUNDATION PLAN)

1. OPENINGS BETWEEN THE GARAGE AND RESIDENCE SHALL BE EQUIPPED WITH 20-MINUTE FIRE RATED DOORS (OR EQUIVALENT PER 2015 MRC SECTION R302.5.1).
2. VENT ALL EXHAUST FANS TO EXTERIOR.
3. WHEN POSSIBLE DIRECT ALL FLUES AND VENTS THAT PENETRATE ROOF BEHIND MAIN RIDGE.
4. INSTALL WATER SUPPLY AND DRAIN BOX (GREY BOX) AT WASHING MACHINE LOCATION.
5. USE MOISTURE RESISTANT DRYWALL AT ALL AREAS SUSCEPTIBLE TO MOISTURE.
6. ALL FIRST FLOOR INTERIOR DOORS TO BE FRAMED 8'-0" TALL, ALL SECOND FLOOR INTERIOR DOORS TO BE FRAMED 8'-8" UNLESS NOTED OTHERWISE. VERIFY W/ BUILDER
7. PROVIDE GUARDRAIL AT STAIRS DURING CONSTRUCTION.
8. PROVIDE SQUASH BLOCKS UNDER ALL BEARING CONDITIONS.
9. GARAGE WALLS TO BE 2X6 STUDS IF OVER 10'-0" TALL.
10. PIPING INSTALLED DOWNSTREAM OF THE POINT OF DELIVERY SHALL NOT EXTEND THROUGH ANY TOWNHOUSE UNIT OTHER THAN UNIT SERVED PER SECTION 604B.3

NOTE:
PORCH CLG. FINISH PER BUILDER'S SPEC.

NOTE:
PROVIDE MIN. (2) 2 X 4 HEADER AT ALL INTERIOR & EXTERIOR DOOR & WINDOW OPENINGS (UNLESS NOTED OTHERWISE).

NOTE:
PROVIDE MIN. (1) JACK STUD & (1) KING STUD AT EACH END OF ALL HEADERS (UNLESS NOTED OTHERWISE).

NOTE:
PROVIDE MIN. (1) JOIST OR LADDER FRAMING UNDER ALL UPPER FLOOR PARALLEL PARTITIONS

NOTE: S.D. ⊙ SD/C ◉
ALL SMOKE & CARBON MONOXIDE DETECTORS INTERCONNECTED W/ BATTERY BACK-UP PER CODE.

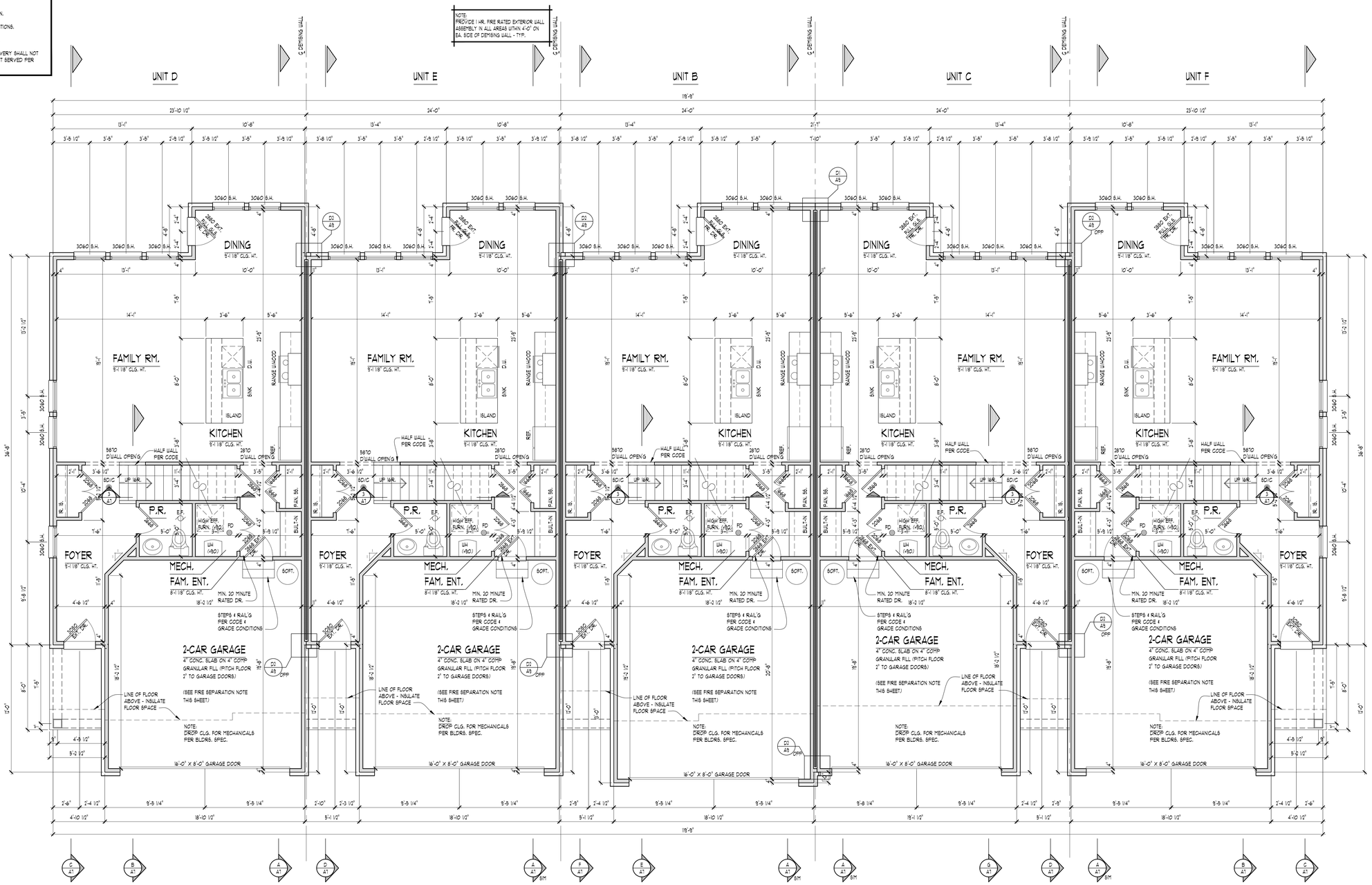
NOTE:
DOOR & WINDOW LOCATIONS:

ALL DOORS & WINDOWS ARE ASSUMED TO BE EITHER IN THE CENTER OF THE WALL MASS OR MIN. 4 INCHES FROM PERPENDICULAR WALL FOR CASING UNLESS NOTED OTHERWISE

FIRE SEPARATION NOTE

FIRE SEPARATION (R302.6)
GARAGE SPACE BENEATH HABITABLE ROOMS SHALL BE SEPARATED FROM ALL HABITABLE ROOMS ABOVE BY NOT LESS THAN 5/8-INCH TYPE X GYPSUM BOARD OR EQUIVALENT. WHERE THE SEPARATION IS A FLOOR-CEILING ASSEMBLY, THE STRUCTURE SUPPORTING THE SEPARATION SHALL ALSO BE PROTECTED BY NOT LESS THAN 1/2-INCH GYPSUM BOARD OR EQUIVALENT. ALL OTHER GARAGE SPACE SHALL BE SEPARATED FROM THE RESIDENCE AND ITS ATTIC AREA BY NOT LESS THAN 1/2-INCH GYPSUM BOARD APPLIED TO THE GARAGE SIDE. (FROM CLG. UNDER FLR. ABV. (ENCLOSE MECHANICAL AND STRUCTURAL ELEMENTS) VERIFY W/ BLDR.

NOTE:
PROVIDE 1 HR. FRE RATED EXTERIOR WALL ASSEMBLY IN ALL AREAS WITHIN 4'-0" ON EA. SIDE OF DEMISING WALL - TYP.



FIRST FLOOR PLAN

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

NOTE:
DROP CLG. TO 8'-0" IN FAMILY ENTRY & MECH. RM. (STAIRS ABOVE)

TK DESIGN
CREATIVE COLLABORATIVE

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

CLIENT / PROJECT

ROBERTSON BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
5 UNIT

JOB No.	WO 2331-21
DRAWN:	AG
CHECKED:	BF
REVIEW	11-1-21
FINAL:	12-6-21
⚠ R VALUE REV. 1-10-22	

SCALE:
PER PLAN

SHEET #
A-2

PLAN NOTES

INTERIOR WALLS:
1/2" GYPSUM WALL BOARD ON EACH SIDE OF 2x4 WOOD STUDS @ 16" O.C. 3 1/2" THICK TYPICAL (UNLESS NOTED OTHERWISE). ALL DIMENSION TAKEN FROM STUD EDGES

EXTERIOR WALLS:
SIDING WITH AIRSPACE, MOISTURE BARRIER PAPER (HOUSE WRAP) ON 7/16" O.S.B. SHEATHING ON 2X4 WOOD STUDS @ 16" O.C. OR AS NOTED, MIN. R-13 WALL CONSTRUCTION, 1/2" GYPSUM WALL BOARD (GLUE & SCREW). WALL TO BE 4" THICK WITH SIDING (TYPICAL UNLESS NOTED OTHERWISE). ALL DIMENSION TAKEN FROM FRAMING (FLOOR PLANS) OR FOUNDATION CORNERS (FOUNDATION PLAN)

1. OPENINGS BETWEEN THE GARAGE AND RESIDENCE SHALL BE EQUIPPED WITH 20-MINUTE FIRE RATED DOORS (OR EQUIVALENT PER 2015 MRC SECTION R302.5.1).
2. VENT ALL EXHAUST FANS TO EXTERIOR.
3. WHEN POSSIBLE DIRECT ALL FLUES AND VENTS THAT PENETRATE ROOF BEHIND MAIN RIDGE.
4. INSTALL WATER SUPPLY AND DRAIN BOX (GREY BOX) AT WASHING MACHINE LOCATION.
5. USE MOISTURE RESISTANT DRYWALL AT ALL AREAS SUSCEPTIBLE TO MOISTURE.
6. ALL FIRST FLOOR INTERIOR DOORS TO BE FRAMED 8'-0" TALL, ALL SECOND FLOOR INTERIOR DOORS TO BE FRAMED 8'-8" UNLESS NOTED OTHERWISE. VERIFY W/ BUILDER
7. PROVIDE GUARDRAIL AT STAIRS DURING CONSTRUCTION.
8. PROVIDE SQUASH BLOCKS UNDER ALL BEARING CONDITIONS.
9. GARAGE WALLS TO BE 2X6 STUDS IF OVER 10'-0" TALL.
10. PIPING INSTALLED DOWNSTREAM OF THE POINT OF DELIVERY SHALL NOT EXTEND THROUGH ANY TOWNHOUSE UNIT OTHER THAN UNIT SERVED PER SECTION G2415.3

NOTE:
PROVIDE MIN. (2) 2 X 4 HEADER AT ALL INTERIOR & EXTERIOR DOOR & WINDOW OPENINGS (UNLESS NOTED OTHERWISE).

NOTE:
PROVIDE MIN. (1) JACK STUD & (1) KING STUD AT EACH END OF ALL HEADERS (UNLESS NOTED OTHERWISE).

NOTE:
PROVIDE MIN. (1) JOIST OR LADDER FRAMING UNDER ALL UPPER FLOOR PARALLEL PARTITIONS

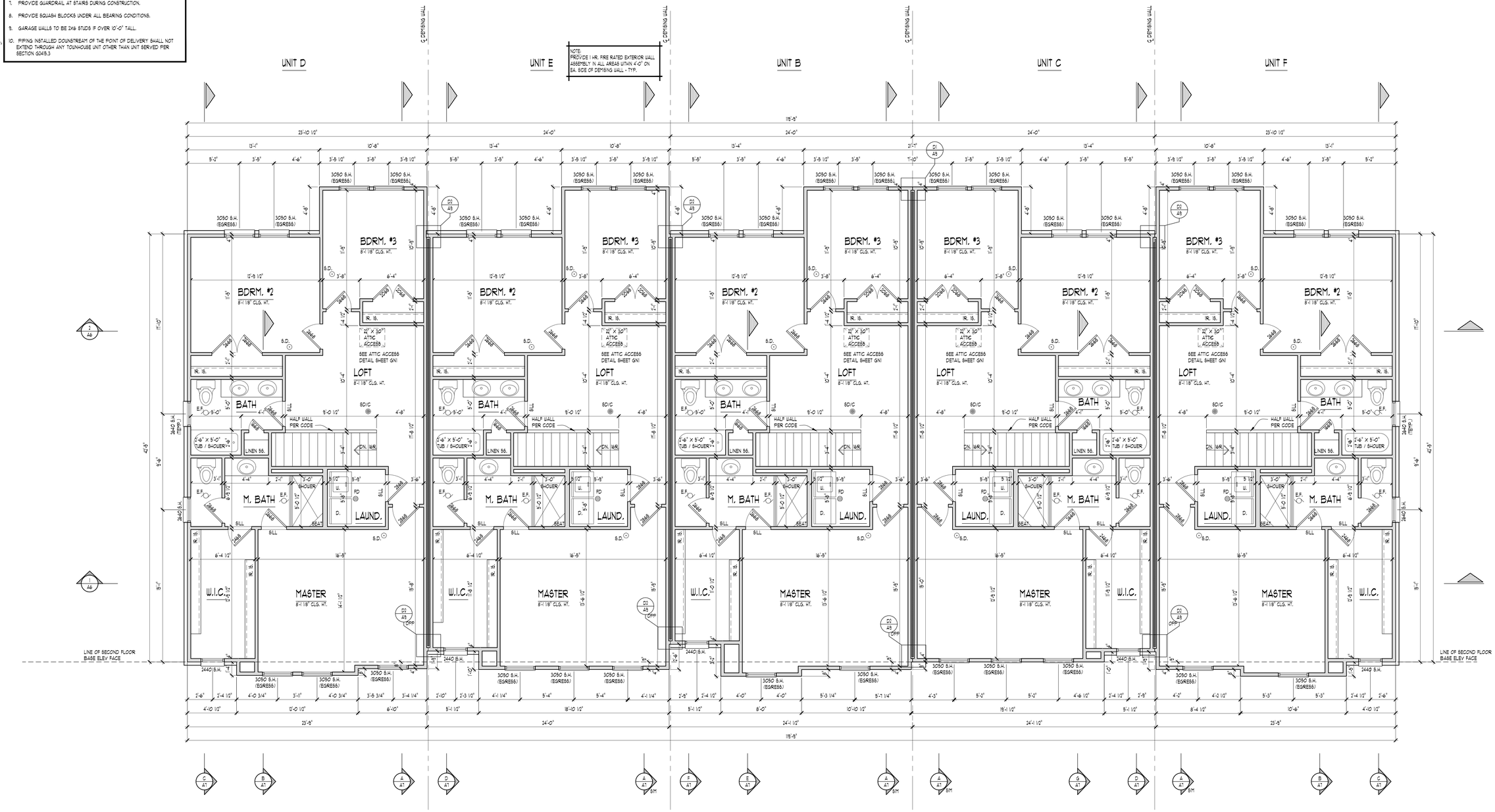
NOTE: S.D. ⊙ SD/C ◉
ALL SMOKE & CARBON MONOXIDE DETECTORS INTERCONNECTED W/ BATTERY BACK-UP PER CODE.

NOTE:
DOOR & WINDOW LOCATIONS:

ALL DOORS & WINDOWS ARE ASSUMED TO BE EITHER IN THE CENTER OF THE WALL MASS OR MIN. 4 INCHES FROM PERPENDICULAR WALL FOR CASING UNLESS NOTED OTHERWISE

FIRE SEPARATION NOTE

FIRE SEPARATION (R302.6)
GARAGE SPACE BENEATH HABITABLE ROOMS SHALL BE SEPARATED FROM ALL HABITABLE ROOMS ABOVE BY NOT LESS THAN 5/8-INCH TYPE X GYPSUM BOARD OR EQUIVALENT. WHERE THE SEPARATION IS A FLOOR-CEILING ASSEMBLY, THE STRUCTURE SUPPORTING THE SEPARATION SHALL ALSO BE PROTECTED BY NOT LESS THAN 1/2-INCH GYPSUM BOARD OR EQUIVALENT. ALL OTHER GARAGE SPACE SHALL BE SEPARATED FROM THE RESIDENCE AND ITS ATTIC AREA BY NOT LESS THAN 1/2-INCH GYPSUM BOARD APPLIED TO THE GARAGE SIDE. (FROM CLG. UNDER FLR. ABV. (ENCLOSE MECHANICAL AND STRUCTURAL ELEMENTS) VERIFY W/ BLDR.



SECOND FLOOR PLAN

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

TK DESIGN
CREATIVE COLLABORATIVE

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

CLIENT / PROJECT
ROBERTSON BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
5 UNIT

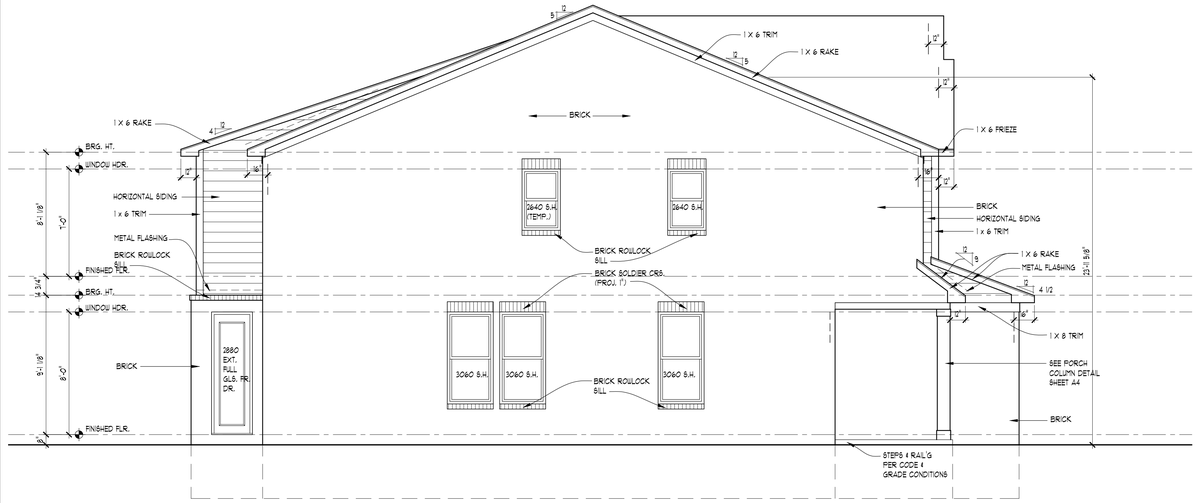
JOB No.	WO 2331-21
DRAWN:	AG
CHECKED:	BF
REVIEW	11-1-21
FINAL:	12-6-21

⚠ R VALUE REV. 1-10-22

SCALE:
PER PLAN

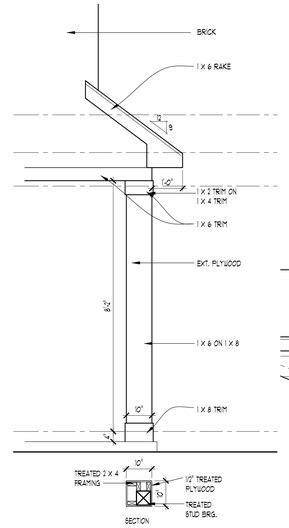
SHEET #
A-3

UNIT D



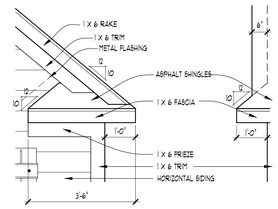
LEFT ELEVATION

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



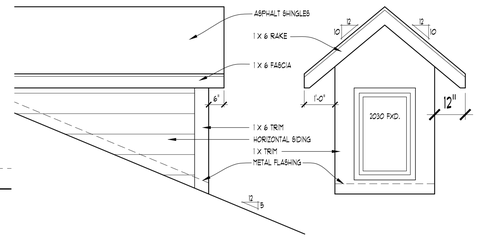
PORCH COLUMN DETAIL

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



QUEEN ANNE DETAIL

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



DORMER DETAIL

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

ELEVATION NOTES

1. ALL ROOF SADDLES TO BE O.S.B. SHEATHED WITH ICE & WATER SHIELD AND SHINGLES.
2. PROVIDE ICE & WATER SHIELD MIN. 6'-0" COVERAGE AT ALL VALLEYS
3. FIREPLACE FLUE TO BE DETERMINED PER MANUFACTURER'S SPECIFICATION
4. METAL FLASHING AS REQUIRED BY CODE.
5. ROOF & SOFFIT VENTS AS REQUIRED BY CODE.
6. PROVIDE GUTTERS & DOWNSPOUTS FOR DRAINAGE OF ROOF WATER. DOWNSPOUTS ARE TO BE LOCATED SO THAT THE DISCHARGE WILL NOT SPILL ON OR FLOW ACROSS ANY PORCHES, WALKS OR DRIVES.
7. CARPENTER TO VERIFY THICKNESS OF MASONRY PRIOR TO BUILDING BRICK RACK

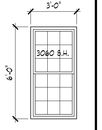
NOTE:
OVERHANG DIMENSIONS (O.H.) ARE FROM SHEATHING U.N.O.

TYPICAL WINDOW DESIGNATION

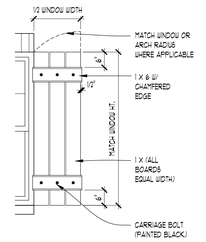
NOTE:
GENERAL REFERENCE FOR ROUGH OPENING SIZES ONLY. CONSULT WITH WINDOW MANUFACTURER FOR EXACT WINDOW SIZES & REQUIREMENTS.

NOTE:
ALL CASEMENT VENTING TO BE VERIFIED W/ BUILDER/ HOMEOWNER PRIOR TO ORDERING WINDOWS

NOTE:
WINDOW MANUFACTURER TO VERIFY ALL WINDOW GRID PATTERNS WITH HOME OWNER.



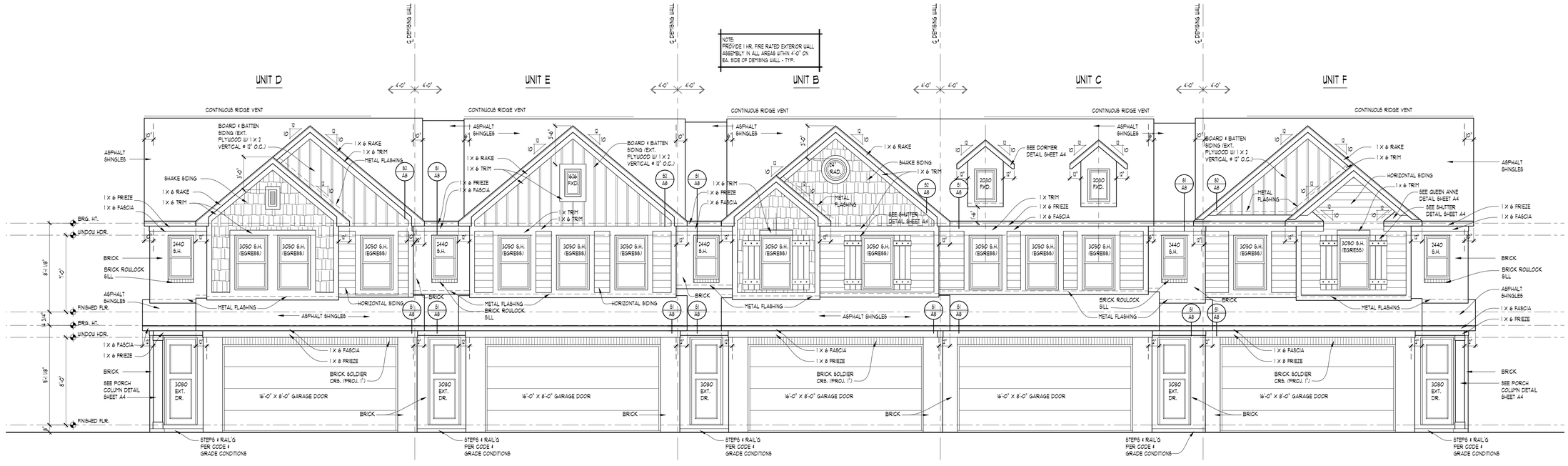
NOTE:
ALL WINDOW SILLS OVER 6'-0" ABOVE EXTERIOR GRADE OR SURFACE BELOW TO BE MINIMUM 24" ABOVE FINISHED FLOOR OR HAVE SASH LIMITERS PER CODE REQUIREMENTS



SHUTTER DETAIL

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

NOTE:
PROVIDE 1 HR. FIRE RATED EXTERIOR WALL ASSEMBLY IN ALL AREAS WITHIN 4'-0" ON EA. SIDE OF DEMISING WALL - TYP.



FRONT ELEVATION

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

TK DESIGN
CREATIVE COLLABORATIVE

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

CLIENT / PROJECT

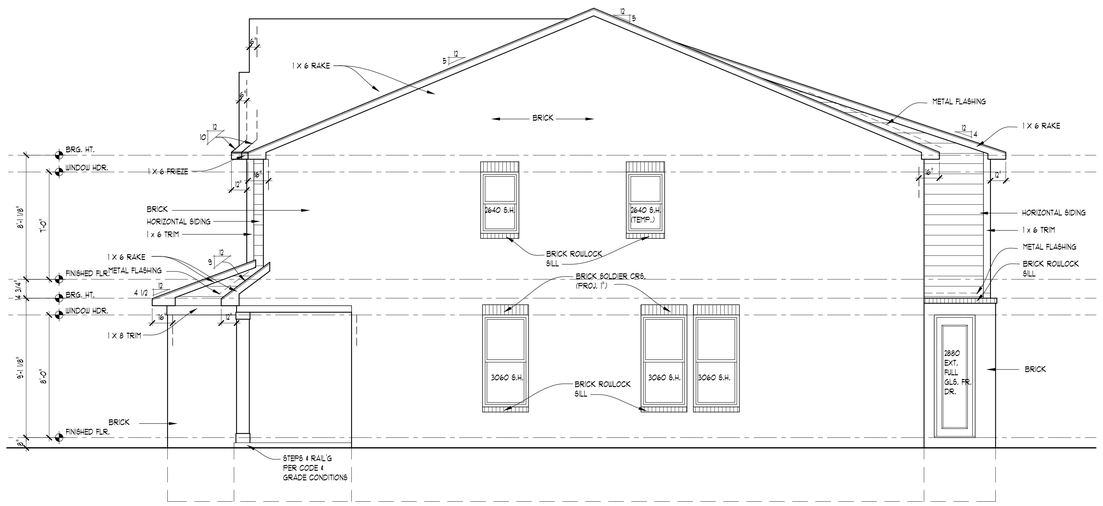
ROBERTSON BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
5 UNIT

JOB No.	WO 2331-21
DRAWN:	AG
CHECKED:	BF
REVIEW	11-1-21
FINAL:	12-6-21

⚠ R VALUE REV. 1-10-22

SCALE:
PER PLAN

SHEET #
A-4



RIGHT ELEVATION

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

ELEVATION NOTES

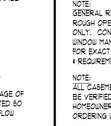
1. ALL ROOF SADDLES TO BE O.S.B. SHEATHED WITH ICE & WATER SHIELD AND SHINGLES.
2. PROVIDE ICE & WATER SHIELD MIN. 6'-0" COVERAGE AT ALL VALLEYS
3. FIREPLACE FLUE TO BE DETERMINED PER MANUFACTURER'S SPECIFICATION
4. METAL FLASHING AS REQUIRED BY CODE.
5. ROOF & SOFFIT VENTS AS REQUIRED BY CODE.
6. PROVIDE GUTTERS & DOWNSPOUTS FOR DRAINAGE OF ROOF WATER. DOWNSPOUTS ARE TO BE LOCATED SO THAT THE DISCHARGE WILL NOT SPILL ON OR FLOW ACROSS ANY PORCHES, WALKS OR DRIVES.
7. CARPENTER TO VERIFY THICKNESS OF MASONRY PRIOR TO BUILDING BRICK RACK

TYPICAL WINDOW DESIGNATION

NOTE:
GENERAL REFERENCE FOR ROUGH OPENING SIZES ONLY. CONSULT WITH WINDOW MANUFACTURER FOR EXACT WINDOW SIZES & REQUIREMENTS.

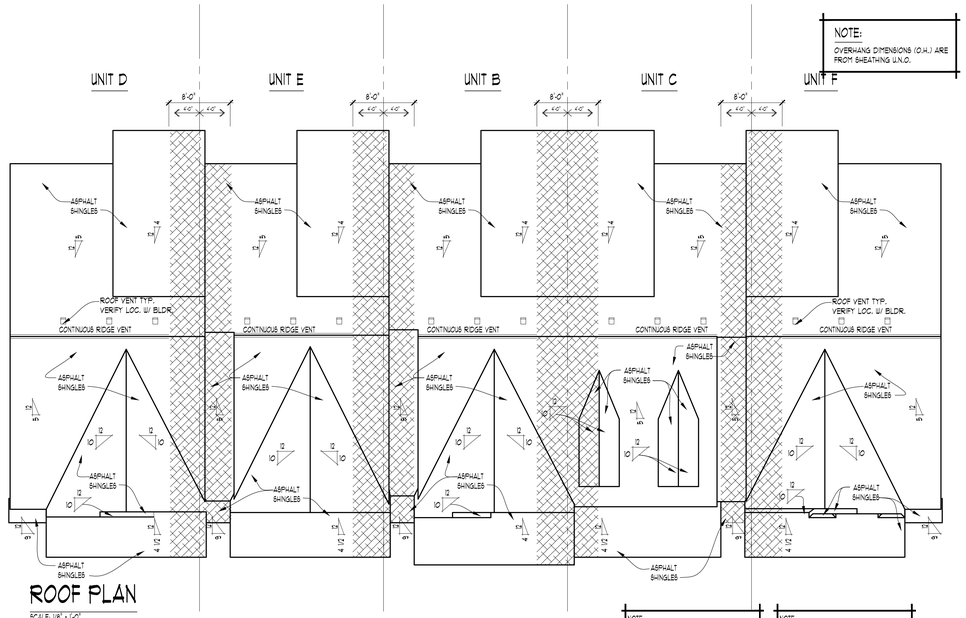
NOTE:
ALL CASEMENT VENTING TO BE VERIFIED W/ BUILDER/ HOMEOWNER PRIOR TO ORDERING WINDOWS

NOTE:
WINDOW MANUFACTURER TO VERIFY ALL WINDOW GRID PATTERNS WITH HOME OWNER.



NOTE:
OVERHANG DIMENSIONS (O.H.) ARE FROM SHEATHING U.N.O.

NOTE:
ALL WINDOW SILLS OVER 8'-0" ABOVE EXTERIOR GRADE OR SURFACE BELOW TO BE MINIMUM 24" ABOVE FINISHED FLOOR OR HAVE SASH LIMITERS PER CODE REQUIREMENTS



ROOF PLAN

SCALE: 1/8" = 1'-0"

NOTE:
PROVIDE 1 HR. FIRE RATED EXTERIOR WALL ASSEMBLY IN ALL AREAS WITHIN 4'-0" ON EA. SIDE OF DEMISING WALL - TYP.

PROVIDE FIRE RETARDANT ROOF SHEATHING WITHIN 4'-0" ON EA. SIDE OF DEMISING WALL - TYP.

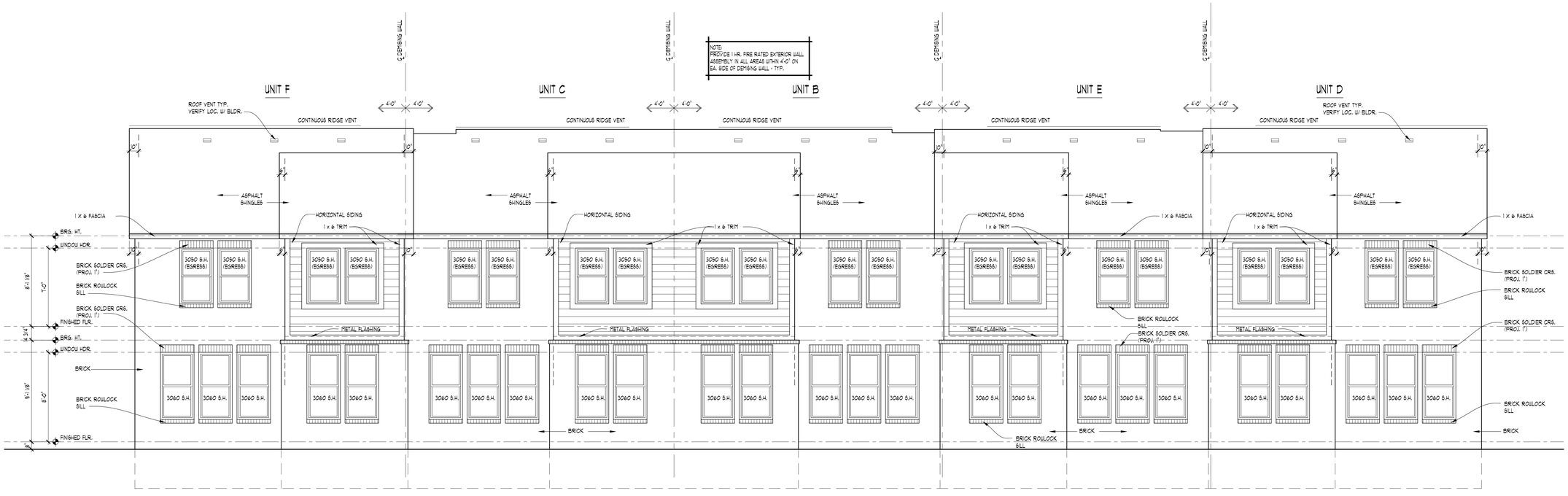
NOTE:
DO NOT INSTALL ANY ROOF VENTILATION WITHIN 8'-0" OF DIMENSION WALL/FIRE RATED SHEATHING

DO NOT INSTALL ANY SOFFIT VENTILATION WITHIN 4'-0" OF EA. SIDE OF DIMENSION WALL

ATTIC VENTILATION CALCULATIONS:

AREA OF ATTIC OVER HEATED SPACE = 5047 SQ. FT.
5047/150 = 34.9 (SQ. FT. REQ'D.)
34.9 X 144" = 5026" (SQ. INCH CONVERSION)
RIDGE VENTING:
5026" X 0.45 = 2262" (SQ. INCHES REQ'D.)
2262" / 18 = 126' (LINEAR FT. OF RIDGE VENT REQ'D.)
EAVE OR CORNICE VENTING:
5026" X 0.55 = 2764" (SQ. INCHES REQ'D.)

UNVENTABLE RIDGE:
128' - 8'T (AVAIL. RIDGE) = 39' (UNVENTABLE RIDGE)
39' X 18" = 702" (REMAINING SQ. INCHES)
702" / 9.0 = 14 (ROOF VENTS REQ'D.)



REAR ELEVATION

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

TK DESIGN
CREATIVE COLLABORATIVE
WWW.TKHOMEDESIGN.COM
26030 PONTIAC TRAIL
SOUTH LYON, MI 48178
PHONE: (248)-446-1960
FAX: (248)-446-1961

CLIENT / PROJECT

ROBERTSON BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
5 UNIT

JOB No.	WO 2331-21
DRAWN:	AG
CHECKED:	BF
REVIEW	11-1-21
FINAL:	12-6-21

1 R VALUE REV. 1-13-22

SCALE:
PER PLAN

SHEET #
A-5

STRUCTURAL NOTES:

(2) 2x8 HEADERS TO BEAR ON (1) ONE JACK STUD UNLESS NOTED OTHERWISE.

(2) 2x10 & LARGER HEADERS TO BEAR ON (2) TWO JACK STUDS UNLESS NOTED OTHERWISE.

ALL PRE-ENGINEERED HEADERS FRAMED PERPENDICULAR TO WALL LINE SHALL BEAR ON REQUIRED NUMBER OF STUDS TO MATCH WIDTH OF HEADER MATERIAL.

ALL PRE-ENGINEERED HEADERS FRAMED PARALLEL TO WALL LINE SHALL BEAR ON A MINIMUM (2) TWO JACK STUDS UNLESS NOTED OTHERWISE.

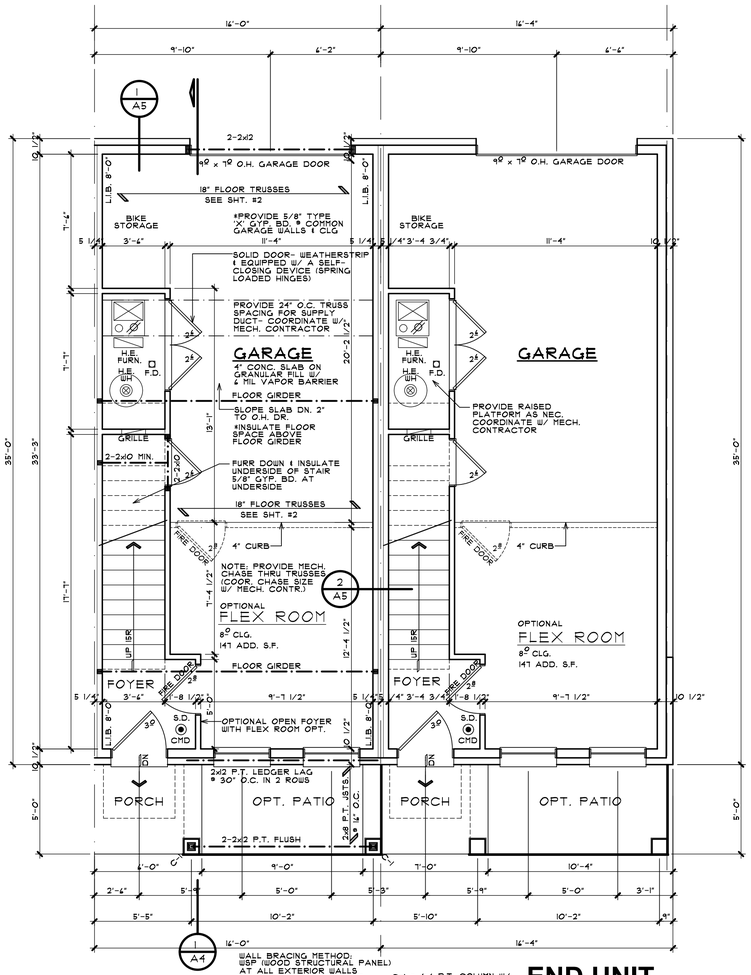
ALL PRE-ENGINEERED LUMBER HEADERS SHALL BE BUILT-UP FROM THE NUMBER OF HEADERS INDICATED ON DRAWINGS. ALL MEMBERS SHALL BE SECURED WITH NAILS OR BOLTS AS SPECIFIED BY THE MANUFACTURER FOR SIZES INDICATED.

ALL GIRDER TRUSSES TO BEAR ON (2) TWO STUDS MINIMUM OR AS REQUIRED TO MATCH NUMBER OF TRUSS PLYS, WHICH EVER IS GREATER.

TRUSS FABRICATOR/CONTRACTOR TO PROVIDE ALL HANGERS W/ MODEL No. CLEARLY STAMPED & LAYOUT DRAWINGS CLEARLY INDICATING LOCATION OF VARIOUS HANGERS REQUIRED.

CARPENTER CONTRACTOR TO INSTALL NAIL SIZES & NUMBER REQ'D. AS SPECIFIED FOR EACH TYPE OF HANGER.

LVL DESIGN VALUES FOR MODULUS OF ELASTICITY (E) SHALL BE 2,000,000 PSI (2.0 E)



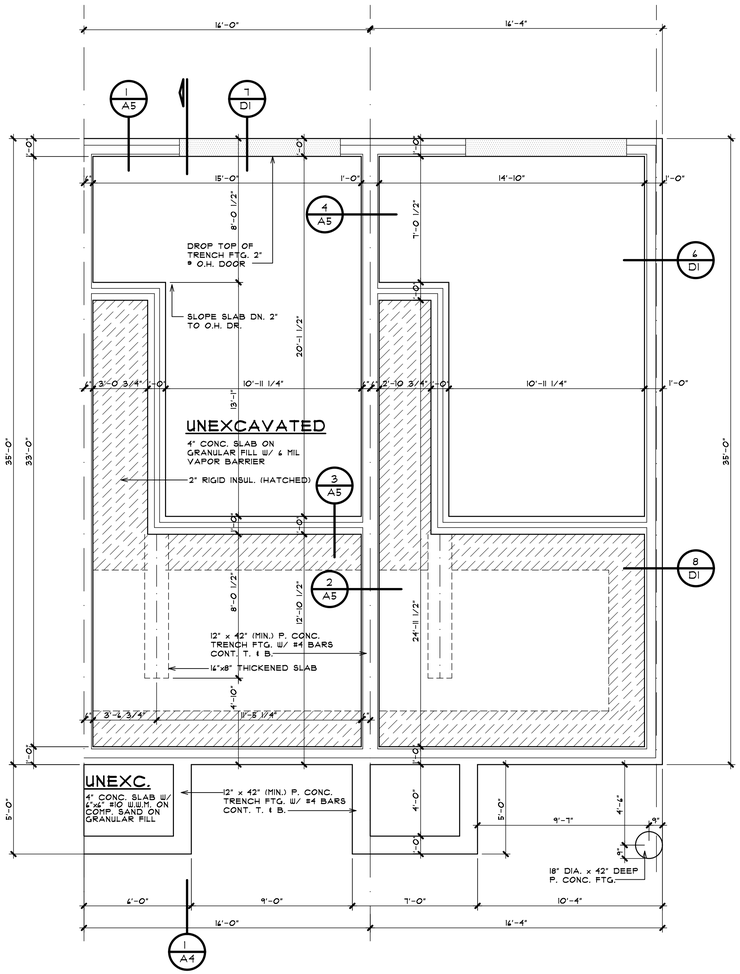
WALL BRACING METHOD: WSP (WOOD STRUCTURAL PANEL) AT ALL EXTERIOR WALLS UNLESS NOTED OTHERWISE

C-1 = 6x6 P.T. COLUMN W/ SIMPSON AB BASE

GROUND FLOOR PLAN — END UNIT

STANDARD INTERIOR LAYOUT

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



FOUNDATION PLAN

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

BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
630 North Old Woodward, Suite 203
BIRMINGHAM, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE: UNIT PLANS — PRELIMINARY

CLIENT / PROJECT: ROBERTSON HOMES
HUDSON TOWNS
16' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-20
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-1

STRUCTURAL NOTES:

(2) 2x8 HEADERS TO BEAR ON (1) ONE JACK STUD UNLESS NOTED OTHERWISE.

(2) 2x10 & LARGER HEADERS TO BEAR ON (2) TWO JACK STUDS UNLESS NOTED OTHERWISE.

ALL PRE-ENGINEERED HEADERS FRAMED PERPENDICULAR TO WALL LINE SHALL BEAR ON REQUIRED NUMBER OF STUDS TO MATCH WIDTH OF HEADER MATERIAL.

ALL PRE-ENGINEERED HEADERS FRAMED PARALLEL TO WALL LINE SHALL BEAR ON A MINIMUM (2) TWO JACK STUDS UNLESS NOTED OTHERWISE.

ALL PRE-ENGINEERED LUMBER HEADERS SHALL BE BUILT-UP FROM THE NUMBER OF HEADERS INDICATED ON DRAWINGS. ALL MEMBERS SHALL BE SECURED WITH NAILS OR BOLTS AS SPECIFIED BY THE MANUFACTURER FOR SIZES INDICATED.

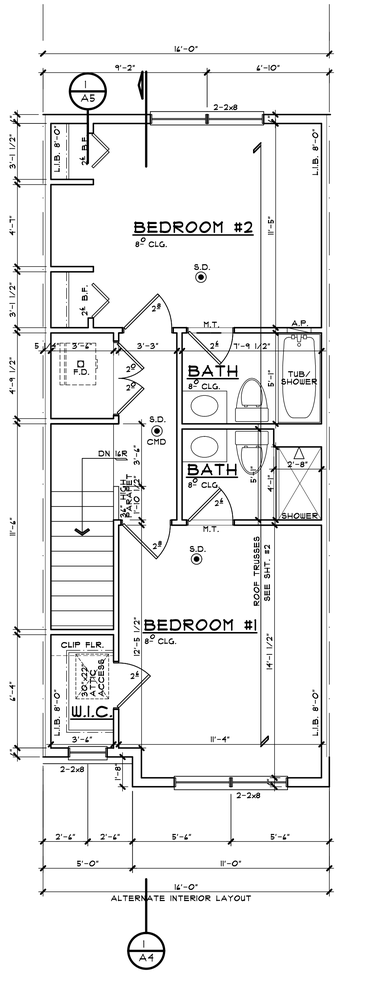
ALL GIRDER TRUSSES TO BEAR ON (2) TWO STUDS MINIMUM OR AS REQUIRED TO MATCH NUMBER OF TRUSS PLYS, WHICH EVER IS GREATER.

TRUSS FABRICATOR/CONTRACTOR TO PROVIDE ALL HANGERS W/ MODEL No. CLEARLY STAMPED & LAYOUT DRAWINGS CLEARLY INDICATING LOCATION OF VARIOUS HANGERS REQUIRED.

CARPENTER CONTRACTOR TO INSTALL NAIL SIZES & NUMBER REQ'D. AS SPECIFIED FOR EACH TYPE OF HANGER.

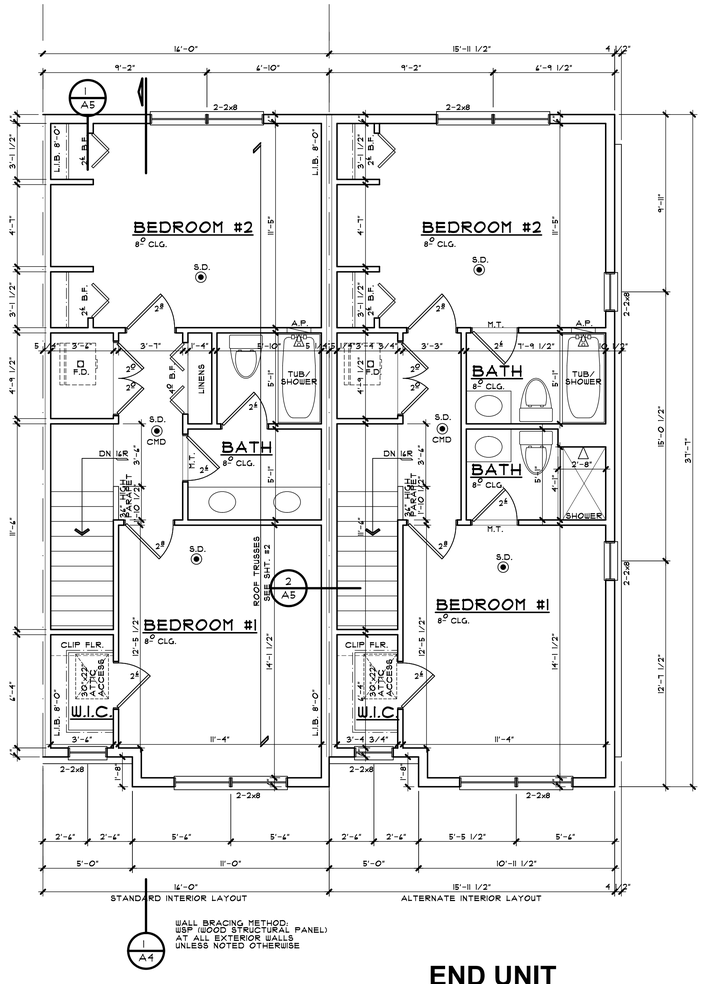
LVL DESIGN VALUES FOR MODULUS OF ELASTICITY (E) SHALL BE 2,000,000 PSI (2.0 E)

SQUARE FOOTAGE	
LOWER LEVEL	35 SQ FT
1ST FLOOR	548 SQ FT
2ND FLOOR	601 SQ FT
TOTAL	1,184 SQ FT
OPT. FLEX RM	147 SQ FT
TOTAL W/ OPT.	1,331 SQ FT



SECOND FLOOR PLAN

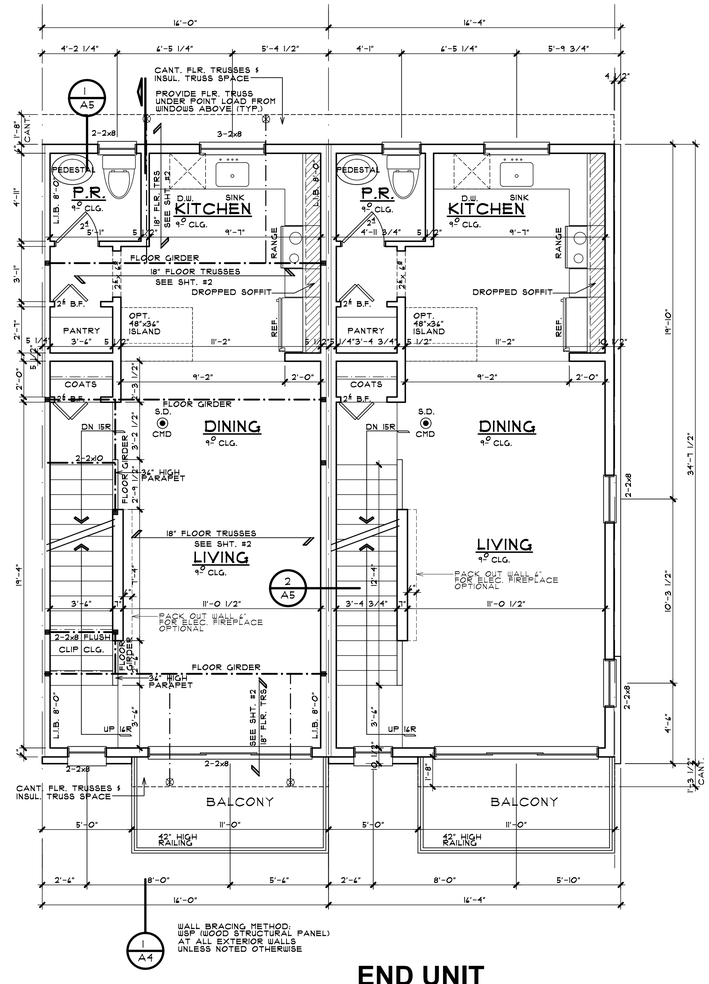
SCALE: 1/4" = 1'-0"



SECOND FLOOR PLAN

END UNIT

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



FIRST FLOOR PLAN

END UNIT

STANDARD INTERIOR LAYOUT

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

ARCHITECTURE

BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
630 North Old Woodward, Suite 203
BIRMINGHAM, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
UNIT PLANS

PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
16' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-20
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-2

WINDOW SILLS

IN DWELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 72" ABOVE FINISHED GRADE OR SURFACE BELOW, THE LOWEST PART OF THE CLEAR OPENING OF THE WINDOW SHALL BE A MINIMUM OF 24 INCHES ABOVE THE FINISHED FLOOR OF THE ROOM IN WHICH THE WINDOW IS LOCATED. GLAZING BETWEEN THE FLOOR AND 24" SHALL BE FIXED OR HAVE OPENINGS THROUGH WHICH A 4 INCH DIAMETER SPHERE CANNOT PASS. EXCEPTIONS:

1. WINDOWS WHOSE OPENINGS WILL NOT ALLOW A 4" DIA. SPHERE TO PASS THROUGH THE OPENING WHERE THE OPENING IS IN ITS LARGEST OPENED POSITION.
2. OPENINGS THAT ARE PROVIDED WITH WINDOW GUARDS THAT COMPLY WITH ASTM F 2006 OR F 2090.

OVERHANGS & DRAINAGE

PROVIDE GUTTERS & DOWNSPOUTS FOR DRAINAGE OF ROOF WATER. DOWNSPOUTS ARE TO BE LOCATED SO THAT THE DISCHARGE IS CONNECTED TO AN UDERGROUND STORM DRAINAGE SYSTEM PER SITE ENGINEER.

UNLESS NOTED OTHERWISE OVERHANG DIMENSIONS ARE 12" FROM FRAME. RAKE DIMENSIONS ARE 4" AT BRICK AND 6" AT SIDING.

STEEL LINTEL SCHEDULE

LOOSE STEEL LINTELS FOR MASONRY - EXTERIOR ANGLES FOR BRICK OR STONE (NO FLOOR LOAD)

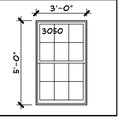
MAX. SPEAR SPAN	LINTEL SIZE
5'-0" OR LESS	3 1/2" x 3 1/2" x 5/16"
7'-0" OR LESS	4" x 3 1/2" x 5/16"
8'-0" OR LESS	5" x 3 1/2" x 5/16"
9'-0" OR LESS	5" x 3 1/2" x 3/8"
10'-0" OR LESS	6" x 3 1/2" x 3/8"

NOTE: THIS SCHEDULE APPLIES UNLESS NOTED OTHERWISE ON THE PLANS AND/OR ELEVATIONS.

NOTE: STEEL ANGLE LINTELS REQUIRE A SHOP COAT OF RUST-INHIBITIVE PAINT EXCEPT FOR LINTELS MADE OF CORROSION-RESISTANT STEEL.

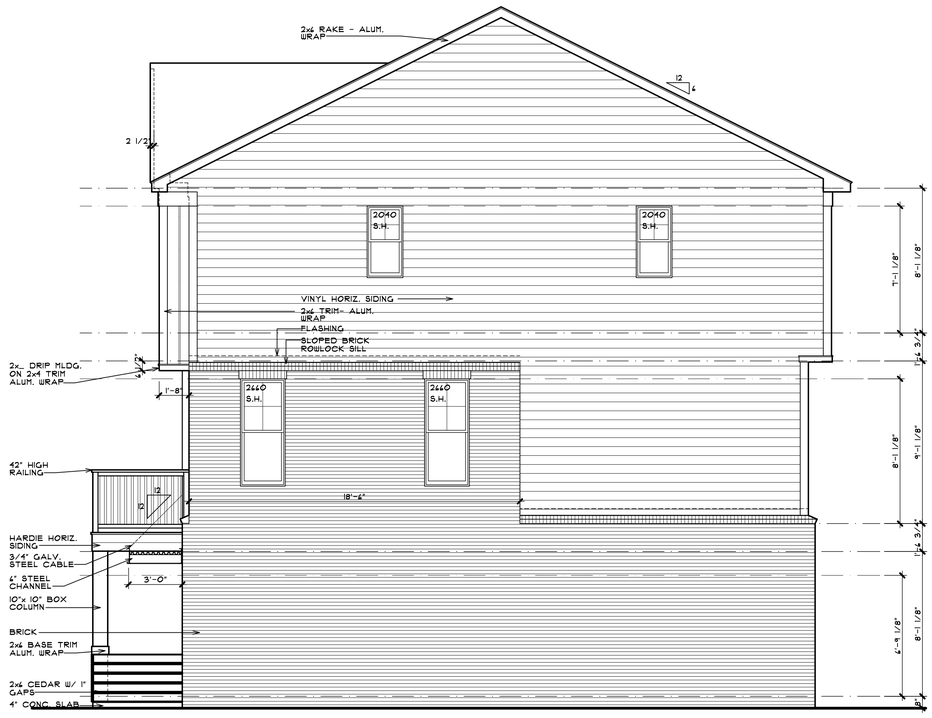
TYP. WINDOW DESIGNATION

GENERAL REFERENCE FOR ROUGH OPENING SIZES ONLY. CONSULT WITH WINDOW MANUFACTURER FOR EXACT WINDOW SIZES & REQUIREMENTS.



EGRESS WINDOW

EVERY SLEEPING ROOM SHALL HAVE AT LEAST ONE OPERABLE WINDOW OR EXTERIOR DOOR APPROVED FOR EMERGENCY EGRESS OR RESCUE. THE UNIT(S) MUST BE OPERABLE FROM THE INSIDE TO A FULL CLEAR OPENING WITHOUT THE USE OF SEPARATE TOOLS. WHERE WINDOWS ARE PROVIDED AS A MEANS OF EGRESS, OR RESCUE, THEY SHALL HAVE SILL HEIGHT OF NOT MORE THAN 44 INCHES ABOVE THE FLOOR. ALL EGRESS OR RESCUE WINDOWS FROM SLEEPING ROOMS MUST HAVE A MINIMUM NET CLEAR OPENING HEIGHT DIMENSION SHALL BE 24 INCHES AND WIDTH OF 20 INCHES.



NOTE: ALL WOOD TRIM IS TO BE WRAPPED IN ALUMINUM.

RIGHT SIDE ELEVATION

LEFT SIDE ELEVATION - OPPOSITE - SIMILAR

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

NOTE: ALL WOOD TRIM IS TO BE WRAPPED IN ALUMINUM.

ELEVATION 'C'

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

NOTE: ALL WOOD TRIM IS TO BE WRAPPED IN ALUMINUM.

ELEVATION 'B'

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

NOTE: ALL WOOD TRIM IS TO BE WRAPPED IN ALUMINUM.

ELEVATION 'A'

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

ARCHITECTURE

BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
630 North Old Woodward, Suite 203
BIRMINGHAM, MICHIGAN
BRIANNEEPER.COM
248.259.1784

SHEET TITLE

UNIT ELEVATIONS
FRONTS AND SIDE

PRELIMINARY

CLIENT / PROJECT

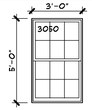
ROBERTSON HOMES
HUDSON TOWNS
16' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

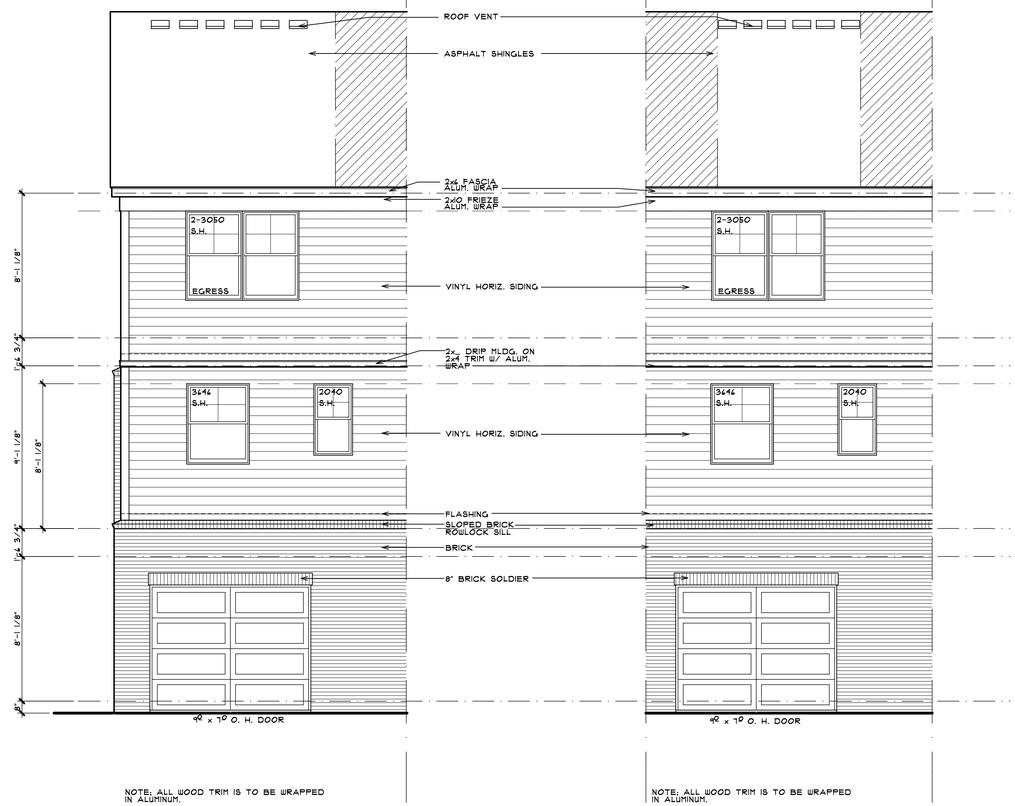
PRELIMINARY	6-18-20
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	

SHEET NUMBER

A-3





WINDOW SILLS

IN DWELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 72" ABOVE FINISHED GRADE OR SURFACE BELOW, THE LOWEST PART OF THE CLEAR OPENING OF THE WINDOW SHALL BE A MINIMUM OF 24 INCHES ABOVE THE FINISHED FLOOR OF THE ROOM IN WHICH THE WINDOW IS LOCATED. GLAZING BETWEEN THE FLOOR AND 24" SHALL BE FIXED OR HAVE OPENINGS THROUGH WHICH A 4 INCH DIAMETER SPHERE CANNOT PASS.
EXCEPTIONS:

1. WINDOWS WHOSE OPENINGS WILL NOT ALLOW A 4" DIA. SPHERE TO PASS THROUGH THE OPENING WHERE THE OPENING IS IN ITS LARGEST OPENED POSITION.
2. OPENINGS THAT ARE PROVIDED WITH WINDOW GUARDS THAT COMPLY WITH ASTM F 2006 OR F 2090.

TYP. WINDOW DESIGNATION

GENERAL REFERENCE FOR ROUGH OPENING SIZES ONLY. CONSULT WITH WINDOW MANUFACTURER FOR EXACT WINDOW SIZES & REQUIREMENTS.

OVERHANGS & DRAINAGE

PROVIDE GUTTERS & DOWNSPOUTS FOR DRAINAGE OF ROOF WATER. DOWNSPOUTS ARE TO BE LOCATED SO THAT THE DISCHARGE IS CONNECTED TO AN UDERGROUND STORM DRAINAGE SYSTEM PER SITE ENGINEER.

UNLESS NOTED OTHERWISE OVERHANG DIMENSIONS ARE 12" FROM FRAME. RAKE DIMENSIONS ARE 4" AT BRICK AND 6" AT SIDING.

EGRESS WINDOW

EVERY SLEEPING ROOM SHALL HAVE AT LEAST ONE OPERABLE WINDOW OR EXTERIOR DOOR APPROVED FOR EMERGENCY EGRESS OR RESCUE. THE UNIT(S) MUST BE OPERABLE FROM THE INSIDE TO A FULL CLEAR OPENING WITHOUT THE USE OF SEPARATE TOOLS. WHERE WINDOWS ARE PROVIDED AS A MEANS OF EGRESS, OR RESCUE, THEY SHALL HAVE SILL HEIGHT OF NOT MORE THAN 44 INCHES ABOVE THE FLOOR. ALL EGRESS OR RESCUE WINDOWS FROM SLEEPING ROOMS MUST HAVE A MINIMUM NET CLEAR OPENING HEIGHT DIMENSION SHALL BE 24 INCHES AND WIDTH OF 20 INCHES.

STEEL LINTEL SCHEDULE

LOOSE STEEL LINTELS FOR MASONRY - EXTERIOR ANGLES FOR BRICK OR STONE (NO FLOOR LOAD)

MAX. CLEAR SPAN	LINTEL SIZE
5'-0" OR LESS	3 1/2" x 3 1/2" x 5/16"
7'-0" OR LESS	4" x 3 1/2" x 5/16"
8'-0" OR LESS	5" x 3 1/2" x 5/16"
9'-0" OR LESS	5" x 3 1/2" x 3/8"
10'-0" OR LESS	6" x 3 1/2" x 3/8"

NOTE: THIS SCHEDULE APPLIES UNLESS NOTED OTHERWISE ON THE PLANS AND/OR ELEVATIONS.

NOTE: STEEL ANGLE LINTELS REQUIRE A SHOP COAT OF RUST-INHIBITIVE PAINT EXCEPT FOR LINTELS MADE OF CORROSION-RESISTANT STEEL.

PROPOSED VENT AREA PER UNIT

VENT AREA RATIO 1:150
ATTIC AREA = 601 SQ.FT. (1/150)
VENT AREA = 4 SQ.FT. x 144 = 576 SQ.IN.
50% SOFFIT AND 50% RIDGE = 288 SQ.IN. EACH

VENT AREA PROVIDED @ RIDGE

LOUVER AT RIDGE TYPE @ 54 SQ.IN. EA. = 6 UNITS
TOTAL VENTING AT RIDGE = 324 SQ.IN.

VENT AREA PROVIDED @ SOFFIT

CONTINUOUS SOFFIT TYPE @ 18 SQ.IN. PER FT. = 16 FEET
TOTAL VENTING AT SOFFIT = 288 SQ.IN.

1
A4
BUILDING SECTION

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

NOTE: ALL WOOD TRIM IS TO BE WRAPPED IN ALUMINUM.

REAR ELEVATION

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

NOTE: HATCHED AREA INDICATES EITHER NON-COMB. ROOF SHEATHING WITHIN 4'-0" OF THE TENANT SEPARATION WALL OR ONE LAYER OF TYPE 'X' GYP. BD. ATTACHED TO THE UNDERSIDE OF TYP. ROOF SHEATHING WITHIN 4'-0" OF SEPARATION WALL.

NOTE: ALL WOOD TRIM IS TO BE WRAPPED IN ALUMINUM.

REAR ELEVATION

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

ARCHITECTURE

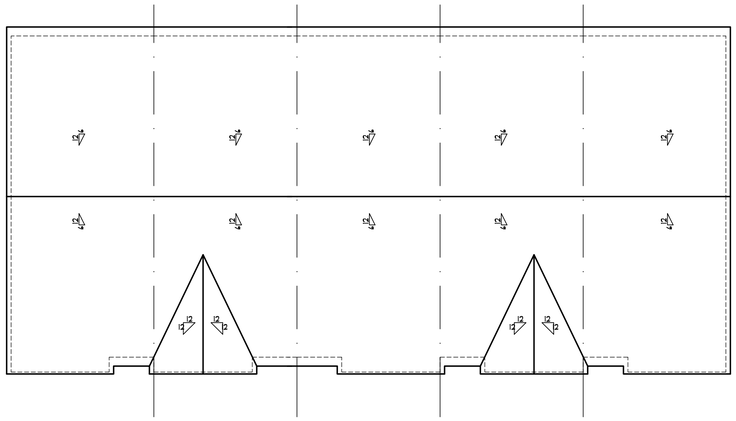
BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
630 North Old Woodward, Suite 203
BIRMINGHAM, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
REAR ELEVATIONS
BUILDING SECTIONS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
16' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

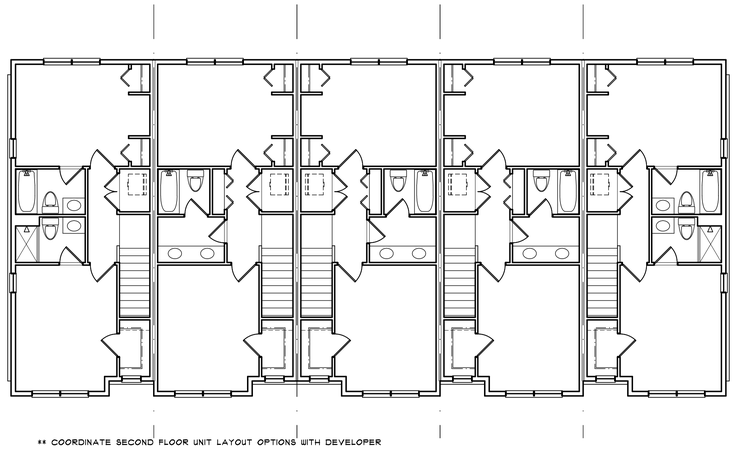
PRELIMINARY 6-18-20
BIDS
PERMITS
FINAL
REVISIONS

JOB NUMBER 21038
DRAWN BY BN / RR
CHECKED BY
SHEET NUMBER
A-4



ROOF PLAN
5 UNIT BUILDING

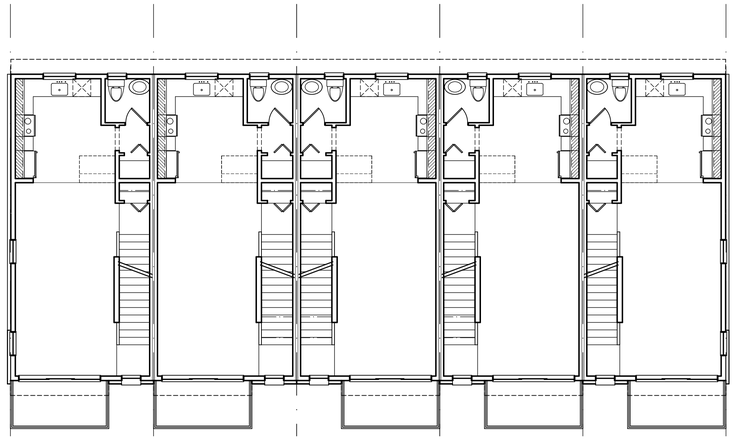
SCALE: 1/8" = 1'-0"



** COORDINATE SECOND FLOOR UNIT LAYOUT OPTIONS WITH DEVELOPER

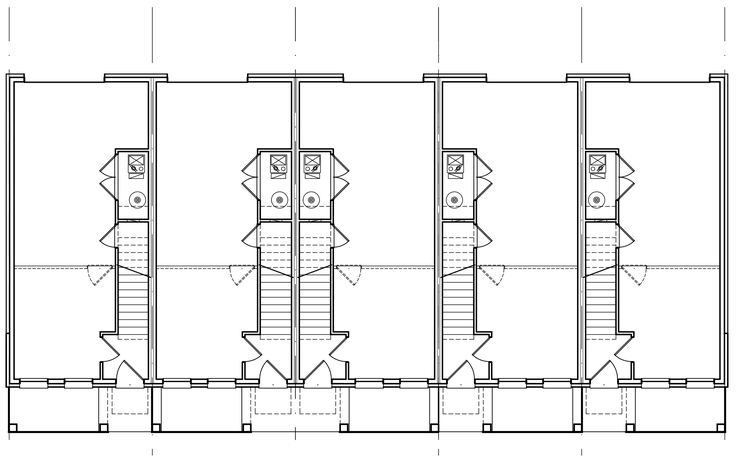
SECOND FLOOR PLAN
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"



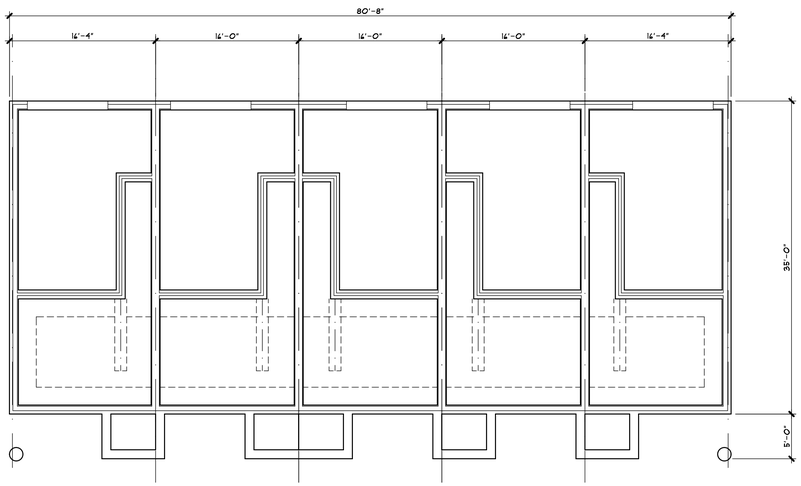
FIRST FLOOR PLAN
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"



LOWER LEVEL PLAN
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"



FOUNDATION PLAN
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"

ARCHITECTURE

BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
630 North Old Woodward, Suite 203
BIRMINGHAM, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
5 UNIT BUILDING
BUILDING PLANS
PRELIMINARY

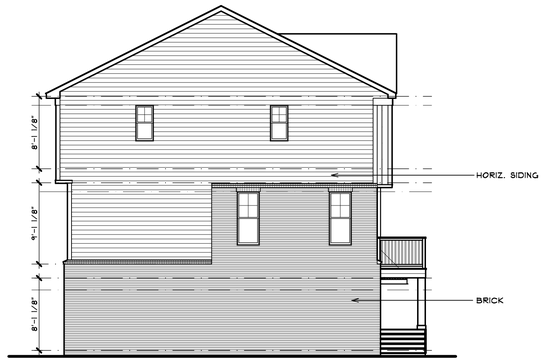
CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
16' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-20
BIDS	
PERMITS	
FINAL	
REVISIONS	

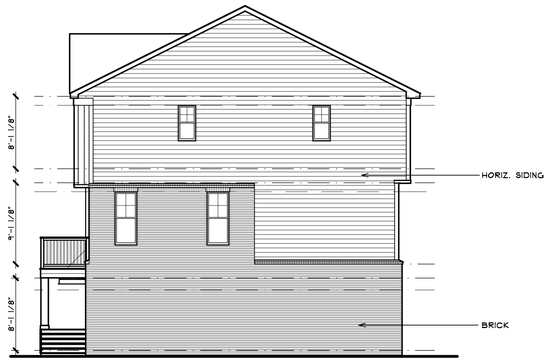
JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-6

REAR ELEVATION
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"



LEFT SIDE ELEVATION
SCALE: 1/8" = 1'-0"



RIGHT SIDE ELEVATION
SCALE: 1/8" = 1'-0"

FRONT ELEVATION
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"

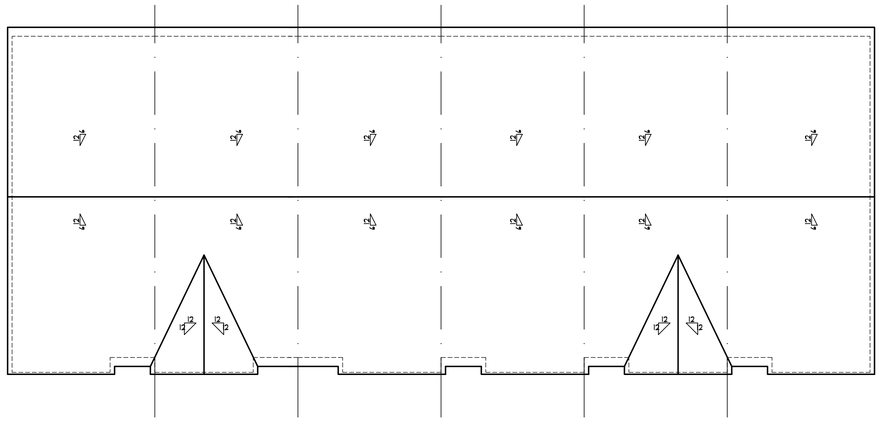
ARCHITECTURE
BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
630 North Old Woodward, Suite 203
BIRMINGHAM, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
5 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
16' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

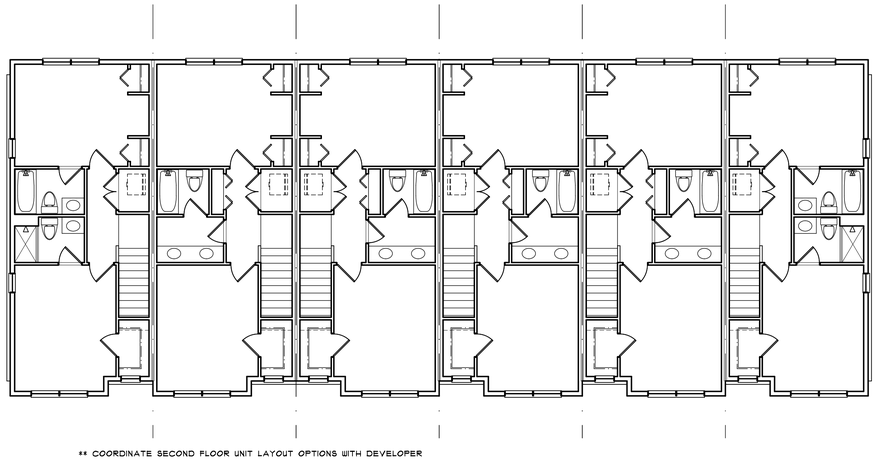
PRELIMINARY	6-18-20
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-7



ROOF PLAN
6 UNIT BUILDING

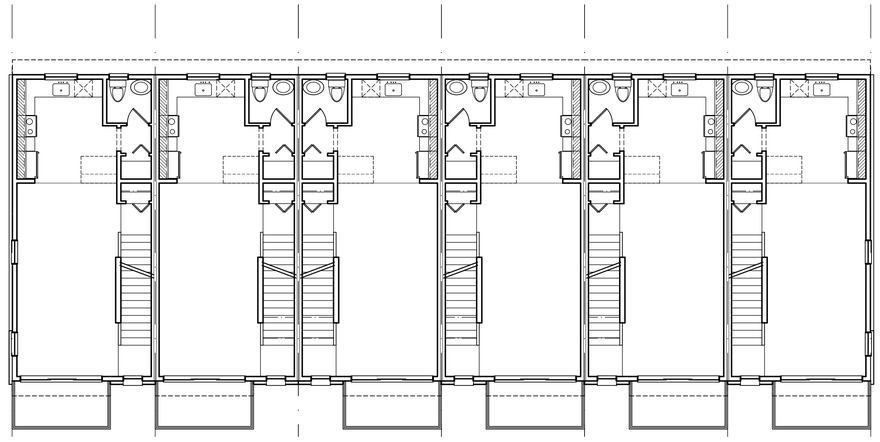
SCALE: 1/8" = 1'-0"



** COORDINATE SECOND FLOOR UNIT LAYOUT OPTIONS WITH DEVELOPER

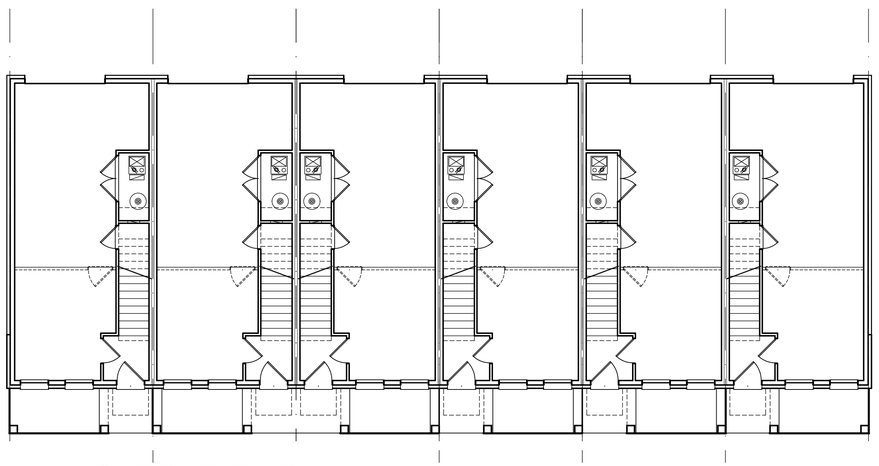
SECOND FLOOR PLAN
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"



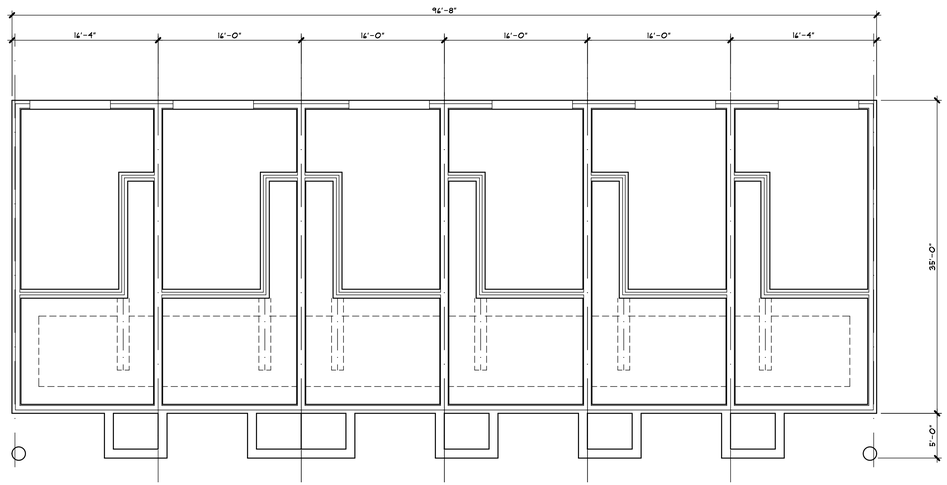
FIRST FLOOR PLAN
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"



LOWER LEVEL PLAN
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"



FOUNDATION PLAN
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"

ARCHITECTURE

BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
630 North Old Woodward, Suite 203
BIRMINGHAM, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
6 UNIT BUILDING
BUILDING PLANS
PRELIMINARY

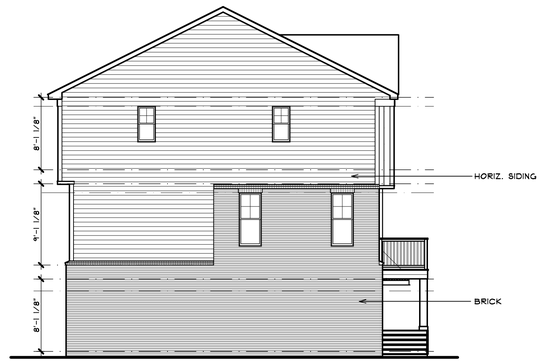
CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
16' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-20
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-8

REAR ELEVATION
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"



LEFT SIDE ELEVATION

SCALE: 1/8" = 1'-0"

RIGHT SIDE ELEVATION

SCALE: 1/8" = 1'-0"

FRONT ELEVATION
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"

ARCHITECTURE

BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
630 North Old Woodward, Suite 203
BIRMINGHAM, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
6 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
16' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-20
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-9

FOUNDATION NOTES:

FOOTING SIZES ARE TO MEET THE MINIMUM SIZES AS PRESCRIBED IN THE 2015 MICHIGAN RESIDENTIAL CODE SECTION R403.

PER TABLES R403.1(1) AND R403.1(2) 3 STORY LIGHT FRAME BUILDING WITH OR WITHOUT MASONRY VENEER WITH A SLAB ON GRADE WILL ALLOW FOR A MINIMUM 12" WIDE FOOTING.

ALL NATURAL AND ENGINEERED SOILS ARE TO BE A MINIMUM OF 3000 PSF.

STRUCTURAL NOTES:

(2) 2x6 HEADERS TO BEAR ON (1) ONE JACK STUD UNLESS NOTED OTHERWISE.

(2) 2x10 & LARGER HEADERS TO BEAR ON (2) TWO JACK STUDS UNLESS NOTED OTHERWISE.

ALL PRE-ENGINEERED HEADERS FRAMED PERPENDICULAR TO WALL LINE SHALL BEAR ON REQUIRED NUMBER OF STUDS TO MATCH WIDTH OF HEADER MATERIAL.

ALL PRE-ENGINEERED HEADERS FRAMED PARALLEL TO WALL LINE SHALL BEAR ON A MINIMUM (2) TWO JACK STUDS UNLESS NOTED OTHERWISE.

ALL PRE-ENGINEERED LUMBER HEADERS SHALL BE BUILT-UP FROM THE NUMBER OF HEADERS INDICATED ON DRAWINGS. ALL MEMBERS SHALL BE SECURED WITH NAILS OR BOLTS AS SPECIFIED BY THE MANUFACTURER FOR SIZES INDICATED.

ALL GIRDER TRUSSES TO BEAR ON (2) TWO STUDS MINIMUM OR AS REQUIRED TO MATCH NUMBER OF TRUSS PLYS, WHICH EVER IS GREATER.

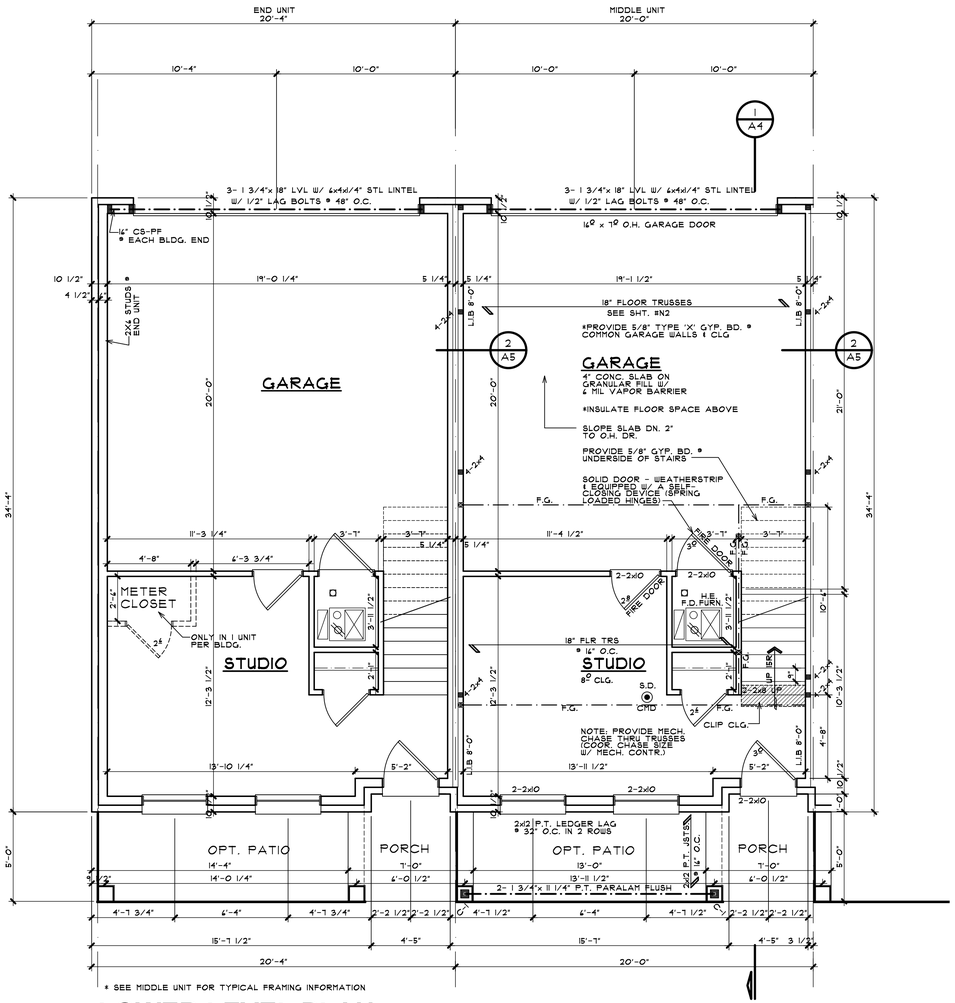
TRUSS FABRICATOR/CONTRACTOR TO PROVIDE ALL HANGERS W/ MODEL No. CLEARLY STAMPED & LAYOUT DRAWINGS CLEARLY INDICATING LOCATION OF VARIOUS HANGERS REQUIRED.

CARPENTER CONTRACTOR TO INSTALL NAIL SIZES & NUMBER REQ'D. AS SPECIFIED FOR EACH TYPE OF HANGER.

LVL DESIGN VALUES FOR MODULUS OF ELASTICITY (E) SHALL BE 2,000,000 PSI (2.0 E)

WALL DIMENSION NOTE:

ALL WALL DIMENSIONS ARE TO THE ROUGH. INTERIOR PARTITIONS ARE 3 1/2" (2x4) UNLESS NOTED OR DIMENSIONED OTHERWISE. EXTERIOR FRAME WALLS INCLUDE 1/2" NOMINAL DIMENSION FOR EXTERIOR SHEATHING. EXTERIOR FRAME WALLS ARE 6" (2x6) OR 4" (2x4) UNLESS NOTED OR DIMENSIONED OTHERWISE. "BRICK LEDGE" BRICK OR STONE EXTERIOR WITH AIR SPACE IS 4 1/2" UNLESS NOTED OR DIMENSIONED OTHERWISE.



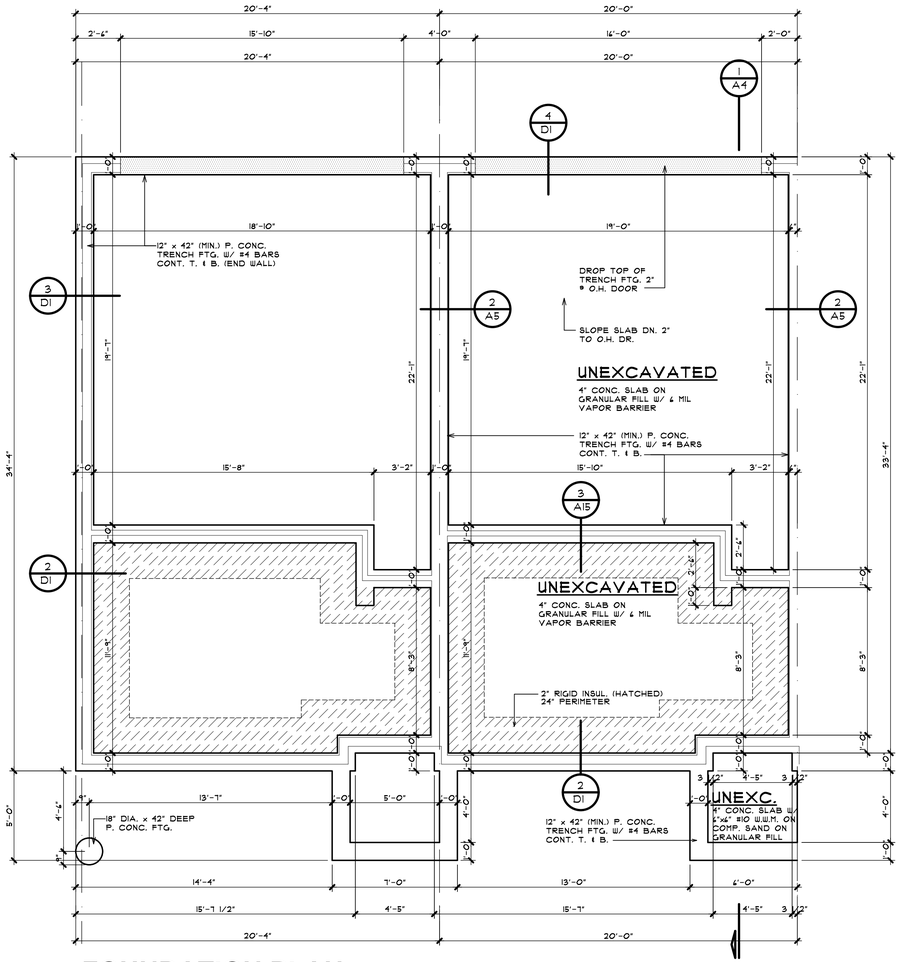
* SEE MIDDLE UNIT FOR TYPICAL FRAMING INFORMATION

LOWER LEVEL PLAN

C-1 = 4x4 P.T. WOOD POST W/ "SIMPSON" AB BASE AND CC CAP

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

WALL BRACING METHOD: WSP (WOOD STRUCTURAL PANEL) AT ALL EXTERIOR WALLS UNLESS NOTED OTHERWISE



FOUNDATION PLAN

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

ARCHITECTURE

BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248.259.1784

SHEET TITLE
FOUNDATION PLAN
LOWER LEVEL PLAN
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-1

STRUCTURAL NOTES:

(2) 2x8 HEADERS TO BEAR ON (1) ONE JACK STUD UNLESS NOTED OTHERWISE.

(2) 2x10 & LARGER HEADERS TO BEAR ON (2) TWO JACK STUDS UNLESS NOTED OTHERWISE.

ALL PRE-ENGINEERED HEADERS FRAMED PERPENDICULAR TO WALL LINE SHALL BEAR ON REQUIRED NUMBER OF STUDS TO MATCH WIDTH OF HEADER MATERIAL.

ALL PRE-ENGINEERED HEADERS FRAMED PARALLEL TO WALL LINE SHALL BEAR ON A MINIMUM (2) TWO JACK STUDS UNLESS NOTED OTHERWISE.

ALL PRE-ENGINEERED LUMBER HEADERS SHALL BE BUILT-UP FROM THE NUMBER OF HEADERS INDICATED ON DRAWINGS. ALL MEMBERS SHALL BE SECURED WITH NAILS OR BOLTS AS SPECIFIED BY THE MANUFACTURER FOR SIZES INDICATED.

ALL GIRDER TRUSSES TO BEAR ON (2) TWO STUDS MINIMUM OR AS REQUIRED TO MATCH NUMBER OF TRUSS PLYS, WHICH EVER IS GREATER.

TRUSS FABRICATOR/CONTRACTOR TO PROVIDE ALL HANGERS W/ MODEL No. CLEARLY STAMPED & LAYOUT DRAWINGS CLEARLY INDICATING LOCATION OF VARIOUS HANGERS REQUIRED.

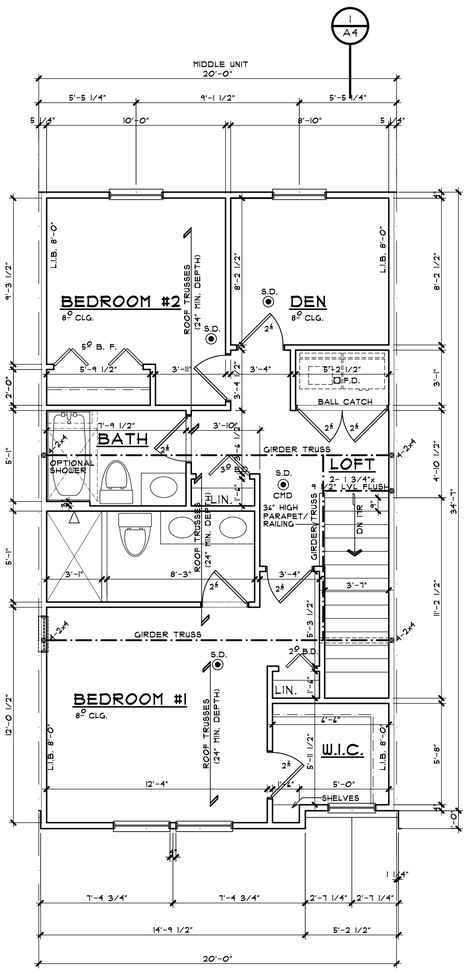
CARPENTER CONTRACTOR TO INSTALL NAIL SIZES & NUMBER REQ'D. AS SPECIFIED FOR EACH TYPE OF HANGER.

LVL DESIGN VALUES FOR MODULUS OF ELASTICITY (E) SHALL BE 2,000,000 PSI (2.0 E)

WALL DIMENSION NOTE:

ALL WALL DIMENSIONS ARE TO THE ROUGH. INTERIOR PARTITIONS ARE 3 1/2" (2x4) UNLESS NOTED OR DIMENSIONED OTHERWISE. EXTERIOR FRAME WALLS INCLUDE 1/2" NOMINAL DIMENSION FOR EXTERIOR SHEATHING. EXTERIOR FRAME WALLS ARE 4" (2x6) OR 4" (2x4) UNLESS NOTED OR DIMENSIONED OTHERWISE. "BRICK LEDGE" BRICK OR STONE EXTERIOR WITH AIR SPACE IS 4 1/2" UNLESS NOTED OR DIMENSIONED OTHERWISE.

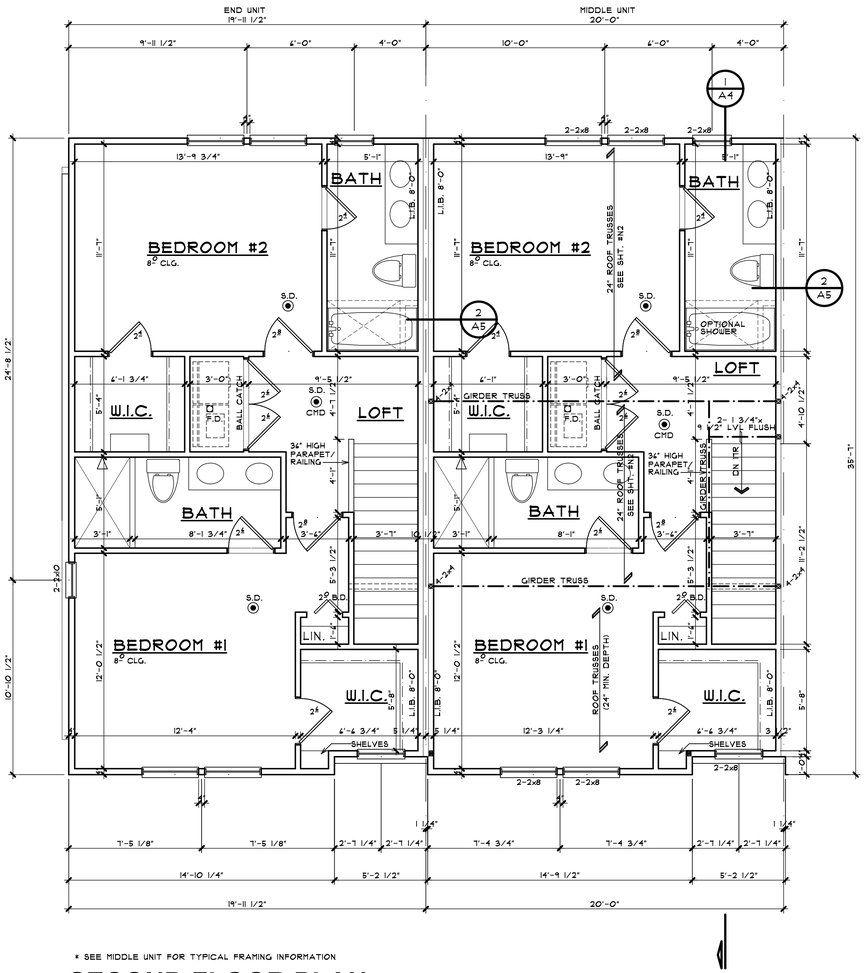
SQUARE FOOTAGE	
LOWER LEVEL	237 SQ FT
1ST FLOOR	668 SQ FT
2ND FLOOR	707 SQ FT
TOTAL	1,612 SQ FT



SECOND FLOOR PLAN

2 BEDROOM/DEN

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

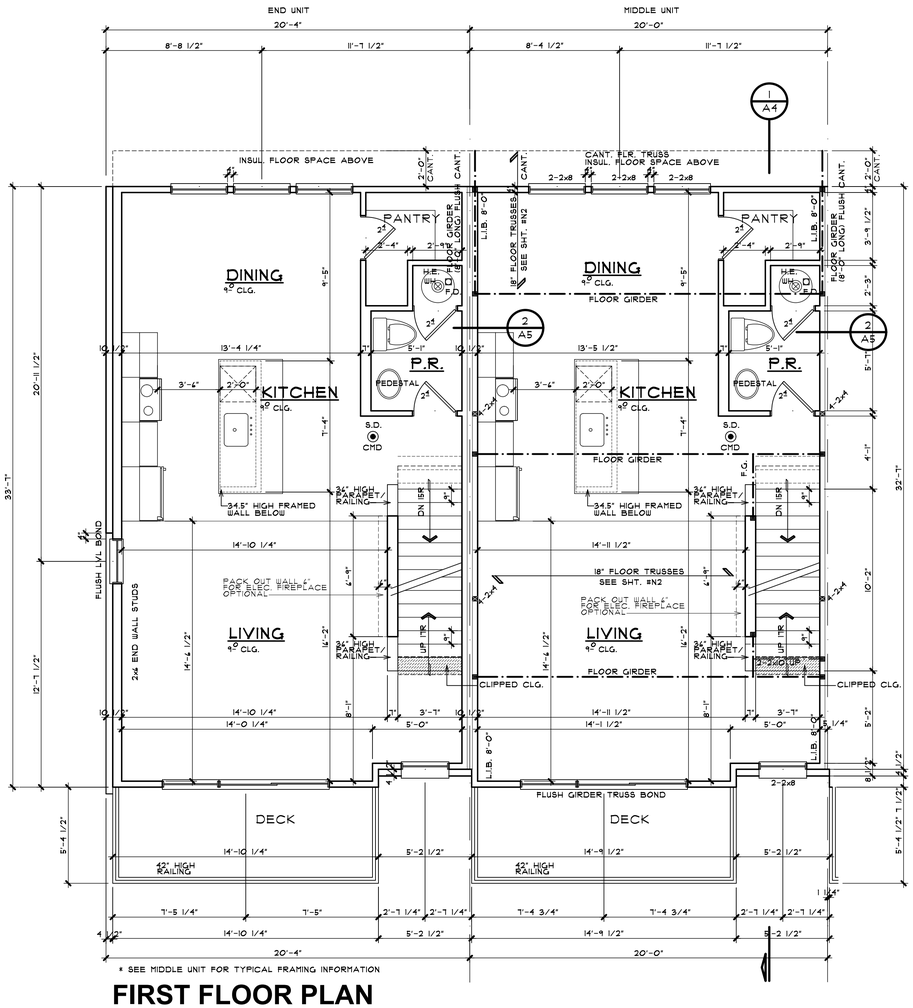


* SEE MIDDLE UNIT FOR TYPICAL FRAMING INFORMATION

SECOND FLOOR PLAN

2 BEDROOM

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



* SEE MIDDLE UNIT FOR TYPICAL FRAMING INFORMATION

FIRST FLOOR PLAN

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

WALL BRACING METHOD:
WSP (WOOD STRUCTURAL PANEL)
AT ALL EXTERIOR WALLS
UNLESS NOTED OTHERWISE

BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248.259.1784

SHEET TITLE
FIRST FLOOR PLAN
SECOND FLOOR PLAN
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-2

WINDOW SILLS

IN DWELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 72" ABOVE FINISHED GRADE OR SURFACE BELOW, THE LOWEST PART OF THE CLEAR OPENING OF THE WINDOW SHALL BE A MINIMUM OF 24 INCHES ABOVE THE FINISHED FLOOR OF THE ROOM IN WHICH THE WINDOW IS LOCATED. GLAZING BETWEEN THE FLOOR AND 24" SHALL BE FIXED OR HAVE OPENINGS THROUGH WHICH A 4 INCH DIAMETER SPHERE CANNOT PASS.
EXCEPTIONS:

1. WINDOWS WHOSE OPENINGS WILL NOT ALLOW A 4" DIA. SPHERE TO PASS THROUGH THE OPENING WHERE THE OPENING IS IN ITS LARGEST OPENED POSITION.
2. OPENINGS THAT ARE PROVIDED WITH WINDOW GUARDS THAT COMPLY WITH ASTM F 2006 OR F 2090.

OVERHANGS & DRAINAGE

PROVIDE GUTTERS & DOWNSPOUTS FOR DRAINAGE OF ROOF WATER. DOWNSPOUTS ARE TO BE LOCATED SO THAT THE DISCHARGE WILL NOT SPILL ON OR FLOW ACROSS ANY PORCHES, WALKS OR DRIVES.

UNLESS NOTED OTHERWISE OVERHANG DIMENSIONS ARE 12" FROM FRAME. RAKE DIMENSIONS ARE 4" AT BRICK AND 6" AT SIDING.

STEEL LINTEL SCHEDULE

LOOSE STEEL LINTELS FOR MASONRY - EXTERIOR ANGLES FOR BRICK OR STONE (NO FLOOR LOAD)

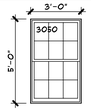
MAX. CLEAR SPAN	LINTEL SIZE
5'-0" OR LESS	3 1/2" x 3 1/2" x 5/16"
7'-0" OR LESS	4" x 3 1/2" x 5/16"
8'-0" OR LESS	5" x 3 1/2" x 5/16"
9'-0" OR LESS	5" x 3 1/2" x 3/8"
10'-0" OR LESS	6" x 3 1/2" x 3/8"

NOTE: THIS SCHEDULE APPLIES UNLESS NOTED OTHERWISE ON THE PLANS AND/OR ELEVATIONS.

NOTE: STEEL ANGLE LINTELS REQUIRE A SHOP COAT OF RUST-INHIBITIVE PAINT EXCEPT FOR LINTELS MADE OF CORROSION-RESISTANT STEEL.

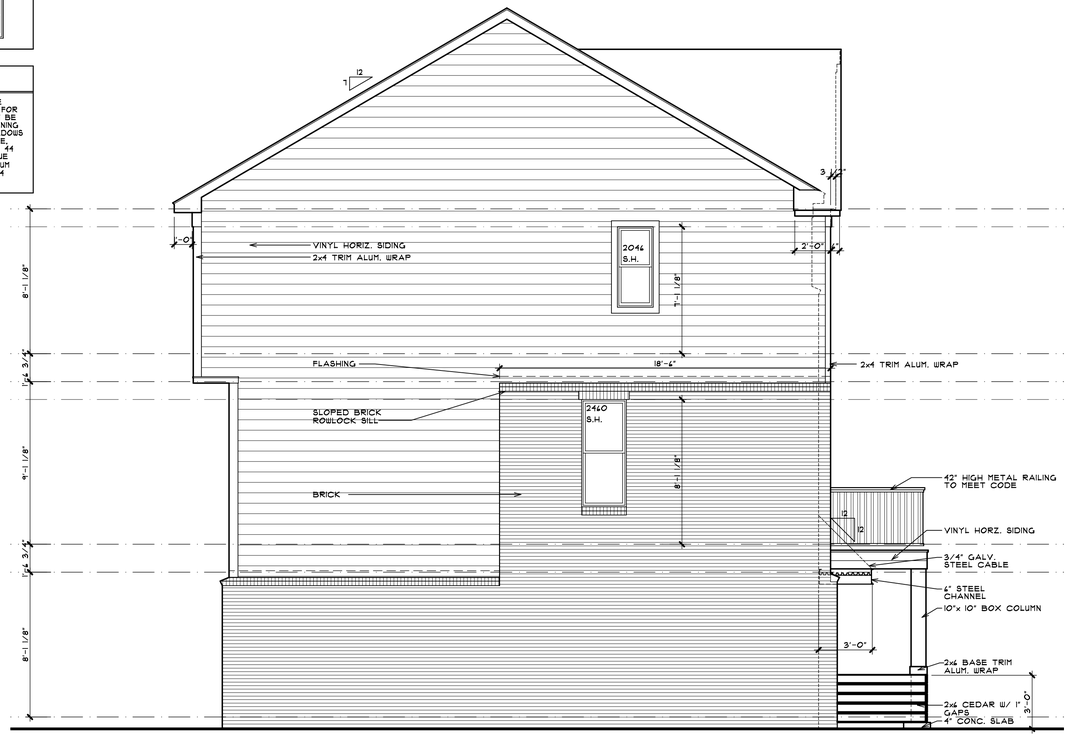
TYP. WINDOW DESIGNATION

GENERAL REFERENCE FOR ROUGH OPENING SIZES ONLY. CONSULT WITH WINDOW MANUFACTURER FOR EXACT WINDOW SIZES & REQUIREMENTS.



EGRESS WINDOW

EVERY SLEEPING ROOM SHALL HAVE AT LEAST ONE OPERABLE WINDOW OR EXTERIOR DOOR APPROVED FOR EMERGENCY EGRESS OR RESCUE. THE UNIT(S) MUST BE OPERABLE FROM THE INSIDE TO A FULL CLEAR OPENING WITHOUT THE USE OF SEPARATE TOOLS. WHERE WINDOWS ARE PROVIDED AS A MEANS OF EGRESS, OR RESCUE, THEY SHALL HAVE SILL HEIGHT OF NOT MORE THAN 44 INCHES ABOVE THE FLOOR. ALL EGRESS OR RESCUE WINDOWS FROM SLEEPING ROOMS MUST HAVE A MINIMUM NET CLEAR OPENING HEIGHT DIMENSION SHALL BE 24 INCHES AND WIDTH OF 20 INCHES.



SIDE ELEVATION

OPPOSITE HAND REVERSE

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

NOTE: HATCHED AREA INDICATES EITHER NON-COMB. ROOF SHEATHING WITHIN 4'-0" OF THE TENANT SEPARATION WALL OR ONE LAYER OF TYPE 'X' GYP. BD. ATTACHED TO THE UNDERSIDE OF TYP. ROOF SHEATHING WITHIN 4'-0" OF SEPARATION WALL.
- NO SOFFIT OR ROOF PENETRATIONS ARE ALLOWED IN THIS AREA

FRONT ELEVATION

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

ARCHITECTURE

BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248.259.1784

SHEET TITLE
ELEVATIONS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	

SHEET NUMBER
A-3

WINDOW SILLS

IN DWELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 72" ABOVE FINISHED GRADE OR SURFACE BELOW, THE LOWEST PART OF THE CLEAR OPENING OF THE WINDOW SHALL BE A MINIMUM OF 24 INCHES ABOVE THE FINISHED FLOOR OF THE ROOM IN WHICH THE WINDOW IS LOCATED. GLAZING BETWEEN THE FLOOR AND 24" SHALL BE FIXED OR HAVE OPENINGS THROUGH WHICH A 4 INCH DIAMETER SPHERE CANNOT PASS.
EXCEPTIONS:

1. WINDOWS WHOSE OPENINGS WILL NOT ALLOW A 4" DIA. SPHERE TO PASS THROUGH THE OPENING WHERE THE OPENING IS IN ITS LARGEST OPENED POSITION.
2. OPENINGS THAT ARE PROVIDED WITH WINDOW GUARDS THAT COMPLY WITH ASTM F 2004 OR F 2090.

OVERHANGS & DRAINAGE

PROVIDE GUTTERS & DOWNSPOUTS FOR DRAINAGE OF ROOF WATER. DOWNSPOUTS ARE TO BE LOCATED SO THAT THE DISCHARGE WILL NOT SPILL ON OR FLOW ACROSS ANY PORCHES, WALKS OR DRIVES.

UNLESS NOTED OTHERWISE OVERHANG DIMENSIONS ARE 12" FROM FRAME. RAKE DIMENSIONS ARE 4" AT BRICK AND 6" AT SIDING.

STEEL LINTEL SCHEDULE

LOOSE STEEL LINTELS FOR MASONRY - EXTERIOR ANGLES FOR BRICK OR STONE (NO FLOOR LOAD)

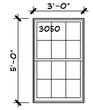
MAX. CLEAR SPAN	LINTEL SIZE
5'-0" OR LESS	3 1/2" x 3 1/2" x 5/16"
7'-0" OR LESS	4" x 3 1/2" x 5/16"
8'-0" OR LESS	5" x 3 1/2" x 5/16"
9'-0" OR LESS	5" x 3 1/2" x 3/8"
10'-0" OR LESS	6" x 3 1/2" x 3/8"

NOTE: THIS SCHEDULE APPLIES UNLESS NOTED OTHERWISE ON THE PLANS AND/OR ELEVATIONS.

NOTE: STEEL ANGLE LINTELS REQUIRE A SHOP COAT OF RUST-INHIBITIVE PAINT EXCEPT FOR LINTELS MADE OF CORROSION-RESISTANT STEEL.

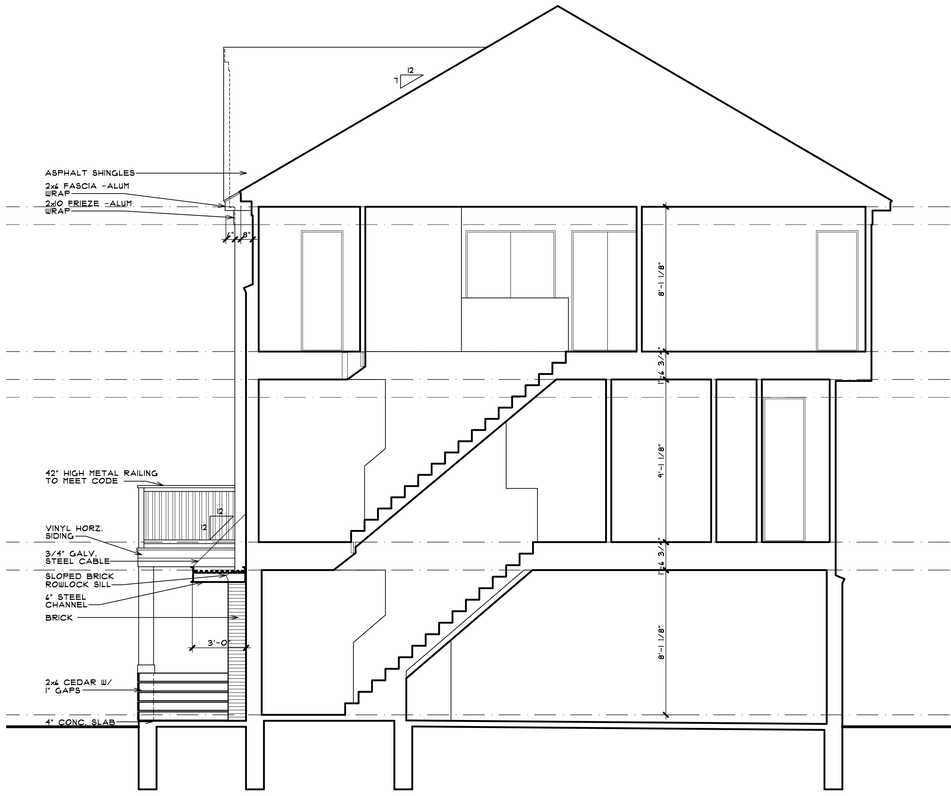
TYP. WINDOW DESIGNATION

GENERAL REFERENCE FOR ROUGH OPENING SIZES ONLY. CONSULT WITH WINDOW MANUFACTURER FOR EXACT WINDOW SIZES & REQUIREMENTS.



EGRESS WINDOW

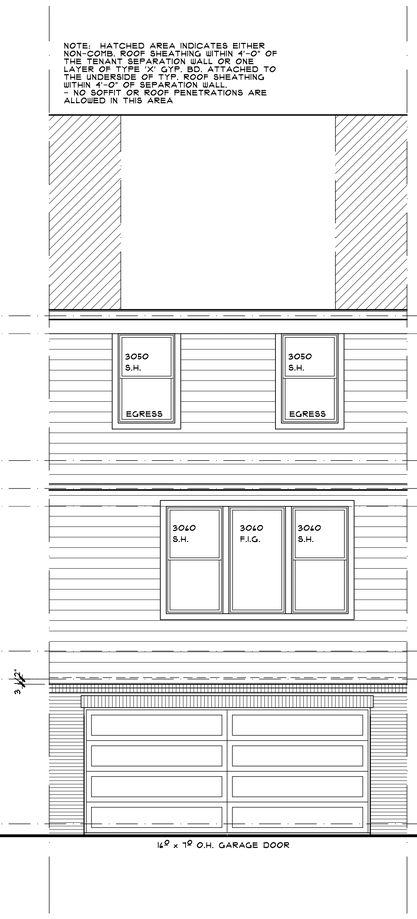
EVERY SLEEPING ROOM SHALL HAVE AT LEAST ONE OPERABLE WINDOW OR EXTERIOR DOOR APPROVED FOR EMERGENCY EGRESS OR RESCUE. THE UNIT(S) MUST BE OPERABLE FROM THE INSIDE TO A FULL CLEAR OPENING WITHOUT THE USE OF SEPARATE TOOLS. WHERE WINDOWS ARE PROVIDED AS A MEANS OF EGRESS, OR RESCUE, THEY SHALL HAVE SILL HEIGHT OF NOT MORE THAN 44 INCHES ABOVE THE FLOOR. ALL EGRESS OR RESCUE WINDOWS FROM SLEEPING ROOMS MUST HAVE A MINIMUM NET CLEAR OPENING HEIGHT DIMENSION SHALL BE 24 INCHES AND WIDTH OF 20 INCHES.



1 / A5 **BUILDING SECTION**

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

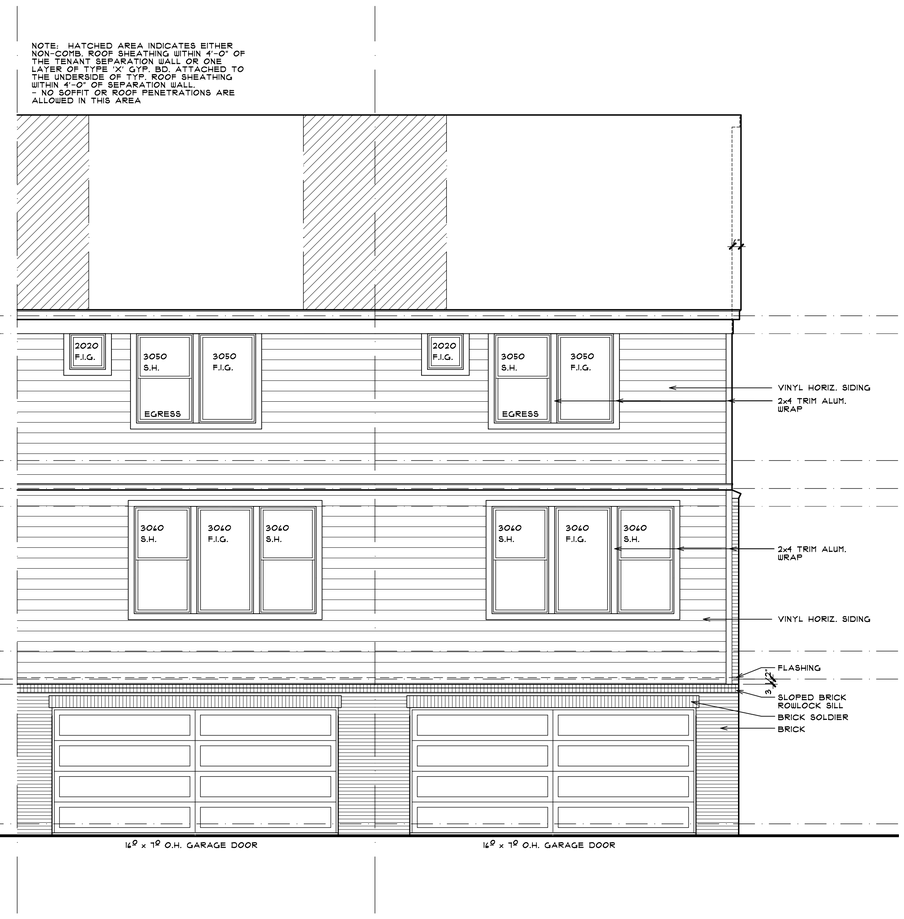
NOTE: HATCHED AREA INDICATES EITHER NON-COMB. ROOF SHEATHING WITHIN 4'-0" OF THE TENANT SEPARATION WALL OR ONE LAYER OF TYPE 'X' GYP. BD. ATTACHED TO THE UNDERSIDE OF TYP. ROOF SHEATHING WITHIN 4'-0" OF SEPARATION WALL.
- NO SOFFIT OR ROOF PENETRATIONS ARE ALLOWED IN THIS AREA



ALT. REAR ELEVATION

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

NOTE: HATCHED AREA INDICATES EITHER NON-COMB. ROOF SHEATHING WITHIN 4'-0" OF THE TENANT SEPARATION WALL OR ONE LAYER OF TYPE 'X' GYP. BD. ATTACHED TO THE UNDERSIDE OF TYP. ROOF SHEATHING WITHIN 4'-0" OF SEPARATION WALL.
- NO SOFFIT OR ROOF PENETRATIONS ARE ALLOWED IN THIS AREA



REAR ELEVATION

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

ARCHITECTURE

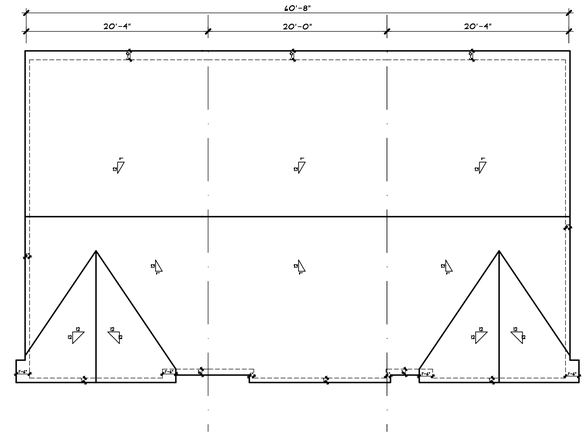
BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248.259.1784

SHEET TITLE
ELEVATIONS
WALL SECTION
PRELIMINARY

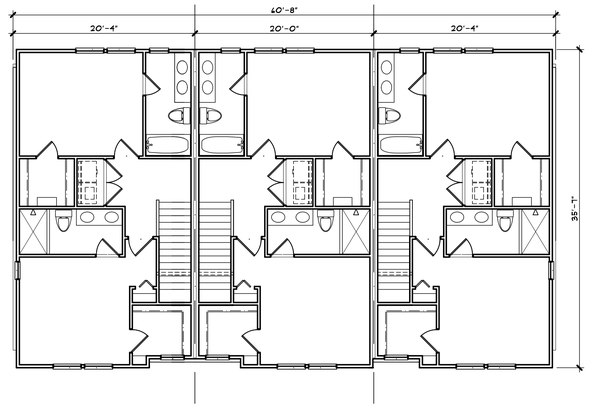
CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

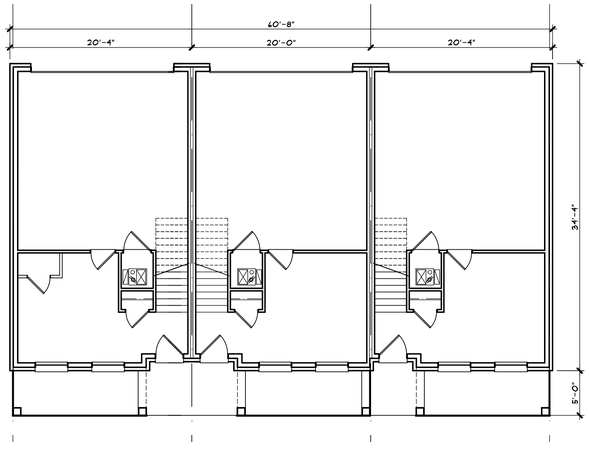
JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-4



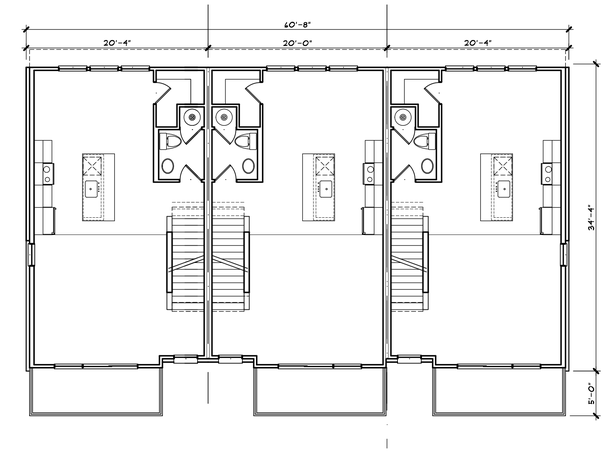
ROOF PLAN
3 UNIT BUILDING
SCALE: 1/8" = 1'-0"



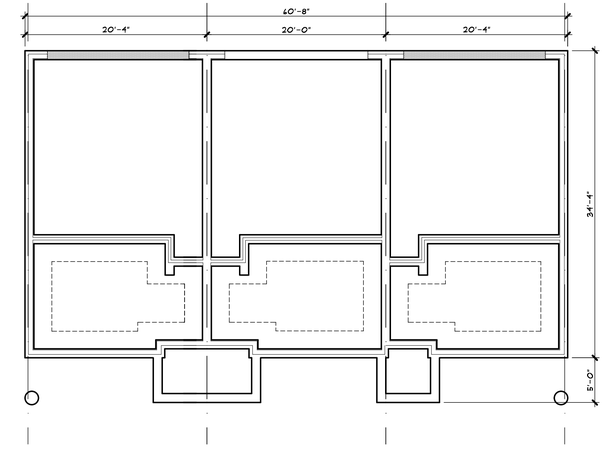
SECOND FLOOR PLAN
3 UNIT BUILDING
SCALE: 1/8" = 1'-0"



LOWER LEVEL PLAN
3 UNIT BUILDING
SCALE: 1/8" = 1'-0"



FIRST FLOOR PLAN
3 UNIT BUILDING
SCALE: 1/8" = 1'-0"



FOUNDATION PLAN
3 UNIT BUILDING
SCALE: 1/8" = 1'-0"

ARCHITECTURE
BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
3 UNIT BUILDING
BUILDING PLANS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

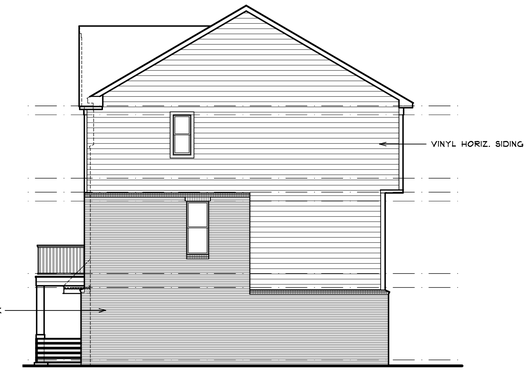
JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-6

REAR ELEVATION
3 UNIT BUILDING

SCALE: 1/8" = 1'-0"

LEFT SIDE ELEVATION

SCALE: 1/8" = 1'-0"



RIGHT SIDE ELEVATION

SCALE: 1/8" = 1'-0"

FRONT ELEVATION
3 UNIT BUILDING

SCALE: 1/8" = 1'-0"

ARCHITECTURE

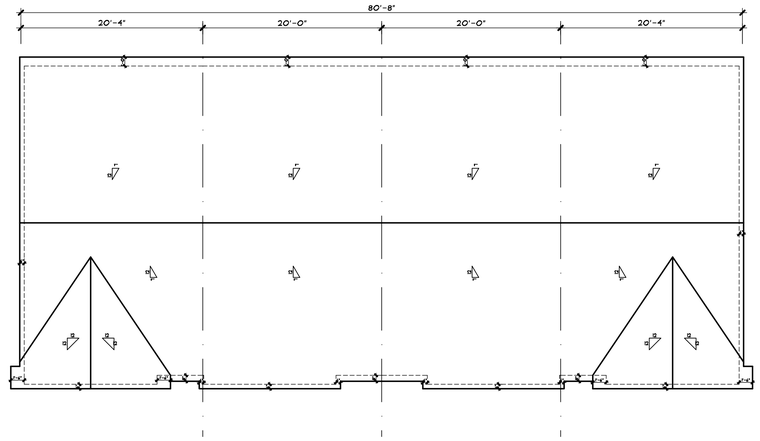
BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
3 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

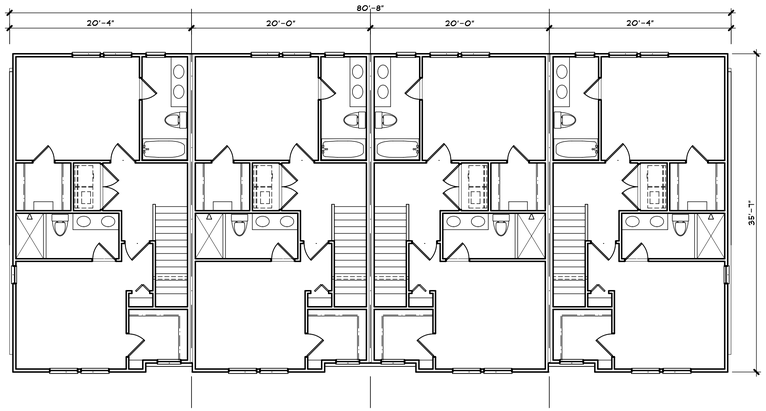
PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-7



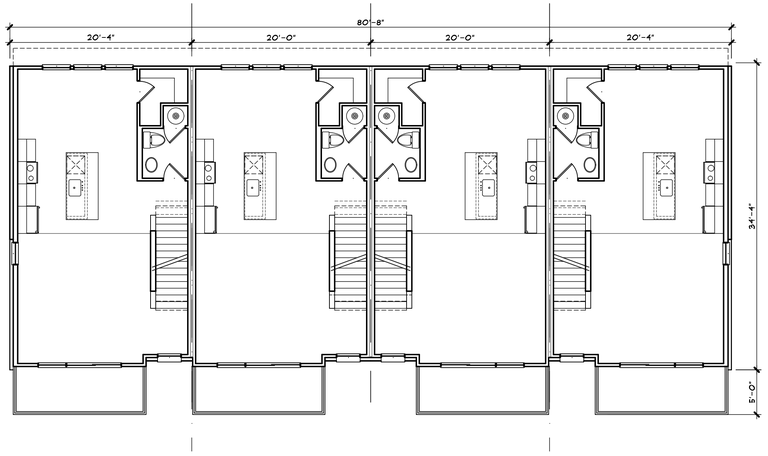
ROOF PLAN
4 UNIT BUILDING

SCALE: 1/8" = 1'-0"



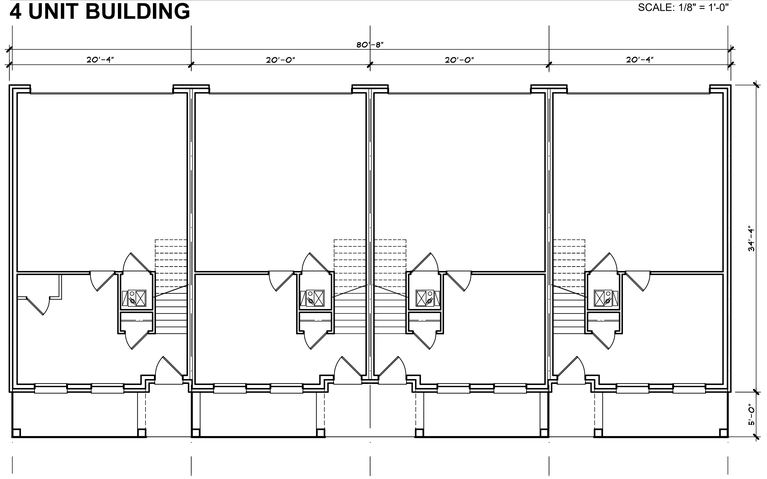
SECOND FLOOR PLAN
4 UNIT BUILDING

SCALE: 1/8" = 1'-0"



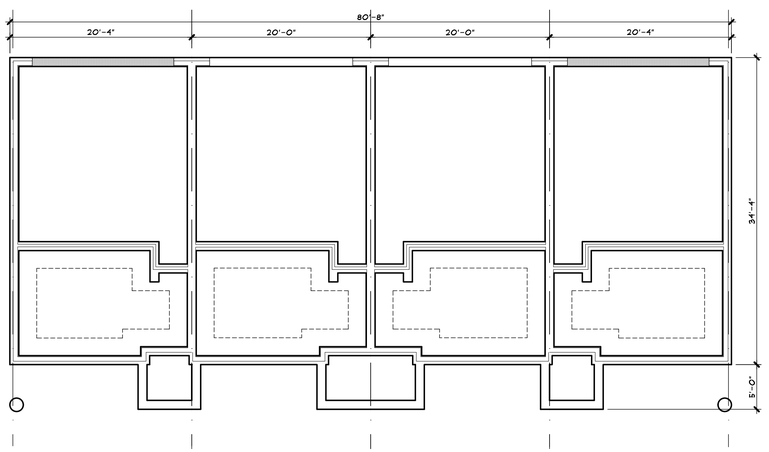
FIRST FLOOR PLAN
4 UNIT BUILDING

SCALE: 1/8" = 1'-0"



LOWER LEVEL PLAN
4 UNIT BUILDING

SCALE: 1/8" = 1'-0"



FOUNDATION PLAN
4 UNIT BUILDING

SCALE: 1/8" = 1'-0"

ARCHITECTURE
BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
4 UNIT BUILDING
BUILDING PLANS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

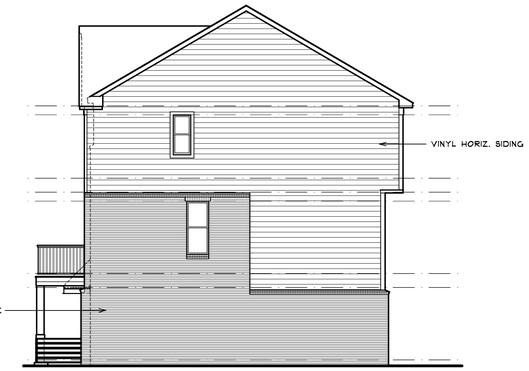
JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-8

REAR ELEVATION
4 UNIT BUILDING

SCALE: 1/8" = 1'-0"

LEFT SIDE ELEVATION

SCALE: 1/8" = 1'-0"



RIGHT SIDE ELEVATION

SCALE: 1/8" = 1'-0"

FRONT ELEVATION
4 UNIT BUILDING

SCALE: 1/8" = 1'-0"

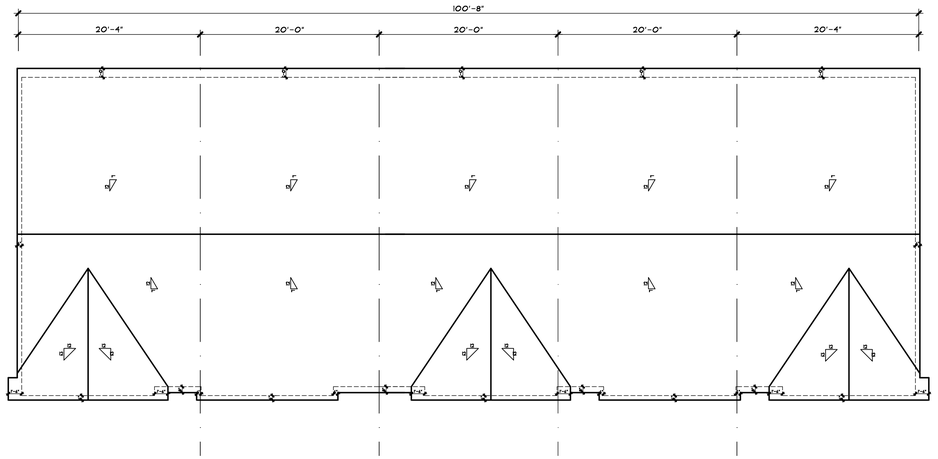
ARCHITECTURE
BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
4 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

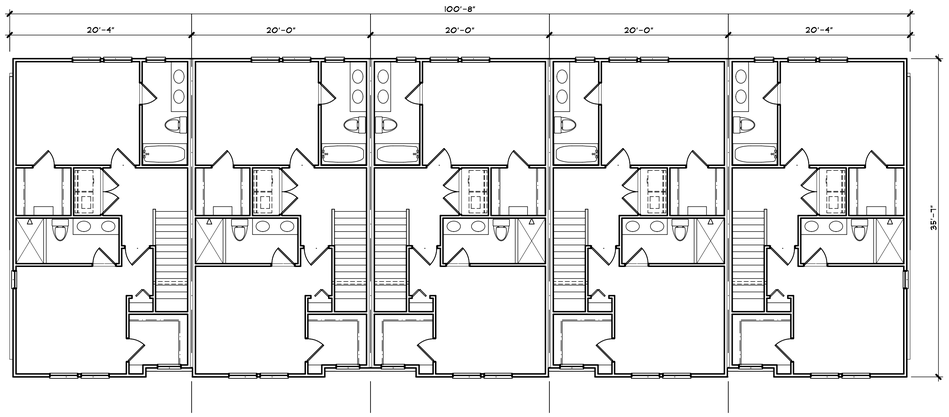
PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-9



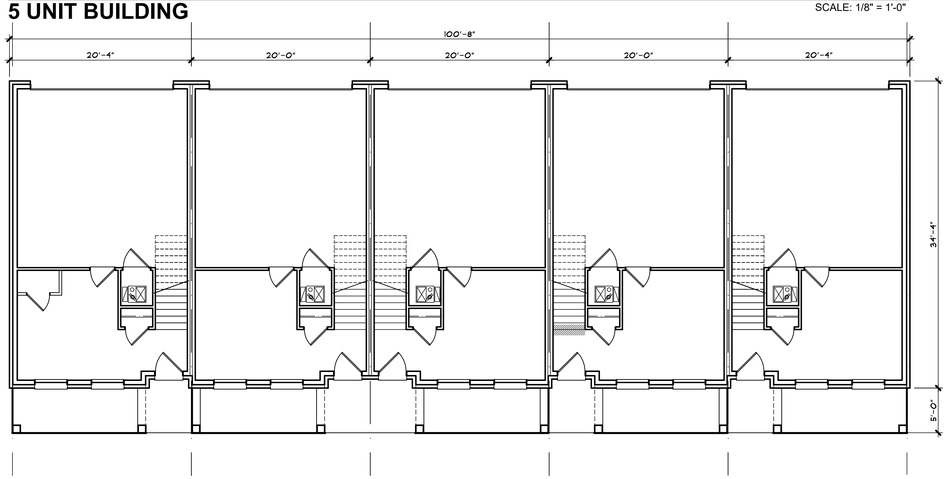
ROOF PLAN
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"



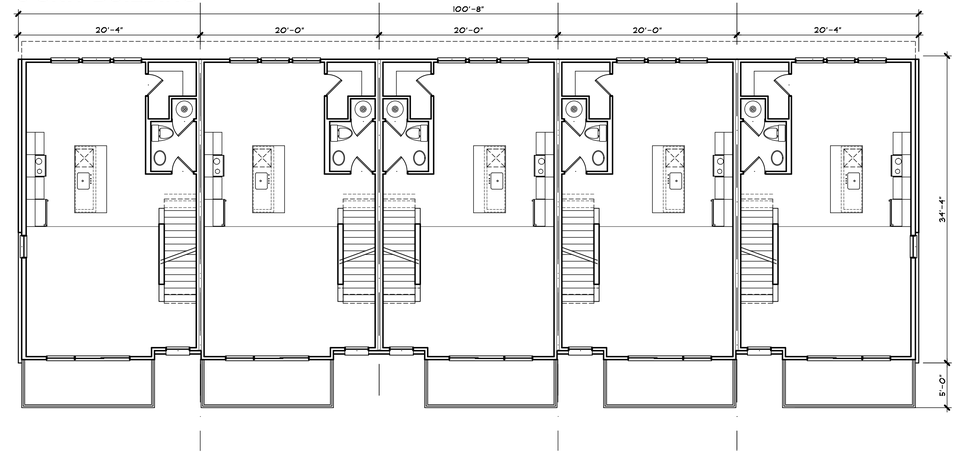
SECOND FLOOR PLAN
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"



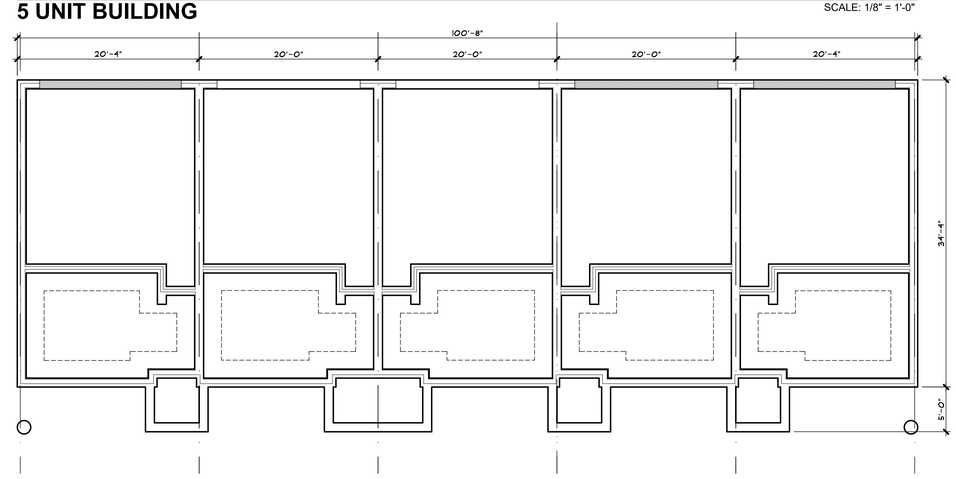
LOWER LEVEL PLAN
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"



FIRST FLOOR PLAN
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"



FOUNDATION PLAN
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"

ARCHITECTURE
BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
5 UNIT BUILDING
BUILDING PLANS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

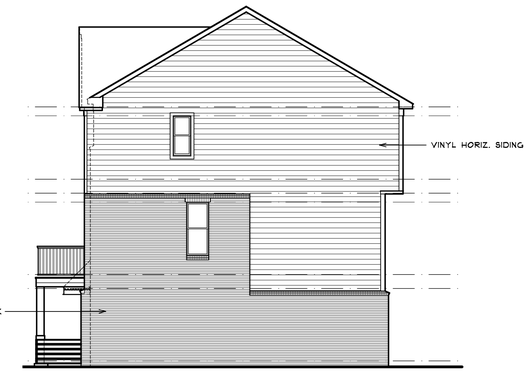
JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-10

REAR ELEVATION
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"

LEFT SIDE ELEVATION

SCALE: 1/8" = 1'-0"



RIGHT SIDE ELEVATION

SCALE: 1/8" = 1'-0"

FRONT ELEVATION
5 UNIT BUILDING

SCALE: 1/8" = 1'-0"

ARCHITECTURE

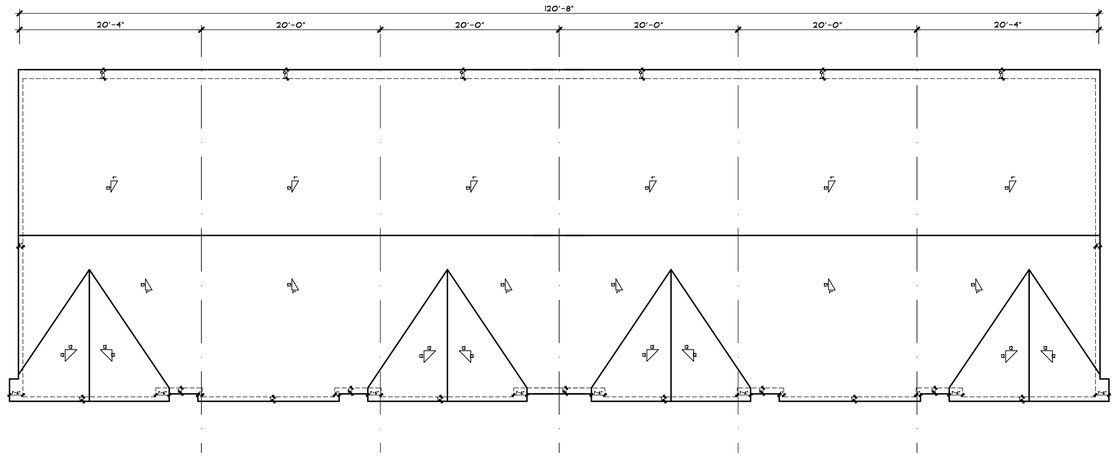
BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
5 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

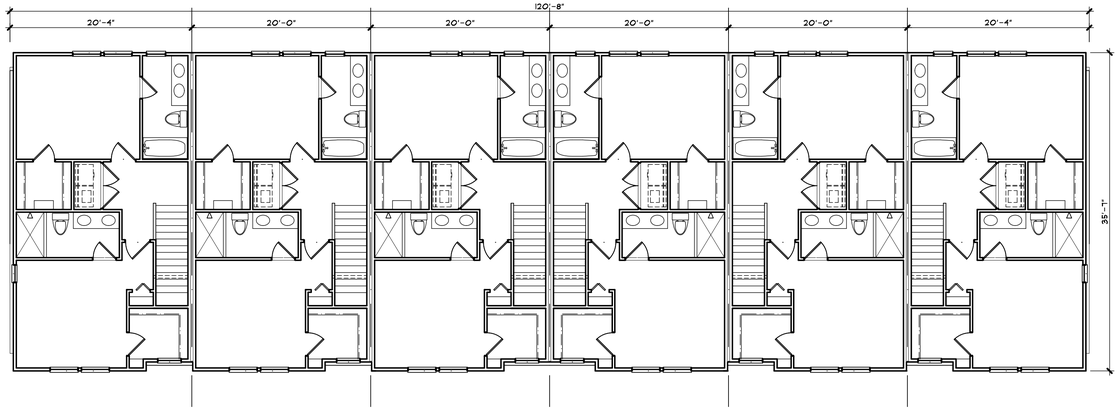
PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-11



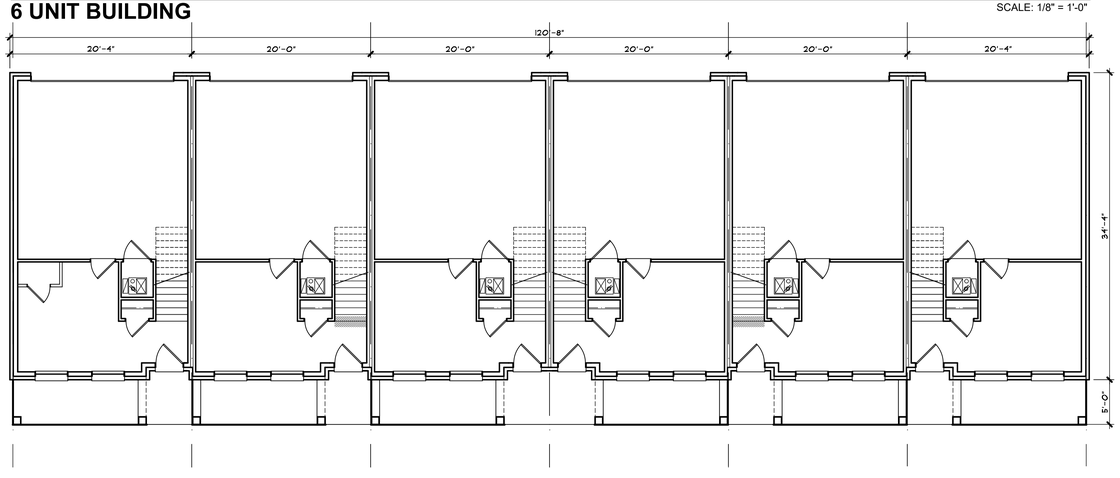
ROOF PLAN
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"



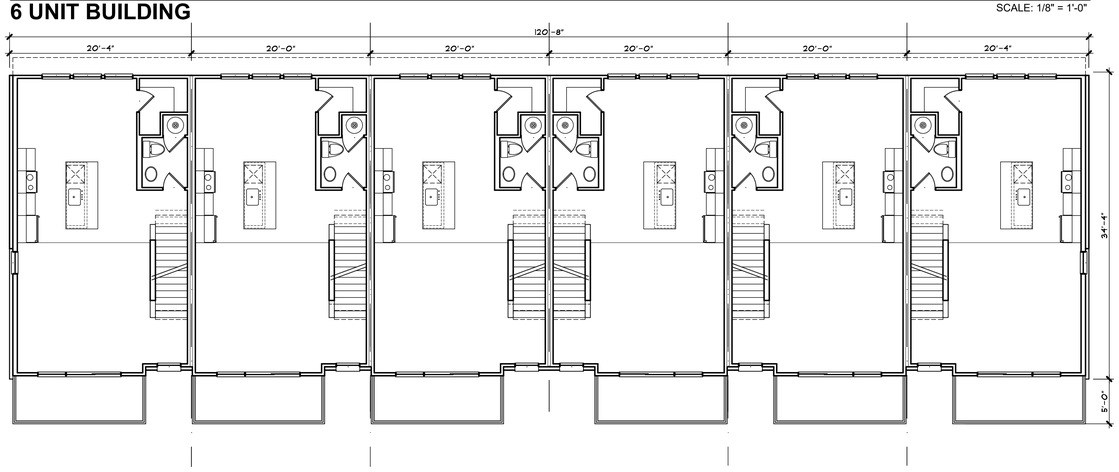
SECOND FLOOR PLAN
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"



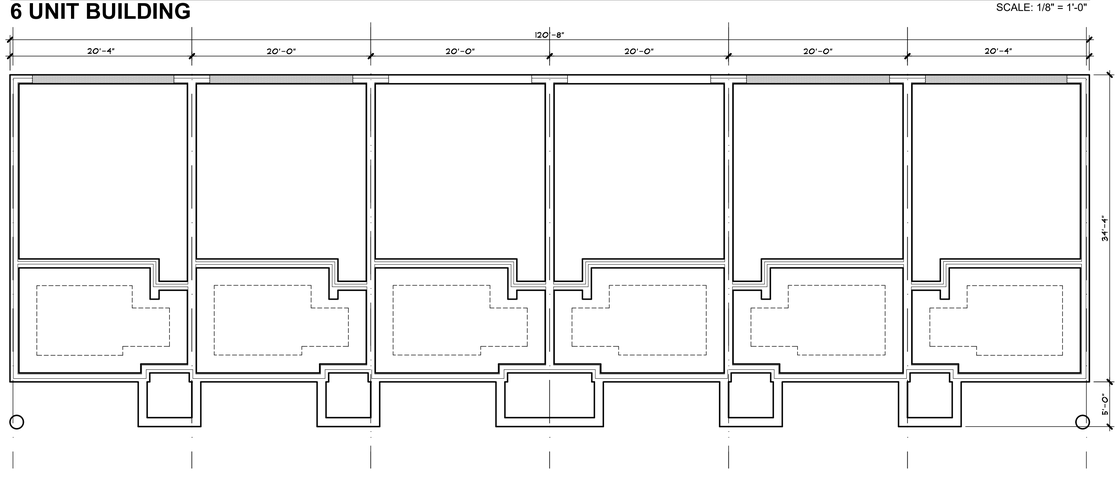
LOWER LEVEL PLAN
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"



FIRST FLOOR PLAN
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"



FOUNDATION PLAN
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"

ARCHITECTURE

BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

SHEET TITLE
6 UNIT BUILDING
BUILDING PLANS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	

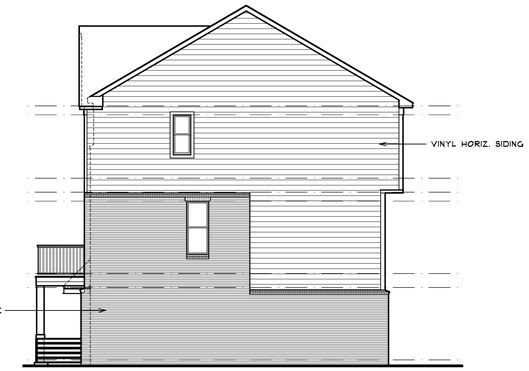
SHEET NUMBER
A-12

REAR ELEVATION
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"

LEFT SIDE ELEVATION

SCALE: 1/8" = 1'-0"



RIGHT SIDE ELEVATION

SCALE: 1/8" = 1'-0"

FRONT ELEVATION
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"

BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248. 259. 1784

ARCHITECTURE

SHEET TITLE
6 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	

JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-13

CLAREMONT

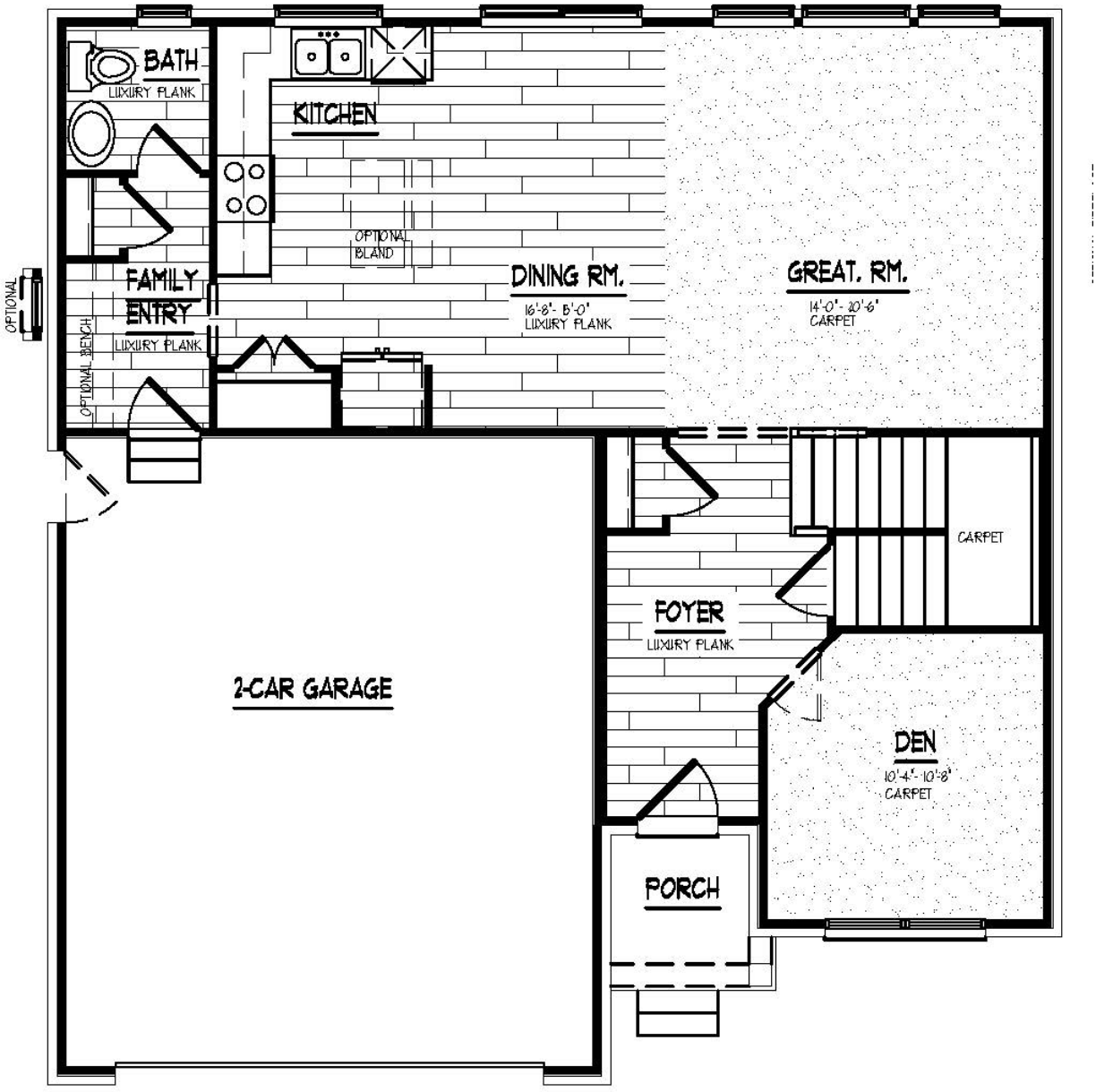
ELEVATIONS

ROBERTSON BROTHERS HOMES

CLAREMONT

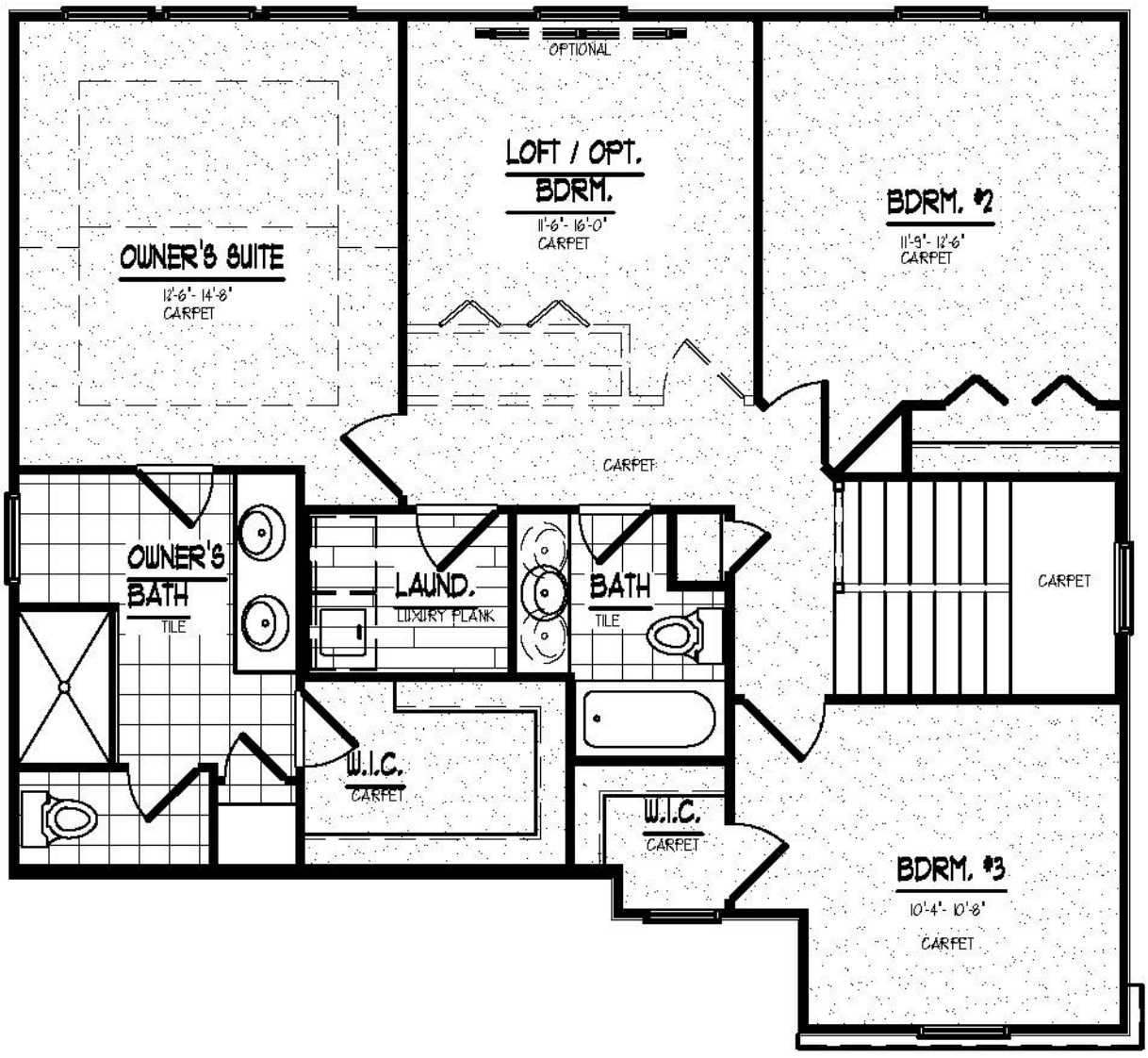
MAIN LEVEL

1,939 sqft.



CLAREMONT

SECOND LEVEL



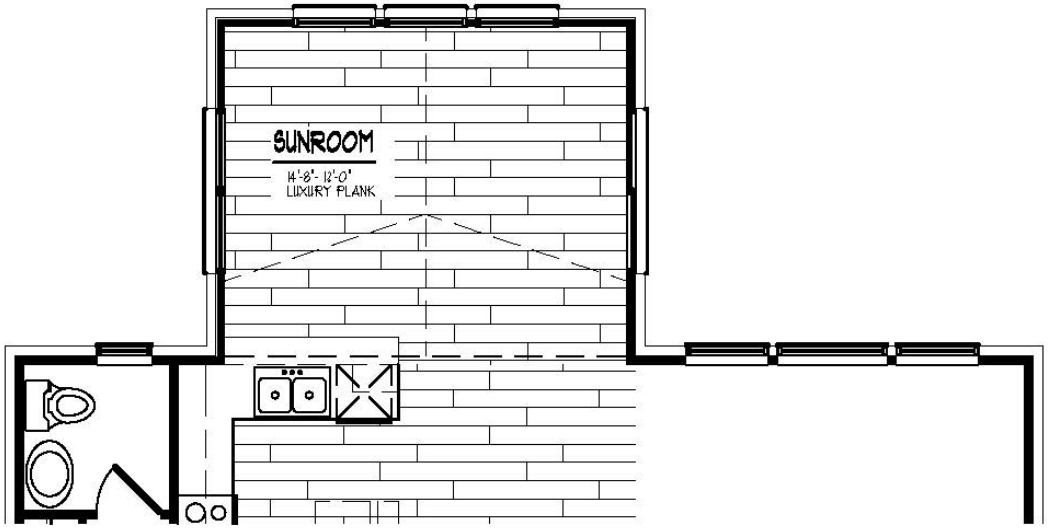
ROBERTSON BROTHERS HOMES

Artistic conceptual rendering should be used as a reference only and not be relied upon as the final details of the residences. Images featured are samples and may not reflect your home site's garage handing, elevation conditions or color package materials. Physical material board signed off will be required during your purchase process. Any specifications in this depiction may change at developer's sole discretion without notice. All information herein was accurate at the time of publication. We reserve the right to make changes in specification, or materials, or to change or discontinue models without notice or obligation.

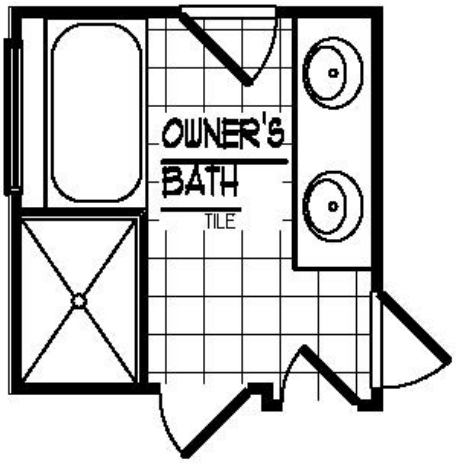
EQUAL HOUSING OPPORTUNITY

CLAREMONT

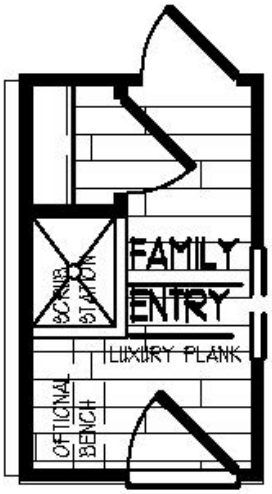
OPTIONS



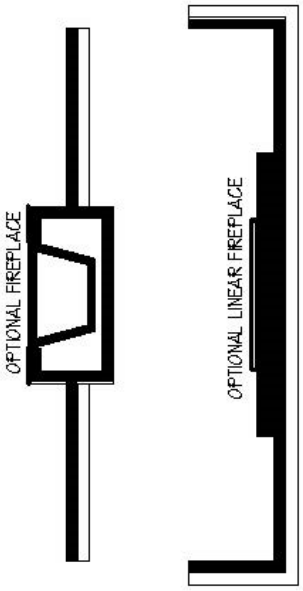
OPT. SUNROOM



OPT. OWNER'S BATH



OPT. FAMILY ENTRY



ROBERTSON BROTHERS HOMES

HAWTHORNE

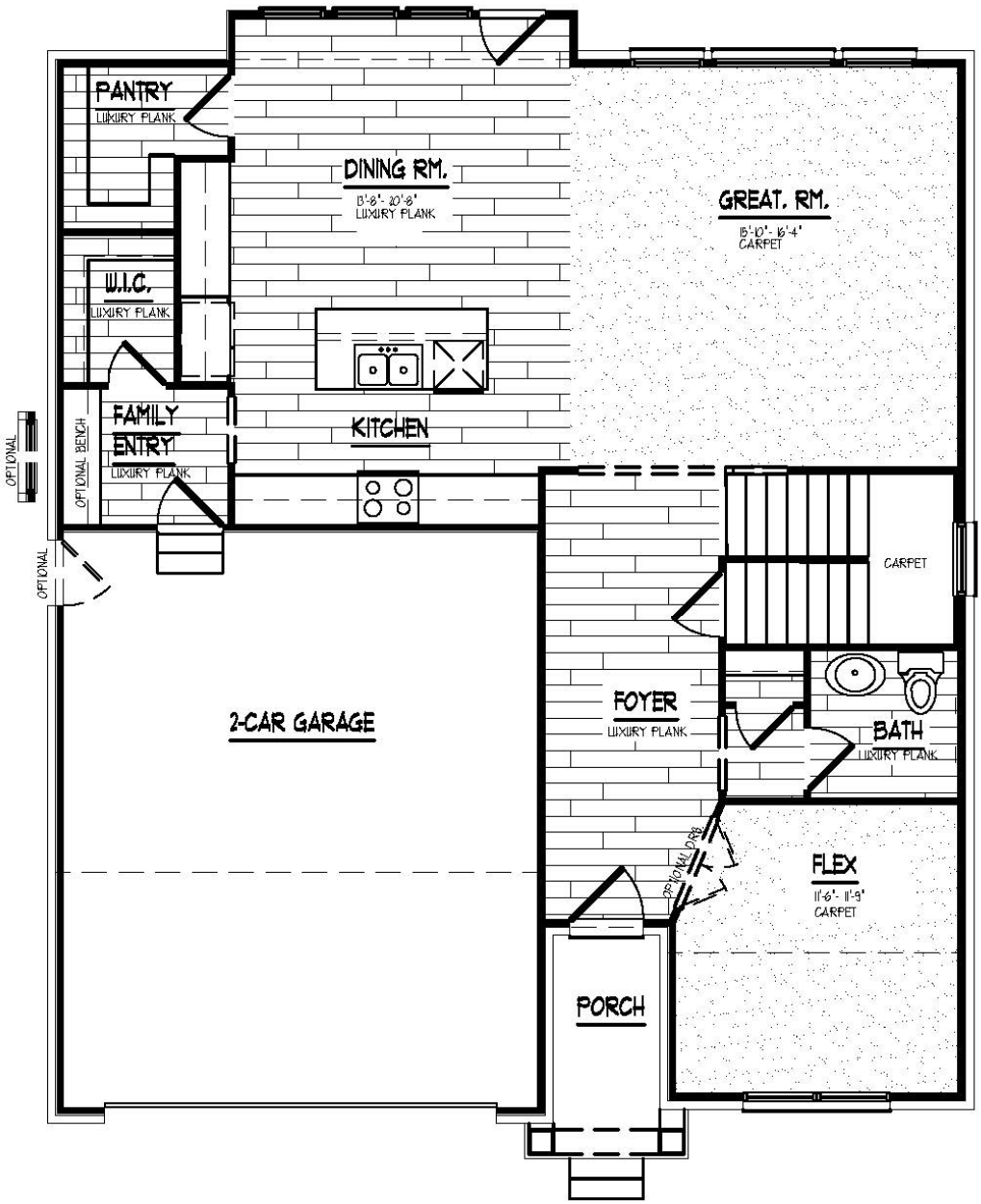
ELEVATIONS

ROBERTSON BROTHERS HOMES

HAWTHORNE

MAIN LEVEL

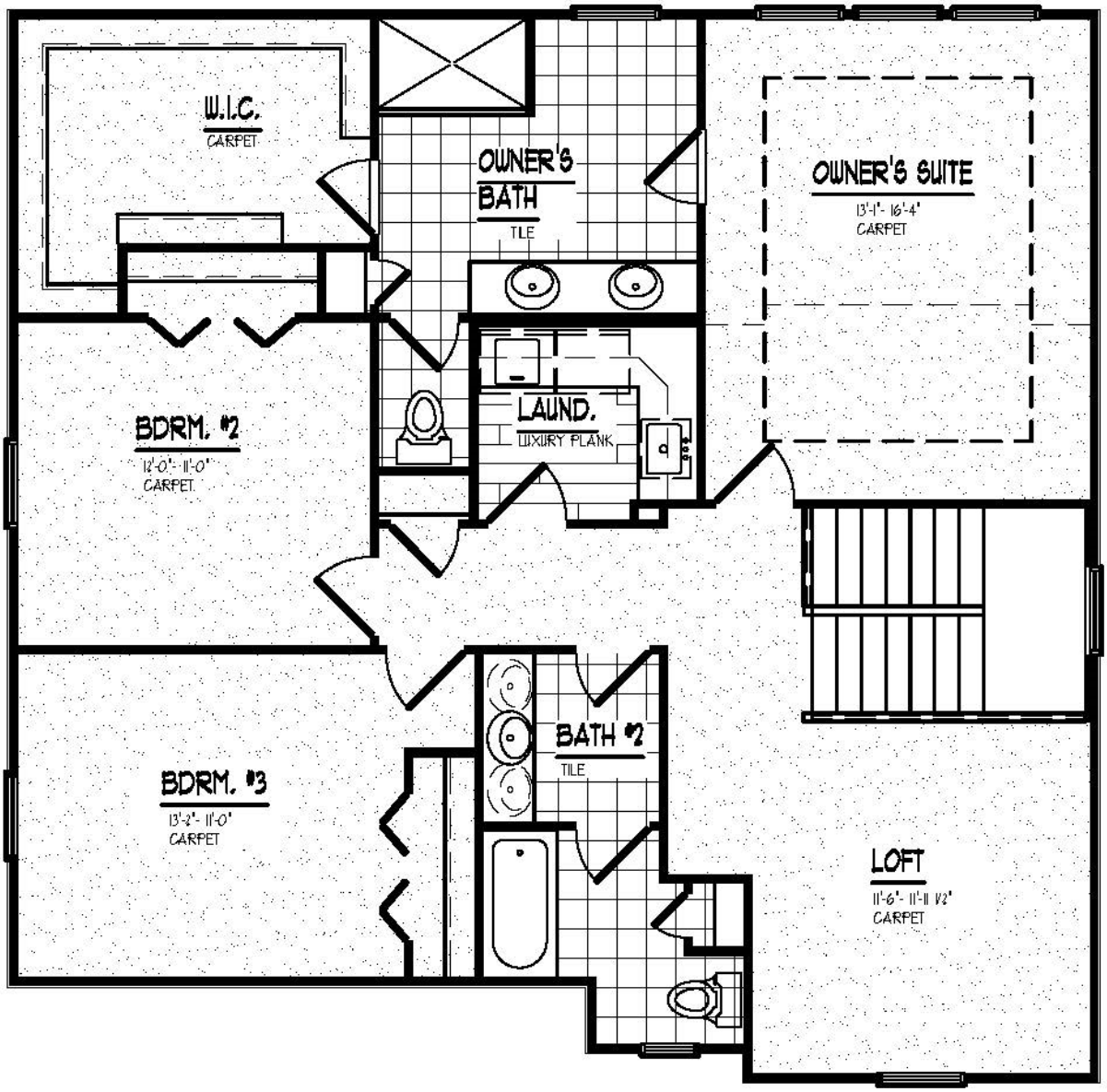
2,336 sqft.



ROBERTSON BROTHERS HOMES

HAWTHORNE

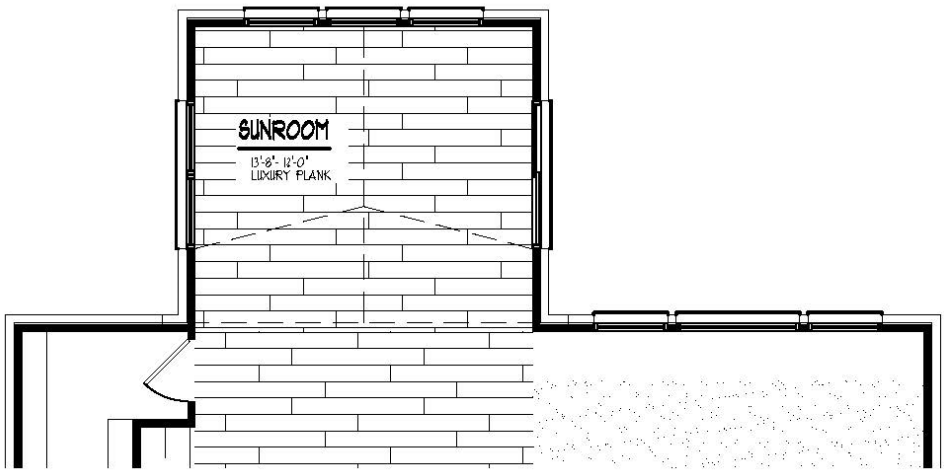
SECOND LEVEL



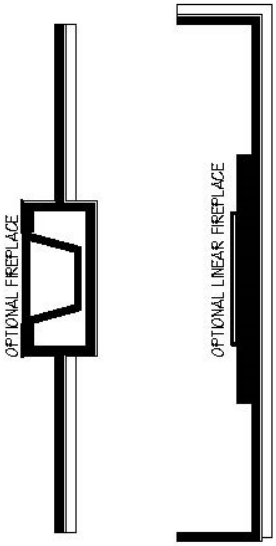
ROBERTSON BROTHERS HOMES

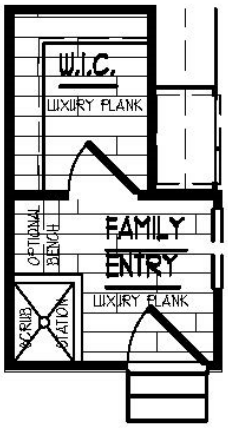
HAWTHORNE

OPTIONS

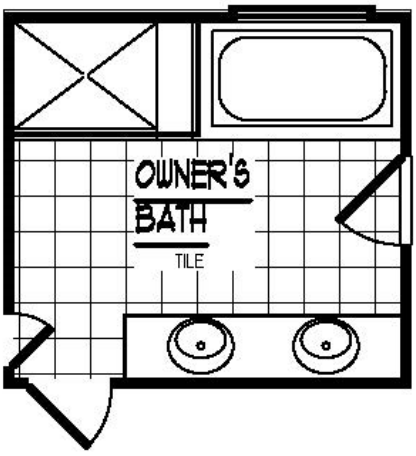


OPT. SUNROOM

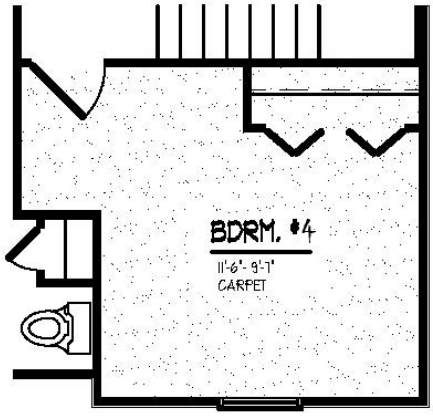




OPT. FAMILY ENTRY



OPT. OWNER'S BATH



OPT. BDRM. #4

ROBERTSON BROTHERS HOMES

NORWOOD

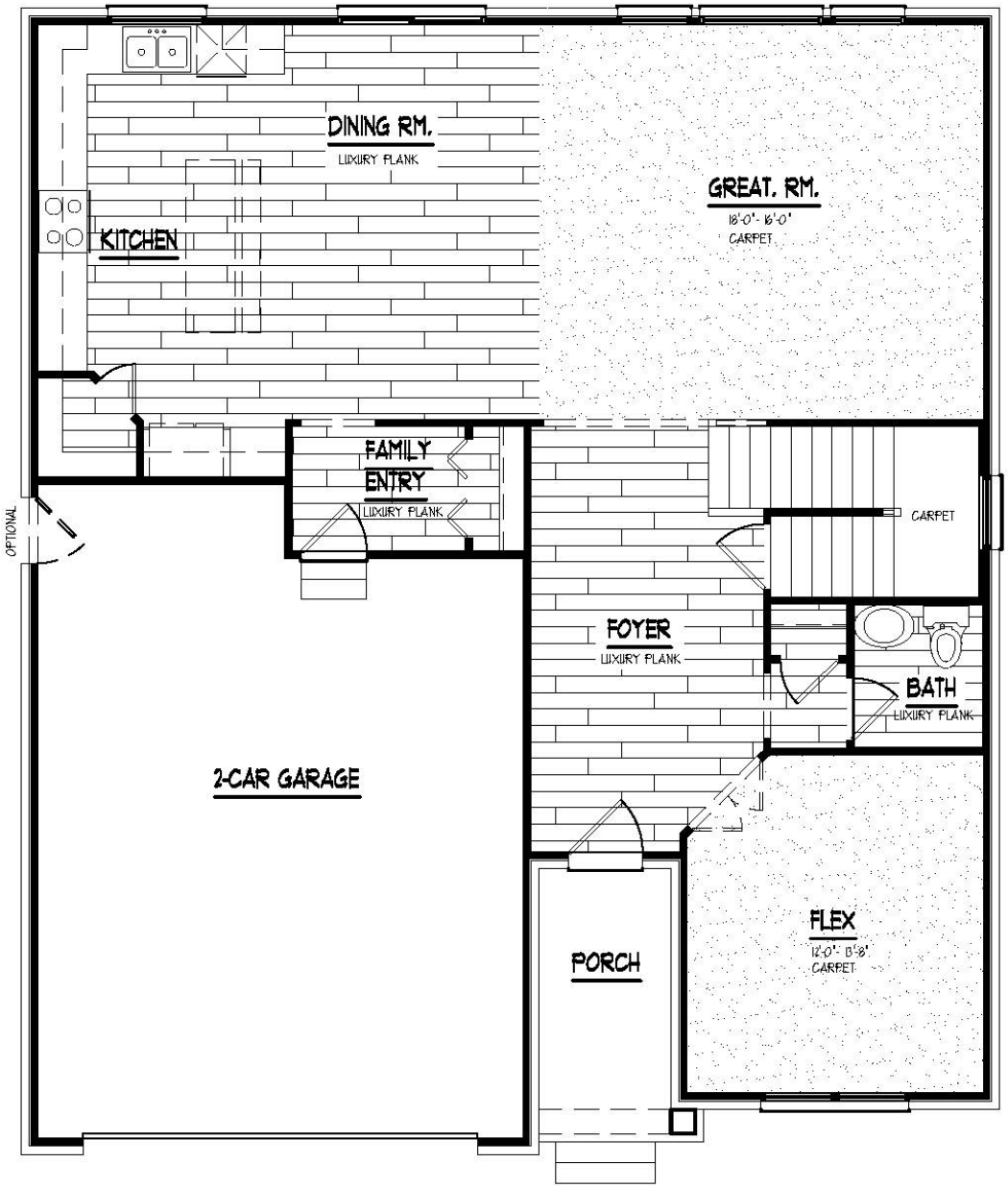
ELEVATIONS

ROBERTSON BROTHERS HOMES

NORWOOD

MAIN LEVEL

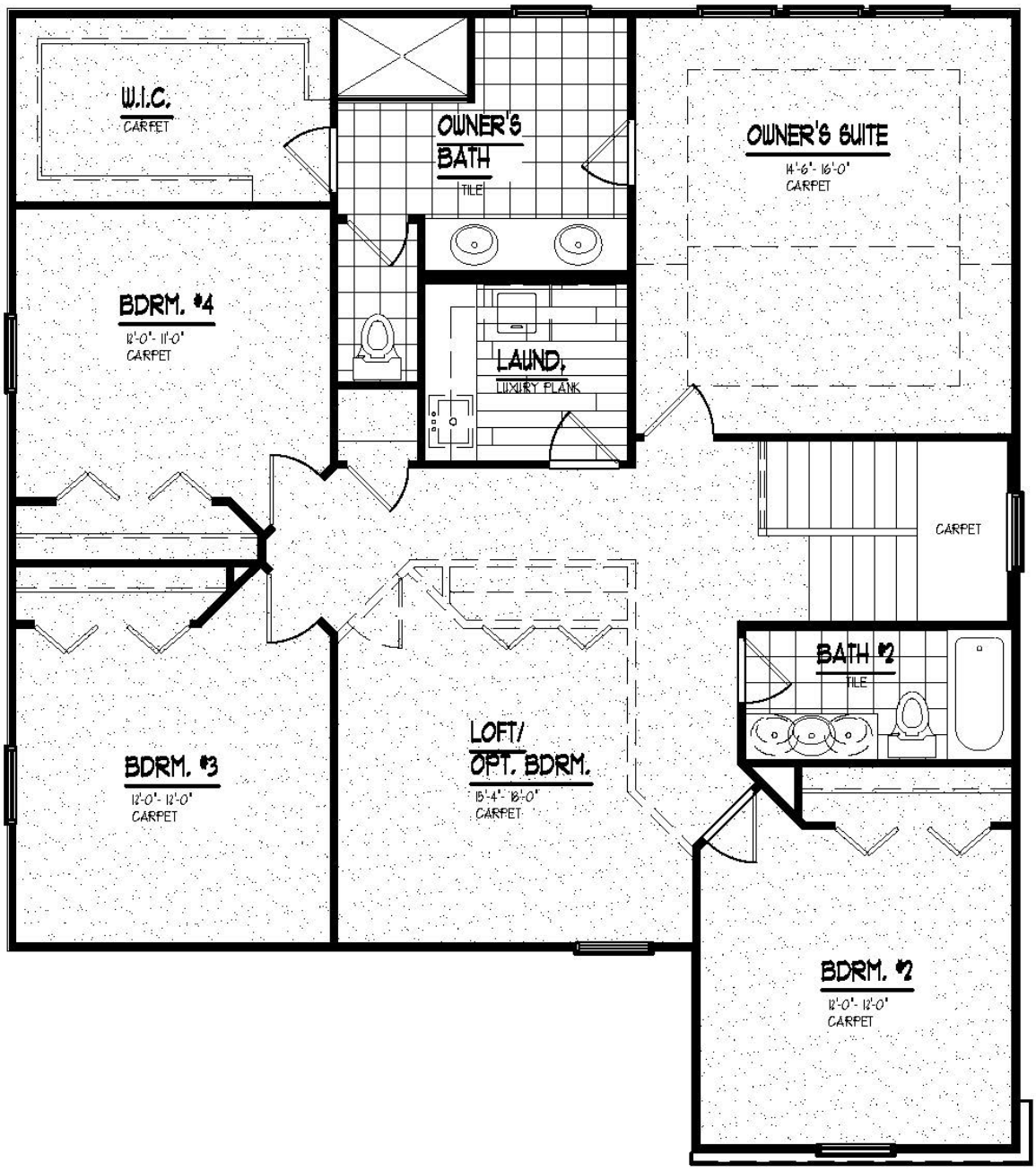
2,632 sqft.



ROBERTSON BROTHERS HOMES

NORWOOD

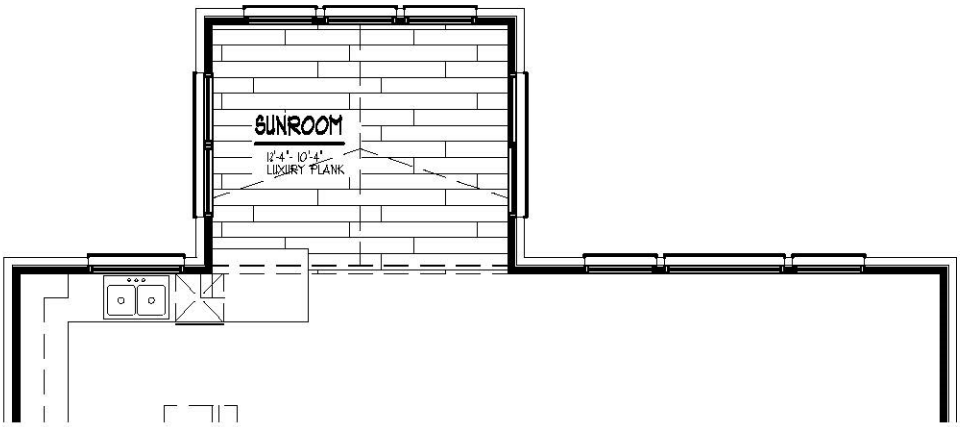
SECOND LEVEL



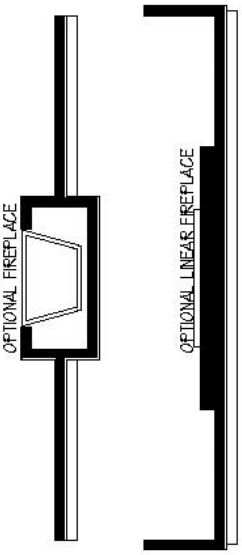
ROBERTSON BROTHERS HOMES

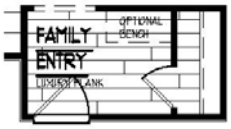
NORWOOD

OPTIONS

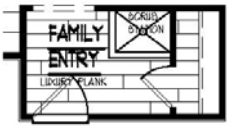


OPT. SUNROOM

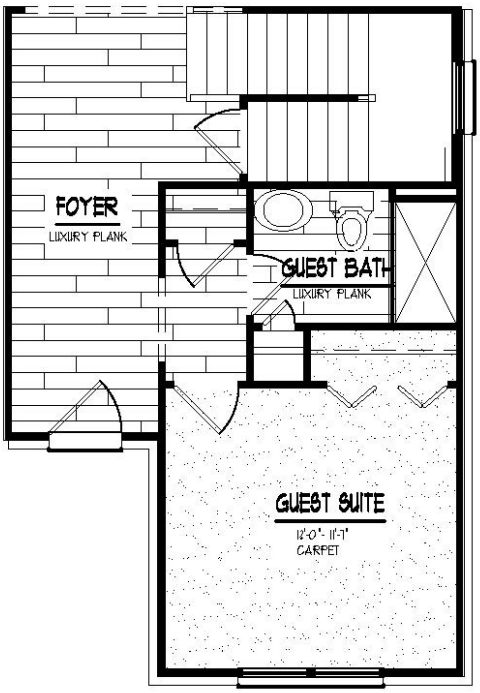


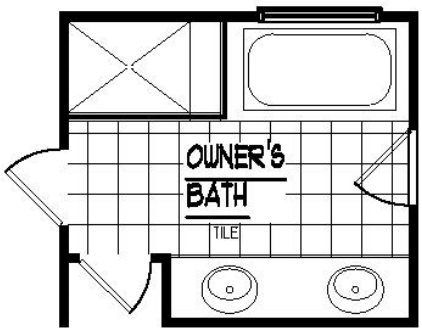


OPT. FAMILY ENTRY

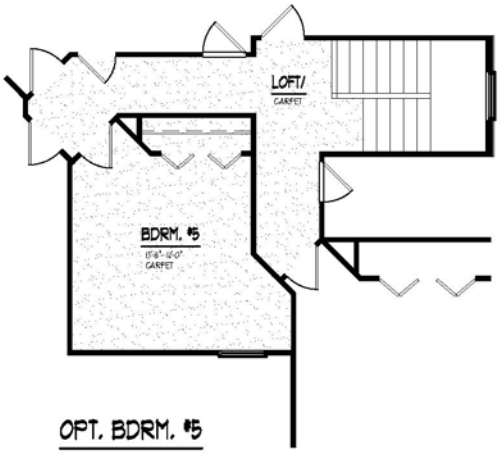


OPT. FAMILY ENTRY





OPT. OWNER'S BATH



OPT. BDRM. #5

ROBERTSON BROTHERS HOMES

RALEIGH

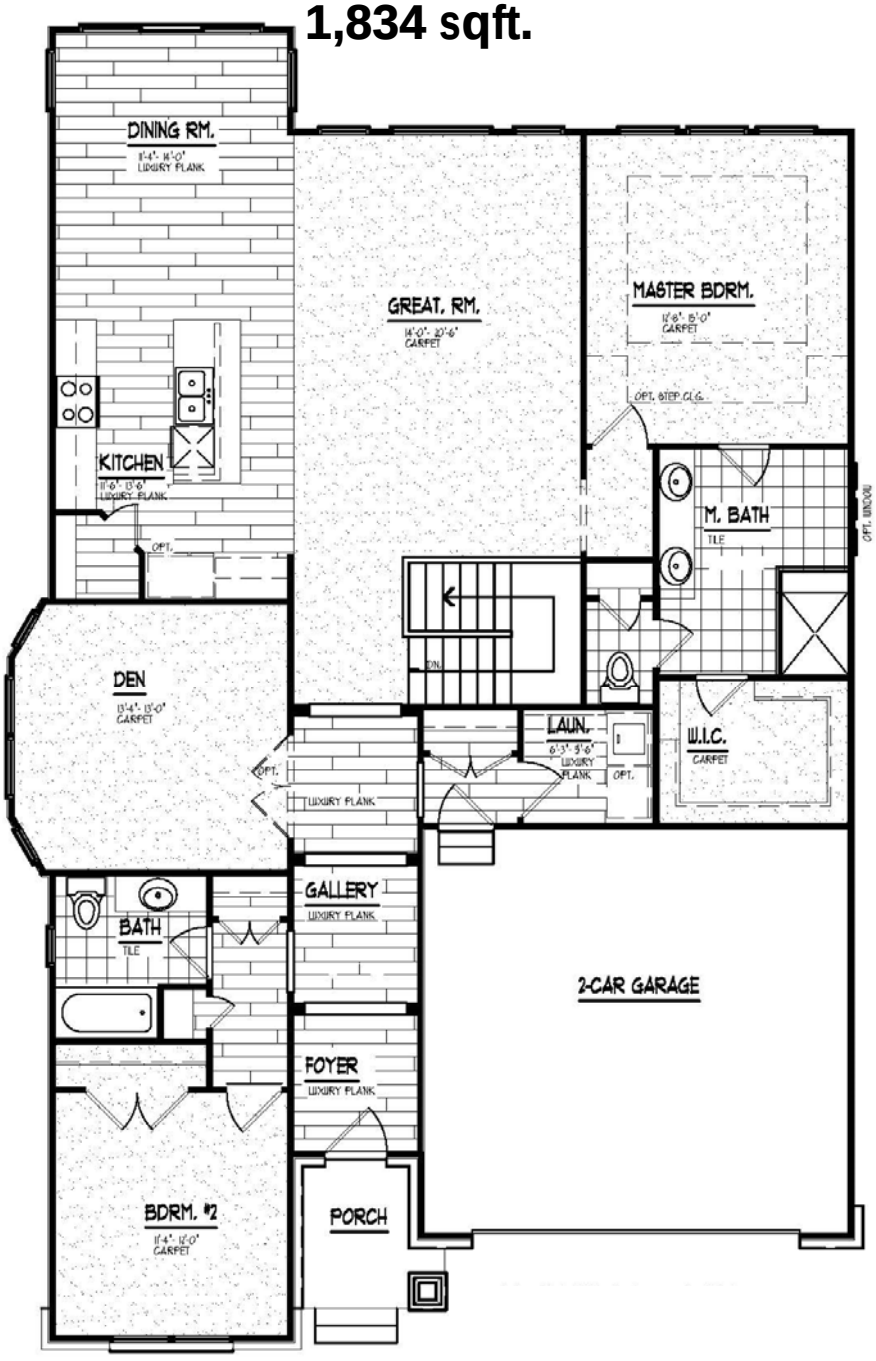
ELEVATIONS

ROBERTSON BROTHERS HOMES

RALEIGH

MAIN LEVEL

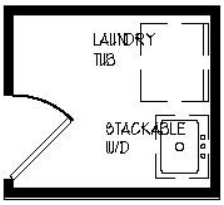
1,834 sqft.



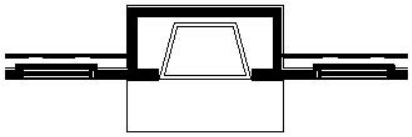
ROBERTSON BROTHERS HOMES

RALEIGH

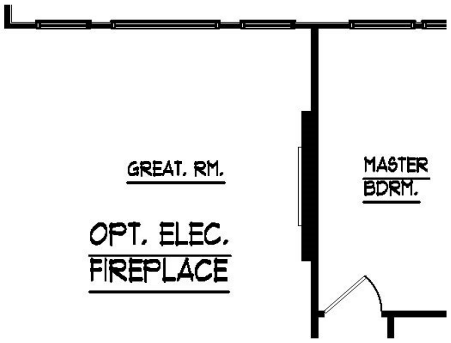
OPTIONS



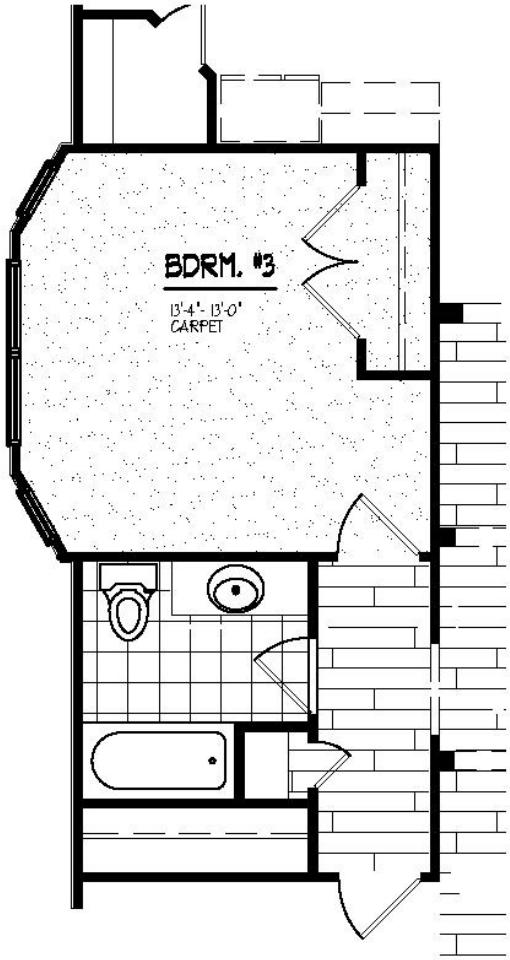
OPT. LAUNDRY



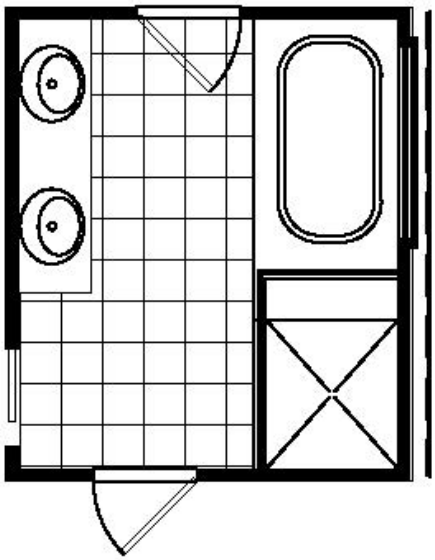
OPT. FIREPLACE



OPT. ELEC.
FIREPLACE



OPT. BEDROOM

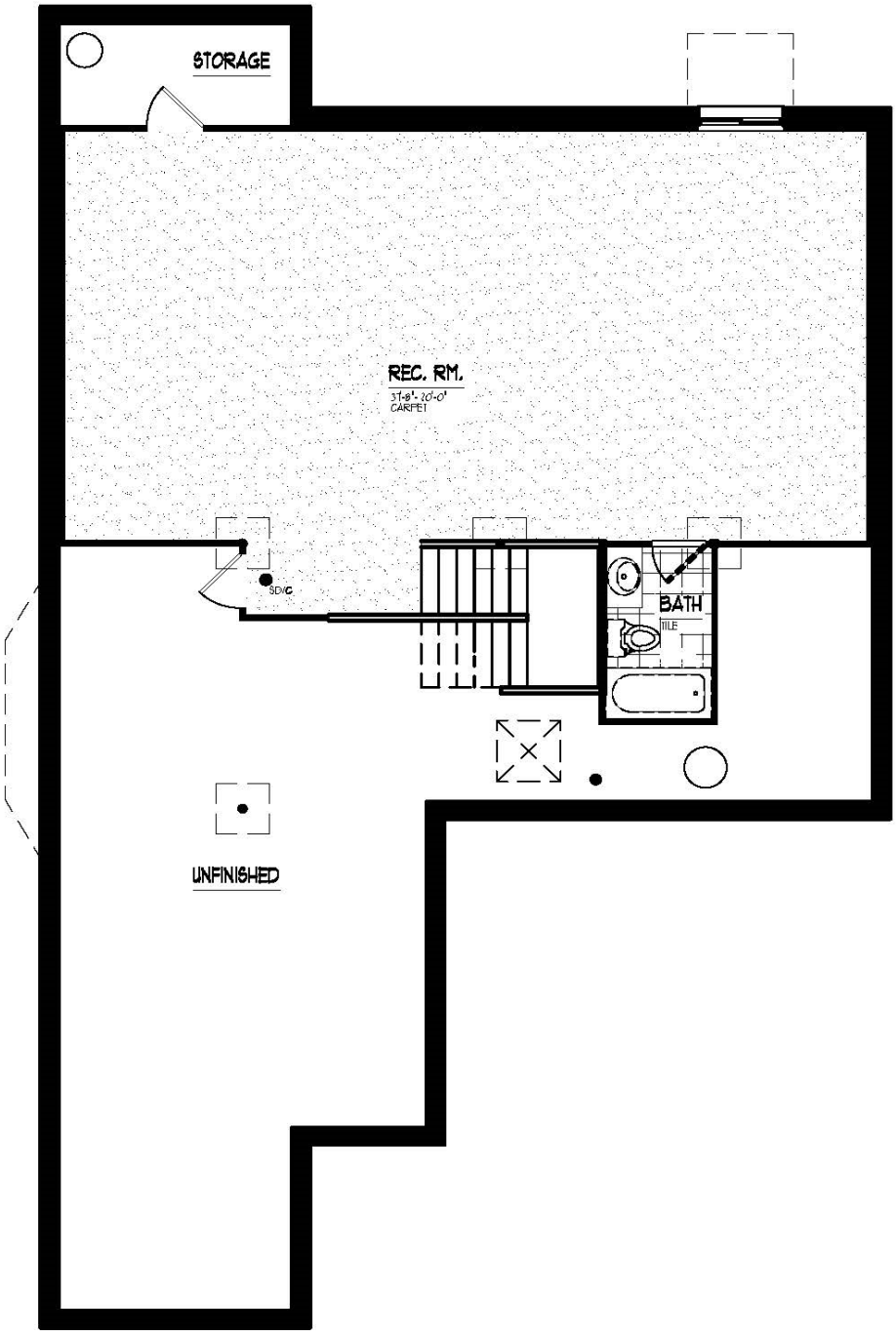


OPT. M.BATH

ROBERTSON BROTHERS HOMES

RALEIGH

LOWER LEVEL OPTION 1 936 SQFT



ROBERTSON BROTHERS HOMES

SHERIDAN

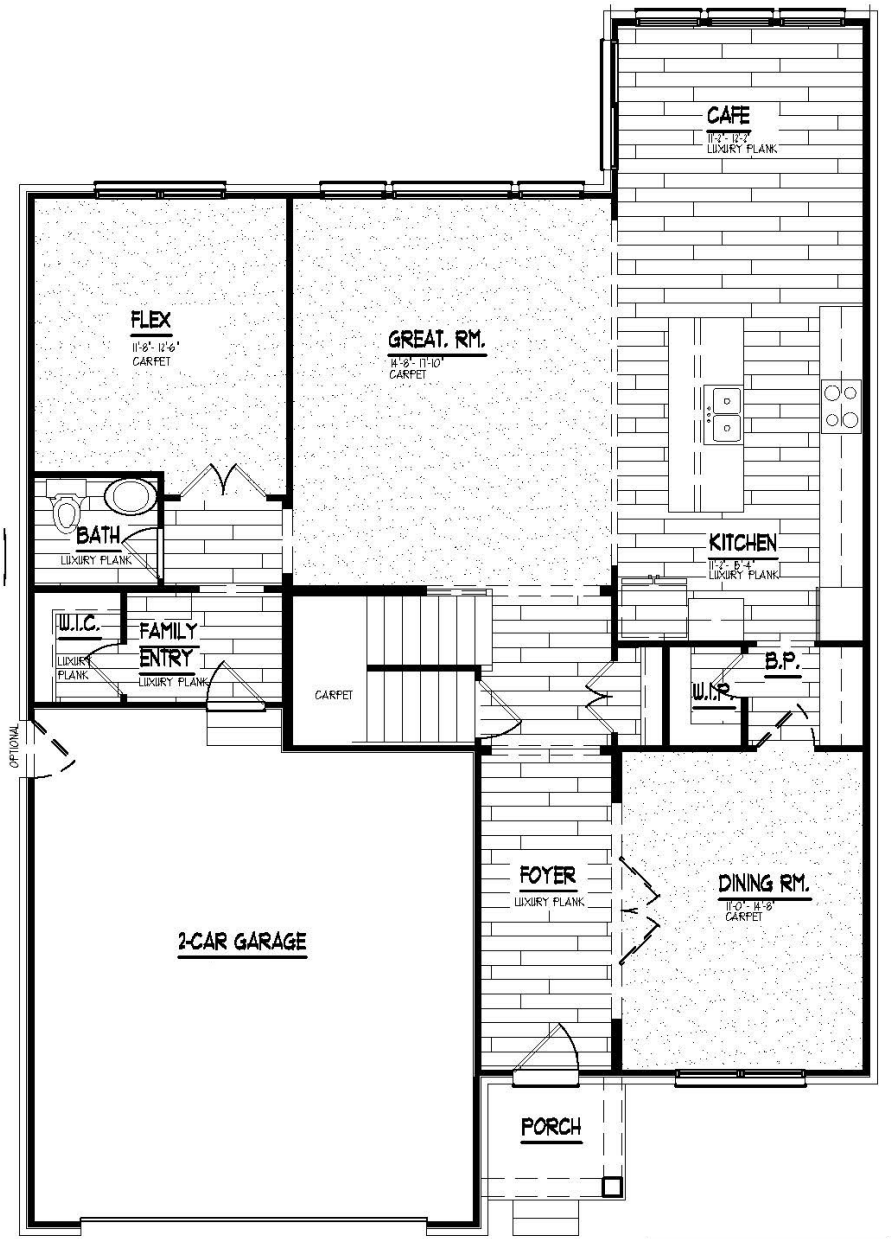
ELEVATIONS

ROBERTSON BROTHERS HOMES

SHERIDAN

MAIN LEVEL

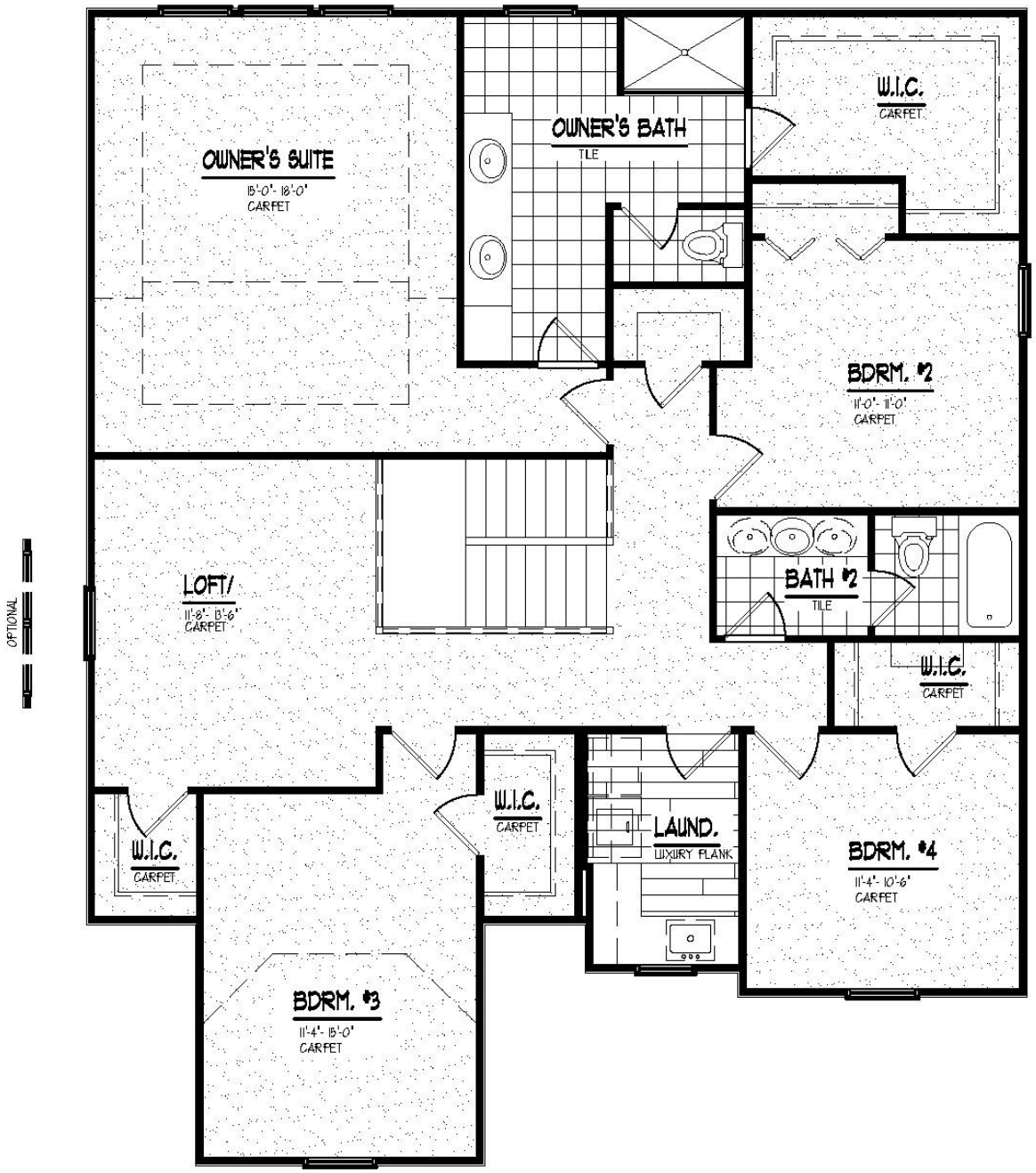
2,948 sqft.



ROBERTSON BROTHERS HOMES

SHERIDAN

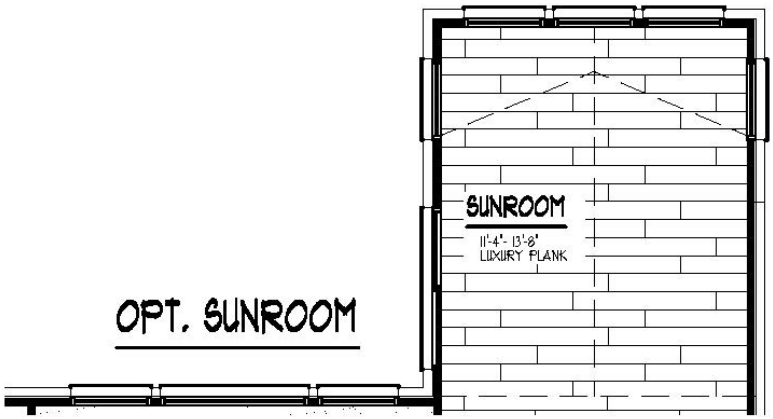
SECOND LEVEL



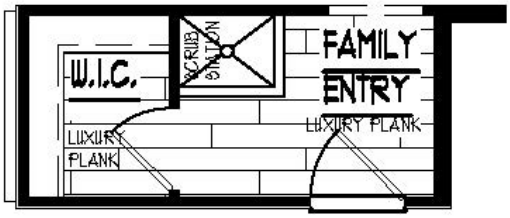
ROBERTSON BROTHERS HOMES

SHERIDAN

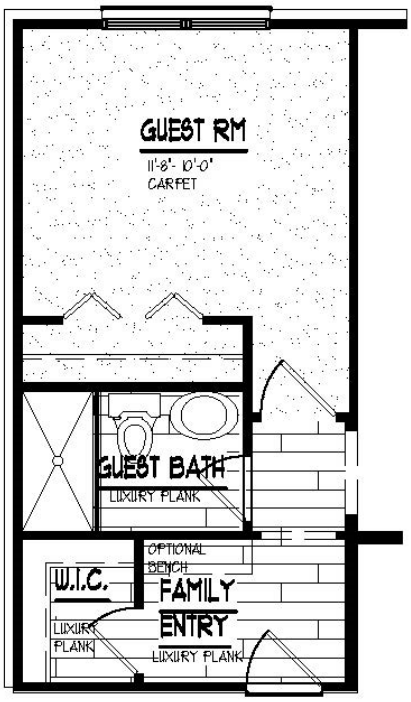
OPTIONS



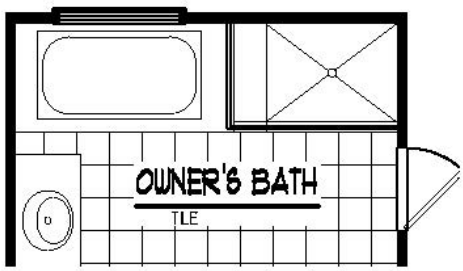
OPT. SUNROOM



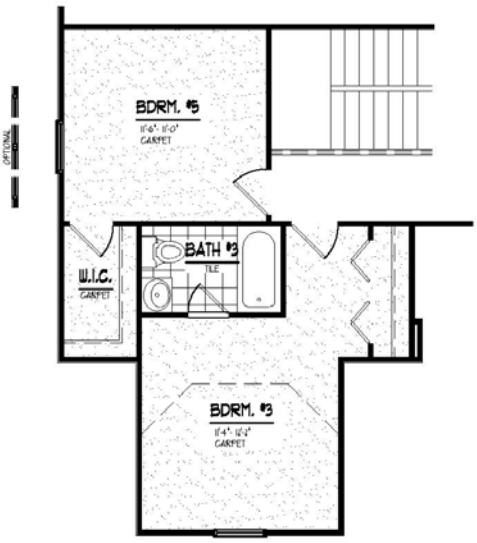
OPT. FAMILY ENTRY



OPT. GUEST RM.



OPT. OWNER'S BATH



OPT. BDRM. #5 & BATH

ROBERTSON BROTHERS HOMES

WHITMORE

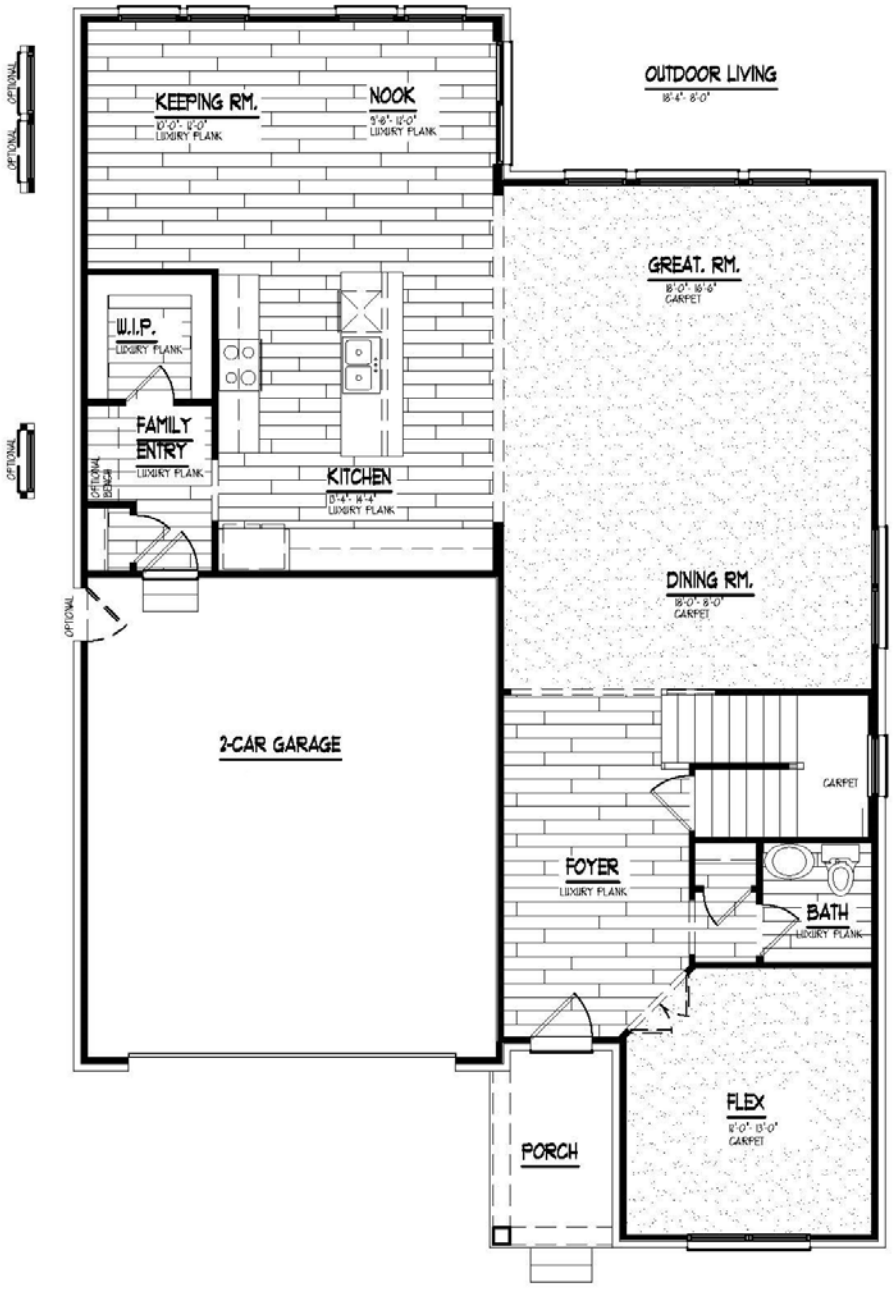
ELEVATIONS

ROBERTSON BROTHERS HOMES

WHITMORE

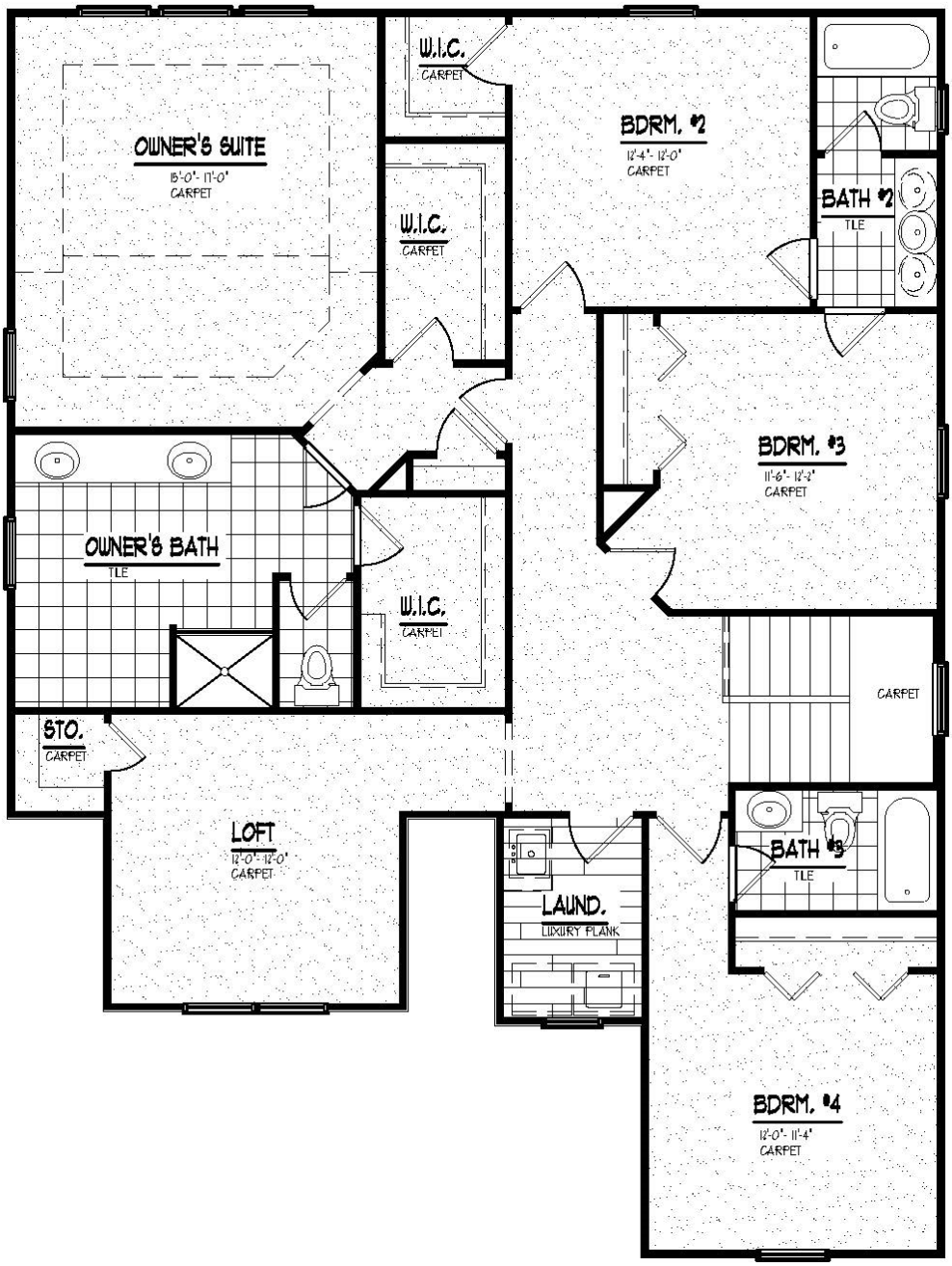
MAIN LEVEL

3,110 sqft.



WHITMORE

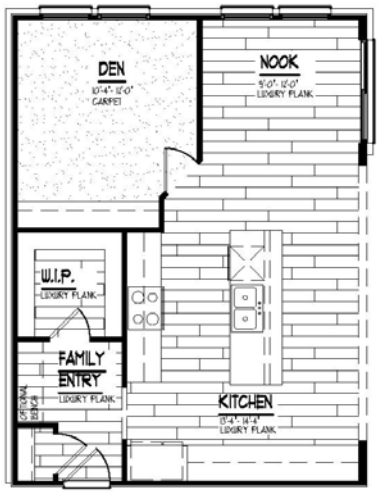
SECOND LEVEL



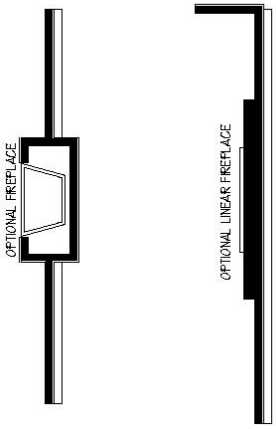
ROBERTSON BROTHERS HOMES

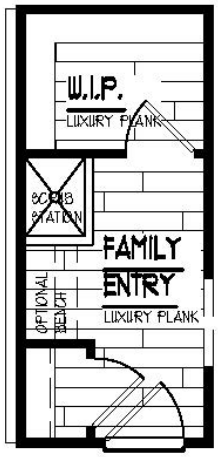
WHITMORE

OPTIONS

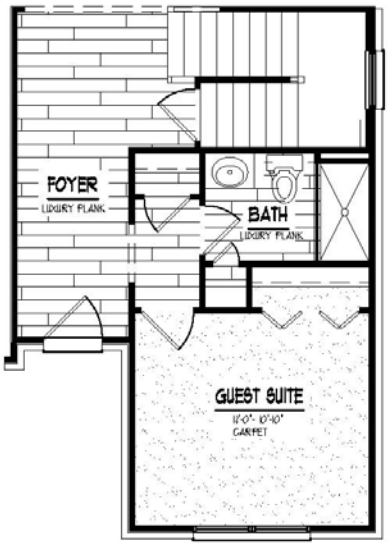


ALT. DEN OPT.

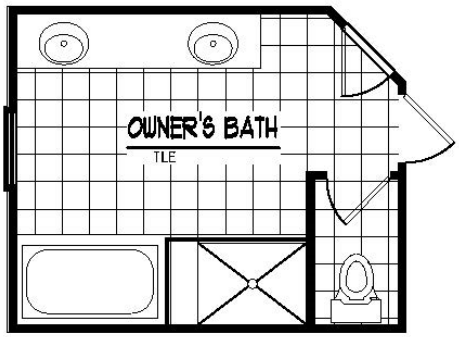




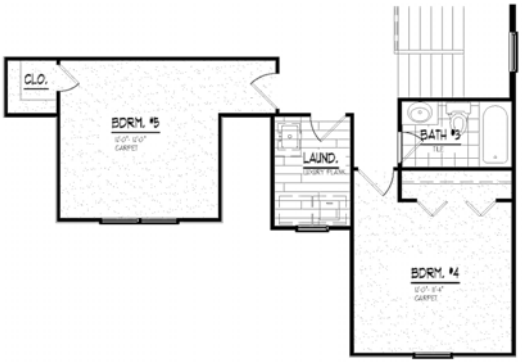
OPT. FAMILY ENTRY



OPT. GUEST SUITE



OPT. OWNER'S BATH



ROBERTSON BROTHERS HOMES

ASTI ENVIRONMENTAL

Investigation • Remediation
Compliance • Restoration

10448 Citation Drive, Suite 100
Brighton, MI 48116

Mailing Address:
P.O. Box 2160
Brighton, MI 48116-2160

800 395-ASTI
Fax: 810.225.3800

www.asti-env.com

Sent Via Email Only

April 5, 2021

Mr. Tim Loughrin
Robertson Brothers Homes
6905 Telegraph Road, Suite 200
Bloomfield Hills, MI 48301-3159

RE: Wetland Delineation and Jurisdictional Assessment
Goodman Property
City of Troy, Oakland County, Michigan
ASTI File No. 11812

Dear Mr. Loughrin:

On March 24, 2021 ASTI Environmental (ASTI) conducted a site investigation to delineate wetland boundaries on approximately 20 acres of land located west of Rochester Road and south of E. Long Lake Road, City of Troy, Oakland County, Michigan (Property). One wetland (Wetland B) likely regulated by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) and three wetlands (Wetland A, Wetland C, Wetland P) not likely regulated by EGLE were found on the Property (Figure 1 – *GPS-Surveyed Wetland Boundaries*). Wetland boundaries, as depicted on Figure 1, were located using a professional grade, hand-held Global Positioning System unit (GPS).

SUPPORTING DATA AND MAPPING

The USDA Web Soil Survey (WSS), the National Wetlands Inventory (NWI), the EGLE Wetlands Map Viewer web site, and digital aerial photographs were all used to support the wetland delineation and subsequent regulatory status determination. The NWI map showed no wetlands on the Property. The EGLE map identified wetlands throughout the western portion of the Property, and wetland soils throughout the western and central portions of the Property.

In addition, the WSS indicated the Property is comprised of the soils Lenawee silty clay loam (0-1% slopes), Metea loamy sand (0-6% slopes), Selfridge loamy sand (0-3% slopes), Owosso silty loam (1-6% slopes), Aquents (sandy, loamy, undulating), and Urban land. According to the WSS, Lenawee and Aquents are listed as hydric soils.

FINDINGS

ASTI investigated the Property for the presence of any lakes, ponds, wetlands, and watercourses. This work is based on *MCL 324 Part 301 (Inland Lakes and Streams)* and *Part 303 (Wetland Protection).*

It should be noted that some municipalities have local wetland ordinances and natural features setbacks that may apply to this property. In addition, in some circumstances the US Army Corps of Engineers (ACOE) may also have jurisdiction of wetlands or watercourses on your Property. This is not the case for your site.

The delineation protocol used by ASTI for this delineation is based on the US Army Corps of Engineers' *Wetland Delineation Manual,* 1987, the *Regional Supplement to the Corps of Engineer Wetland Delineation Manual: Northcentral and Northeast Region*, and related guidance/documents, as appropriate. Wetland vegetation, hydrology, and soils were used to locate the wetland boundaries. Four wetland areas were found on the Property and are discussed below.

Wetland A

Wetland A is a scrub-shrub wetland (see Figure 1) 0.61 acres in size. Dominant vegetation included green ash (*Fraxinus pennsylvanica*), and dogwood (*Cornus racemosa, Cornus amomum*). Soils were considered hydric because the criteria for depleted matrix was met. Indicators of wetland hydrology included water marks.

The adjacent upland was shrubby field. Dominant vegetation included red cedar (*Juniper virginiana*), Canada goldenrod (*Solidago canadensis*), and Queen Anne's lace (*Daucus carota*). There was no evidence of wetland hydrology. Soils were not considered hydric.

It is ASTI's opinion that Wetland A is not regulated by EGLE because it is less than five acres in size and isolated (located over 500 feet from any inland lakes, streams, or ponds).

Wetland B

Wetland B is a forested wetland (see Figure 1) 0.7 acres in size on-site. Dominant vegetation included common reed (*Phragmites australis*), green ash (*Fraxinus pennsylvanica*), silver maple (*Acer saccharinum*), and eastern cottonwood (*Populus deltoides*). Soils were considered hydric because the criteria for depleted below dark surface were met. Indicators of wetland hydrology included a high water table, saturation, and moss trim lines. This wetland continues off-site to the west and also has a culvert connection to linear wetlands located to the north of E. Long Lake Road.

The adjacent uplands included an old field that appears to have been historically developed or graded. Dominant vegetation included annual grasses, Canada thistle (*Cirsium arvense*), and Queen Anne's lace (*Daucus carota*). There was no evidence of wetland hydrology. Soils were not hydric.

It is ASTI's opinion that Wetland B is regulated by EGLE because it is greater than five acres in size, including off-site portions. This size is based off of aerial photograph interpretation.

Wetland C

Wetland C is a forested wetland (see Figure 1) 0.06 acres in size. Dominant vegetation included silver maple (*Acer saccharinum*), and bur oak (*Quercus macrocarpa*). Soils were considered hydric because the criteria for redox dark surface was met. Indicators of wetland hydrology included water stained leaves and Fac-Neutral test.

The adjacent uplands included an old field that appears to have been historically developed or graded. Dominant vegetation included annual grasses, Canada thistle (*Cirsium arvense*), and Queen Anne's lace (*Daucus carota*). There was no evidence of wetland hydrology. Soils were not hydric.

It is ASTI's opinion that Wetland C is not regulated by EGLE because it is less than five acres in size and isolated (located over 500 feet from any inland lakes, streams, or ponds).

Wetland P

Wetland P is an emergent wetland 0.06 acres in size (see Figure 1) dominated by common reed (*Phragmites australis*). Soils were considered hydric because the criteria for redox dark surface was met. Indicators of wetland hydrology included surface soil cracks and Fac-Neutral test. A non-functioning culvert left in place was observed in Wetland P.

The adjacent uplands included an old field that appears to have been historically developed or graded. Dominant vegetation included Siberian elm (*Ulmus pumila*), and common reed (*Phragmites australis*). There was no evidence of wetland hydrology. Soils were considered hydric the criteria for depleted below dark surface were met.

It is ASTI's opinion that Wetland P is not regulated by EGLE because it is less than five acres in size and isolated (located over 500 feet from any inland lakes, streams, or ponds).

Areas of Disturbance

Review of historic aerial photographs as far back as 1999 indicates that the majority of the Property has been developed and ground disturbed. During the wetland delineation activities, there were a number of isolated areas observed within old field that have been historically developed, structures razed, and ground graded. Dominant vegetation included common reed (*Phragmites australis*) and rushes (*Juncus torreyi, Juncus dudleyi*). These areas were determined to be upland due to a lack of a primary wetland hydrology indicator. Soil saturation, where present, was due to a restrictive layer (in this case gravel) within 12 inches of the ground surface, not a high water table. Per the USACE methodology, saturation due to a restrictive layer within 12 inches of the ground surface is not considered a primary hydrology indicator. Therefore, these areas were not identified as wetland.

Wetland Flagging

Wetland boundaries were GPS surveyed and marked in the field with day-glow pink and black striped flagging marked with the following flagging numbers:
Wetland A: A-1 through A-32
Wetland B: B-1 through B-43
Wetland C: C-1 through C-7
Wetland P: P-1 through P-8

SUMMARY

Based upon the data, criteria, and evidence noted above, it is ASTI's professional opinion that the Property includes one wetland, Wetland B, regulated by EGLE under the Natural Resources and Environmental Protection Act (1994 P.A. 451), Part 303 (Wetland Protection). In addition, three wetlands not likely regulated by EGLE were also found on the Property. Please note that EGLE has the final authority on the extent of regulated wetlands, lakes, and streams in the State of Michigan. Any proposed impact to the areas that ASTI has identified as regulated will require an EGLE permit.

Attached are Figure 1, which shows the GPS locations of wetland flagging on the Property, and completed US Army Corps of Engineers (ACOE) Wetland Data Forms. Please note that the data sheet numbers match the data collection sampling points shown on Figure 1.

Thank you for the opportunity to assist you with this project. Please let us know if we can be of any further assistance in moving your project forward.

Sincerely yours,

ASTI ENVIRONMENTAL

Brad Kassuba, CWB, PWS
Wetland Ecologist
Professional Wetland Scientist #1330

Dana R. Knox, PWS
Wetland Ecologist
Professional Wetland Scientist #213

Attachments: Figure 1 – *GPS-Surveyed Wetland Boundaries*
Completed ACOE Wetland Data Forms

Figure 1 - GPS-Surveyed Wetland Boundaries

Goodman Property

Long Lake Road and Rochester Road,
Troy, Oakland Co., MI

Client: Robertson Brothers Homes
Created by: RMH, April 1, 2021, ASTI Project 11812
Imagery: Oakland County 2017

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Goodman Property City/County: Oakland County Sampling Date: 3/24/21

Applicant/Owner: Robertson Brothers Homes State: MI Sampling Point: U1

Investigator(s): ASTI Environmental - B. Kassuba Section, Township, Range: Section 15, T02N, R11E

Landform (hillside, terrace, etc.): _____ Local relief (concave, convex, none): none Slope %: _____

Subregion (LRR or MLRA): LRR L Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Urban land NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes _____	No X	**within a Wetland?** **Yes** _____ **No** X
Wetland Hydrology Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: U1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Pinus sylvestris*	5	No	UPL
2. *Juniperus virginiana*	5	No	FACU
3. *Fraxinus pennsylvanica*	10	Yes	FACW
4. *Rhamnus cathartica*	20	Yes	FAC
5.			
6.			
7.			
	40 =Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phleum pratense*	2	Yes	FACU
2. *Solidago canadensis*	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	7 =Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	20	x 3 =	60
FACU species	12	x 4 =	48
UPL species	5	x 5 =	25
Column Totals:	47 (A)		153 (B)

Prevalence Index = B/A = 3.26

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point U1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2			100	C	M	Loamy/Clayey	
10-18	10YR 3/3	96	10YR 5/8	4	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** ____

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Goodman Property City/County: Oakland County Sampling Date: 3/24/21

Applicant/Owner: Robertson Brothers Homes State: MI Sampling Point: U2

Investigator(s): ASTI Environmental - B. Kassuba Section, Township, Range: Section 15, T02N, R11E

Landform (hillside, terrace, etc.): _____ Local relief (concave, convex, none): none Slope %: _____

Subregion (LRR or MLRA): LRR L Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Selfrdige loamy sand NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area**
Hydric Soil Present?	Yes _____	No X	**within a Wetland?** **Yes** _____ **No** X
Wetland Hydrology Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)
This area and adjacent areas appear to have been historically developed and/or graded. Concrete rubble and gravel are prevalent. Soils are compacted or rutted as well. Surface soils were saturated at the time of inspection, but did not indicate hydrology because it does not appear to be associated with a high water table below the saturated zone, and there appears to be a restrictive layer of gravel within 12 inches of the surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 4

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: U2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phragmites australis*	70	Yes	FACW
2. *Juncus dudleyi*	15	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85 =Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	85	x 2 =	170
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	85 (A)		170 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point U2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/2	100			C	M	Loamy/Clayey	
8-11	10YR 4/3	91	5YR 4/6	9	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Goodman Property City/County: Oakland County Sampling Date: 3/24/21

Applicant/Owner: Robertson Brothers Homes State: MI Sampling Point: U3

Investigator(s): ASTI Environmental - B. Kassuba Section, Township, Range: Section 15, T02N, R11E

Landform (hillside, terrace, etc.): Local relief (concave, convex, none): none Slope %:

Subregion (LRR or MLRA): LRR L Lat: Long: Datum:

Soil Map Unit Name: Owosso silty loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation N, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No	**within a Wetland?** **Yes** **No** X
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)
Area appears to have been graded in the past. Some gravel is present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? **Yes** **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: U3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus pumila*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Fraxinus pennsylvanica*	50	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	50	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Phragmites australis*	50	Yes	FACW
2. *Phalaris arundinacea*	5	No	FACW
3. *Dipsacus fullonum*	19	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	74	=Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	105	x 2 =	210
FAC species	0	x 3 =	0
FACU species	29	x 4 =	116
UPL species	0	x 5 =	0
Column Totals:	134 (A)		326 (B)

Prevalence Index = B/A = 2.43

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point U3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	100			C	M	Loamy/Clayey	
12-18	10YR 4/2	96	10YR 6/6	4	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Goodman Property City/County: Oakland County Sampling Date: 3/24/21

Applicant/Owner: Robertson Brothers Homes State: MI Sampling Point: W1

Investigator(s): ASTI Environmental - B. Kassuba Section, Township, Range: Section 15, T02N, R11E.

Landform (hillside, terrace, etc.): _____ Local relief (concave, convex, none): none Slope %: _____

Subregion (LRR or MLRA): LRR L Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Urban land NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No _____	**within a Wetland?** **Yes** X **No** _____
Wetland Hydrology Present?	Yes X	No _____	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	15	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	15	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Rhamnus cathartica*	5	No	FAC
2. *Fraxinus pennsylvanica*	50	Yes	FACW
3. *Cornus amomum*	2	No	FACW
4.			
5.			
6.			
7.			
	57	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Phalaris arundinacea*	5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	=Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	57	x 2 =	114
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	77 (A)		174 (B)

Prevalence Index = B/A = 2.26

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/2	96	10YR 5/8	4	C	M	Loamy/Clayey	Prominent redox concentrations
12-18	10YR 4/2	85	10YR 5/8	15	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ? Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Goodman Property City/County: Oakland County Sampling Date: 3/24/21

Applicant/Owner: Robertson Brothers Homes State: MI Sampling Point: W2

Investigator(s): ASTI Environmental - B. Kassuba Section, Township, Range: Section 15, T02N, R11E

Landform (hillside, terrace, etc.): _____ Local relief (concave, convex, none): concave Slope %: _____

Subregion (LRR or MLRA): LRR L Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Selfridge loamy sand NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No _____	**within a Wetland?** **Yes** X **No** _____
Wetland Hydrology Present?	Yes X	No _____	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes X	No _____	Depth (inches): 6
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 5

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer saccharinum*	20	Yes	FACW
2. *Ulmus americana*	20	Yes	FACW
3. *Acer negundo*	15	Yes	FAC
4.			
5.			
6.			
7.			
	55	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Fraxinus pennsylvanica*	30	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Phragmites australis*	3	No	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	3	=Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	73	x 2 =	146
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	88 (A)		191 (B)

Prevalence Index = B/A = 2.17

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	100			C	M	Loamy/Clayey	
12-18	10YR 4/1	98	10YR 5/8	2	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Goodman Property City/County: Oakland County Sampling Date: 3/24/21

Applicant/Owner: Robertson Brothers Homes State: MI Sampling Point: W3

Investigator(s): ASTI Environmental - B. Kassuba Section, Township, Range: Section 15, T02N, R11E

Landform (hillside, terrace, etc.): Local relief (concave, convex, none): none Slope %:

Subregion (LRR or MLRA): LRR L Lat: Long: Datum:

Soil Map Unit Name: Selfridge loamy sand NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No	**within a Wetland?** **Yes** X **No**
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)
Area appears to be within a constructed swale/ditch. There is a culvert in place connecting this area to another swale/ditch. Surface water was not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? **Yes** X **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	15	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	15	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Phragmites australis*	80	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80	=Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	80	x 2 =	160
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		205 (B)

Prevalence Index = B/A = 2.16

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	95	5YR 4/6	5	C	M	Loamy/Clayey	Prominent redox concentrations
6-12	10YR 4/3	90	5YR 4/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ? Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

MEMO

VIA EMAIL tloughrin@robertsonhomes.com

To:	**Mr. Tim Loughrin** **Director of Land Acquisition** **Robertson Brothers Homes**
From:	**Julie Kroll, PE, PTOE** **Trevor Boer** **Fleis & VandenBrink**
Date:	**June 22, 2022**
Re:	**The Village of Troy PUD** **City of Troy, Michigan** **Traffic Impact Study**

1 INTRODUCTION

This memorandum presents the results of the Traffic Impact Study (TIS) for the proposed Village of Troy PUD. The proposed residential development is located generally in the southeast quadrant of the Long Lake Road and Rochester Road intersection in Troy, Michigan. The project includes the construction of single-family detached homes and single-family attached (townhomes/duplex) residential homes, with site access provided via two (2) driveways; one (1) driveway on Long Lake Road and one (1) driveway on Rochester Road. Long Lake Road is under the jurisdiction of the Road Commission for Oakland County (RCOC) and Rochester Road is under the jurisdiction of the City of Troy. The City of Troy has required the completion of Traffic Impact Study for the development as part of the PUD site plan approval process.

The scope of work for this study was developed based on the requirements of the City of Troy, 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). Sources of data for this study include F&V subconsultant Gewalt Hamilton Associates, SEMCOG, MDOT, and ITE.

2 BACKGROUND

2.1 EXISTING ROAD NETWORK

The lane uses and traffic control at the study intersections are shown on the attached **Figure 2,** and the study roadways are summarized in **Table 1** and are further described herein. For the purposes of this study, all minor streets, crossovers, and site driveways are assumed to have an operating speed of 25 miles per hour (mph), unless otherwise noted.

27725 Stansbury Boulevard, Suite 195
Farmington Hills, MI 48334
P: 248.536.0080
F: 248.536.0079
www.fveng.com

Table 1: Roadway Information

Roadway Segment	Long Lake Road	Rochester Road	Glaser Drive
Number of Lanes	4 Lanes (divided boulevard)	5 Lanes (2 lanes each direction + TWLTL)	2 Lanes (1 lane each direction)
Functional Classification	Other Principal Arterial	Other Principal Arterial	Local Road
Roadway Jurisdiction	RCOC	City of Troy	City of Troy
Speed Limit	45 mph	45 mph	25 mph
Traffic Volumes (SEMCOG)	26,695 vpd (2019)	23,209 vpd (2019)	N/A

Long Lake Road generally runs in the east and west directions, north of the project sight, with a posted speed limit of 45 mph. Long Lake Road has an Annual Average Daily Traffic (AADT) volume of approximately 26,695 vehicles per day (SEMCOG 2019); 12,713 vpd EB and 13,982 vpd WB. The roadway has a four-lane, median divided cross-section, with the with two (2) lanes eastbound and two (2) lanes westbound. At the intersection with Rochester Road, Long Lake Road widens to have exclusive right-turn lanes; left-turns are facilitated via median U-turns. Long Lake Road is under the jurisdiction of the RCOC and has a functional classification of an *Other Principal Arterial.*

Rochester Road generally runs in the north and south directions, east of the project site, with a posted speed limit of 45 mph. Rochester Road has an Annual Average Daily Traffic (AADT) volume of approximately 22,342 vehicles per day (SEMCOG 2019) northbound and approximately 23,209 vehicles per day (SEMCOG 2019) southbound. The roadway has five (5) lanes, with the with two (2) lanes northbound, two (2) lanes southbound, and a two-way left-turn lane (TWLTL). At the intersection with Rochester Road, Long Lake Road widens to have exclusive right-turn lanes; left-turns are facilitated via median U-turns. Rochester Road is under the jurisdiction of the City of Troy and has a functional classification of *Other Principal Arterial*.

Glaser Drive generally runs in the east and west directions, adjacent to the east side of the project site. The roadway is classified as *Local Road* and is under the jurisdiction of the City of Troy. Glaser Drive does not have a posted speed limit; therefore, a premia facia residential street speed limit of 25 mph was assumed for this roadway. The roadway geometry is a typical two-lane cross section with one lane in each direction. Additionally, the eastbound approach at Rochester Road permits right-turn only movements.

2.2 EXISTING TRAFFIC VOLUMES

Due to the impacts of COVID-19, current traffic volume data is not representative of "typical" operations. Therefore, the traffic volume data necessary for this study were obtained from multiple sources:

- Sydney Coordinated Automated Traffic System (SCATS) volume data was obtained along Long Lake Road and Rochester Road from RCOC for use in this study. The SCATS data utilized for this study was obtained on Wednesday, March 30th, 2018, and Wednesday, June 5th, 2019 prior to the traffic impacts of COVID-19.
- F&V subconsultant Traffic Data Collection, Inc. (TDC) performed weekday AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak hour turning movement counts on Wednesday, June 1st, 2022, at the study intersections.

The mainline traffic volumes at the 2022 intersections were compared with historical volumes and the SCATS mainline volumes at the signalized intersection of Rochester Road & Long Lake Road; then COVID-19 adjustment factors were determined for each of the study intersection's approaches as shown in **Table 2**. The results of the comparison showed that only the AM peak hour currently has traffic volumes lower than expected. The PM peak hour and during both the AM and PM southbound approach, traffic volumes are higher than expected, therefore no COVID adjustments were applied for these approaches.

Table 2: COVID Adjustment Factors

Rochester Road & Long Lake Road				
Peak Period	EB	WB	NB	SB
AM	33%	39%	24%	N/A
PM	N/A	N/A	N/A	N/A

The COVID-19 adjustment factors and growth rates were applied in order to calculate the baseline 'existing' 2022 traffic volumes, as shown on the attached **Figure 3**. The traffic volumes were then balanced upwards through the study network. Dummy nodes were utilized where necessary to account for sink-and-source between intersections.

The peak periods for the adjacent streets were observed to generally occur between 7:30AM to 8:30 AM and 4:45 PM to 5:45 PM. F&V collected an inventory of existing lane use and traffic controls, as shown on the attached **Figure 2**; additionally, F&V obtained the signal timing permits from RCOC. All applicable background data referenced in this memorandum are attached.

3 EXISTING CONDITIONS

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). The lane use and traffic control used at of the study intersection of Rochester Road and Long Lake Road includes non-NEMA phasing and clustered intersections, which are not supported by the HCM 6th Edition (HCM6) analysis methodology; therefore, HCM 2000 was determined to be more appropriate for use at signalized intersections.

Descriptions of LOS "A" through "F" as defined in the HCM, are attached for signalized and unsignalized intersections. Typically, LOS D is considered acceptable, with LOS A representing minimal delay, and LOS F indicating failing conditions. Microsimulations were also conducted at the study intersections using SimTraffic to further evaluate the network performance and vehicle queueing. The results of the analysis of existing conditions are attached and are summarized in **Table 3**.

Table 3: Existing Intersection Operations

Intersection		Control	Approach	Existing Conditions			
				AM Peak		PM Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS
1	Rochester Road & Glaser Drive	Stop (Minor)	EBR	19.2	B	12.8	B
			WB	$	F	$	F
			NBL	13.7	B	10.0	A
			SBL	14.6	B	21.0	C
2	Rochester Road & Long Lake Road	Signalized	EBT	17.2	B	42.1	D
			EBR	15.8	B	15.3	B
			WBT	83.0	F	28.3	C
			WBR	25.5	C	26.0	C
			NBT	31.9	C	45.4	D
			NBR	21.0	C	27.0	C
			SBT	69.8	E	27.3	C
			SBR	21.2	C	19.8	B
			Overall	**52.1**	**E**	**30.4**	**C**
3	WB to EB Long Lake Road X/O West of Rochester Road	Signalized	EB	23.0	C	24.4	C
			SBL	36.9	D	35.2	D
			Overall	**26.6**	**C**	**26.2**	**C**

$ Delay Exceeds 300 Seconds

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 peak periods with the following exceptions:

Rochester Road & Long Lake Road

- During AM peak hour: The intersection is currently operating at LOS E. The southbound and westbound through movements are currently operating at LOS E and LOS F, respectively.
- The high volumes of southbound and westbound through traffic are both in need of signal split time to accommodate the directional traffic volumes. Since the movements are conflicting, the signal splits are essentially equal, and neither southbound nor westbound approaches operate well.
- The City and RCOC should continue to monitor the intersection operations as traffic volumes recover post-COVID to determine if regional improvements on Rochester Road and Long Lake Road should be considered to improve the intersection operations.

Rochester Road & Glaser Drive

- During AM and PM peak hour: The westbound approach is currently operating at LOS F.
- The westbound approach has very low traffic volumes (6 AM and 23 PM). Although a poor LOS was calculated by the HCM analysis, a review of SimTraffic network simulations indicates vehicles are able to find adequate gaps within the through traffic along Rochester Road without experiencing significant delays or excessive vehicle queueing.

4 BACKGROUND CONDITIONS (2027)

Historical population and economic profile data was obtained for the City of Troy from the Southeast Michigan Council of Governments (SEMCOG) to calculate a background growth rate for the 2022 traffic volumes in order to calculate the 2027 site buildout year traffic volumes. Population and employment projections from 2020 to 2045 were reviewed and show an average annual growth of -0.15% and 0.30%, respectively. Therefore, a conservative background growth rate of **0.50%** per year was applied to the adjusted existing peak hour traffic volumes to forecast the background 2027 traffic volume ***without the proposed development***.

Background peak hour vehicles delays and LOS ***without the proposed development*** were calculated at the study intersections based on the existing lane use and traffic control shown on the attached **Figure 2**, the background 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 4**.

Table 4: 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	Rochester Road & Glaser Drive	Stop (Minor)	EBR	19.2	B	12.8	B	20.8	C	13.3	B	1.6	B→C	0.5	-
			WB	$	F	$	F	$	F	$	F	N/A	-	N/A	-
			NBL	13.7	B	10.0	A	14.6	B	10.3	B	0.9	-	0.3	A→B
			SBL	14.6	B	21.0	C	14.9	B	21.8	C	0.3	-	0.8	-
2	Rochester Road & Long Lake Road	Signalized	EBT	17.2	B	42.1	D	17.3	B	51.0	D	0.1	-	8.9	-
			EBR	15.8	B	15.3	B	15.9	B	16.4	B	0.1	-	1.1	-
			WBT	83.0	F	28.3	C	93.4	F	28.4	C	10.4	-	0.1	-
			WBR	25.5	C	26.0	C	25.6	C	26.1	C	0.1	-	0.1	-
			NBT	31.9	C	45.4	D	32.8	C	50.5	D	0.9	-	5.1	-
			NBR	21.0	C	27.0	C	21.2	C	27.6	C	0.2	-	0.6	-
			SBT	69.8	E	27.3	C	79.5	E	27.9	C	9.7	-	0.6	-
			SBR	21.2	C	19.8	B	21.3	C	20.0	B	0.1	-	0.2	-
			Overall	**52.1**	**E**	**30.4**	**C**	**58.7**	**E**	**34.6**	**C**	**6.6**	**-**	**4.2**	**-**

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
3	WB to EB Long Lake Road X/O West of	Signalized	EB	23.0	C	24.4	C	23.1	C	24.9	C	0.1	-	0.5	-
			SBL	36.9	D	35.2	D	34.6	D	35.0	D	-2.3	-	-0.2	-
			Overall	**26.6**	**C**	**26.2**	**C**	**26.2**	**C**	**26.6**	**C**	**-0.4**	**-**	**0.4**	**-**

$ Delay Exceeds 300 Seconds

The results of the background conditions analysis indicates that all of the study intersection's approaches and movements will continue to operate in a manner similar to existing conditions analysis. *Note: Several of the intersection movements improved with the addition of background traffic. This is due to the optimization of signal splits with the SCATS operations and increased lane utilization which decreased the delay for certain movements.*

5 SITE TRIP GENERATION

The proposed development includes the construction of 20 single-family detached homes and 126 single-family attached homes. 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 equations published by the Institute of Transportation Engineers (ITE) in *Trip Generation, 11th Edition*. The site trip generation forecast utilized for the proposed development is summarized in **Table 5**.

Table 4: Site Trip Generation Summary

Land Use	ITE Code	Size	Unit	Weekday Average Daily Traffic (vpd)	AM Peak Hour (vph)			PM Peak Hour (vph)		
					In	Out	Total	In	Out	Total
Single-Family Detached	210	20	DU	230	4	13	17	14	8	22
Single-Family Attached Housing	215	126	DU	910	19	41	60	41	31	72
Total		**146**	**DU**	**1,140**	**23**	**54**	**77**	**55**	**39**	**94**

6 SITE TRIP DISTRIBUTION

The vehicular trips that would be generated by the proposed development were assigned to the study roads based on the proposed site access plan, the existing peak hour traffic patterns on the adjacent roadway network, and the methodologies published by ITE. The adjacent street traffic volumes were used to develop the trip distribution. To determine the projected site traffic distribution, it was assumed that the existing adjacent street traffic volumes in the AM are home-to-work based trips, and in the PM are work-to-home based trips. Therefore, the trip distribution assumes trips are leaving the proposed development and exiting the study network in the AM, then entering the network to return to the proposed development in the PM. The site trip distribution used in the analysis is summarized in **Table 6**.

Table 5: Site Trip Distribution

To/From	via	AM	PM
North	Rochester Road	24%	26%
South	Rochester Road	41%	37%
East	Long Lake Road	13%	15%
West	Long Lake Road	22%	22%
	Total	**100%**	**100%**

7 FUTURE CONDITIONS

Future peak hour vehicle delays and LOS ***with the proposed development*** were calculated based on the future lane use shown on the attached **Figure 2**, future traffic volumes shown on the attached **Figure 6**, and the methodologies presented in the HCM6. The results of the future conditions analysis are summarized in **Table 7.** Table 6: 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	Rochester Road & Glaser Drive	Stop (Minor)	EBR	20.8	C	13.3	B	22.9	C	13.8	B	2.1	-	0.5	-
			WB	$	F	$	F	$	F	$	F	N/A	-	N/A	-
			NBL	14.6	B	10.3	B	14.8	B	10.4	B	0.2	-	0.1	-
			SBL	14.9	B	21.8	C	14.9	B	21.8	C	0.0	-	0.0	-
2	Rochester Road & Long Lake Road	Signalized	EBT	17.3	B	51.0	D	16.9	B	54.7	D	-0.4	-	3.7	-
			EBR	15.9	B	16.4	B	15.4	B	16.6	B	-0.5	-	0.2	-
			WBT	93.4	F	28.4	C	94.1	F	28.6	C	0.7	-	0.2	-
			WBR	25.6	C	26.1	C	25.9	C	26.3	C	0.3	-	0.2	-
			NBT	32.8	C	50.5	D	32.8	C	50.5	D	0.0	-	0.0	-
			NBR	21.2	C	27.6	C	21.3	C	27.6	C	0.1	-	0.0	-
			SBT	79.5	E	27.9	C	80.0	E	28.0	C	0.5	-	0.1	-
			SBR	21.3	C	20.0	B	21.4	C	20.1	C	0.1	-	0.1	B→C
			Overall	**58.7**	**E**	**34.6**	**C**	**59.0**	**E**	**35.7**	**C**	**0.3**	**-**	**1.1**	**-**
3	WB to EB Long Lake Road X/O West of Rochester Road	Signalized	EB	23.1	C	24.9	C	23.4	C	25.2	C	0.3	-	0.3	-
			SBL	34.6	D	35.0	D	32.9	D	34.7	D	-1.7	-	-0.3	-
			Overall	**26.2**	**C**	**26.6**	**C**	**25.8**	**C**	**26.8**	**C**	**-0.4**	**-**	**0.2**	**-**
4	Long Lake Road & Site Drive	Stop (Minor)	EB	N/A				Free				N/A			
			WBL					9.2	A	12.5	B				
			NB					15.0	C	20.7	C				

$ Delay Exceeds 300 Seconds

The results of the future conditions analysis indicates that all of the study intersection approaches and movements will continue to operate in a manner similar to existing background conditions analysis. *Note: Several of the intersection movements improved with the addition of future traffic. This is due to the optimization of signal splits and increased lane utilization which decreased the delay on certain movements.*

Rochester Road & Long Lake Road

- <u>During AM peak hour:</u> The intersection is expected to continue operating at LOS E, with the southbound and westbound through movements continuing to operate at LOS E and LOS F, respectively. However, the increase in delay at this intersection due to site generated traffic is negligible (1-2 seconds).
- The high volumes of southbound and westbound through traffic are both in need of signal split time to accommodate the directional traffic volumes. Since the movements are conflicting, the signal splits are essentially equal, and neither southbound nor westbound approaches operate well.
- The City and RCOC should continue to monitor the intersection operations as traffic volumes recover post-COVID to determine if regional improvements on Rochester Road and Long Lake Road should be considered to improve the intersection operations.

Rochester Road & Glaser Drive

- During AM and PM peak hour: The westbound approach is expected to continue operating at LOS F.
- The westbound approach has very low traffic volumes (6 AM and 23 PM). Although a poor LOS was calculated by the HCM analysis, a review of SimTraffic network simulations indicates vehicles are able to find adequate gaps within the through traffic along Rochester Road without experiencing significant delays or excessive vehicle queueing.

Long Lake Road & Site Drive

- The proposed site driveway on Long Lake Road provides full access for the development. The ingress left turns were reviewed to determine the projected queue length and the potential impacts to the adjacent street.
- The SimTraffic network simulations show a 95th percentile queue length of 42 feet (~2 cars) for ingress left turns at the proposed site driveway on Long Lake Road. Therefore, the existing center left-turn lane provides adequate length to store the expected queues.

8 AUXILIARY TURN LANE EVALUATION

Rochester Road and Long Lake Road both have two-way center left-turn lanes at the proposed site drives. Additionally, there is an existing right-turn lane on Rochester Road at Glaser Drive; therefore, only the right-turn treatment criteria was evaluated at the proposed site driveway on Long Lake Road. The results of the analysis are summarized in **Table 8** below, and the RCOC auxiliary lane warrant charts are attached.

Table 7: Turn Lane Warrant Analysis Summary

Intersection	Right-Treatment
Long Lake Road & Site Drive	**Right-Turn Taper**

9 CONCLUSIONS

The conclusions of this TIS are as follows:

1. **Existing Conditions (2022)**

   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 peak periods with following exceptions:

   Rochester Road & Long Lake Road

   - During AM peak hour: The intersection is currently operating at LOS E. The southbound and westbound through movements are currently operating at LOS E and LOS F, respectively. The high volumes of southbound and westbound through traffic are both in need of signal split time to accommodate the directional traffic volumes. Since the movements are conflicting, the signal splits are essentially equal, and neither southbound nor westbound approaches operate well.
   - The City and RCOC should continue to monitor the intersection operations as traffic volumes recover post-COVID to determine if regional improvements on Rochester Road and Long Lake Road should be considered to improve the intersection operations.

   Rochester Road & Glaser Drive

   During AM and PM peak hour: The westbound approach is currently operating at LOS F. The westbound approach has very low traffic volumes (6 AM and 23 PM). Although a poor LOS was calculated by the HCM analysis, a review of SimTraffic network simulations indicates vehicles are able to find adequate gaps within the through traffic along Rochester Road without experiencing significant delays or excessive vehicle queueing.

2. Background Conditions (2023):

- A conservative 0.5% annual background growth rate was utilized in order to project the existing traffic volumes to the buildout year of 2027.
- The results of the background conditions analysis indicates that all approaches and movements at the study intersections will continue to operate in a manner similar to existing conditions.

3. Future Conditions (2023)

The results of the background conditions analysis indicates that all approaches and movements at the study intersections will continue to operate in a manner similar to existing conditions.

Rochester Road & Long Lake Road

- During AM peak hour: The intersection is expected to continue operating at LOS E, with the southbound and westbound through movements continuing to operate at LOS E and LOS F, respectively. However, the increase in delay at this intersection due to site generated traffic is negligible (1-2 seconds).
- The City and RCOC should continue to monitor the intersection operations as traffic volumes recover post-COVID to determine if regional improvements on Rochester Road and Long Lake Road should be considered to improve the intersection operations.

Rochester Road & Glaser Drive

- During AM and PM peak hour: The westbound approach is expected to continue operating at LOS F.
- The westbound approach has very low traffic volumes (6 AM and 23 PM). Although a poor LOS was calculated by the HCM analysis, a review of SimTraffic network simulations indicates vehicles can find adequate gaps within the through traffic along Rochester Road without experiencing significant delays or excessive vehicle queueing.

Long Lake Road & Site Drive

- The proposed site driveway on Long Lake Road provides full access for the development. The ingress left turns were reviewed to determine the projected queue length and the potential impacts to the adjacent street.
- The SimTraffic network simulations show a 95th percentile queue length of 42 feet (~2 cars) for ingress left turns at the proposed site driveway on Long Lake Road. Therefore, the existing center left-turn lane can accommodate the projected vehicle queues.

4. Auxiliary Turn Lane Evaluation

- Rochester Road and Long Lake Road both have two-way center left-turn lanes at the proposed site drives. Additionally, there is an existing right-turn lane on Rochester Road at the Glaser Drive; therefore, only the right turn treatment criteria was evaluated at the proposed site driveway on Long Lake Road.
- The results of the analysis show that a right-turn deceleration taper is recommended on EB Long Lake Road at the proposed Site Drive.

10 RECOMMENDATIONS

The recommendation of this TIS are as follows:

- The City and RCOC should continue to monitor the intersection operations as traffic volumes recover post-COVID to determine if regional improvements on Rochester Road and Long Lake Road should be considered to improve the intersection operations.
- Provide a right-turn deceleration taper on EB Long Lake Road at the proposed W. Site Drive.

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

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Michigan.

Attached:

Figures 1-6
Proposed Site Plan
Traffic Volume Data
Signal Timing Permits
Synchro / SimTraffic Results
Auxiliary Lane Warrant

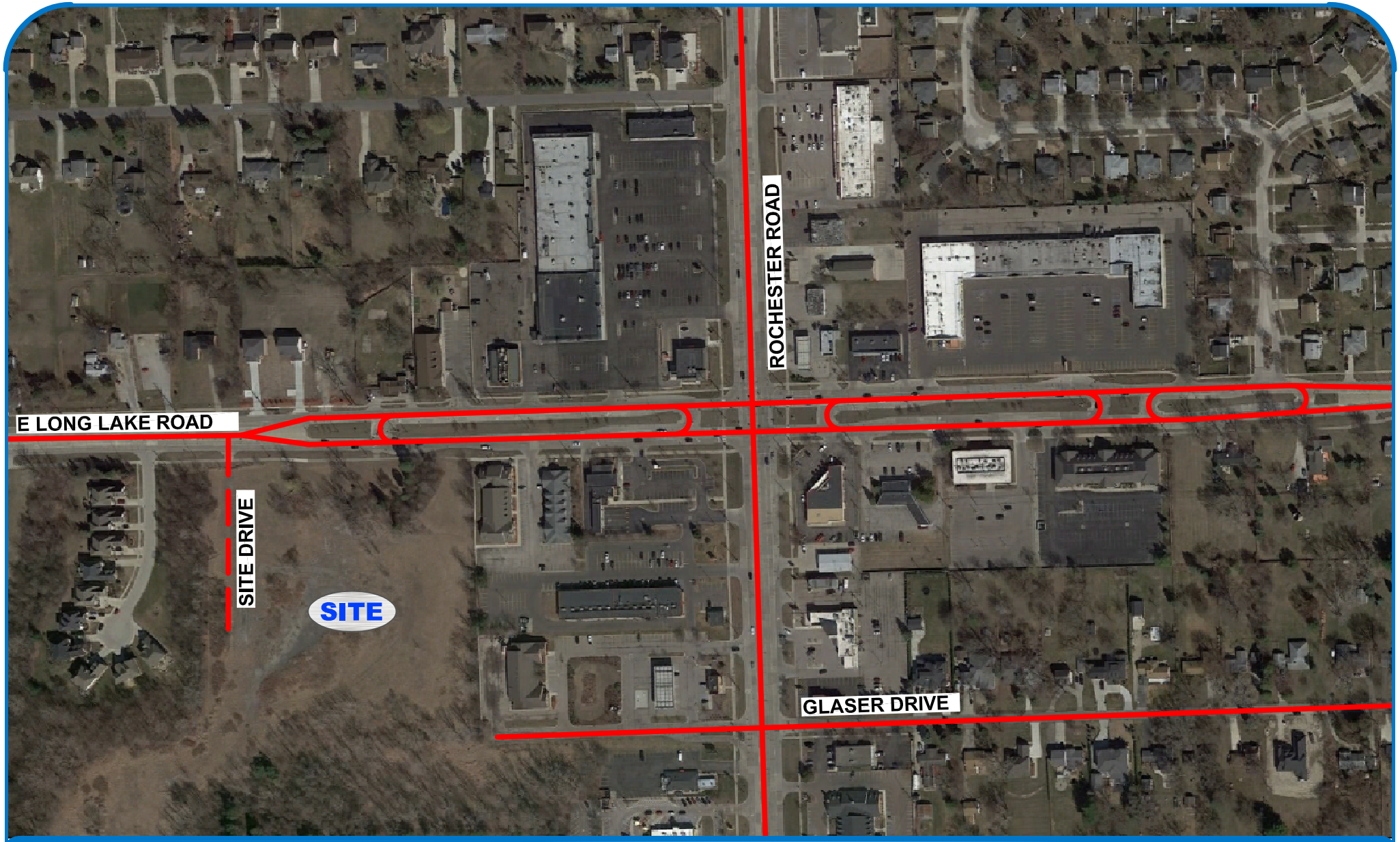


FIGURE 1

SITE LOCATION

Village of Troy PUD - Troy, MI

LEGEND

SITE SITE LOCATION

NORTH

SCALE: NOT TO SCALE

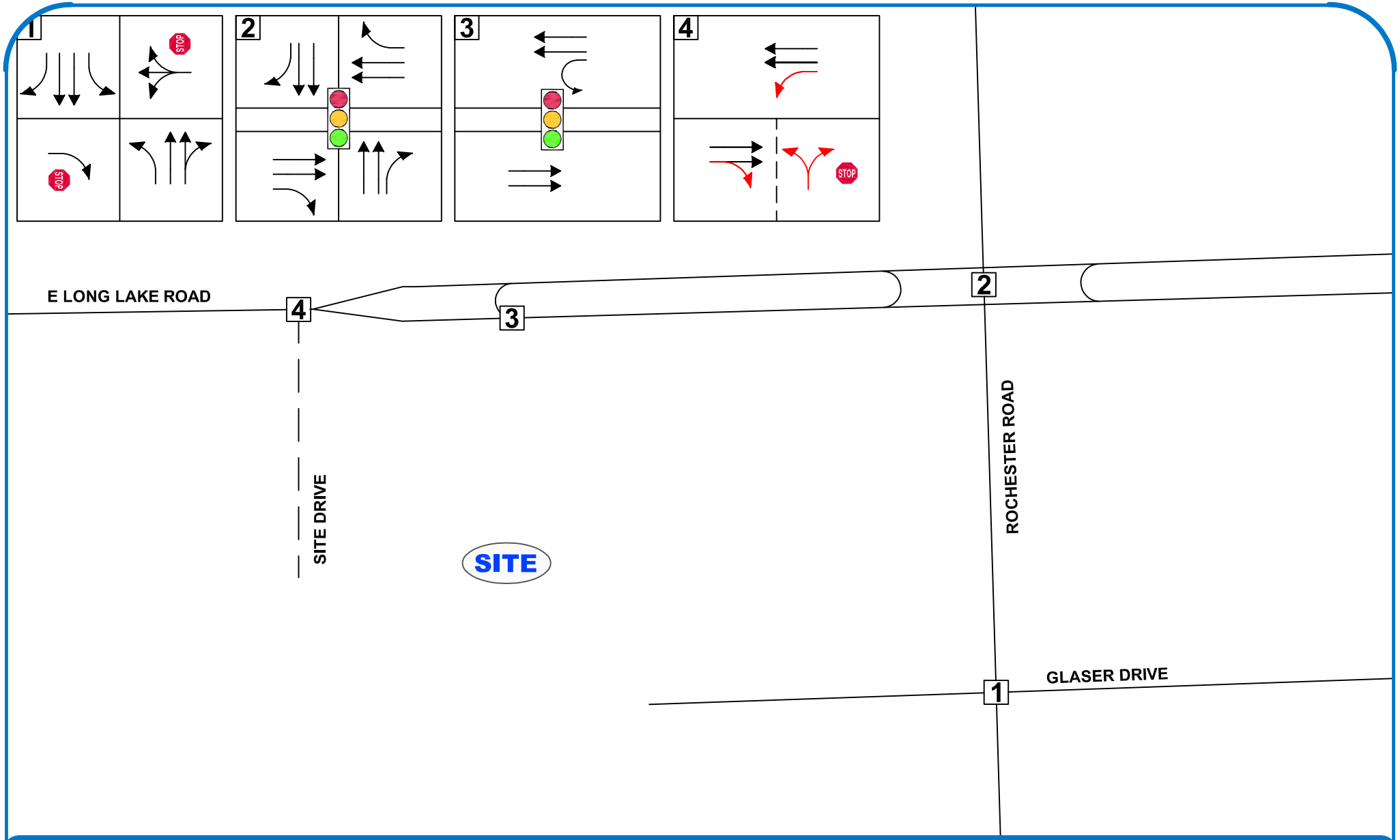


FIGURE 2

LANE USE AND TRAFFIC CONTROL

Village of Troy PUD - Troy, MI

LEGEND

- ROADS
- PROPOSED ROADS
- LANE USE
- PROPOSED LANE USE
- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION
- ROUNDABOUT INTERSECTION

NORTH

SCALE: NOT TO SCALE

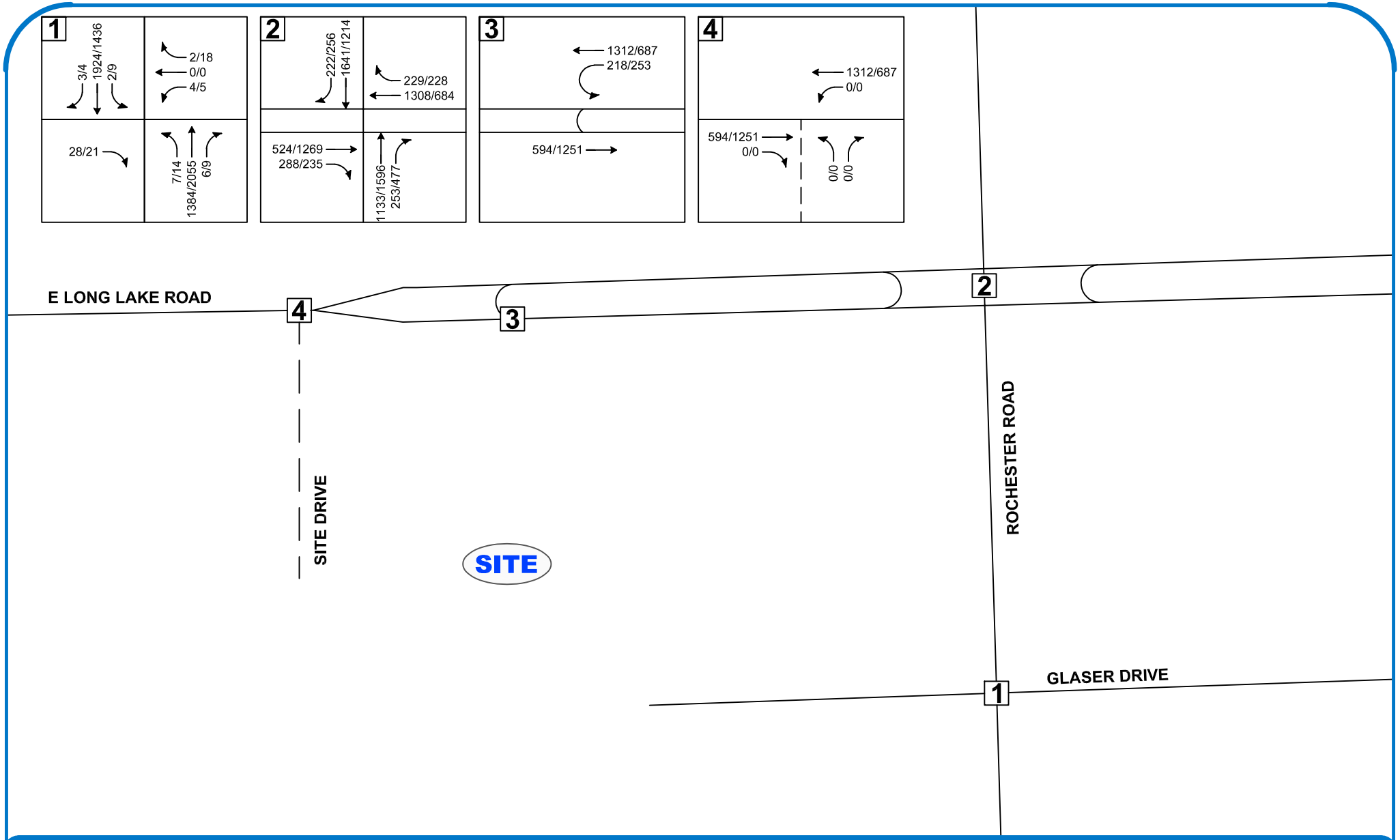


FIGURE 3

EXISTING TRAFFIC VOLUMES

Village of Troy PUD - Troy, MI

LEGEND

ROADS

PROPOSED ROADS

TRAFFIC VOLUMES (AM/PM)

NORTH

SCALE: NOT TO SCALE

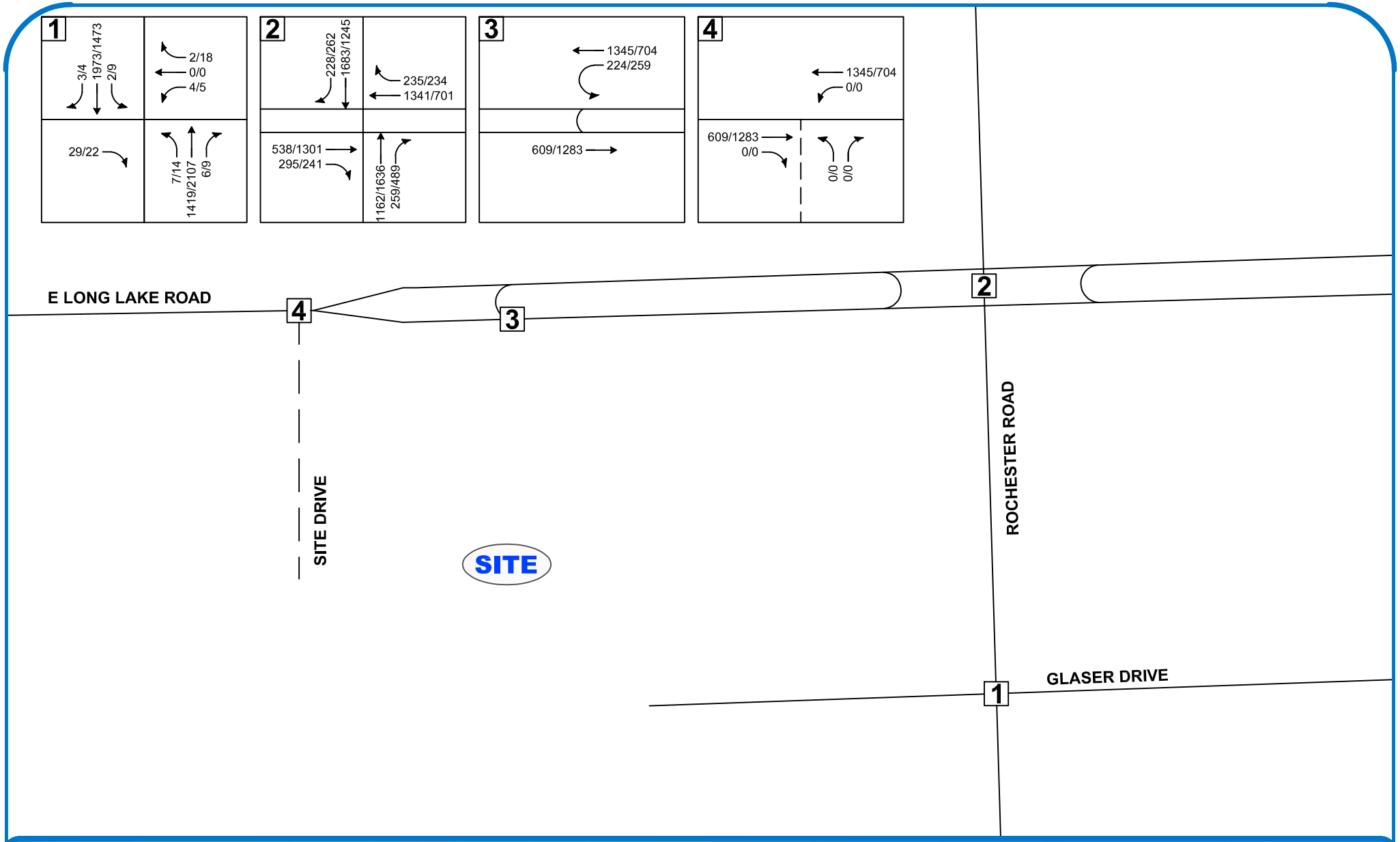


FIGURE 4

BACKGROUND TRAFFIC VOLUMES

Village of Troy PUD - Troy, MI

LEGEND

ROADS

PROPOSED ROADS

TRAFFIC VOLUMES (AM/PM)

NORTH

SCALE: NOT TO SCALE

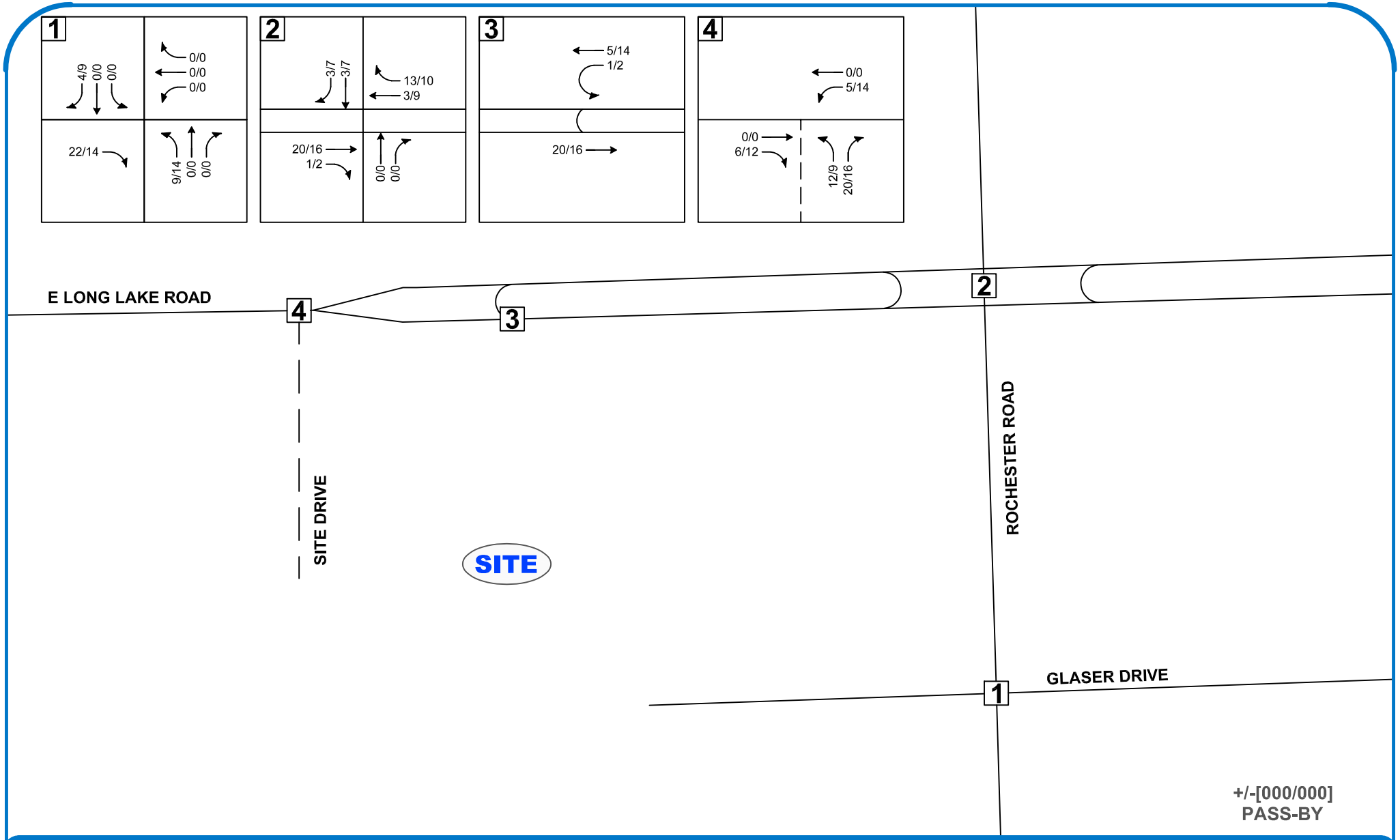


FIGURE 5

SITE-GENERATED TRAFFIC VOLUMES

Village of Troy PUD - Troy, MI

LEGEND

ROADS

PROPOSED ROADS

TRAFFIC VOLUMES (AM/PM)

NORTH

SCALE: NOT TO SCALE

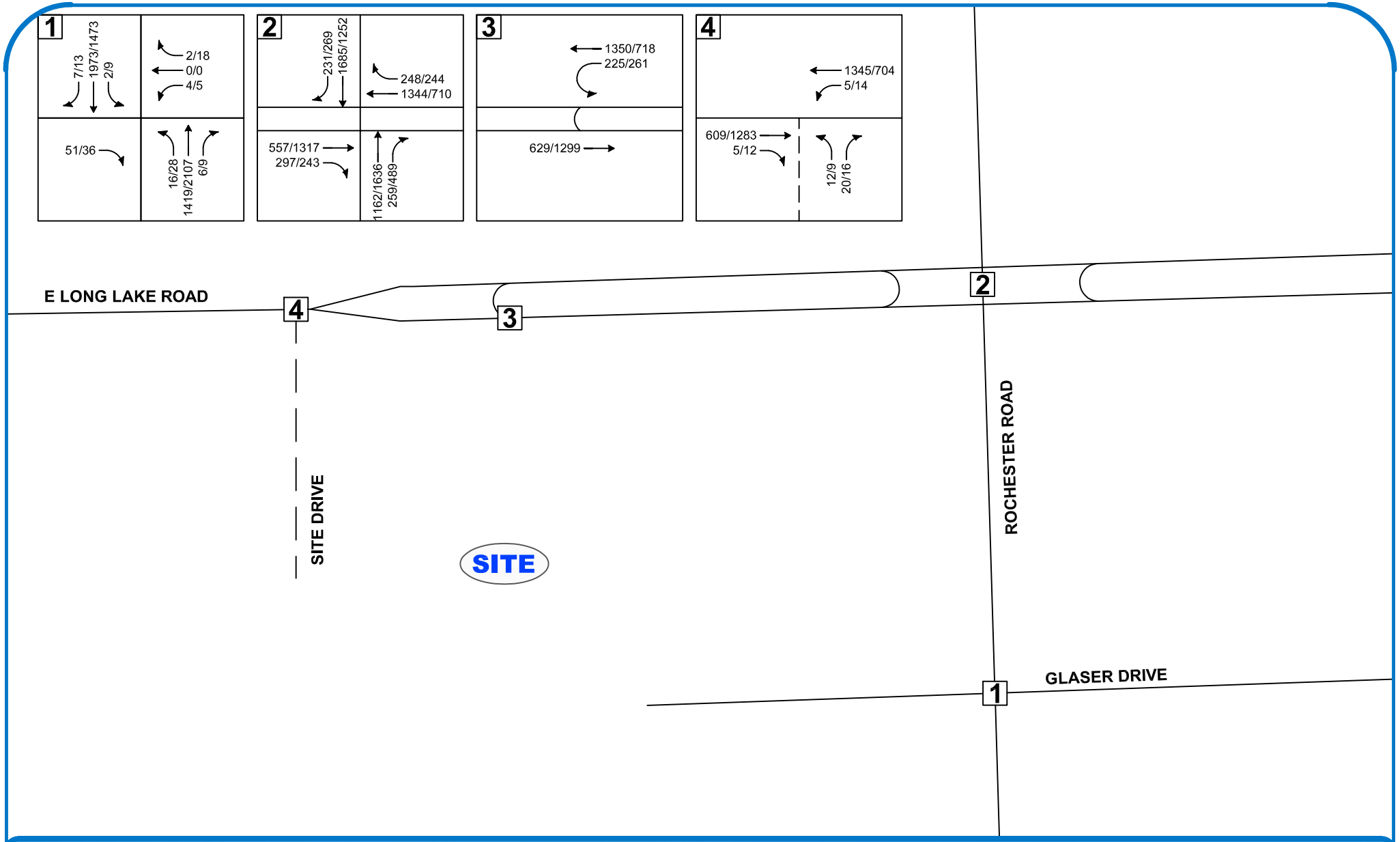


FIGURE 6

FUTURE TRAFFIC VOLUMES

Village of Troy PUD - Troy, MI

LEGEND

ROADS

PROPOSED ROADS

TRAFFIC VOLUMES (AM/PM)

NORTH

SCALE: NOT TO SCALE

Village of Troy

Rendered Site Plan
City of Troy, Michigan

March 2022

ROBERTSON BROTHERS HOMES 70 Years

design studio LAND landscape architecture / land planning

"Defining community, lifestyle and place"

0 30' 60' 120' 180' 300'

North

Rochester Road & Glaser Drive - TMC

Wed Jun 1, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957212, Location: 42.590185, -83.129014

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Glaser							Glaser							Rochester						
Direction	Eastbound							Westbound							Northbound						
Time	L	T	R	HR	U	App	Ped*	L	BL	T	R	U	App	Ped*	HL	L	T	R	U	App	Ped*
2022-06-01 7:00AM	0	0	0	0	0	**0**	1	1	0	0	3	0	**4**	0	0	1	194	0	0	**195**	0
7:15AM	0	0	0	0	0	**0**	0	1	0	0	2	0	**3**	0	0	2	238	1	0	**241**	0
7:30AM	0	0	0	0	0	**0**	0	2	0	0	1	0	**3**	0	0	1	261	1	0	**263**	0
7:45AM	0	0	0	0	0	**0**	0	2	0	0	0	0	**2**	0	0	2	340	3	0	**345**	0
Hourly Total	0	0	0	0	0	**0**	1	6	0	0	6	0	**12**	0	0	6	1033	5	0	**1044**	0
8:00AM	0	0	0	0	0	**0**	0	0	0	0	0	0	**0**	0	0	1	259	1	0	**261**	0
8:15AM	0	0	0	0	0	**0**	0	0	0	0	1	0	**1**	0	0	3	270	1	0	**274**	0
8:30AM	0	0	0	0	0	**0**	1	2	0	0	2	0	**4**	0	0	4	258	1	0	**263**	0
8:45AM	0	0	0	0	0	**0**	0	1	0	0	5	0	**6**	0	0	3	286	2	0	**291**	0
Hourly Total	0	0	0	0	0	**0**	1	3	0	0	8	0	**11**	0	0	11	1073	5	0	**1089**	0
4:00PM	0	0	0	0	0	**0**	0	0	0	0	3	0	**3**	0	0	2	464	3	0	**469**	0
4:15PM	0	0	0	0	0	**0**	0	0	0	0	1	0	**1**	0	0	3	463	3	0	**469**	0
4:30PM	0	0	0	0	0	**0**	0	1	0	0	3	0	**4**	0	0	3	499	1	0	**503**	0
4:45PM	0	0	0	0	0	**0**	0	2	0	0	5	0	**7**	0	0	5	482	3	0	**490**	0
Hourly Total	0	0	0	0	0	**0**	0	3	0	0	12	0	**15**	0	0	13	1908	10	0	**1931**	0
5:00PM	0	0	0	0	0	**0**	0	2	0	0	1	0	**3**	0	0	2	509	1	0	**512**	0
5:15PM	0	0	0	0	0	**0**	1	1	0	0	6	0	**7**	0	0	3	513	1	0	**517**	0
5:30PM	0	0	0	0	0	**0**	0	0	0	0	6	0	**6**	0	0	4	551	4	0	**559**	0
5:45PM	0	0	0	0	0	**0**	0	0	0	0	1	0	**1**	0	0	1	419	4	0	**424**	0
Hourly Total	0	0	0	0	0	**0**	1	3	0	0	14	0	**17**	0	0	10	1992	10	0	**2012**	0
Total	0	0	0	0	0	**0**	3	15	0	0	40	0	**55**	0	0	40	6006	30	0	**6076**	0
% Approach	0%	0%	0%	0%	0%	**-**	-	27.3%	0%	0%	72.7%	0%	**-**	-	0%	0.7%	98.8%	0.5%	0%	**-**	-
% Total	0%	0%	0%	0%	0%	**0%**	-	0.1%	0%	0%	0.3%	0%	**0.4%**	-	0%	0.3%	47.4%	0.2%	0%	**47.9%**	-
Lights	0	0	0	0	0	**0**	-	15	0	0	38	0	**53**	-	0	40	5867	29	0	**5936**	-
% Lights	0%	0%	0%	0%	0%	**-**	-	100%	0%	0%	95.0%	0%	**96.4%**	-	0%	100%	97.7%	96.7%	0%	**97.7%**	-
Single-Unit Trucks	0	0	0	0	0	**0**	-	0	0	0	1	0	**1**	-	0	0	74	0	0	**74**	-
% Single-Unit Trucks	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	2.5%	0%	**1.8%**	-	0%	0%	1.2%	0%	0%	**1.2%**	-
Articulated Trucks	0	0	0	0	0	**0**	-	0	0	0	1	0	**1**	-	0	0	47	0	0	**47**	-
% Articulated Trucks	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	2.5%	0%	**1.8%**	-	0%	0%	0.8%	0%	0%	**0.8%**	-
Buses	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	0	0	18	0	0	**18**	-
% Buses	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	0%	**0%**	-	0%	0%	0.3%	0%	0%	**0.3%**	-
Bicycles on Road	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	0	0	0	1	0	**1**	-
% Bicycles on Road	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	0%	**0%**	-	0%	0%	0%	3.3%	0%	**0%**	-
Pedestrians	-	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	33.3%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	2	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	66.7%	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & Glaser Drive - TMC

Wed Jun 1, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957212, Location: 42.590185, -83.129014

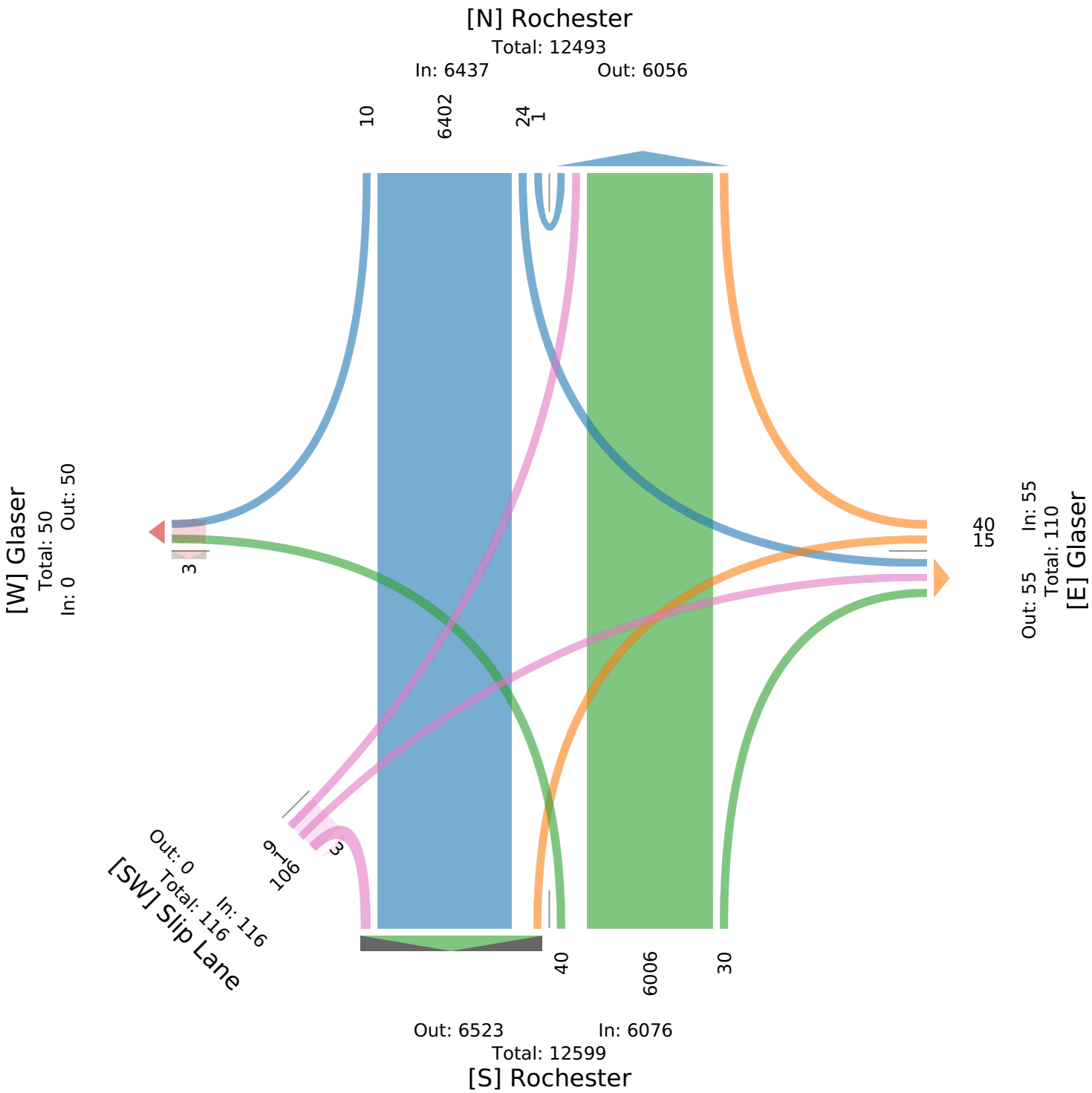
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Rochester Southbound							Slip Lane Northeastbound							
Time	L	T	BR	R	U	**App**	Ped*	HL	BL	BR	HR	U	**App**	Ped*	**Int**
2022-06-01 7:00AM	0	383	0	0	0	**383**	0	0	0	0	5	0	**5**	1	**587**
7:15AM	2	474	0	0	0	**476**	0	0	0	0	9	0	**9**	0	**729**
7:30AM	1	489	0	2	0	**492**	0	0	0	1	6	0	**7**	0	**765**
7:45AM	0	473	0	0	0	**473**	0	0	0	0	5	0	**5**	0	**825**
Hourly Total	3	1819	0	2	0	**1824**	0	0	0	1	25	0	**26**	1	**2906**
8:00AM	1	401	0	0	0	**402**	0	0	1	0	8	0	**9**	0	**672**
8:15AM	0	450	0	1	0	**451**	0	0	0	0	9	0	**9**	0	**735**
8:30AM	1	465	0	1	0	**467**	0	0	0	0	6	0	**6**	1	**740**
8:45AM	0	383	0	1	0	**384**	0	0	0	0	10	0	**10**	0	**691**
Hourly Total	2	1699	0	3	0	**1704**	0	0	1	0	33	0	**34**	1	**2838**
4:00PM	2	324	0	0	0	**326**	0	0	0	0	6	0	**6**	0	**804**
4:15PM	5	400	0	0	0	**405**	0	0	0	0	6	0	**6**	0	**881**
4:30PM	1	363	0	1	0	**365**	0	0	3	0	5	0	**8**	0	**880**
4:45PM	1	355	0	1	0	**357**	0	0	0	0	2	0	**2**	0	**856**
Hourly Total	9	1442	0	2	0	**1453**	0	0	3	0	19	0	**22**	0	**3421**
5:00PM	3	353	0	1	0	**357**	0	0	1	0	4	0	**5**	0	**877**
5:15PM	3	349	0	1	0	**353**	0	0	0	0	8	0	**8**	1	**885**
5:30PM	2	379	0	1	0	**382**	0	0	3	0	7	0	**10**	0	**957**
5:45PM	2	361	0	0	1	**364**	0	0	1	0	10	0	**11**	0	**800**
Hourly Total	10	1442	0	3	1	**1456**	0	0	5	0	29	0	**34**	1	**3519**
Total	24	6402	0	10	1	**6437**	0	0	9	1	106	0	**116**	3	**12684**
% Approach	0.4%	99.5%	0%	0.2%	0%	**-**	-	0%	7.8%	0.9%	91.4%	0%	**-**	-	**-**
% Total	0.2%	50.5%	0%	0.1%	0%	**50.7%**	-	0%	0.1%	0%	0.8%	0%	**0.9%**	-	**-**
Lights	21	6302	0	10	1	**6334**	-	0	9	1	106	0	**116**	-	12439
% Lights	87.5%	98.4%	0%	100%	100%	**98.4%**	-	0%	100%	100%	100%	0%	**100%**	-	98.1%
Single-Unit Trucks	2	46	0	0	0	**48**	-	0	0	0	0	0	**0**	-	123
% Single-Unit Trucks	8.3%	0.7%	0%	0%	0%	**0.7%**	-	0%	0%	0%	0%	0%	**0%**	-	1.0%
Articulated Trucks	1	34	0	0	0	**35**	-	0	0	0	0	0	**0**	-	83
% Articulated Trucks	4.2%	0.5%	0%	0%	0%	**0.5%**	-	0%	0%	0%	0%	0%	**0%**	-	0.7%
Buses	0	20	0	0	0	**20**	-	0	0	0	0	0	**0**	-	38
% Buses	0%	0.3%	0%	0%	0%	**0.3%**	-	0%	0%	0%	0%	0%	**0%**	-	0.3%
Bicycles on Road	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	1
% Bicycles on Road	0%	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	33.3%	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	2	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	66.7%	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & Glaser Drive - TMC
Wed Jun 1, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957212, Location: 42.590185, -83.129014

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Rochester Road & Glaser Drive - TMC

Wed Jun 1, 2022
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957212, Location: 42.590185, -83.129014

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg / Direction	Glaser Eastbound							Glaser Westbound							Rochester Northbound						
Time	L	T	R	HR	U	**App**	Ped*	L	BL	T	R	U	**App**	Ped*	HL	L	T	R	U	**App**	Ped*
2022-06-01 7:30AM	0	0	0	0	0	**0**	0	2	0	0	1	0	**3**	0	0	1	261	1	0	**263**	0
7:45AM	0	0	0	0	0	**0**	0	2	0	0	0	0	**2**	0	0	2	340	3	0	**345**	0
8:00AM	0	0	0	0	0	**0**	0	0	0	0	0	0	**0**	0	0	1	259	1	0	**261**	0
8:15AM	0	0	0	0	0	**0**	0	0	0	0	1	0	**1**	0	0	3	270	1	0	**274**	0
Total	0	0	0	0	0	**0**	0	4	0	0	2	0	**6**	0	0	7	1130	6	0	**1143**	0
% Approach	0%	0%	0%	0%	0%	**-**	-	66.7%	0%	0%	33.3%	0%	**-**	-	0%	0.6%	98.9%	0.5%	0%	**-**	-
% Total	0%	0%	0%	0%	0%	**0%**	-	0.1%	0%	0%	0.1%	0%	**0.2%**	-	0%	0.2%	37.7%	0.2%	0%	**38.1%**	-
PHF	-	-	-	-	-	**-**	-	0.500	-	-	0.500	-	**0.500**	-	-	0.583	0.831	0.625	-	**0.830**	-
Lights	0	0	0	0	0	**0**	-	4	0	0	2	0	**6**	-	0	7	1078	5	0	**1090**	-
% Lights	0%	0%	0%	0%	0%	**-**	-	100%	0%	0%	100%	0%	**100%**	-	0%	100%	95.4%	83.3%	0%	**95.4%**	-
Single-Unit Trucks	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	0	0	27	0	0	**27**	-
% Single-Unit Trucks	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	0%	**0%**	-	0%	0%	2.4%	0%	0%	**2.4%**	-
Articulated Trucks	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	0	0	16	0	0	**16**	-
% Articulated Trucks	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	0%	**0%**	-	0%	0%	1.4%	0%	0%	**1.4%**	-
Buses	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	0	0	9	0	0	**9**	-
% Buses	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	0%	**0%**	-	0%	0%	0.8%	0%	0%	**0.8%**	-
Bicycles on Road	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	0	0	0	1	0	**1**	-
% Bicycles on Road	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	0%	**0%**	-	0%	0%	0%	16.7%	0%	**0.1%**	-
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & Glaser Drive - TMC

Wed Jun 1, 2022
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957212, Location: 42.590185, -83.129014

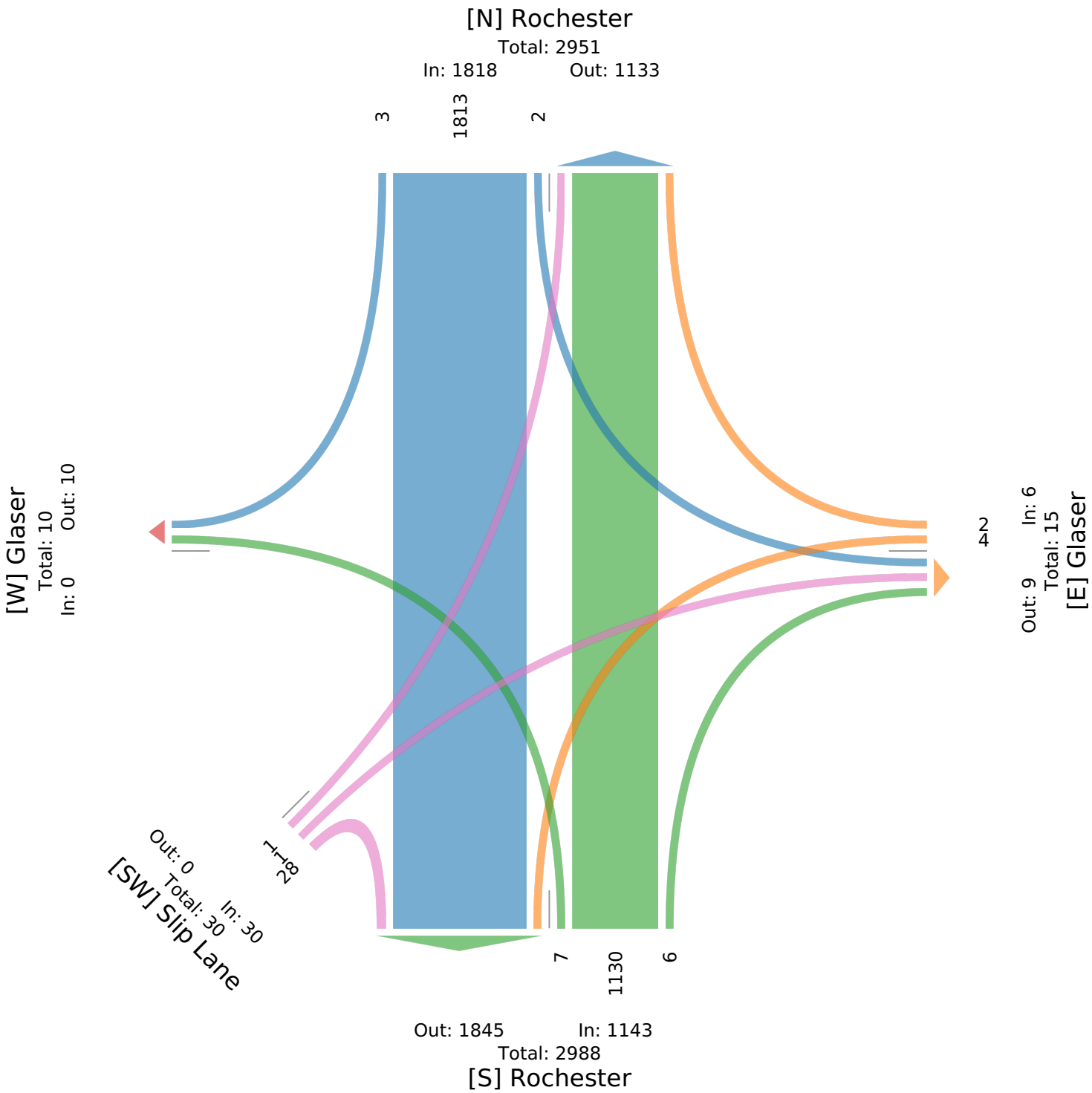
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Rochester Southbound							Slip Lane Northeastbound							
Time	L	T	BR	R	U	**App**	Ped*	HL	BL	BR	HR	U	**App**	Ped*	**Int**
2022-06-01 7:30AM	1	489	0	2	0	**492**	0	0	0	1	6	0	**7**	0	**765**
7:45AM	0	473	0	0	0	**473**	0	0	0	0	5	0	**5**	0	**825**
8:00AM	1	401	0	0	0	**402**	0	0	1	0	8	0	**9**	0	**672**
8:15AM	0	450	0	1	0	**451**	0	0	0	0	9	0	**9**	0	**735**
Total	2	1813	0	3	0	**1818**	0	0	1	1	28	0	**30**	0	**2997**
% Approach	0.1%	99.7%	0%	0.2%	0%	**-**	-	0%	3.3%	3.3%	93.3%	0%	**-**	-	**-**
% Total	0.1%	60.5%	0%	0.1%	0%	**60.7%**	-	0%	0%	0%	0.9%	0%	**1.0%**	-	**-**
PHF	0.500	0.927	-	0.375	-	**0.924**	-	-	0.250	0.250	0.778	-	**0.833**	-	0.909
Lights	2	1784	0	3	0	**1789**	-	0	1	1	28	0	**30**	-	2915
% Lights	100%	98.4%	0%	100%	0%	**98.4%**	-	0%	100%	100%	100%	0%	**100%**	-	97.3%
Single-Unit Trucks	0	14	0	0	0	**14**	-	0	0	0	0	0	**0**	-	41
% Single-Unit Trucks	0%	0.8%	0%	0%	0%	**0.8%**	-	0%	0%	0%	0%	0%	**0%**	-	1.4%
Articulated Trucks	0	8	0	0	0	**8**	-	0	0	0	0	0	**0**	-	24
% Articulated Trucks	0%	0.4%	0%	0%	0%	**0.4%**	-	0%	0%	0%	0%	0%	**0%**	-	0.8%
Buses	0	7	0	0	0	**7**	-	0	0	0	0	0	**0**	-	16
% Buses	0%	0.4%	0%	0%	0%	**0.4%**	-	0%	0%	0%	0%	0%	**0%**	-	0.5%
Bicycles on Road	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	1
% Bicycles on Road	0%	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & Glaser Drive - TMC
Wed Jun 1, 2022
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957212, Location: 42.590185, -83.129014

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Rochester Road & Glaser Drive - TMC

Wed Jun 1, 2022
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957212, Location: 42.590185, -83.129014

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Glaser							Glaser							Rochester						
Direction	Eastbound							Westbound							Northbound						
Time	L	T	R	HR	U	**App**	Ped*	L	BL	T	R	U	**App**	Ped*	HL	L	T	R	U	**App**	Ped*
2022-06-01 4:45PM	0	0	0	0	0	**0**	0	2	0	0	5	0	**7**	0	0	5	482	3	0	**490**	0
5:00PM	0	0	0	0	0	**0**	0	2	0	0	1	0	**3**	0	0	2	509	1	0	**512**	0
5:15PM	0	0	0	0	0	**0**	1	1	0	0	6	0	**7**	0	0	3	513	1	0	**517**	0
5:30PM	0	0	0	0	0	**0**	0	0	0	0	6	0	**6**	0	0	4	551	4	0	**559**	0
Total	0	0	0	0	0	**0**	1	5	0	0	18	0	**23**	0	0	14	2055	9	0	**2078**	0
% Approach	0%	0%	0%	0%	0%	**-**	-	21.7%	0%	0%	78.3%	0%	**-**	-	0%	0.7%	98.9%	0.4%	0%	**-**	-
% Total	0%	0%	0%	0%	0%	**0%**	-	0.1%	0%	0%	0.5%	0%	**0.6%**	-	0%	0.4%	57.5%	0.3%	0%	**58.1%**	-
PHF	-	-	-	-	-	**-**	-	0.625	-	-	0.750	-	**0.821**	-	-	0.700	0.932	0.563	-	**0.929**	-
Lights	0	0	0	0	0	**0**	-	5	0	0	16	0	**21**	-	0	14	2044	9	0	**2067**	-
% Lights	0%	0%	0%	0%	0%	**-**	-	100%	0%	0%	88.9%	0%	**91.3%**	-	0%	100%	99.5%	100%	0%	**99.5%**	-
Single-Unit Trucks	0	0	0	0	0	**0**	-	0	0	0	1	0	**1**	-	0	0	8	0	0	**8**	-
% Single-Unit Trucks	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	5.6%	0%	**4.3%**	-	0%	0%	0.4%	0%	0%	**0.4%**	-
Articulated Trucks	0	0	0	0	0	**0**	-	0	0	0	1	0	**1**	-	0	0	1	0	0	**1**	-
% Articulated Trucks	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	5.6%	0%	**4.3%**	-	0%	0%	0%	0%	0%	**0%**	-
Buses	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	0	0	2	0	0	**2**	-
% Buses	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	0%	**0%**	-	0%	0%	0.1%	0%	0%	**0.1%**	-
Bicycles on Road	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-
% Bicycles on Road	0%	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	0%	**0%**	-
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & Glaser Drive - TMC

Wed Jun 1, 2022
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957212, Location: 42.590185, -83.129014

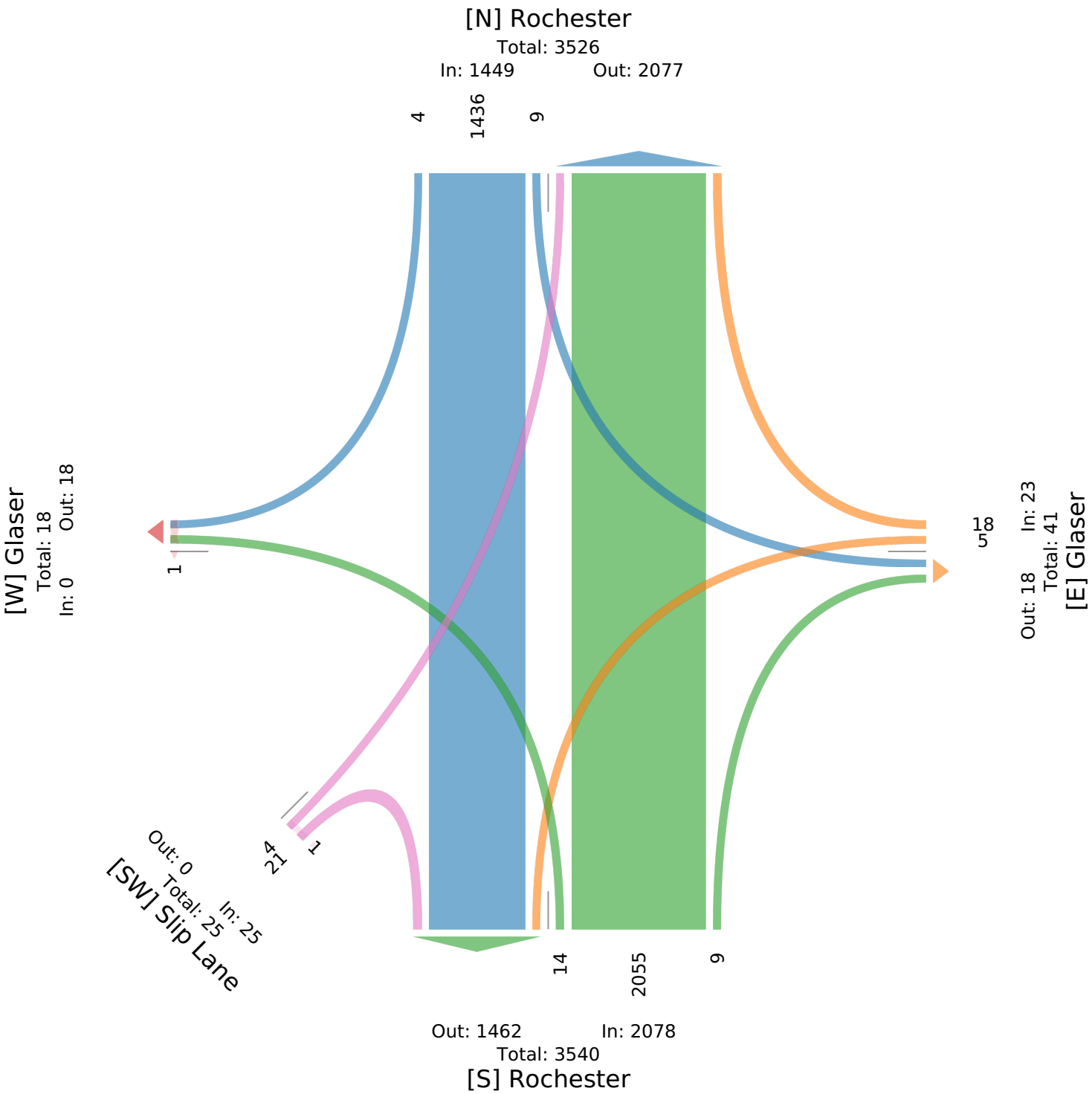
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Rochester							Slip Lane							
Direction	Southbound							Northeastbound							
Time	L	T	BR	R	U	**App**	Ped*	HL	BL	BR	HR	U	**App**	Ped*	**Int**
2022-06-01 4:45PM	1	355	0	1	0	**357**	0	0	0	0	2	0	**2**	0	**856**
5:00PM	3	353	0	1	0	**357**	0	0	1	0	4	0	**5**	0	**877**
5:15PM	3	349	0	1	0	**353**	0	0	0	0	8	0	**8**	1	**885**
5:30PM	2	379	0	1	0	**382**	0	0	3	0	7	0	**10**	0	**957**
Total	9	1436	0	4	0	**1449**	0	0	4	0	21	0	**25**	1	**3575**
% Approach	0.6%	99.1%	0%	0.3%	0%	**-**	-	0%	16.0%	0%	84.0%	0%	**-**	-	**-**
% Total	0.3%	40.2%	0%	0.1%	0%	**40.5%**	-	0%	0.1%	0%	0.6%	0%	**0.7%**	-	**-**
PHF	0.750	0.947	-	1.000	-	**0.948**	-	-	0.333	-	0.656	-	**0.625**	-	0.934
Lights	8	1416	0	4	0	**1428**	-	0	4	0	21	0	**25**	-	3541
% Lights	88.9%	98.6%	0%	100%	0%	**98.6%**	-	0%	100%	0%	100%	0%	**100%**	-	99.0%
Single-Unit Trucks	1	11	0	0	0	**12**	-	0	0	0	0	0	**0**	-	21
% Single-Unit Trucks	11.1%	0.8%	0%	0%	0%	**0.8%**	-	0%	0%	0%	0%	0%	**0%**	-	0.6%
Articulated Trucks	0	9	0	0	0	**9**	-	0	0	0	0	0	**0**	-	11
% Articulated Trucks	0%	0.6%	0%	0%	0%	**0.6%**	-	0%	0%	0%	0%	0%	**0%**	-	0.3%
Buses	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	2
% Buses	0%	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	0%	**0%**	-	0.1%
Bicycles on Road	0	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	1	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & Glaser Drive - TMC
Wed Jun 1, 2022
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957212, Location: 42.590185, -83.129014

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



EB East Long Lake Road & WB to EB X/O West o... - TMC

Wed Jun 1, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957211, Location: 42.591905, -83.13221

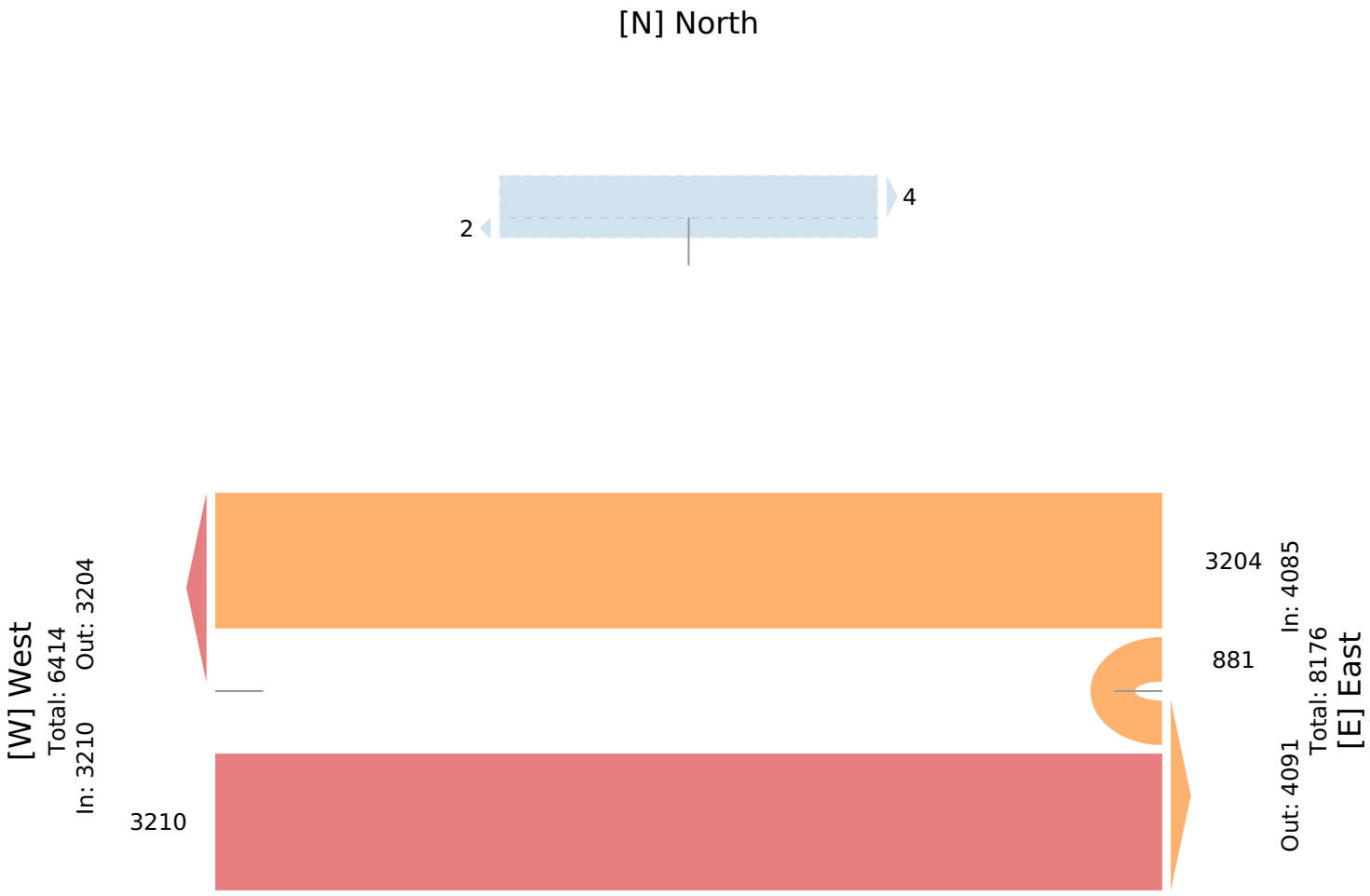
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg / Direction	West Eastbound					East Westbound					North Southbound					
Time	L	T	U	**App**	Ped*	T	R	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2022-06-01 7:00AM	0	67	0	**67**	0	138	0	31	**169**	0	0	0	0	**0**	0	**236**
7:15AM	0	106	0	**106**	0	221	0	50	**271**	0	0	0	0	**0**	0	**377**
7:30AM	0	110	0	**110**	0	249	0	59	**308**	0	0	0	0	**0**	0	**418**
7:45AM	0	120	0	**120**	0	234	0	41	**275**	0	0	0	0	**0**	0	**395**
Hourly Total	0	403	0	**403**	0	842	0	181	**1023**	0	0	0	0	**0**	0	**1426**
8:00AM	0	120	0	**120**	0	298	0	41	**339**	0	0	0	0	**0**	0	**459**
8:15AM	0	98	0	**98**	0	215	0	34	**249**	0	0	0	0	**0**	0	**347**
8:30AM	0	142	0	**142**	0	257	0	51	**308**	0	0	0	0	**0**	0	**450**
8:45AM	0	105	0	**105**	0	225	0	51	**276**	0	0	0	0	**0**	0	**381**
Hourly Total	0	465	0	**465**	0	995	0	177	**1172**	0	0	0	0	**0**	0	**1637**
4:00PM	0	263	0	**263**	0	181	0	59	**240**	0	0	0	0	**0**	1	**503**
4:15PM	0	264	0	**264**	0	146	0	64	**210**	0	0	0	0	**0**	0	**474**
4:30PM	0	322	0	**322**	0	176	0	58	**234**	0	0	0	0	**0**	0	**556**
4:45PM	0	281	0	**281**	0	183	0	59	**242**	0	0	0	0	**0**	0	**523**
Hourly Total	0	1130	0	**1130**	0	686	0	240	**926**	0	0	0	0	**0**	1	**2056**
5:00PM	0	317	0	**317**	0	168	0	60	**228**	0	0	0	0	**0**	0	**545**
5:15PM	0	331	0	**331**	0	160	0	76	**236**	0	0	0	0	**0**	2	**567**
5:30PM	0	279	0	**279**	0	169	0	74	**243**	0	0	0	0	**0**	1	**522**
5:45PM	0	285	0	**285**	0	184	0	73	**257**	0	0	0	0	**0**	2	**542**
Hourly Total	0	1212	0	**1212**	0	681	0	283	**964**	0	0	0	0	**0**	5	**2176**
Total	0	3210	0	**3210**	0	3204	0	881	**4085**	0	0	0	0	**0**	6	**7295**
% Approach	0%	100%	0%	**-**	-	78.4%	0%	21.6%	**-**	-	0%	0%	0%	**-**	-	-
% Total	0%	44.0%	0%	**44.0%**	-	43.9%	0%	12.1%	**56.0%**	-	0%	0%	0%	**0%**	-	-
Lights	0	3137	0	**3137**	-	3127	0	873	**4000**	-	0	0	0	**0**	-	7137
% Lights	0%	97.7%	0%	**97.7%**	-	97.6%	0%	99.1%	**97.9%**	-	0%	0%	0%	**-**	-	97.8%
Single-Unit Trucks	0	42	0	**42**	-	43	0	3	**46**	-	0	0	0	**0**	-	88
% Single-Unit Trucks	0%	1.3%	0%	**1.3%**	-	1.3%	0%	0.3%	**1.1%**	-	0%	0%	0%	**-**	-	1.2%
Articulated Trucks	0	14	0	**14**	-	12	0	2	**14**	-	0	0	0	**0**	-	28
% Articulated Trucks	0%	0.4%	0%	**0.4%**	-	0.4%	0%	0.2%	**0.3%**	-	0%	0%	0%	**-**	-	0.4%
Buses	0	17	0	**17**	-	22	0	3	**25**	-	0	0	0	**0**	-	42
% Buses	0%	0.5%	0%	**0.5%**	-	0.7%	0%	0.3%	**0.6%**	-	0%	0%	0%	**-**	-	0.6%
Bicycles on Road	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**-**	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	4	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66.7%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	2	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33.3%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

EB East Long Lake Road & WB to EB X/O West o... - TMC
Wed Jun 1, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957211, Location: 42.591905, -83.13221

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



EB East Long Lake Road & WB to EB X/O West o... - TMC

Wed Jun 1, 2022
AM Peak (7:45 AM - 8:45 AM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957211, Location: 42.591905, -83.13221

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	West Eastbound					East Westbound					North Southbound					
Time	L	T	U	**App**	Ped*	T	R	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2022-06-01 7:45AM	0	120	0	**120**	0	234	0	41	**275**	0	0	0	0	**0**	0	**395**
8:00AM	0	120	0	**120**	0	298	0	41	**339**	0	0	0	0	**0**	0	**459**
8:15AM	0	98	0	**98**	0	215	0	34	**249**	0	0	0	0	**0**	0	**347**
8:30AM	0	142	0	**142**	0	257	0	51	**308**	0	0	0	0	**0**	0	**450**
Total	0	480	0	**480**	0	1004	0	167	**1171**	0	0	0	0	**0**	0	**1651**
% Approach	0%	100%	0%	**-**	-	85.7%	0%	14.3%	**-**	-	0%	0%	0%	**-**	-	-
% Total	0%	29.1%	0%	**29.1%**	-	60.8%	0%	10.1%	**70.9%**	-	0%	0%	0%	**0%**	-	-
PHF	-	0.845	-	**0.845**	-	0.842	-	0.819	**0.864**	-	-	-	-	**-**	-	0.899
Lights	0	464	0	**464**	-	980	0	165	**1145**	-	0	0	0	**0**	-	1609
% Lights	0%	96.7%	0%	**96.7%**	-	97.6%	0%	98.8%	**97.8%**	-	0%	0%	0%	**-**	-	97.5%
Single-Unit Trucks	0	7	0	**7**	-	11	0	1	**12**	-	0	0	0	**0**	-	19
% Single-Unit Trucks	0%	1.5%	0%	**1.5%**	-	1.1%	0%	0.6%	**1.0%**	-	0%	0%	0%	**-**	-	1.2%
Articulated Trucks	0	5	0	**5**	-	5	0	0	**5**	-	0	0	0	**0**	-	10
% Articulated Trucks	0%	1.0%	0%	**1.0%**	-	0.5%	0%	0%	**0.4%**	-	0%	0%	0%	**-**	-	0.6%
Buses	0	4	0	**4**	-	8	0	1	**9**	-	0	0	0	**0**	-	13
% Buses	0%	0.8%	0%	**0.8%**	-	0.8%	0%	0.6%	**0.8%**	-	0%	0%	0%	**-**	-	0.8%
Bicycles on Road	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**-**	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

EB East Long Lake Road & WB to EB X/O West o... - TMC
Wed Jun 1, 2022
AM Peak (7:45 AM - 8:45 AM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957211, Location: 42.591905, -83.13221

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

EB East Long Lake Road & WB to EB X/O West o... - TMC

Wed Jun 1, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957211, Location: 42.591905, -83.13221

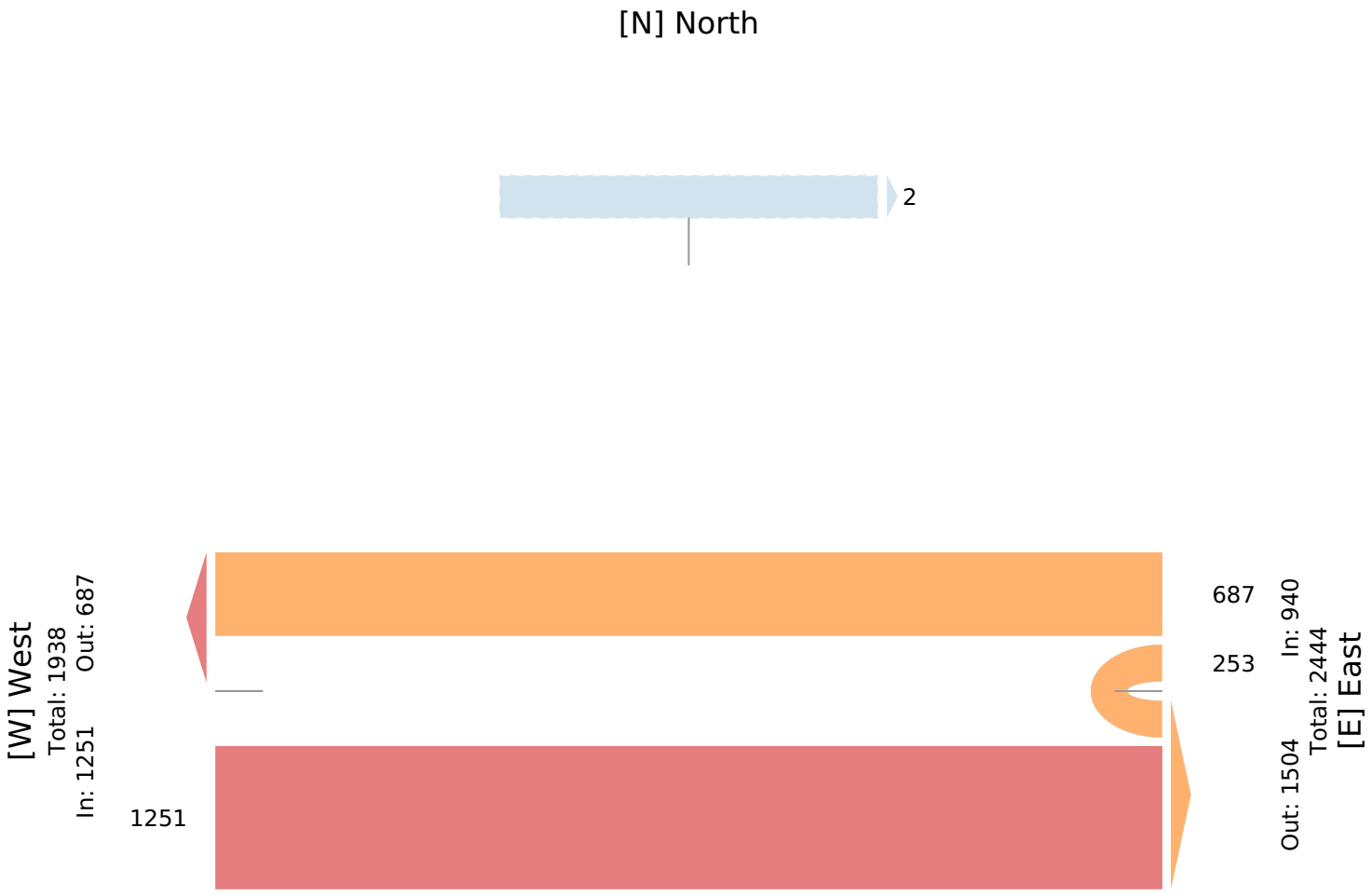
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	West Eastbound					East Westbound					North Southbound					
Time	L	T	U	**App**	Ped*	T	R	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2022-06-01 4:30PM	0	322	0	**322**	0	176	0	58	**234**	0	0	0	0	**0**	0	**556**
4:45PM	0	281	0	**281**	0	183	0	59	**242**	0	0	0	0	**0**	0	**523**
5:00PM	0	317	0	**317**	0	168	0	60	**228**	0	0	0	0	**0**	0	**545**
5:15PM	0	331	0	**331**	0	160	0	76	**236**	0	0	0	0	**0**	2	**567**
Total	0	1251	0	**1251**	0	687	0	253	**940**	0	0	0	0	**0**	2	**2191**
% Approach	0%	100%	0%	**-**	-	73.1%	0%	26.9%	**-**	-	0%	0%	0%	**-**	-	-
% Total	0%	57.1%	0%	**57.1%**	-	31.4%	0%	11.5%	**42.9%**	-	0%	0%	0%	**0%**	-	-
PHF	-	0.945	-	**0.945**	-	0.939	-	0.832	**0.971**	-	-	-	-	**-**	-	0.966
Lights	0	1229	0	**1229**	-	677	0	250	**927**	-	0	0	0	**0**	-	2156
% Lights	0%	98.2%	0%	**98.2%**	-	98.5%	0%	98.8%	**98.6%**	-	0%	0%	0%	**-**	-	98.4%
Single-Unit Trucks	0	17	0	**17**	-	8	0	1	**9**	-	0	0	0	**0**	-	26
% Single-Unit Trucks	0%	1.4%	0%	**1.4%**	-	1.2%	0%	0.4%	**1.0%**	-	0%	0%	0%	**-**	-	1.2%
Articulated Trucks	0	5	0	**5**	-	0	0	2	**2**	-	0	0	0	**0**	-	7
% Articulated Trucks	0%	0.4%	0%	**0.4%**	-	0%	0%	0.8%	**0.2%**	-	0%	0%	0%	**-**	-	0.3%
Buses	0	0	0	**0**	-	2	0	0	**2**	-	0	0	0	**0**	-	2
% Buses	0%	0%	0%	**0%**	-	0.3%	0%	0%	**0.2%**	-	0%	0%	0%	**-**	-	0.1%
Bicycles on Road	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**-**	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

EB East Long Lake Road & WB to EB X/O West o... - TMC
Wed Jun 1, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957211, Location: 42.591905, -83.13221

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Rochester Road & WB East Long Lake Road - TMC

Wed Jun 1, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957209, Location: 42.592164, -83.129104

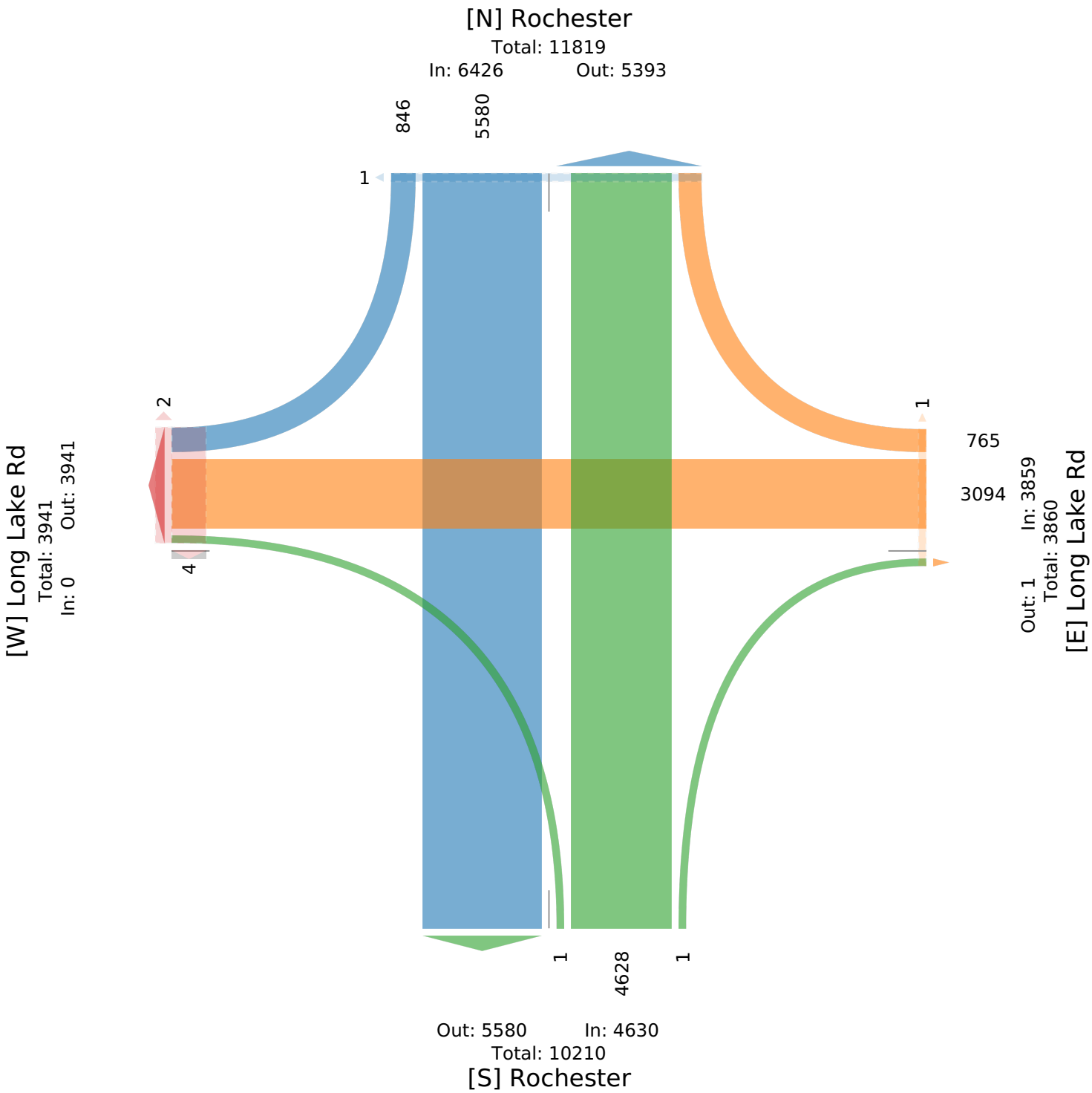
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Long Lake Rd						Long Lake Rd						Rochester						Rochester						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-06-01 7:00AM	0	0	0	0	**0**	0	0	127	22	0	**149**	0	0	167	1	0	**168**	0	0	349	42	0	**391**	0	**708**
7:15AM	0	0	0	0	**0**	0	0	222	40	0	**262**	0	0	177	0	0	**177**	0	0	416	46	0	**462**	0	**901**
7:30AM	0	0	0	0	**0**	0	0	229	38	0	**267**	0	0	202	0	0	**202**	0	0	447	69	0	**516**	0	**985**
7:45AM	0	0	0	0	**0**	0	0	220	47	0	**267**	0	0	261	0	0	**261**	0	0	406	61	0	**467**	0	**995**
Hourly Total	0	0	0	0	**0**	0	0	798	147	0	**945**	0	0	807	1	0	**808**	0	0	1618	218	0	**1836**	0	**3589**
8:00AM	0	0	0	0	**0**	0	0	295	48	0	**343**	0	0	205	0	0	**205**	0	0	360	40	0	**400**	0	**948**
8:15AM	0	0	0	0	**0**	0	0	197	32	0	**229**	0	0	231	0	0	**231**	0	0	428	52	0	**480**	0	**940**
8:30AM	0	0	0	0	**0**	1	0	255	50	0	**305**	1	0	195	0	0	**195**	0	0	359	54	0	**413**	0	**913**
8:45AM	0	0	0	0	**0**	0	0	223	39	0	**262**	0	0	234	0	0	**234**	0	0	353	45	0	**398**	1	**894**
Hourly Total	0	0	0	0	**0**	1	0	970	169	0	**1139**	1	0	865	0	0	**865**	0	0	1500	191	0	**1691**	1	**3695**
4:00PM	0	0	0	0	**0**	1	0	183	56	0	**239**	0	0	321	0	0	**321**	0	0	257	45	0	**302**	0	**862**
4:15PM	0	0	0	0	**0**	0	0	140	42	0	**182**	0	0	371	0	0	**371**	0	0	372	48	0	**420**	0	**973**
4:30PM	0	0	0	0	**0**	0	0	178	73	0	**251**	0	0	362	0	0	**362**	0	0	314	41	0	**355**	0	**968**
4:45PM	0	0	0	0	**0**	0	0	164	50	0	**214**	0	0	396	0	0	**396**	0	0	318	58	0	**376**	0	**986**
Hourly Total	0	0	0	0	**0**	1	0	665	221	0	**886**	0	0	1450	0	0	**1450**	0	0	1261	192	0	**1453**	0	**3789**
5:00PM	0	0	0	0	**0**	0	0	158	60	0	**218**	0	0	361	0	0	**361**	0	0	283	66	0	**349**	0	**928**
5:15PM	0	0	0	0	**0**	1	0	152	65	0	**217**	0	0	405	0	0	**405**	0	0	293	60	0	**353**	0	**975**
5:30PM	0	0	0	0	**0**	1	0	174	53	0	**227**	0	1	419	0	0	**420**	0	0	319	58	0	**377**	0	**1024**
5:45PM	0	0	0	0	**0**	2	0	177	50	0	**227**	0	0	321	0	0	**321**	0	0	306	61	0	**367**	0	**915**
Hourly Total	0	0	0	0	**0**	4	0	661	228	0	**889**	0	1	1506	0	0	**1507**	0	0	1201	245	0	**1446**	0	**3842**
Total	0	0	0	0	**0**	6	0	3094	765	0	**3859**	1	1	4628	1	0	**4630**	0	0	5580	846	0	**6426**	1	**14915**
% Approach	0%	0%	0%	0%	**-**	-	0%	80.2%	19.8%	0%	**-**	-	0%	100.0%	0%	0%	**-**	-	0%	86.8%	13.2%	0%	**-**	-	**-**
% Total	0%	0%	0%	0%	**0%**	-	0%	20.7%	5.1%	0%	**25.9%**	-	0%	31.0%	0%	0%	**31.0%**	-	0%	37.4%	5.7%	0%	**43.1%**	-	**-**
Lights	0	0	0	0	**0**	-	0	3030	747	0	**3777**	-	1	4516	1	0	**4518**	-	0	5500	831	0	**6331**	-	14626
% Lights	0%	0%	0%	0%	**-**	-	0%	97.9%	97.6%	0%	**97.9%**	-	100%	97.6%	100%	0%	**97.6%**	-	0%	98.6%	98.2%	0%	**98.5%**	-	98.1%
Single-Unit Trucks	0	0	0	0	**0**	-	0	36	10	0	**46**	-	0	64	0	0	**64**	-	0	47	9	0	**56**	-	166
% Single-Unit Trucks	0%	0%	0%	0%	**-**	-	0%	1.2%	1.3%	0%	**1.2%**	-	0%	1.4%	0%	0%	**1.4%**	-	0%	0.8%	1.1%	0%	**0.9%**	-	1.1%
Articulated Trucks	0	0	0	0	**0**	-	0	8	4	0	**12**	-	0	37	0	0	**37**	-	0	26	2	0	**28**	-	77
% Articulated Trucks	0%	0%	0%	0%	**-**	-	0%	0.3%	0.5%	0%	**0.3%**	-	0%	0.8%	0%	0%	**0.8%**	-	0%	0.5%	0.2%	0%	**0.4%**	-	0.5%
Buses	0	0	0	0	**0**	-	0	20	4	0	**24**	-	0	9	0	0	**9**	-	0	7	4	0	**11**	-	44
% Buses	0%	0%	0%	0%	**-**	-	0%	0.6%	0.5%	0%	**0.6%**	-	0%	0.2%	0%	0%	**0.2%**	-	0%	0.1%	0.5%	0%	**0.2%**	-	0.3%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	2	0	0	**2**	-	0	0	0	0	**0**	-	2
% Bicycles on Road	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	33.3%	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	4	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	66.7%	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & WB East Long Lake Road - TMC
Wed Jun 1, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957209, Location: 42.592164, -83.129104

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Rochester Road & WB East Long Lake Road - TMC

Wed Jun 1, 2022
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957209, Location: 42.592164, -83.129104

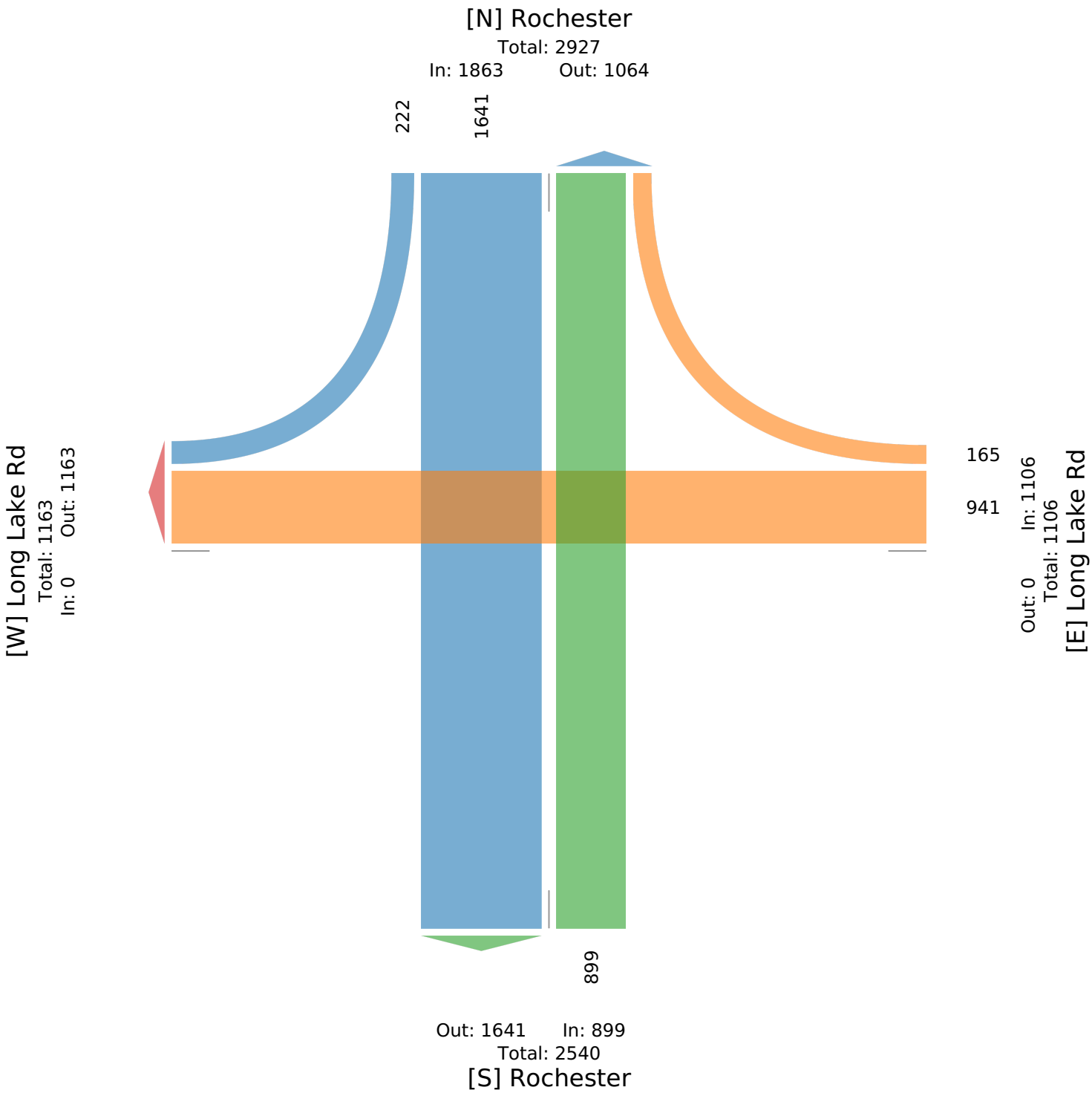
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Long Lake Rd						Long Lake Rd						Rochester						Rochester						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2022-06-01 7:30AM	0	0	0	0	**0**	0	0	229	38	0	**267**	0	0	202	0	0	**202**	0	0	447	69	0	**516**	0	**985**
7:45AM	0	0	0	0	**0**	0	0	220	47	0	**267**	0	0	261	0	0	**261**	0	0	406	61	0	**467**	0	**995**
8:00AM	0	0	0	0	**0**	0	0	295	48	0	**343**	0	0	205	0	0	**205**	0	0	360	40	0	**400**	0	**948**
8:15AM	0	0	0	0	**0**	0	0	197	32	0	**229**	0	0	231	0	0	**231**	0	0	428	52	0	**480**	0	**940**
Total	0	0	0	0	**0**	0	0	941	165	0	**1106**	0	0	899	0	0	**899**	0	0	1641	222	0	**1863**	0	**3868**
% Approach	0%	0%	0%	0%	**-**	-	0%	85.1%	14.9%	0%	**-**	-	0%	100%	0%	0%	**-**	-	0%	88.1%	11.9%	0%	**-**	-	-
% Total	0%	0%	0%	0%	**0%**	-	0%	24.3%	4.3%	0%	**28.6%**	-	0%	23.2%	0%	0%	**23.2%**	-	0%	42.4%	5.7%	0%	**48.2%**	-	-
PHF	-	-	-	-	**-**	-	-	0.797	0.859	-	**0.806**	-	-	0.861	-	-	**0.861**	-	-	0.918	0.804	-	**0.903**	-	0.972
Lights	0	0	0	0	**0**	-	0	923	160	0	**1083**	-	0	852	0	0	**852**	-	0	1620	219	0	**1839**	-	3774
% Lights	0%	0%	0%	0%	**-**	-	0%	98.1%	97.0%	0%	**97.9%**	-	0%	94.8%	0%	0%	**94.8%**	-	0%	98.7%	98.6%	0%	**98.7%**	-	97.6%
Single-Unit Trucks	0	0	0	0	**0**	-	0	8	2	0	**10**	-	0	27	0	0	**27**	-	0	12	1	0	**13**	-	50
% Single-Unit Trucks	0%	0%	0%	0%	**-**	-	0%	0.9%	1.2%	0%	**0.9%**	-	0%	3.0%	0%	0%	**3.0%**	-	0%	0.7%	0.5%	0%	**0.7%**	-	1.3%
Articulated Trucks	0	0	0	0	**0**	-	0	2	2	0	**4**	-	0	14	0	0	**14**	-	0	7	1	0	**8**	-	26
% Articulated Trucks	0%	0%	0%	0%	**-**	-	0%	0.2%	1.2%	0%	**0.4%**	-	0%	1.6%	0%	0%	**1.6%**	-	0%	0.4%	0.5%	0%	**0.4%**	-	0.7%
Buses	0	0	0	0	**0**	-	0	8	1	0	**9**	-	0	6	0	0	**6**	-	0	2	1	0	**3**	-	18
% Buses	0%	0%	0%	0%	**-**	-	0%	0.9%	0.6%	0%	**0.8%**	-	0%	0.7%	0%	0%	**0.7%**	-	0%	0.1%	0.5%	0%	**0.2%**	-	0.5%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & WB East Long Lake Road - TMC
Wed Jun 1, 2022
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957209, Location: 42.592164, -83.129104

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Rochester Road & WB East Long Lake Road - TMC

Wed Jun 1, 2022
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957209, Location: 42.592164, -83.129104

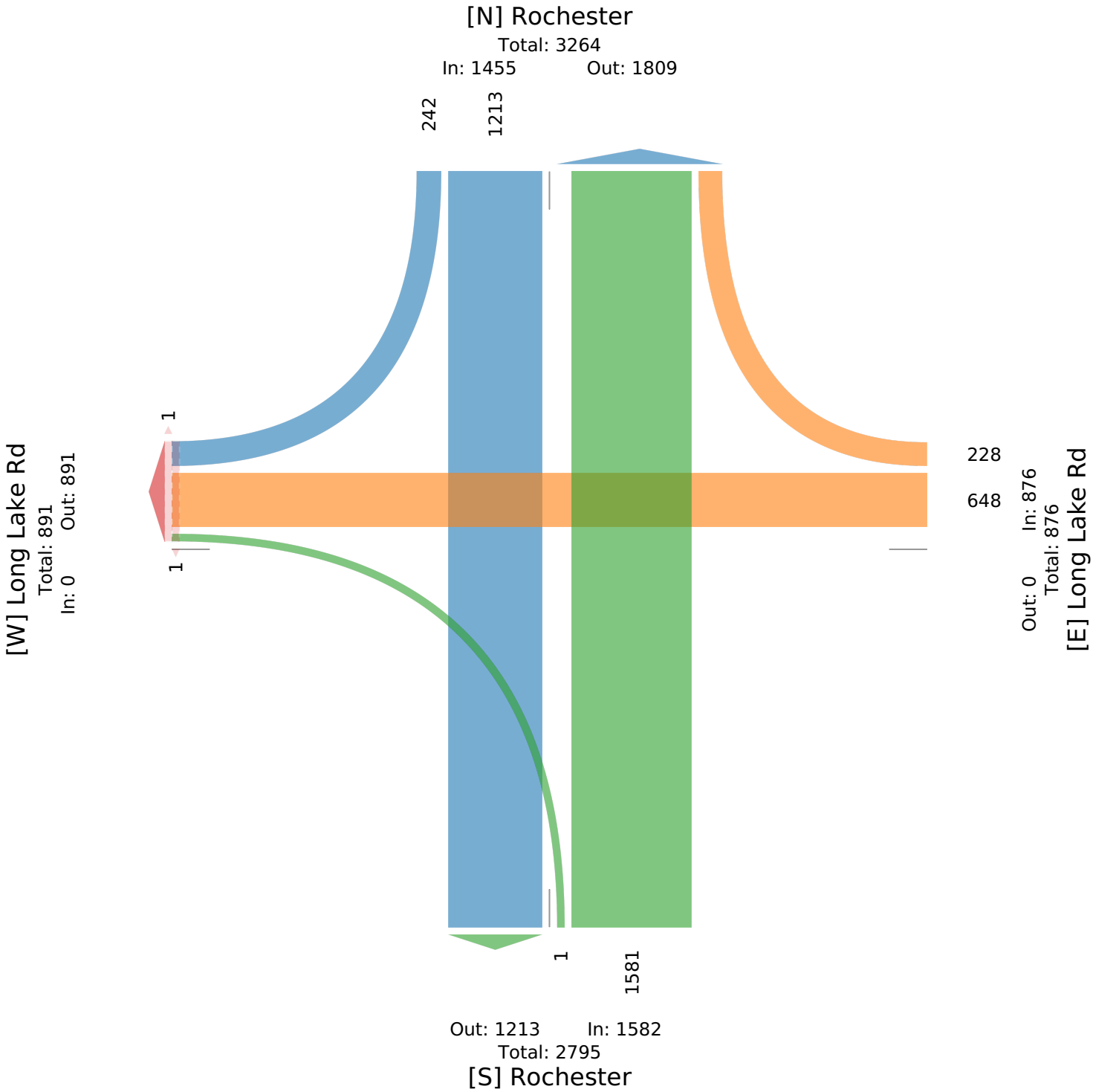
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Long Lake Rd						Long Lake Rd						Rochester						Rochester						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-06-01 4:45PM	0	0	0	0	**0**	0	0	164	50	0	**214**	0	0	396	0	0	**396**	0	0	318	58	0	**376**	0	**986**
5:00PM	0	0	0	0	**0**	0	0	158	60	0	**218**	0	0	361	0	0	**361**	0	0	283	66	0	**349**	0	**928**
5:15PM	0	0	0	0	**0**	1	0	152	65	0	**217**	0	0	405	0	0	**405**	0	0	293	60	0	**353**	0	**975**
5:30PM	0	0	0	0	**0**	1	0	174	53	0	**227**	0	1	419	0	0	**420**	0	0	319	58	0	**377**	0	**1024**
Total	0	0	0	0	**0**	2	0	648	228	0	**876**	0	1	1581	0	0	**1582**	0	0	1213	242	0	**1455**	0	**3913**
% Approach	0%	0%	0%	0%	**-**	-	0%	74.0%	26.0%	0%	**-**	-	0.1%	99.9%	0%	0%	**-**	-	0%	83.4%	16.6%	0%	**-**	-	-
% Total	0%	0%	0%	0%	**0%**	-	0%	16.6%	5.8%	0%	**22.4%**	-	0%	40.4%	0%	0%	**40.4%**	-	0%	31.0%	6.2%	0%	**37.2%**	-	-
PHF	-	-	-	-	**-**	-	-	0.931	0.877	-	**0.965**	-	0.250	0.943	-	-	**0.942**	-	-	0.951	0.917	-	**0.965**	-	0.955
Lights	0	0	0	0	**0**	-	0	640	225	0	**865**	-	1	1569	0	0	**1570**	-	0	1196	238	0	**1434**	-	3869
% Lights	0%	0%	0%	0%	**-**	-	0%	98.8%	98.7%	0%	**98.7%**	-	100%	99.2%	0%	0%	**99.2%**	-	0%	98.6%	98.3%	0%	**98.6%**	-	98.9%
Single-Unit Trucks	0	0	0	0	**0**	-	0	6	3	0	**9**	-	0	9	0	0	**9**	-	0	12	4	0	**16**	-	34
% Single-Unit Trucks	0%	0%	0%	0%	**-**	-	0%	0.9%	1.3%	0%	**1.0%**	-	0%	0.6%	0%	0%	**0.6%**	-	0%	1.0%	1.7%	0%	**1.1%**	-	0.9%
Articulated Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	2	0	0	**2**	-	0	5	0	0	**5**	-	7
% Articulated Trucks	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%	0.1%	0%	0%	**0.1%**	-	0%	0.4%	0%	0%	**0.3%**	-	0.2%
Buses	0	0	0	0	**0**	-	0	2	0	0	**2**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	3
% Buses	0%	0%	0%	0%	**-**	-	0%	0.3%	0%	0%	**0.2%**	-	0%	0.1%	0%	0%	**0.1%**	-	0%	0%	0%	0%	**0%**	-	0.1%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & WB East Long Lake Road - TMC
Wed Jun 1, 2022
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957209, Location: 42.592164, -83.129104

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Rochester Road & EB East Long Lake Road - TMC

Wed Jun 1, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957210, Location: 42.591947, -83.129089

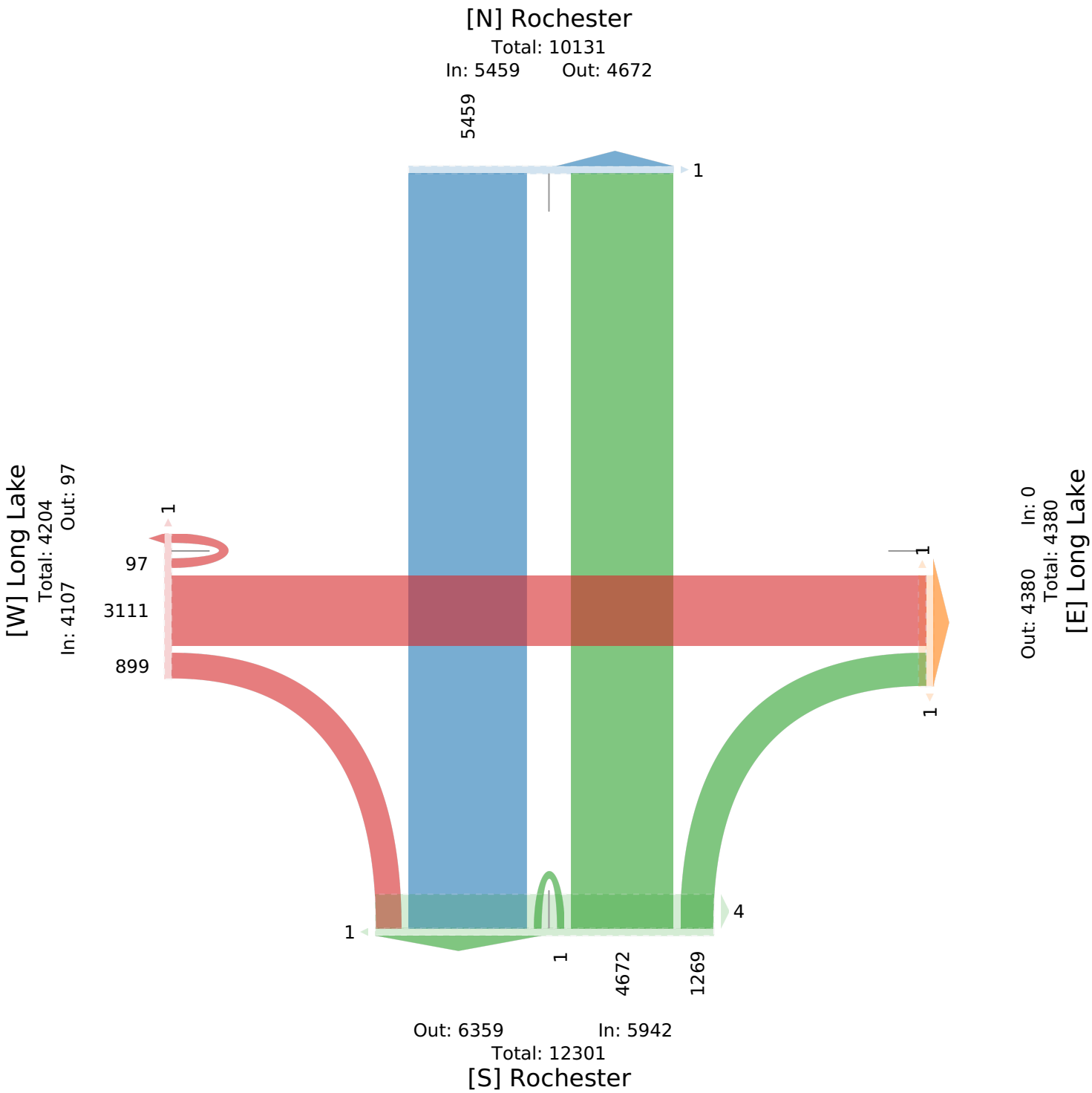
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Long Lake						Long Lake		Rochester					Rochester					
Direction	Eastbound						Westbound		Northbound					Southbound					
Time	L	T	R	U	App	Ped*	App	Ped*	T	R	U	App	Ped*	L	T	U	App	Ped*	Int
2022-06-01 7:00AM	0	55	42	1	**98**	0	**0**	1	173	34	0	**207**	0	0	346	0	**346**	0	**651**
7:15AM	0	91	60	3	**154**	0	**0**	0	190	46	0	**236**	0	0	403	0	**403**	0	**793**
7:30AM	0	91	70	3	**164**	1	**0**	0	212	45	0	**257**	0	0	432	0	**432**	0	**853**
7:45AM	0	104	53	3	**160**	0	**0**	0	258	69	0	**327**	0	0	395	0	**395**	0	**882**
Hourly Total	0	341	225	10	**576**	1	**0**	1	833	194	0	**1027**	0	0	1576	0	**1576**	0	**3179**
8:00AM	0	109	58	3	**170**	0	**0**	0	207	44	0	**251**	1	0	354	0	**354**	0	**775**
8:15AM	0	90	36	3	**129**	0	**0**	0	236	45	0	**281**	0	0	426	0	**426**	0	**836**
8:30AM	0	136	53	4	**193**	0	**0**	1	195	56	0	**251**	1	0	347	0	**347**	0	**791**
8:45AM	0	98	47	2	**147**	0	**0**	0	238	47	0	**285**	0	0	351	0	**351**	0	**783**
Hourly Total	0	433	194	12	**639**	0	**0**	1	876	192	0	**1068**	2	0	1478	0	**1478**	0	**3185**
4:00PM	0	260	64	2	**326**	0	**0**	0	321	94	0	**415**	1	0	249	0	**249**	0	**990**
4:15PM	0	256	61	3	**320**	0	**0**	0	380	120	0	**500**	0	0	348	0	**348**	0	**1168**
4:30PM	0	331	59	10	**400**	0	**0**	0	360	112	0	**472**	0	0	304	0	**304**	0	**1176**
4:45PM	0	296	52	8	**356**	0	**0**	0	394	119	0	**513**	0	0	312	0	**312**	0	**1181**
Hourly Total	0	1143	236	23	**1402**	0	**0**	0	1455	445	0	**1900**	1	0	1213	0	**1213**	0	**4515**
5:00PM	0	292	58	13	**363**	0	**0**	0	358	113	0	**471**	0	0	283	0	**283**	1	**1117**
5:15PM	0	334	64	15	**413**	0	**0**	0	393	114	1	**508**	1	0	294	0	**294**	0	**1215**
5:30PM	0	276	56	13	**345**	0	**0**	0	432	125	0	**557**	0	0	327	0	**327**	0	**1229**
5:45PM	0	292	66	11	**369**	0	**0**	0	325	86	0	**411**	1	0	288	0	**288**	0	**1068**
Hourly Total	0	1194	244	52	**1490**	0	**0**	0	1508	438	1	**1947**	2	0	1192	0	**1192**	1	**4629**
Total	0	3111	899	97	**4107**	1	**0**	2	4672	1269	1	**5942**	5	0	5459	0	**5459**	1	**15508**
% Approach	0%	75.7%	21.9%	2.4%	**-**	-	**-**	-	78.6%	21.4%	0%	**-**	-	0%	100%	0%	**-**	-	-
% Total	0%	20.1%	5.8%	0.6%	**26.5%**	-	**0%**	-	30.1%	8.2%	0%	**38.3%**	-	0%	35.2%	0%	**35.2%**	-	-
Lights	0	3058	870	96	**4024**	-	**0**	-	4552	1245	1	**5798**	-	0	5385	0	**5385**	-	15207
% Lights	0%	98.3%	96.8%	99.0%	**98.0%**	-	**-**	-	97.4%	98.1%	100%	**97.6%**	-	0%	98.6%	0%	**98.6%**	-	98.1%
Single-Unit Trucks	0	40	12	0	**52**	-	**0**	-	71	10	0	**81**	-	0	38	0	**38**	-	171
% Single-Unit Trucks	0%	1.3%	1.3%	0%	**1.3%**	-	**-**	-	1.5%	0.8%	0%	**1.4%**	-	0%	0.7%	0%	**0.7%**	-	1.1%
Articulated Trucks	0	6	6	0	**12**	-	**0**	-	42	5	0	**47**	-	0	30	0	**30**	-	89
% Articulated Trucks	0%	0.2%	0.7%	0%	**0.3%**	-	**-**	-	0.9%	0.4%	0%	**0.8%**	-	0%	0.5%	0%	**0.5%**	-	0.6%
Buses	0	7	11	1	**19**	-	**0**	-	7	9	0	**16**	-	0	6	0	**6**	-	41
% Buses	0%	0.2%	1.2%	1.0%	**0.5%**	-	**-**	-	0.1%	0.7%	0%	**0.3%**	-	0%	0.1%	0%	**0.1%**	-	0.3%
Bicycles on Road	0	0	0	0	**0**	-	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	**-**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	1	-	0	-	-	-	-	0	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	100%	-	0%	-	-	-	-	0%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	2	-	-	-	-	5	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	100%	-	-	-	-	100%	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & EB East Long Lake Road - TMC
Wed Jun 1, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957210, Location: 42.591947, -83.129089

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Rochester Road & EB East Long Lake Road - TMC

Wed Jun 1, 2022
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957210, Location: 42.591947, -83.129089

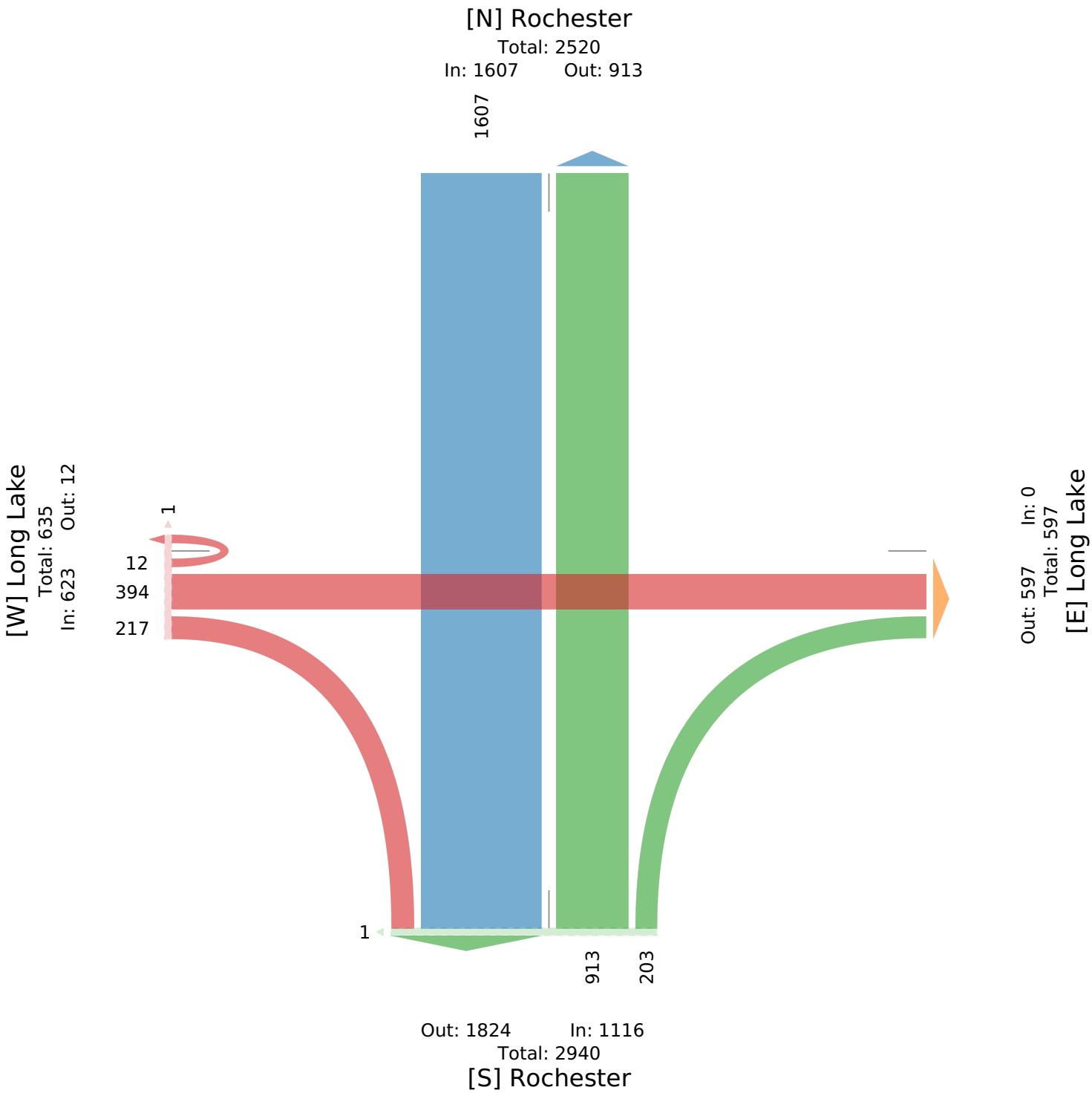
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Long Lake						Long Lake		Rochester					Rochester					
Direction	Eastbound						Westbound		Northbound					Southbound					
Time	L	T	R	U	App	Ped*	App	Ped*	T	R	U	App	Ped*	L	T	U	App	Ped*	Int
2022-06-01 7:30AM	0	91	70	3	**164**	1	**0**	0	212	45	0	**257**	0	0	432	0	**432**	0	**853**
7:45AM	0	104	53	3	**160**	0	**0**	0	258	69	0	**327**	0	0	395	0	**395**	0	**882**
8:00AM	0	109	58	3	**170**	0	**0**	0	207	44	0	**251**	1	0	354	0	**354**	0	**775**
8:15AM	0	90	36	3	**129**	0	**0**	0	236	45	0	**281**	0	0	426	0	**426**	0	**836**
Total	0	394	217	12	**623**	1	**0**	0	913	203	0	**1116**	1	0	1607	0	**1607**	0	**3346**
% Approach	0%	63.2%	34.8%	1.9%	**-**	-	**-**	-	81.8%	18.2%	0%	**-**	-	0%	100%	0%	**-**	-	-
% Total	0%	11.8%	6.5%	0.4%	**18.6%**	-	**0%**	-	27.3%	6.1%	0%	**33.4%**	-	0%	48.0%	0%	**48.0%**	-	-
PHF	-	0.904	0.775	1.000	**0.916**	-	**-**	-	0.885	0.736	-	**0.853**	-	-	0.930	-	**0.930**	-	0.948
Lights	0	386	209	11	**606**	-	**0**	-	866	197	0	**1063**	-	0	1582	0	**1582**	-	3251
% Lights	0%	98.0%	96.3%	91.7%	**97.3%**	-	**-**	-	94.9%	97.0%	0%	**95.3%**	-	0%	98.4%	0%	**98.4%**	-	97.2%
Single-Unit Trucks	0	5	3	0	**8**	-	**0**	-	25	1	0	**26**	-	0	13	0	**13**	-	47
% Single-Unit Trucks	0%	1.3%	1.4%	0%	**1.3%**	-	**-**	-	2.7%	0.5%	0%	**2.3%**	-	0%	0.8%	0%	**0.8%**	-	1.4%
Articulated Trucks	0	2	2	0	**4**	-	**0**	-	17	1	0	**18**	-	0	10	0	**10**	-	32
% Articulated Trucks	0%	0.5%	0.9%	0%	**0.6%**	-	**-**	-	1.9%	0.5%	0%	**1.6%**	-	0%	0.6%	0%	**0.6%**	-	1.0%
Buses	0	1	3	1	**5**	-	**0**	-	5	4	0	**9**	-	0	2	0	**2**	-	16
% Buses	0%	0.3%	1.4%	8.3%	**0.8%**	-	**-**	-	0.5%	2.0%	0%	**0.8%**	-	0%	0.1%	0%	**0.1%**	-	0.5%
Bicycles on Road	0	0	0	0	**0**	-	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	**-**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	1	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	0%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	0	-	-	-	-	1	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	100%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & EB East Long Lake Road - TMC
Wed Jun 1, 2022
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957210, Location: 42.591947, -83.129089

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Rochester Road & EB East Long Lake Road - TMC

Wed Jun 1, 2022
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957210, Location: 42.591947, -83.129089

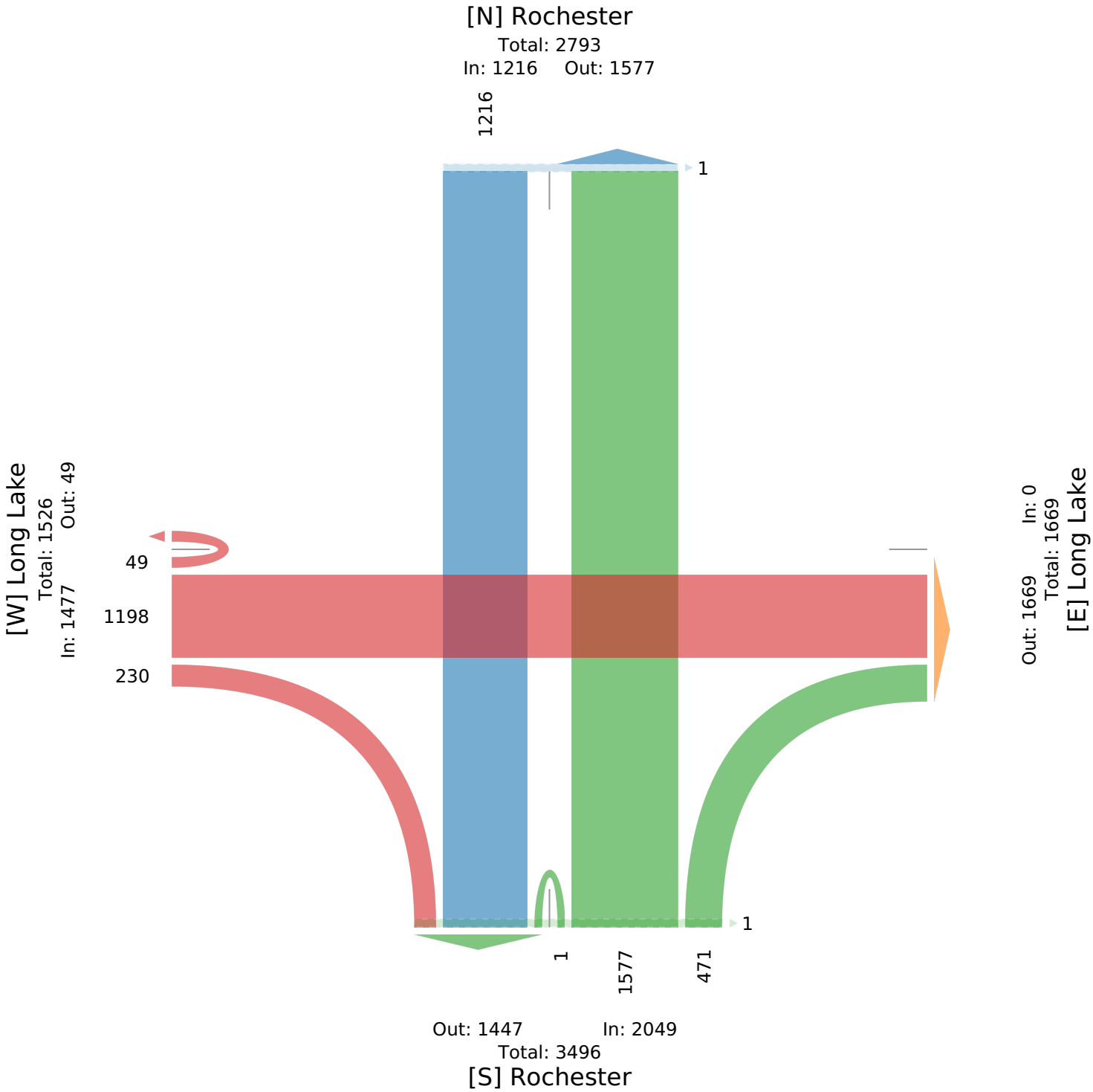
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Long Lake						Long Lake		Rochester					Rochester					
Direction	Eastbound						Westbound		Northbound					Southbound					
Time	L	T	R	U	App	Ped*	App	Ped*	T	R	U	App	Ped*	L	T	U	App	Ped*	Int
2022-06-01 4:45PM	0	296	52	8	**356**	0	**0**	0	394	119	0	**513**	0	0	312	0	**312**	0	**1181**
5:00PM	0	292	58	13	**363**	0	**0**	0	358	113	0	**471**	0	0	283	0	**283**	1	**1117**
5:15PM	0	334	64	15	**413**	0	**0**	0	393	114	1	**508**	1	0	294	0	**294**	0	**1215**
5:30PM	0	276	56	13	**345**	0	**0**	0	432	125	0	**557**	0	0	327	0	**327**	0	**1229**
Total	0	1198	230	49	**1477**	0	**0**	0	1577	471	1	**2049**	1	0	1216	0	**1216**	1	**4742**
% Approach	0%	81.1%	15.6%	3.3%	**-**	-	**-**	-	77.0%	23.0%	0%	**-**	-	0%	100%	0%	**-**	-	-
% Total	0%	25.3%	4.9%	1.0%	**31.1%**	-	**0%**	-	33.3%	9.9%	0%	**43.2%**	-	0%	25.6%	0%	**25.6%**	-	-
PHF	-	0.897	0.898	0.817	**0.894**	-	**-**	-	0.913	0.942	0.250	**0.920**	-	-	0.930	-	**0.930**	-	0.965
Lights	0	1182	222	49	**1453**	-	**0**	-	1566	470	1	**2037**	-	0	1207	0	**1207**	-	4697
% Lights	0%	98.7%	96.5%	100%	**98.4%**	-	**-**	-	99.3%	99.8%	100%	**99.4%**	-	0%	99.3%	0%	**99.3%**	-	99.1%
Single-Unit Trucks	0	16	5	0	**21**	-	**0**	-	9	1	0	**10**	-	0	4	0	**4**	-	35
% Single-Unit Trucks	0%	1.3%	2.2%	0%	**1.4%**	-	**-**	-	0.6%	0.2%	0%	**0.5%**	-	0%	0.3%	0%	**0.3%**	-	0.7%
Articulated Trucks	0	0	3	0	**3**	-	**0**	-	2	0	0	**2**	-	0	5	0	**5**	-	10
% Articulated Trucks	0%	0%	1.3%	0%	**0.2%**	-	**-**	-	0.1%	0%	0%	**0.1%**	-	0%	0.4%	0%	**0.4%**	-	0.2%
Buses	0	0	0	0	**0**	-	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Buses	0%	0%	0%	0%	**0%**	-	**-**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	0	0	0	**0**	-	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	**-**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	0	-	0	-	-	-	-	0	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	0	-	-	-	-	1	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Rochester Road & EB East Long Lake Road - TMC
Wed Jun 1, 2022
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 957210, Location: 42.591947, -83.129089

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: Long Lake + X/o w/o Rochester DATE: 7/30/19

CITY/TOWNSHIP: Troy BY: C. Markel

COUNTY#: 1058 STATE#: — CHARGES: 78010580

PLEASE PERFORM THE FOLLOWING:

_____ ELECTRICAL DEVICE: ____ INSTALL _____ MODERNIZE _____ MAINTENANCE

_____ UNDERGROUND: _____

_____ EDISON OK: _____ YES _____ NO JOB#: _____

_____ COORDINATE W/DISTRICT 7: _____

DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
_____ CHANGE TIMING.....																			
_____ CHANGE OFFSET.....																			
_____ CHANGE CYCLE LENGTH.....																			
_____ ADD DIAL/SPLIT.....																			

X CHANGE BREAKOUT OR EPROM: Change Personality → Rev #2 (Flexi plans)

_____ CHANGE HOURS OF OPERATION:

OLD: _____

NEW: _____

ROAD COMMISSION FOR OAKLAND COUNTY
AUG 15 2019
TRAFFIC OPERATIONS

_____ REPROGRAM TBC

_____ INSTALL INTERCONNECT: _____ TBC _____ MINITROL _____ TONE

_____ MBT OK: _____ YES _____ NO

_____ NO CHANGE - RECORD CORRECTION

X OTHER: Requires a checksum change.

APPROVED BY: _____ DATE: 8/12/19

DATE INSTALLED: 8/13/19

INSTALLED BY: Richardson Controller

INTERSECTION :- 1058 LONG LAKE & X/O W/O ROCHESTER
DESCRIPTION PROMS :- X01058D / F2002
CONTROLLER TYPE :- STANDARD PERSONALITY CONTROLLER
SOFTWARE TYPE :- MOD 52 SCATS

INPUTS :-

1.	X/O W/O ROCHESTER L PRES (LK)	9.	NOTE :- ALL DETECTORS ARE LOOPS.
2.	X/O W/O ROCHESTER C PRES (LK)	10.	
3.	X/O W/O ROCHESTER R PRES (LK)	11.	
4.	EB LONG LAKE L PRES (LK)	12.	
5.	EB LONG LAKE R PRES (LK)	13.	
6.		14.	
7.		15.	
8.		16.	Opticom 1

APPROACHES :-
A APPR 1 : EB LONG LAKE L,R
B APPR 1 : X/O W/O ROCHESTER L,C,R

FLEXIDATA :-

SEQUENCE	A,B	A,B
AUTO REL		
R- REL	A	A
R+ REL	B	B
Q- REL		
Q+ REL		
LOOKAHEAD		

SPECIAL FEATURES :-
The personality revision number is currently 2 (=B).

A STAGE HAS PERMANENT DEMAND.
DEMAND FOR STAGE B FLEXI AND ISOL, SET ZNEG TO DISABLE.

Opticom 1 calls A stage.

BACKPANEL :- SIZE M CABINET

LOAD SWITCH 2: LONG LAKE	A	FLA
LOAD SWITCH 4: X/O W/O ROCHESTER	B	FLR

JUMPERS : -
121-213,151-152,153-154,155-156,173-174,175-176,177-178,233-PB1,
237-PB1,241-PB1,255-156,257-258,259-260,261-262.

SIGNAL MONITOR :- NONE.
ALL SWITCHES OFF EXCEPT: DUAL SELECT A&B, G&Y ENABLE; SSM 2,4
MINIMUM FLASH = 4+2+1 = 7

```
********************************
* CONTROLLER INFORMATION SHEET *
*     FOR SITE NO.  1058       *
*          CARISSA MARKEL      *
*    DATE :- 30-JUL-2019       *
********************************
```

CHECKSUMS
TIMES: 5C/134
PERS: 85/205
TOTAL: D9/331

FLEXILINK PLAN DATA

Intersection # 1058 **State #** _____ **Date:** 07/30/19 **Prepared By:** Carissa Markel

Intersection: Long Lake & X/O W/O Rochester **City:** Troy

Hours of Operation: Mon-Fri: 6am-11pm; Sat-Sun: 8am-10pm **Approved By:** Rachel Jones

Hours of Flashing: Mon-Fri: 11pm-6am; Sat-Sun: 10pm-8am

		PL0	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8
0	CL		80	120	120					
1	A		0	0	0					
2	B		39	55	55					
3	C									
4	D									
5	E									
6	F									
7	G									
8	R-									
9	R+									
10	Of (Y-)		73	13	18					
11	Y+	C								
12	Z-									
13	Z+									
14	Q-									
15	Q+									
16	XH									
17	XL									

NOTE: Stages with 1 second of phase time are skipped. Blank entries are default values equal to 0. Except for an AWA controller, entries #8 to #15 (=254) and 'C' entry means continuous (=255).

							Timers		
Phase	**Direction**	**Min**	**Max**	**ECO**	**Amber**	**All Red**	**Gap**	**Hdwy**	**Waste**
A	Long Lake	10.0	80.0		4.3	1.3	3.0	1.2	10.0
B	X/O W/O Rochester	5.0	20.0		3.5	1.9	3.0	1.2	10.0
C									
D									
E									
F									
G									

	Day	Hours	Plan#
SC1	14	0:00	0
SC2	8	6:00	2
SC3	8	9:00	1
SC4	8	15:00	3
SC5	8	19:00	1
SC6	8	23:00	0
SC7	13	8:00	1
SC8	13	22:00	0
SC9			
SC10			

Pedestrian Crossing Times

Direction	Walk	CL 1	CL 2

TSM 16 = OPTICOM 1 ALARM TIME = 200

Normal Operating Mode

Isolated	Flexilink	Masterlink	Master Isolated	Flexi Isolated
		X		

DAY OF WEEK CODE NUMBER

0	End of Schedule	4	WED	8	MON-FRI	12	MON,FRI,SAT
1	SUN	5	THUR	9	MON-SAT	13	SAT,SUN
2	MON	6	FRI	10	TUE,WED,THU	14	EVERY DAY
3	TUE	7	SAT	11	MON,FRI	15	NEVER

D Connector Form for Mod 52 w/Loops

Intersection Name: Long Lake & X/O W/O Rochester
County No: 1058
Date: 07/30/19

Detector # on Print	Detector Description	D-Conn Term #	D-Conn Description	Phase
1	X/O W/O Rochester L	1	Det. 9	4
2	X/O W/O Rochester C	2	Det. 10	4
3	X/O W/O Rochester R	3	Det. 11	4
4	EB Long Lake L	4	Det. 12	2
5	EB Long Lake R	5	Det. 13	2
		6	Det. 14	
		7	Det. 15	
		8	Det. 16	
		9	Det. 17	
		10	Det. 18	
		11	Det. 19	
		12	Det. 20	
		13	Det. 21	
		14	Det. 22	
		15	Det. 23	
		16	Det. 24	
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		

INSTALL CONTROLLER & FOUNDATION

INSTALL 36' STEEL POLE & FOUNDATION

WOOD POLE
WIRE

INSTALL HANDHOLE

CABLE WIRE

EXIST. 3.05
EASEMENT

#885
CHILD CARE
CENTER

#835

GRAVEL

N

Movement Diagram

4

2

A B

XIST. 60' (18.29) R.O.W.

PROP. 1.52 S/W

EX. 1.52 S/W

INSTALL 6'X15' (FIGURE 8) TRAFFIC LOOPS

2-3"

3-4"

POCH 30'

1-4" CONDUIT TO
HANDHOLE EVERY
150-200'

MATCH LINE 10 + 25

9-00 9-25 9-50 9-75

1-4"

3 2 1

1-3"

49.91 FT. [15.211 M]

4

5

B A B T.S.#1

11'

C.S.#1

A T.S.#2

10'

B T.S.#3

32'

27'

1-3"

POCH 30'

1-3"

INSTALL HANDHOLE

PROP. 2.44 S/W

PROP. 19.81 R.O.W.

PROP. 1.52 EASEMENT

EXIST. 33' (10.06) R.O.W.

porch

#830

Long Lake @ Crossover - W - Rochester
CO#1058

All detectors are Loops.

INSTALL PIPE EXTENSION AS SHOWN:

T.S.#1 = NO PIPE EXTENSION

T.S.#2 = NO PIPE EXTENSION

INSTALL 36' STEEL POLE & FOUNDATION

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: Long Lake + Rochester DATE: 7/25/19

CITY/TOWNSHIP: Troy BY: C Markel

COUNTY#: 585 STATE#: — CHARGES: 78005850

PLEASE PERFORM THE FOLLOWING:

_____ ELECTRICAL DEVICE: ____ INSTALL _____ MODERNIZE _____ MAINTENANCE

_____ UNDERGROUND: ______

_____ EDISON OK: _____ YES _____ NO JOB#: ______

_____ COORDINATE W/DISTRICT 7: ______

DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
_____ CHANGE TIMING........................																			
_____ CHANGE OFFSET........................																			
_____ CHANGE CYCLE LENGTH..........																			
_____ ADD DIAL/SPLIT.........................																			

X CHANGE BREAKOUT OR EPROM: Change Personality → Rev#2 (Flexilink data, Det Alarm Cat)

_____ CHANGE HOURS OF OPERATION:

ROAD COMMISSION FOR OAKLAND COUNTY
AUG 15 2019
TRAFFIC OPERATIONS

OLD: ______

NEW: ______

_____ REPROGRAM TBC

_____ INSTALL INTERCONNECT: _____ TBC _____ MINITROL _____ TONE

_____ MBT OK: _____ YES _____ NO

_____ NO CHANGE - RECORD CORRECTION

X OTHER: Requires a Checksum change.

APPROVED BY: [signature] DATE: 8/12/19

DATE INSTALLED: 8/13/19

INSTALLED BY: RICHARDSON WILCOX/TR

INTERSECTION :- 585 LONG LAKE & ROCHESTER
DESCRIPTION PROMS :- X00585D / F2806
CONTROLLER TYPE :- STANDARD PERSONALITY CONTROLLER
SOFTWARE TYPE :- MOD 52 SCATS
INPUTS :-

1. WB LONG LAKE L PRES (LK)
2. WB LONG LAKE R PRES (LK)
3. WB LONG LAKE RT TIMED (3 SEC)
4. SB ROCHESTER L PRES (LK)
5. SB ROCHESTER C PRES (LK)
6. SB ROCHESTER R PRES (LK)
7. EB LONG LAKE L PRES (LK)
8. EB LONG LAKE R PRES (LK)
9. EB LONG LAKE RT TIMED (3 SEC)
10. NB ROCHESTER L PRES (LK)
11. NB ROCHESTER C PRES (LK)
12. NB ROCHESTER R PRES (LK)
13. -
14. -
15. -
16. -
17. - NOTE :- ALL DETECTORS ARE AUTOSCOPE
18. - (2004 CAMEARAS).
19. -
20. -
21. -
22. -
23. Opticom 2 (BACKPANEL VD7 (167))
24. Opticom 1 (BACKPANEL VD8 (175))

PED 2: NB ROCHESTER PED EAST P.B.
PED 4: WB LONG LAKE PED NORTH P.B.
PED 6: SB ROCHESTER PED WEST P.B.
PED 8: EB LONG LAKE PED SOUTH P.B.

APPROACHES :-

A APPR 1 : SB ROCHESTER L,R,RT
B APPR 1 : WB LONG LAKE L,R
B APPR 3 : EB LONG LAKE L,R
A APPR 2 : NB ROCHESTER L,R,RT
B APPR 2 : WB LONG LAKE RT
B APPR 4 : EB LONG LAKE RT

FLEXIDATA :-

SEQUENCE	A,B	A,B
AUTO REL		
R- REL	A	A
R+ REL	B	B
Q- REL		
Q+ REL		
LOOKAHEAD		

PEDESTRIANS :-
1. NO PED 1
2. NB ROCHESTER PED EAST (P-)
3. NO PED 3
4. WB LONG LAKE PED NORTH (P-)
5. NO PED 5
6. SB ROCHESTER PED WEST (P+)
7. NO PED 7
8. EB LONG LAKE PED SOUTH (P+)

SPECIAL FEATURES :-
The personality revision number is currently 2 (=B).

A stage has a permanent demand.
Demand for B stage in FLEXI & ISOL, set ZNEG to disable.

NB ROCHESTER NEAR has early cut-off operation in A stage.
SB ROCHESTER NEAR has early cut-off operation in A stage.

Opticom 2 calls B stage.
Opticom 1 calls A stage.

NB ROCHESTER PED EAST introduction is suppressed when OPTICOM is active.
WB LONG LAKE PED NORTH introduction is suppressed when OPTICOM is active.
SB ROCHESTER PED WEST introduction is suppressed when OPTICOM is active.
EB LONG LAKE PED SOUTH introduction is suppressed when OPTICOM is active.

BACKPANEL :- SIZE P44-12 CABINET

LOAD SWITCH 1 - SB ROCHESTER FAR	B	FLR
LOAD SWITCH 2 - NB ROCHESTER NEAR	A	FLR
LOAD SWITCH 4 - WB LONG LAKE	C	FLR
LOAD SWITCH 5 - NB ROCHESTER FAR	B	FLR
LOAD SWITCH 6 - SB ROCHESTER NEAR	A	FLR
LOAD SWITCH 8 - EB LONG LAKE	C	FLR
LOAD SWITCH 9 - NB ROCHESTER PED EAST	WA (P1)	
LOAD SWITCH 10- WB LONG LAKE PED NORTH	WC (P2)	
LOAD SWITCH 11- SB ROCHESTER PED WEST	WA (P1)	
LOAD SWITCH 12- EB LONG LAKE PED SOUTH	WC (P2)	

JUMPERS :-

189-190,191-192,193-194,195-196,197-198,199-200,201-202,207-208,217-218,
219-220,221-222,223-224,229-230,233-234,235-236,237-238,239-240,241-242,
243-244,245-246,251-252,261-262,263-264,265-266,267-268,273-274,298-302,
321-322,323-324,325-326,327-328,329-PB1,334-335,343-PB1,347-348,349-350,
351-PB1,356-357,365-366,367-368,369-370,371-372,373-PB1,378-379,387-PB1,
391-392,393-394,395-PB1,400-401.

SIGNAL MONITOR :- 1-2,1-5,1-6,2-5,2-6,4-8,5-6.

All switches OFF EXCEPT: Dual Select A&B; G&Y Enable; SSM 1,2,4,5,6,8.
Minimum Flash = 4 + 2 + 1.

```
********************************
* CONTROLLER INFORMATION SHEET *     CHECKSUMS
*     FOR SITE NO.   585       *     TIMES: 54/124
*        CARISSA MARKEL        *     PERS:  E6/346
*    DATE :- 25-JUL-2019       *     TOTAL: B2/262
********************************
```

FLEXILINK PLAN DATA

Intersection # 585 **State #** _____ **Date:** 07/25/19 **Prepared By:** Carissa Markel

Intersection: Long Lake & Rochester **City:** Troy

Hours of Operation: 7 Days: 24 Hours **Approved By:** Rachel Jones

Hours of Flashing: None

		PL0	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8
0	CL		80	120	120					
1	A		0	0	0					
2	B		41	65	65					
3	C									
4	D									
5	E									
6	F									
7	G									
8	R-									
9	R+									
10	Of (Y-)		36	72	77					
11	Y+	C								
12	Z-									
13	Z+									
14	Q-									
15	Q+									
16	XH									
17	XL									

NOTE: Stages with 1 second of phase time are skipped. Blank entries are default values equal to 0. Except for an AWA controller, entries #8 to #15 (=254) and 'C' entry means continuous (=255).

							Timers		
Phase	**Direction**	**Min**	**Max**	**ECO**	**Amber**	**All Red**	**Gap**	**Hdwy**	**Waste**
A	Rochester	10.0	80.0	3.0	4.3	2.4	3.0	1.2	10.0
B	Long Lake	8.0	20.0		4.3	2.5	3.0	1.2	10.0
C									
D									
E									
F									
G									

	Day	Hours	Plan#
SC1	14	0:00	1
SC2	8	6:00	2
SC3	8	9:00	1
SC4	8	15:00	3
SC5	8	19:00	1
SC6			
SC7			
SC8			
SC9			
SC10			

Pedestrian Crossing Times

Direction	Walk	CL 1	CL 2
NB Rochester Ped East (Ped 2)	7.0	5.0	3.7
WB Long Lake Ped North (Ped 4)	7.0	22.0	3.8
SB Rochester Ped West (Ped 6)	7.0	5.0	3.7
EB Long Lake Ped South (Ped 8)	7.0	22.0	3.8

Normal Operating Mode

Isolated	Flexilink	Masterlink	Master Isolated	Flexi Isolated
		X		

DAY OF WEEK CODE NUMBER

0	End of Schedule	4	WED	8	MON-FRI	12	MON,FRI,SAT
1	SUN	5	THUR	9	MON-SAT	13	SAT,SUN
2	MON	6	FRI	10	TUE,WED,THU	14	EVERY DAY
3	TUE	7	SAT	11	MON,FRI	15	NEVER

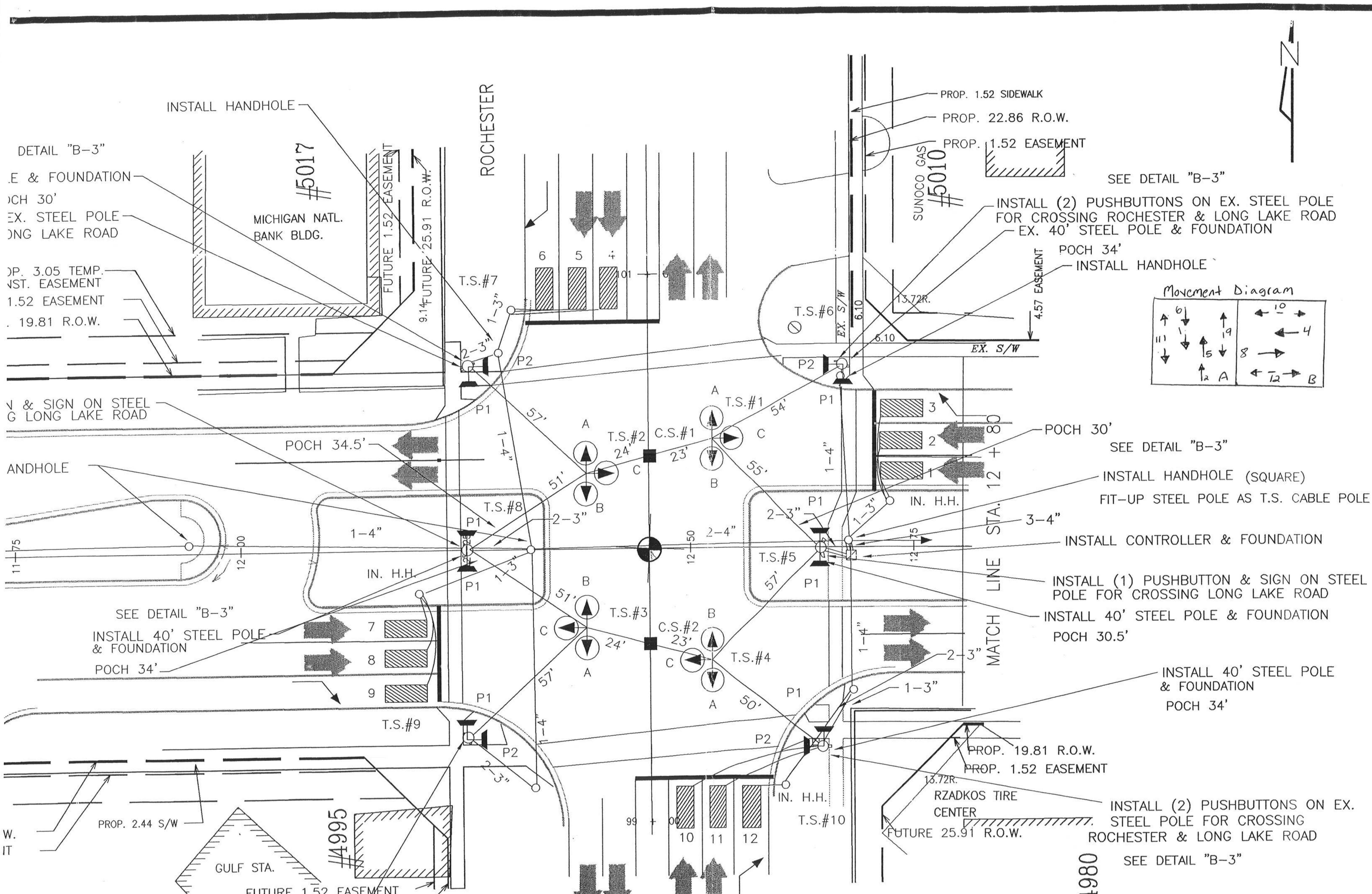
Autoscope 37-Pin Male Output Harness (33457G2) Wiring

Autoscope Output Harness Pins #1 & #20 to Logic Common & Pins #18 & # 37 to +24 VDC **CO#585**

Camera Number	EIM Switch Position	EIM LED#	Output Harness Pin#	D-Conn Pin (1,2,..)	Vehicle Detector No.		Detector Description	Phase No. (1,2,3,...)
					D-Conn format (9,10,...)	On Print (1,2,..)		
1	1	1	29	1	9	1	WB LONG LAKE L	4
	1	2	30	2	10	2	WB LONG LAKE R	4
	1	3	31	3	11	3	WB LONG LAKE RT	4
	1	4	32					
	1	5	33					
	1	6	34					
	1	7	35					
	1	8	36					
2	2	1	10	4	12	4	SB ROCHESTER L	6
	2	2	11	5	13	5	SB ROCHESTER R	6
	2	3	12	6	14	6	SB ROCHESTER RT	6
	2	4	13					
	2	5	14					
	2	6	15					
	2	7	16					
	2	8	17					
3	3	1	21	7	15	7	EB LONG LAKE L	8
	3	2	22	8	16	8	EB LONG LAKE R	8
	3	3	23	9	17	9	EB LONG LAKE RT	8
	3	4	24					
	3	5	25					
	3	6	26					
	3	7	27					
	3	8	28					
4	4	1	2	10	18	10	NB ROCHESTER L	2
	4	2	3	11	19	11	NB ROCHESTER R	2
	4	3	4	12	20	12	NB ROCHESTER RT	2
	4	4	5					
	4	5	6					
	4	6	7					
	4	7	8					
	4	8	9					

Autoscope 37-Pin Female Input Harness (33457G3) Wiring

EIM Switch Position	EIM LED#	Input Harness Pin#	Phase Status Input From +24 VDC	Backpanel Terminal Position and Number
5	1	29	Phase 8 Green	LS 8 Green 265
5	1	30	Phase 7 Green	
5	1	31	Phase 6 Green	LS 6 Green 243
5	1	32	Phase 5 Green	
5	1	33	Phase 4 Green	LS 4 Green 221
5	1	34	Phase 3 Green	
5	1	35	Phase 2 Green	LS 2 Green 199
5	1	36	Phase 1 Green	
6	2	10	Phase 8 Red	LS 8 Red 261
6	2	11	Phase 7 Red	
6	2	12	Phase 6 Red	LS 6 Red 239
6	2	13	Phase 5 Red	
6	2	14	Phase 4 Red	LS 4 Red 217
6	2	15	Phase 3 Red	
6	2	16	Phase 2 Red	LS 2 Red 195
6	2	17	Phase 1 Red	



INSTALL HANDHOLE
DETAIL "B-3"
E & FOUNDATION
OCH 30'
EX. STEEL POLE
ONG LAKE ROAD
P. 3.05 TEMP. NST. EASEMENT
1.52 EASEMENT
19.81 R.O.W.
MICHIGAN NATL. BANK BLDG.
#5017
FUTURE 1.52 EASEMENT
FUTURE 25.91 R.O.W.
ROCHESTER
T.S.#7
PROP. 1.52 SIDEWALK
PROP. 22.86 R.O.W.
PROP. 1.52 EASEMENT
SUNOCO GAS #5010
SEE DETAIL "B-3"
INSTALL (2) PUSHBUTTONS ON EX. STEEL POLE FOR CROSSING ROCHESTER & LONG LAKE ROAD
EX. 40' STEEL POLE & FOUNDATION
POCH 34'
INSTALL HANDHOLE
4.57 EASEMENT
T.S.#6
EX. S/W
13.72R.
Movement Diagram
N & SIGN ON STEEL
G LONG LAKE ROAD
POCH 34.5'
ANDHOLE
T.S.#1
T.S.#2
C.S.#1
POCH 30'
SEE DETAIL "B-3"
INSTALL HANDHOLE (SQUARE)
FIT-UP STEEL POLE AS T.S. CABLE POLE
T.S.#8
IN. H.H.
3-4"
INSTALL CONTROLLER & FOUNDATION
T.S.#5
MATCH LINE STA. 12 + 80
INSTALL (1) PUSHBUTTON & SIGN ON STEEL POLE FOR CROSSING LONG LAKE ROAD
INSTALL 40' STEEL POLE & FOUNDATION
POCH 30.5'
SEE DETAIL "B-3"
INSTALL 40' STEEL POLE & FOUNDATION
POCH 34'
T.S.#3
C.S.#2
T.S.#4
INSTALL 40' STEEL POLE & FOUNDATION
POCH 34'
T.S.#9
PROP. 19.81 R.O.W.
PROP. 1.52 EASEMENT
RZADKOS TIRE CENTER
FUTURE 25.91 R.O.W.
T.S.#10
INSTALL (2) PUSHBUTTONS ON EX. STEEL POLE FOR CROSSING ROCHESTER & LONG LAKE ROAD
SEE DETAIL "B-3"
PROP. 2.44 S/W
#4995
GULF STA.
FUTURE 1.52 EASEMENT
#4980

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 controlled movement is a function three (capacity) factors: distribution of gaps in the major-street traffic stream, driver judgment in selecting gaps through which to execute the desired maneuvers, and the follow-up headways required by each driver in a queue.

The basic capacity model assumes gaps in the conflicting movements are randomly distributed. When traffic 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 Vehciles)

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

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

The LOS criteria for TWSC intersections differ somewhat from the criteria used in Chapter 19 for signalized intersections, primarily because user perceptions differ among transportation facility types. The expectation is that a signalized intersection is designed to carry higher traffic volumes and will present greater delay than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection.

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

Source: Highway Capacity Manual, 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 if vehicle stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D describes operations with control delay between 35 and 55 s/veh. This level is typically assigned when when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E describes operations with control delay between 55 and 80 s/veh. This level is typically assigned when when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level, considered to be unacceptable to most drivers, often occurs with over-saturation, that is, when arrival flow rates exceed the capacity of the intersection. This level is typically assigned when the volume-to-capacity ratio is high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

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

Intersection	
Int Delay, s/veh	1.8

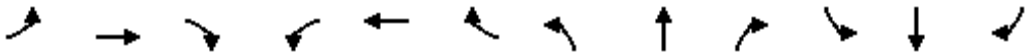
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	28	4	0	2	7	1384	6	2	1924	3
Future Vol, veh/h	0	0	28	4	0	2	7	1384	6	2	1924	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	500	-	-	500	-	450
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	60	60	60	83	83	83	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	5	5	5	2	2	2
Mvmt Flow	0	0	34	7	0	3	8	1667	7	2	2091	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1046	2737	3785	837	2094	0	0	1674	0	0
Stage 1	-	-	-	1687	1687	-	-	-	-	-	-	-
Stage 2	-	-	-	1050	2098	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.2	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.25	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	*288	*10	*0	314	*423	-	-	379	-	-
Stage 1	0	0	-	*100	*151	-	-	-	-	-	-	-
Stage 2	0	0	-	*272	*238	-	-	-	-	-	-	-
Platoon blocked, %			1	1	1		1	-	-		-	-
Mov Cap-1 Maneuver	-	-	*288	*8	*0	314	*423	-	-	379	-	-
Mov Cap-2 Maneuver	-	-	-	*8	*0	-	-	-	-	-	-	-
Stage 1	-	-	-	*98	*148	-	-	-	-	-	-	-
Stage 2	-	-	-	*239	*237	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.2	$ 605	0.1	0
HCM LOS	C	F		

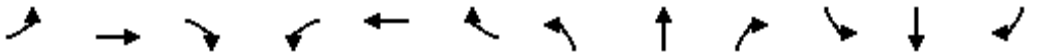
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 423	-	-	288	12	379	-	-
HCM Lane V/C Ratio	0.02	-	-	0.117	0.833	0.006	-	-
HCM Control Delay (s)	13.7	-	-	19.2	$ 605	14.6	-	-
HCM Lane LOS	B	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	1.8	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



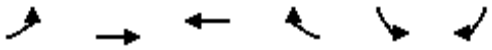
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱					↑↑	↱		↑↑	
Traffic Volume (vph)	0	524	288	0	0	0	0	1133	253	0	1641	0
Future Volume (vph)	0	524	288	0	0	0	0	1133	253	0	1641	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.7	6.7					9.8	9.8		6.8	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3689	1650					3619	1619		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3689	1650					3619	1619		3762	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	0	570	313	0	0	0	0	1333	298	0	1823	0
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	92	0	0	0
Lane Group Flow (vph)	0	570	276	0	0	0	0	1333	206	0	1823	0
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	5%	5%	5%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases			4						2			
Actuated Green, G (s)		48.3	48.3					55.2	55.2		58.2	
Effective Green, g (s)		48.3	48.3					55.2	55.2		58.2	
Actuated g/C Ratio		0.40	0.40					0.46	0.46		0.49	
Clearance Time (s)		6.7	6.7					9.8	9.8		6.8	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		1484	664					1664	744		1824	
v/s Ratio Prot		0.15						0.37			c0.48	
v/s Ratio Perm			c0.17						0.13			
v/c Ratio		0.38	0.42					0.80	0.28		1.00	
Uniform Delay, d1		25.3	25.7					27.7	20.1		30.9	
Progression Factor		0.67	0.60					1.00	1.00		0.04	
Incremental Delay, d2		0.2	0.4					4.2	0.9		6.2	
Delay (s)		17.2	15.8					31.9	21.0		7.5	
Level of Service		B	B					C	C		A	
Approach Delay (s)		16.7			0.0			29.9			7.5	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1308	229	0	1133	0	0	1641	222
Future Volume (vph)	0	0	0	0	1308	229	0	1133	0	0	1641	222
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.7	6.7		6.8			9.8	9.8
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3725	1667		3619			3762	1683
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3725	1667		3619			3762	1683
Peak-hour factor, PHF	0.92	0.92	0.92	0.81	0.81	0.81	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	1615	283	0	1333	0	0	1823	247
RTOR Reduction (vph)	0	0	0	0	0	37	0	0	0	0	0	18
Lane Group Flow (vph)	0	0	0	0	1615	246	0	1333	0	0	1823	229
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	5%	5%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	Perm
Protected Phases					8			6			2	
Permitted Phases						8						2
Actuated Green, G (s)					48.3	48.3		58.2			55.2	55.2
Effective Green, g (s)					48.3	48.3		58.2			55.2	55.2
Actuated g/C Ratio					0.40	0.40		0.49			0.46	0.46
Clearance Time (s)					6.7	6.7		6.8			9.8	9.8
Vehicle Extension (s)					3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)					1499	670		1755			1730	774
v/s Ratio Prot					c0.43			0.37			c0.48	
v/s Ratio Perm						0.15						0.14
v/c Ratio					1.08	0.37		0.76			1.05	0.30
Uniform Delay, d1					35.9	25.1		25.2			32.4	20.2
Progression Factor					1.00	1.00		0.00			1.00	1.00
Incremental Delay, d2					47.2	0.3		1.8			37.4	1.0
Delay (s)					83.0	25.5		1.8			69.8	21.2
Level of Service					F	C		A			E	C
Approach Delay (s)		0.0			74.4			1.8			64.0	
Approach LOS		A			E			A			E	

Intersection Summary			
HCM 2000 Control Delay	52.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	594	0	0	218	0
Future Volume (vph)	0	594	0	0	218	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.6			5.4	
Lane Util. Factor		0.95			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3689			1863	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3689			1863	
Peak-hour factor, PHF	0.84	0.84	0.92	0.92	0.86	0.86
Adj. Flow (vph)	0	707	0	0	253	0
RTOR Reduction (vph)	0	0	0	0	76	0
Lane Group Flow (vph)	0	707	0	0	177	0
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type		NA			Prot	
Protected Phases		2			4	
Permitted Phases						
Actuated Green, G (s)		54.4			54.6	
Effective Green, g (s)		54.4			54.6	
Actuated g/C Ratio		0.45			0.46	
Clearance Time (s)		5.6			5.4	
Vehicle Extension (s)		0.2			0.2	
Lane Grp Cap (vph)		1672			847	
v/s Ratio Prot		c0.19			c0.09	
v/s Ratio Perm						
v/c Ratio		0.42			0.21	
Uniform Delay, d1		22.2			19.7	
Progression Factor		1.00			1.87	
Incremental Delay, d2		0.8			0.2	
Delay (s)		23.0			36.9	
Level of Service		C			D	
Approach Delay (s)		23.0	0.0		36.9	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	594	0	0	1312	0	0
Future Vol, veh/h	594	0	0	1312	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	646	0	0	1426	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	646	0	1359	323
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	713	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	935	-	140	673
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	447	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	935	-	140	673
Mov Cap-2 Maneuver	-	-	-	-	276	-
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	447	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	935	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	23

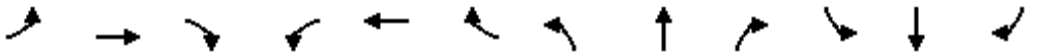
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	21	5	0	18	14	2055	9	9	1436	4
Future Vol, veh/h	0	0	21	5	0	18	14	2055	9	9	1436	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	500	-	-	500	-	450
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	60	60	60	93	93	93	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	1	1	1
Mvmt Flow	0	0	33	8	0	30	15	2210	10	9	1512	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	756	3019	3779	1110	1516	0	0	2220	0	0
Stage 1	-	-	-	2245	2245	-	-	-	-	-	-	-
Stage 2	-	-	-	774	1534	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	0	0	*493	*~ 3	*0	207	*738	-	-	235	-	-
Stage 1	0	0	-	*44	*79	-	-	-	-	-	-	-
Stage 2	0	0	-	*465	*407	-	-	-	-	-	-	-
Platoon blocked, %			1	1	1		1	-	-		-	-
Mov Cap-1 Maneuver	-	-	*493	*~ 2	*0	207	*738	-	-	235	-	-
Mov Cap-2 Maneuver	-	-	-	*~ 2	*0	-	-	-	-	-	-	-
Stage 1	-	-	-	*43	*77	-	-	-	-	-	-	-
Stage 2	-	-	-	*417	*392	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.8	$ 2280.5	0.1	0.1
HCM LOS	B	F		

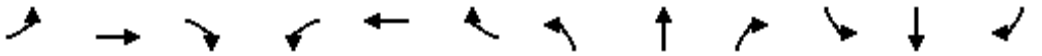
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 738	-	-	493	9	235	-	-
HCM Lane V/C Ratio	0.02	-	-	0.068	4.259	0.04	-	-
HCM Control Delay (s)	10	-	-	12.8	$ 2280.5	21	-	-
HCM Lane LOS	A	-	-	B	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	6	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



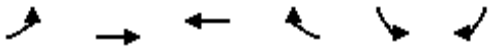
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱					↑↑	↱		↑↑	
Traffic Volume (vph)	0	1269	235	0	0	0	0	1596	477	0	1214	0
Future Volume (vph)	0	1269	235	0	0	0	0	1596	477	0	1214	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.7	6.7					9.8	9.8		6.8	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3725	1667					3762	1683		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3725	1667					3762	1683		3762	
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	1426	264	0	0	0	0	1735	518	0	1278	0
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	1426	226	0	0	0	0	1735	500	0	1278	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases			4						2			
Actuated Green, G (s)		46.3	46.3					57.2	57.2		60.2	
Effective Green, g (s)		46.3	46.3					57.2	57.2		60.2	
Actuated g/C Ratio		0.39	0.39					0.48	0.48		0.50	
Clearance Time (s)		6.7	6.7					9.8	9.8		6.8	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		1437	643					1793	802		1887	
v/s Ratio Prot		c0.38						c0.46			0.34	
v/s Ratio Perm			0.14						0.30			
v/c Ratio		0.99	0.35					0.97	0.62		0.68	
Uniform Delay, d1		36.7	26.2					30.5	23.4		22.6	
Progression Factor		0.62	0.57					1.00	1.00		0.00	
Incremental Delay, d2		19.3	0.3					14.9	3.6		1.4	
Delay (s)		42.1	15.3					45.4	27.0		1.4	
Level of Service		D	B					D	C		A	
Approach Delay (s)		37.9			0.0			41.1			1.4	
Approach LOS		D			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	684	228	0	1596	0	0	1214	256
Future Volume (vph)	0	0	0	0	684	228	0	1596	0	0	1214	256
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.7	6.7		6.8			9.8	9.8
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3762	1683		3762			3762	1683
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3762	1683		3762			3762	1683
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	720	240	0	1735	0	0	1278	269
RTOR Reduction (vph)	0	0	0	0	0	38	0	0	0	0	0	48
Lane Group Flow (vph)	0	0	0	0	720	202	0	1735	0	0	1278	221
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	Perm
Protected Phases					8			6			2	
Permitted Phases						8						2
Actuated Green, G (s)					46.3	46.3		60.2			57.2	57.2
Effective Green, g (s)					46.3	46.3		60.2			57.2	57.2
Actuated g/C Ratio					0.39	0.39		0.50			0.48	0.48
Clearance Time (s)					6.7	6.7		6.8			9.8	9.8
Vehicle Extension (s)					3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)					1451	649		1887			1793	802
v/s Ratio Prot					c0.19			c0.46			0.34	
v/s Ratio Perm						0.12						0.13
v/c Ratio					0.50	0.31		0.92			0.71	0.28
Uniform Delay, d1					28.0	25.7		27.7			24.9	18.9
Progression Factor					1.00	1.00		0.02			1.00	1.00
Incremental Delay, d2					0.3	0.3		2.9			2.4	0.9
Delay (s)					28.3	26.0		3.6			27.3	19.8
Level of Service					C	C		A			C	B
Approach Delay (s)		0.0			27.7			3.6			26.0	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↰	
Traffic Volume (vph)	0	1251	0	0	253	0
Future Volume (vph)	0	1251	0	0	253	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.6			5.4	
Lane Util. Factor		0.95			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3725			1881	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3725			1881	
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.95	0.95
Adj. Flow (vph)	0	1331	0	0	266	0
RTOR Reduction (vph)	0	0	0	0	19	0
Lane Group Flow (vph)	0	1331	0	0	247	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Turn Type		NA			Prot	
Protected Phases		2			3	
Permitted Phases						
Actuated Green, G (s)		61.4			47.6	
Effective Green, g (s)		61.4			47.6	
Actuated g/C Ratio		0.51			0.40	
Clearance Time (s)		5.6			5.4	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		1905			746	
v/s Ratio Prot		c0.36			c0.13	
v/s Ratio Perm						
v/c Ratio		0.70			0.33	
Uniform Delay, d1		22.3			25.1	
Progression Factor		1.00			1.36	
Incremental Delay, d2		2.2			1.1	
Delay (s)		24.4			35.2	
Level of Service		C			D	
Approach Delay (s)		24.4	0.0		35.2	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1251	0	0	687	0	0
Future Vol, veh/h	1251	0	0	687	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	95	95	92	92
Heavy Vehicles, %	3	3	2	2	2	2
Mvmt Flow	1331	0	0	723	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1331	0	1693	666
Stage 1	-	-	-	-	1331	-
Stage 2	-	-	-	-	362	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	514	-	84	402
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	675	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	514	-	84	402
Mov Cap-2 Maneuver	-	-	-	-	172	-
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	675	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	514	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	3.3

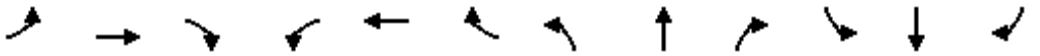
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	29	4	0	2	7	1419	6	2	1973	3
Future Vol, veh/h	0	0	29	4	0	2	7	1419	6	2	1973	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	500	-	-	500	-	450
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	60	60	60	83	83	83	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	5	5	5	2	2	2
Mvmt Flow	0	0	35	7	0	3	8	1710	7	2	2145	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1073	2807	3882	859	2148	0	0	1717	0	0
Stage 1	-	-	-	1730	1730	-	-	-	-	-	-	-
Stage 2	-	-	-	1077	2152	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.2	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.25	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	*262	*~ 6	*0	304	*385	-	-	365	-	-
Stage 1	0	0	-	*94	*144	-	-	-	-	-	-	-
Stage 2	0	0	-	*248	*217	-	-	-	-	-	-	-
Platoon blocked, %			1	1	1		1	-	-		-	-
Mov Cap-1 Maneuver	-	-	*262	*~ 5	*0	304	*385	-	-	365	-	-
Mov Cap-2 Maneuver	-	-	-	*~ 5	*0	-	-	-	-	-	-	-
Stage 1	-	-	-	*92	*141	-	-	-	-	-	-	-
Stage 2	-	-	-	*213	*216	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.8	$ 1198.7	0.1	0
HCM LOS	C	F		

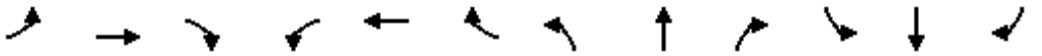
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 385	-	-	262	7	365	-	-
HCM Lane V/C Ratio	0.022	-	-	0.133	1.429	0.006	-	-
HCM Control Delay (s)	14.6	-	-	20.8	$ 1198.7	14.9	-	-
HCM Lane LOS	B	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	2.1	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



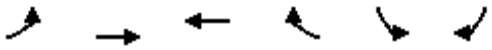
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱					↑↑	↱		↑↑	
Traffic Volume (vph)	0	538	295	0	0	0	0	1162	259	0	1683	0
Future Volume (vph)	0	538	295	0	0	0	0	1162	259	0	1683	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.7	6.7					9.8	9.8		6.8	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3689	1650					3619	1619		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3689	1650					3619	1619		3762	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	0	585	321	0	0	0	0	1367	305	0	1870	0
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	87	0	0	0
Lane Group Flow (vph)	0	585	284	0	0	0	0	1367	218	0	1870	0
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	5%	5%	5%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases			4						2			
Actuated Green, G (s)		48.3	48.3					55.2	55.2		58.2	
Effective Green, g (s)		48.3	48.3					55.2	55.2		58.2	
Actuated g/C Ratio		0.40	0.40					0.46	0.46		0.49	
Clearance Time (s)		6.7	6.7					9.8	9.8		6.8	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		1484	664					1664	744		1824	
v/s Ratio Prot		0.16						0.38			c0.50	
v/s Ratio Perm			c0.17						0.13			
v/c Ratio		0.39	0.43					0.82	0.29		1.03	
Uniform Delay, d1		25.5	25.9					28.1	20.2		30.9	
Progression Factor		0.67	0.60					1.00	1.00		0.04	
Incremental Delay, d2		0.2	0.4					4.7	1.0		14.2	
Delay (s)		17.3	15.9					32.8	21.2		15.6	
Level of Service		B	B					C	C		B	
Approach Delay (s)		16.8			0.0			30.7			15.6	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1341	235	0	1162	0	0	1683	228
Future Volume (vph)	0	0	0	0	1341	235	0	1162	0	0	1683	228
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.7	6.7		6.8			9.8	9.8
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3725	1667		3619			3762	1683
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3725	1667		3619			3762	1683
Peak-hour factor, PHF	0.92	0.92	0.92	0.81	0.81	0.81	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	1656	290	0	1367	0	0	1870	253
RTOR Reduction (vph)	0	0	0	0	0	37	0	0	0	0	0	18
Lane Group Flow (vph)	0	0	0	0	1656	253	0	1367	0	0	1870	235
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	5%	5%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	Perm
Protected Phases					8			6			2	
Permitted Phases						8						2
Actuated Green, G (s)					48.3	48.3		58.2			55.2	55.2
Effective Green, g (s)					48.3	48.3		58.2			55.2	55.2
Actuated g/C Ratio					0.40	0.40		0.49			0.46	0.46
Clearance Time (s)					6.7	6.7		6.8			9.8	9.8
Vehicle Extension (s)					3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)					1499	670		1755			1730	774
v/s Ratio Prot					c0.44			0.38			c0.50	
v/s Ratio Perm						0.15						0.14
v/c Ratio					1.10	0.38		0.78			1.08	0.30
Uniform Delay, d1					35.9	25.3		25.6			32.4	20.3
Progression Factor					1.00	1.00		0.00			1.00	1.00
Incremental Delay, d2					57.5	0.4		1.9			47.1	1.0
Delay (s)					93.4	25.6		1.9			79.5	21.3
Level of Service					F	C		A			E	C
Approach Delay (s)		0.0			83.3			1.9			72.6	
Approach LOS		A			F			A			E	

Intersection Summary			
HCM 2000 Control Delay	58.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	609	0	0	224	0
Future Volume (vph)	0	609	0	0	224	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.6			5.4	
Lane Util. Factor		0.95			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3689			1863	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3689			1863	
Peak-hour factor, PHF	0.84	0.84	0.92	0.92	0.86	0.86
Adj. Flow (vph)	0	725	0	0	260	0
RTOR Reduction (vph)	0	0	0	0	72	0
Lane Group Flow (vph)	0	725	0	0	188	0
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type		NA			Prot	
Protected Phases		2			4	
Permitted Phases						
Actuated Green, G (s)		54.4			54.6	
Effective Green, g (s)		54.4			54.6	
Actuated g/C Ratio		0.45			0.46	
Clearance Time (s)		5.6			5.4	
Vehicle Extension (s)		0.2			0.2	
Lane Grp Cap (vph)		1672			847	
v/s Ratio Prot		c0.20			c0.10	
v/s Ratio Perm						
v/c Ratio		0.43			0.22	
Uniform Delay, d1		22.3			19.8	
Progression Factor		1.00			1.74	
Incremental Delay, d2		0.8			0.1	
Delay (s)		23.1			34.6	
Level of Service		C			C	
Approach Delay (s)		23.1	0.0		34.6	
Approach LOS		C	A		C	

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	609	0	0	1345	0	0
Future Vol, veh/h	609	0	0	1345	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	86	86	92	92
Heavy Vehicles, %	3	3	2	2	2	2
Mvmt Flow	725	0	0	1564	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	725	0	1507	363
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	782	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	874	-	112	634
Stage 1	-	-	-	-	440	-
Stage 2	-	-	-	-	411	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	874	-	112	634
Mov Cap-2 Maneuver	-	-	-	-	245	-
Stage 1	-	-	-	-	440	-
Stage 2	-	-	-	-	411	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	874	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	22.5

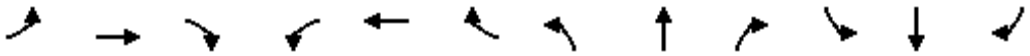
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	22	5	0	18	14	2107	9	9	1473	4
Future Vol, veh/h	0	0	22	5	0	18	14	2107	9	9	1473	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	500	-	-	500	-	450
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	60	60	60	93	93	93	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	1	1	1
Mvmt Flow	0	0	35	8	0	30	15	2266	10	9	1551	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	776	3095	3874	1138	1555	0	0	2276	0	0
Stage 1	-	-	-	2301	2301	-	-	-	-	-	-	-
Stage 2	-	-	-	794	1573	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	0	0	*468	*~ 2	*0	198	*699	-	-	224	-	-
Stage 1	0	0	-	*40	*74	-	-	-	-	-	-	-
Stage 2	0	0	-	*441	*386	-	-	-	-	-	-	-
Platoon blocked, %			1	1	1		1	-	-		-	-
Mov Cap-1 Maneuver	-	-	*468	*~ 2	*0	198	*699	-	-	224	-	-
Mov Cap-2 Maneuver	-	-	-	*~ 2	*0	-	-	-	-	-	-	-
Stage 1	-	-	-	*39	*72	-	-	-	-	-	-	-
Stage 2	-	-	-	*392	*371	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.3	$ 2280.5	0.1	0.1
HCM LOS	B	F		

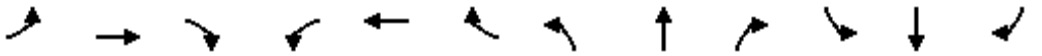
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 699	-	-	468	9	224	-	-
HCM Lane V/C Ratio	0.022	-	-	0.075	4.259	0.042	-	-
HCM Control Delay (s)	10.3	-	-	13.3	$ 2280.5	21.8	-	-
HCM Lane LOS	B	-	-	B	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	6	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



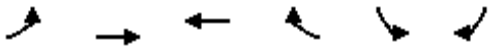
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱					↑↑	↱		↑↑	
Traffic Volume (vph)	0	1301	241	0	0	0	0	1636	489	0	1245	0
Future Volume (vph)	0	1301	241	0	0	0	0	1636	489	0	1245	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.7	6.7					9.8	9.8		6.8	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3725	1667					3762	1683		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3725	1667					3762	1683		3762	
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	1462	271	0	0	0	0	1778	532	0	1311	0
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	1462	233	0	0	0	0	1778	514	0	1311	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases			4						2			
Actuated Green, G (s)		46.3	46.3					57.2	57.2		60.2	
Effective Green, g (s)		46.3	46.3					57.2	57.2		60.2	
Actuated g/C Ratio		0.39	0.39					0.48	0.48		0.50	
Clearance Time (s)		6.7	6.7					9.8	9.8		6.8	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		1437	643					1793	802		1887	
v/s Ratio Prot		c0.39						c0.47			0.35	
v/s Ratio Perm			0.14						0.31			
v/c Ratio		1.02	0.36					0.99	0.64		0.69	
Uniform Delay, d1		36.9	26.3					31.2	23.7		22.9	
Progression Factor		0.63	0.59					1.00	1.00		0.00	
Incremental Delay, d2		25.5	0.3					19.4	3.9		1.4	
Delay (s)		48.6	15.7					50.5	27.6		1.4	
Level of Service		D	B					D	C		A	
Approach Delay (s)		43.4			0.0			45.2			1.4	
Approach LOS		D			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	701	234	0	1636	0	0	1245	262
Future Volume (vph)	0	0	0	0	701	234	0	1636	0	0	1245	262
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.7	6.7		6.8			9.8	9.8
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3762	1683		3762			3762	1683
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3762	1683		3762			3762	1683
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	738	246	0	1778	0	0	1311	276
RTOR Reduction (vph)	0	0	0	0	0	38	0	0	0	0	0	45
Lane Group Flow (vph)	0	0	0	0	738	208	0	1778	0	0	1311	231
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	Perm
Protected Phases					8			6			2	
Permitted Phases						8						2
Actuated Green, G (s)					46.3	46.3		60.2			57.2	57.2
Effective Green, g (s)					46.3	46.3		60.2			57.2	57.2
Actuated g/C Ratio					0.39	0.39		0.50			0.48	0.48
Clearance Time (s)					6.7	6.7		6.8			9.8	9.8
Vehicle Extension (s)					3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)					1451	649		1887			1793	802
v/s Ratio Prot					c0.20			c0.47			0.35	
v/s Ratio Perm						0.12						0.14
v/c Ratio					0.51	0.32		0.94			0.73	0.29
Uniform Delay, d1					28.2	25.8		28.3			25.2	19.0
Progression Factor					1.00	1.00		0.03			1.00	1.00
Incremental Delay, d2					0.3	0.3		3.3			2.7	0.9
Delay (s)					28.4	26.1		4.2			27.9	20.0
Level of Service					C	C		A			C	B
Approach Delay (s)		0.0			27.9			4.2			26.5	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1283	0	0	259	0
Future Volume (vph)	0	1283	0	0	259	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.6			5.4	
Lane Util. Factor		0.95			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3725			1881	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3725			1881	
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.95	0.95
Adj. Flow (vph)	0	1365	0	0	273	0
RTOR Reduction (vph)	0	0	0	0	17	0
Lane Group Flow (vph)	0	1365	0	0	256	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Turn Type		NA			Prot	
Protected Phases		2			3	
Permitted Phases						
Actuated Green, G (s)		61.4			47.6	
Effective Green, g (s)		61.4			47.6	
Actuated g/C Ratio		0.51			0.40	
Clearance Time (s)		5.6			5.4	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		1905			746	
v/s Ratio Prot		c0.37			c0.14	
v/s Ratio Perm						
v/c Ratio		0.72			0.34	
Uniform Delay, d1		22.6			25.3	
Progression Factor		1.00			1.34	
Incremental Delay, d2		2.3			1.1	
Delay (s)		24.9			35.0	
Level of Service		C			C	
Approach Delay (s)		24.9	0.0		35.0	
Approach LOS		C	A		C	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1283	0	0	704	0	0
Future Vol, veh/h	1283	0	0	704	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	95	95	92	92
Heavy Vehicles, %	3	3	2	2	2	2
Mvmt Flow	1365	0	0	741	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1365	0	1736	683
Stage 1	-	-	-	-	1365	-
Stage 2	-	-	-	-	371	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	499	-	79	392
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	668	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	499	-	79	392
Mov Cap-2 Maneuver	-	-	-	-	165	-
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	668	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	499	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	4.1

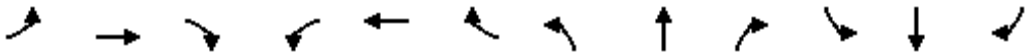
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	51	4	0	2	16	1419	6	2	1973	7
Future Vol, veh/h	0	0	51	4	0	2	16	1419	6	2	1973	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	500	-	-	500	-	450
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	60	60	60	83	83	83	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	5	5	5	2	2	2
Mvmt Flow	0	0	61	7	0	3	19	1710	7	2	2145	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1073	2829	3909	859	2153	0	0	1717	0	0
Stage 1	-	-	-	1752	1752	-	-	-	-	-	-	-
Stage 2	-	-	-	1077	2157	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.2	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.25	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	*262	*~ 5	*0	304	*385	-	-	365	-	-
Stage 1	0	0	-	*91	*141	-	-	-	-	-	-	-
Stage 2	0	0	-	*248	*217	-	-	-	-	-	-	-
Platoon blocked, %			1	1	1		1	-	-		-	-
Mov Cap-1 Maneuver	-	-	*262	*~ 4	*0	304	*385	-	-	365	-	-
Mov Cap-2 Maneuver	-	-	-	*~ 4	*0	-	-	-	-	-	-	-
Stage 1	-	-	-	*87	*134	-	-	-	-	-	-	-
Stage 2	-	-	-	*188	*216	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.9	$ 1442.4	0.2	0
HCM LOS	C	F		

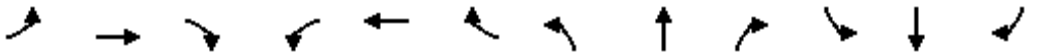
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 385	-	-	262	6	365	-	-
HCM Lane V/C Ratio	0.05	-	-	0.235	1.667	0.006	-	-
HCM Control Delay (s)	14.8	-	-	22.9	$ 1442.4	14.9	-	-
HCM Lane LOS	B	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.9	2.2	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



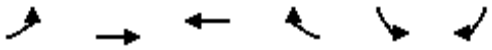
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱					↑↑	↱		↑↑	
Traffic Volume (vph)	0	557	297	0	0	0	0	1162	259	0	1685	0
Future Volume (vph)	0	557	297	0	0	0	0	1162	259	0	1685	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.7	6.7					9.8	9.8		6.8	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3689	1650					3619	1619		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3689	1650					3619	1619		3762	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	0	605	323	0	0	0	0	1367	305	0	1872	0
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	82	0	0	0
Lane Group Flow (vph)	0	605	286	0	0	0	0	1367	223	0	1872	0
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	5%	5%	5%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases			4						2			
Actuated Green, G (s)		48.3	48.3					55.2	55.2		58.2	
Effective Green, g (s)		48.3	48.3					55.2	55.2		58.2	
Actuated g/C Ratio		0.40	0.40					0.46	0.46		0.49	
Clearance Time (s)		6.7	6.7					9.8	9.8		6.8	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		1484	664					1664	744		1824	
v/s Ratio Prot		0.16						0.38			c0.50	
v/s Ratio Perm			c0.17						0.14			
v/c Ratio		0.41	0.43					0.82	0.30		1.03	
Uniform Delay, d1		25.6	25.9					28.1	20.3		30.9	
Progression Factor		0.66	0.59					1.00	1.00		0.04	
Incremental Delay, d2		0.2	0.4					4.7	1.0		14.6	
Delay (s)		17.2	15.7					32.8	21.3		16.0	
Level of Service		B	B					C	C		B	
Approach Delay (s)		16.7			0.0			30.7			16.0	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1344	248	0	1162	0	0	1685	231
Future Volume (vph)	0	0	0	0	1344	248	0	1162	0	0	1685	231
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.7	6.7		6.8			9.8	9.8
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3725	1667		3619			3762	1683
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3725	1667		3619			3762	1683
Peak-hour factor, PHF	0.92	0.92	0.92	0.81	0.81	0.81	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	1659	306	0	1367	0	0	1872	257
RTOR Reduction (vph)	0	0	0	0	0	37	0	0	0	0	0	18
Lane Group Flow (vph)	0	0	0	0	1659	269	0	1367	0	0	1872	239
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	5%	5%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	Perm
Protected Phases					8			6			2	
Permitted Phases						8						2
Actuated Green, G (s)					48.3	48.3		58.2			55.2	55.2
Effective Green, g (s)					48.3	48.3		58.2			55.2	55.2
Actuated g/C Ratio					0.40	0.40		0.49			0.46	0.46
Clearance Time (s)					6.7	6.7		6.8			9.8	9.8
Vehicle Extension (s)					3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)					1499	670		1755			1730	774
v/s Ratio Prot					c0.45			0.38			c0.50	
v/s Ratio Perm						0.16						0.14
v/c Ratio					1.11	0.40		0.78			1.08	0.31
Uniform Delay, d1					35.9	25.5		25.6			32.4	20.4
Progression Factor					1.00	1.00		0.00			1.00	1.00
Incremental Delay, d2					58.3	0.4		1.9			47.6	1.0
Delay (s)					94.1	25.9		1.9			80.0	21.4
Level of Service					F	C		A			E	C
Approach Delay (s)		0.0			83.5			1.9			72.9	
Approach LOS		A			F			A			E	

Intersection Summary			
HCM 2000 Control Delay	59.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	629	0	0	225	0
Future Volume (vph)	0	629	0	0	225	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.6			5.4	
Lane Util. Factor		0.95			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3689			1863	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3689			1863	
Peak-hour factor, PHF	0.84	0.84	0.92	0.92	0.86	0.86
Adj. Flow (vph)	0	749	0	0	262	0
RTOR Reduction (vph)	0	0	0	0	67	0
Lane Group Flow (vph)	0	749	0	0	195	0
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type		NA			Prot	
Protected Phases		2			4	
Permitted Phases						
Actuated Green, G (s)		54.4			54.6	
Effective Green, g (s)		54.4			54.6	
Actuated g/C Ratio		0.45			0.46	
Clearance Time (s)		5.6			5.4	
Vehicle Extension (s)		0.2			0.2	
Lane Grp Cap (vph)		1672			847	
v/s Ratio Prot		c0.20			c0.10	
v/s Ratio Perm						
v/c Ratio		0.45			0.23	
Uniform Delay, d1		22.5			19.9	
Progression Factor		1.00			1.65	
Incremental Delay, d2		0.9			0.1	
Delay (s)		23.4			32.9	
Level of Service		C			C	
Approach Delay (s)		23.4	0.0		32.9	
Approach LOS		C	A		C	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	609	6	5	1345	12	20
Future Vol, veh/h	609	6	5	1345	12	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	86	86	92	92
Heavy Vehicles, %	3	3	2	2	2	2
Mvmt Flow	725	7	6	1564	13	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	732	0	1523	366
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	794	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	868	-	109	631
Stage 1	-	-	-	-	438	-
Stage 2	-	-	-	-	406	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	868	-	108	631
Mov Cap-2 Maneuver	-	-	-	-	241	-
Stage 1	-	-	-	-	438	-
Stage 2	-	-	-	-	403	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	393	-	-	868	-
HCM Lane V/C Ratio	0.089	-	-	0.007	-
HCM Control Delay (s)	15	-	-	9.2	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	42.7

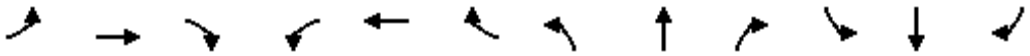
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	36	5	0	18	28	2107	9	9	1473	13
Future Vol, veh/h	0	0	36	5	0	18	28	2107	9	9	1473	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	500	-	-	500	-	450
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	60	60	60	93	93	93	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	1	1	1
Mvmt Flow	0	0	57	8	0	30	30	2266	10	9	1551	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	776	3125	3914	1138	1565	0	0	2276	0	0
Stage 1	-	-	-	2331	2331	-	-	-	-	-	-	-
Stage 2	-	-	-	794	1583	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	0	0	*468	*~ 2	*0	198	*699	-	-	224	-	-
Stage 1	0	0	-	*39	*72	-	-	-	-	-	-	-
Stage 2	0	0	-	*441	*386	-	-	-	-	-	-	-
Platoon blocked, %			1	1	1		1	-	-		-	-
Mov Cap-1 Maneuver	-	-	*468	*~ 1	*0	198	*699	-	-	224	-	-
Mov Cap-2 Maneuver	-	-	-	*~ 1	*0	-	-	-	-	-	-	-
Stage 1	-	-	-	*37	*69	-	-	-	-	-	-	-
Stage 2	-	-	-	*372	*371	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	$ 4400.8	0.1	0.1
HCM LOS	B	F		

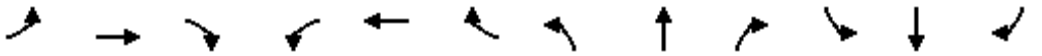
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 699	-	-	468	5	224	-	-
HCM Lane V/C Ratio	0.043	-	-	0.122	7.667	0.042	-	-
HCM Control Delay (s)	10.4	-	-	13.8	$ 4400.8	21.8	-	-
HCM Lane LOS	B	-	-	B	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	6.4	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



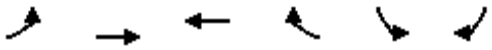
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱					↑↑	↱		↑↑	
Traffic Volume (vph)	0	1317	243	0	0	0	0	1636	489	0	1252	0
Future Volume (vph)	0	1317	243	0	0	0	0	1636	489	0	1252	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.7	6.7					9.8	9.8		6.8	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3725	1667					3762	1683		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3725	1667					3762	1683		3762	
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	1480	273	0	0	0	0	1778	532	0	1318	0
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	1480	235	0	0	0	0	1778	514	0	1318	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases			4						2			
Actuated Green, G (s)		46.3	46.3					57.2	57.2		60.2	
Effective Green, g (s)		46.3	46.3					57.2	57.2		60.2	
Actuated g/C Ratio		0.39	0.39					0.48	0.48		0.50	
Clearance Time (s)		6.7	6.7					9.8	9.8		6.8	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		1437	643					1793	802		1887	
v/s Ratio Prot		c0.40						c0.47			0.35	
v/s Ratio Perm			0.14						0.31			
v/c Ratio		1.03	0.37					0.99	0.64		0.70	
Uniform Delay, d1		36.9	26.3					31.2	23.7		22.9	
Progression Factor		0.63	0.59					1.00	1.00		0.00	
Incremental Delay, d2		29.0	0.3					19.4	3.9		1.4	
Delay (s)		52.2	15.9					50.5	27.6		1.5	
Level of Service		D	B					D	C		A	
Approach Delay (s)		46.5			0.0			45.2			1.5	
Approach LOS		D			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	710	244	0	1636	0	0	1252	269
Future Volume (vph)	0	0	0	0	710	244	0	1636	0	0	1252	269
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.7	6.7		6.8			9.8	9.8
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3762	1683		3762			3762	1683
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3762	1683		3762			3762	1683
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	747	257	0	1778	0	0	1318	283
RTOR Reduction (vph)	0	0	0	0	0	38	0	0	0	0	0	43
Lane Group Flow (vph)	0	0	0	0	747	219	0	1778	0	0	1318	240
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	Perm
Protected Phases					8			6			2	
Permitted Phases						8						2
Actuated Green, G (s)					46.3	46.3		60.2			57.2	57.2
Effective Green, g (s)					46.3	46.3		60.2			57.2	57.2
Actuated g/C Ratio					0.39	0.39		0.50			0.48	0.48
Clearance Time (s)					6.7	6.7		6.8			9.8	9.8
Vehicle Extension (s)					3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)					1451	649		1887			1793	802
v/s Ratio Prot					c0.20			c0.47			0.35	
v/s Ratio Perm						0.13						0.14
v/c Ratio					0.51	0.34		0.94			0.74	0.30
Uniform Delay, d1					28.2	26.0		28.3			25.3	19.2
Progression Factor					1.00	1.00		0.03			1.00	1.00
Incremental Delay, d2					0.3	0.3		3.3			2.7	1.0
Delay (s)					28.6	26.3		4.2			28.0	20.1
Level of Service					C	C		A			C	C
Approach Delay (s)		0.0			28.0			4.2			26.6	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1299	0	0	261	0
Future Volume (vph)	0	1299	0	0	261	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.6			5.4	
Lane Util. Factor		0.95			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3725			1881	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3725			1881	
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.95	0.95
Adj. Flow (vph)	0	1382	0	0	275	0
RTOR Reduction (vph)	0	0	0	0	17	0
Lane Group Flow (vph)	0	1382	0	0	258	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Turn Type		NA			Prot	
Protected Phases		2			3	
Permitted Phases						
Actuated Green, G (s)		61.4			47.6	
Effective Green, g (s)		61.4			47.6	
Actuated g/C Ratio		0.51			0.40	
Clearance Time (s)		5.6			5.4	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		1905			746	
v/s Ratio Prot		c0.37			c0.14	
v/s Ratio Perm						
v/c Ratio		0.73			0.35	
Uniform Delay, d1		22.8			25.3	
Progression Factor		1.00			1.33	
Incremental Delay, d2		2.4			1.1	
Delay (s)		25.2			34.7	
Level of Service		C			C	
Approach Delay (s)		25.2	0.0		34.7	
Approach LOS		C	A		C	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1283	12	14	704	9	16
Future Vol, veh/h	1283	12	14	704	9	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	95	95	92	92
Heavy Vehicles, %	3	3	2	2	2	2
Mvmt Flow	1365	13	15	741	10	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1378	0	1773	689
Stage 1	-	-	-	-	1372	-
Stage 2	-	-	-	-	401	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	493	-	74	388
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	645	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	493	-	72	388
Mov Cap-2 Maneuver	-	-	-	-	161	-
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	626	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	20.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	257	-	-	493	-
HCM Lane V/C Ratio	0.106	-	-	0.03	-
HCM Control Delay (s)	20.7	-	-	12.5	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection: 10: Rochester Rd. & Glaser Dr.

Movement	EB	WB	NB	SB
Directions Served	R	LTR	L	L
Maximum Queue (ft)	52	39	30	5
Average Queue (ft)	18	7	4	0
95th Queue (ft)	41	28	18	4
Link Distance (ft)	888	1866		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			500	500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 20: Rochester Rd. & EB Long Lake Rd.

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	T	T	R	T	T	R	T	T
Maximum Queue (ft)	154	150	191	420	428	140	35	45
Average Queue (ft)	80	88	105	247	227	50	9	9
95th Queue (ft)	128	136	170	356	341	105	32	33
Link Distance (ft)	737	737		582	582		32	32
Upstream Blk Time (%)							12	12
Queuing Penalty (veh)							99	100
Storage Bay Dist (ft)			500			500		
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 25: Rochester Rd. & WB Long Lake Rd.

Movement	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	T	R	T	T	T	T	R
Maximum Queue (ft)	993	1017	612	15	16	1507	1532	600
Average Queue (ft)	497	499	200	1	1	915	931	390
95th Queue (ft)	937	939	609	9	11	1728	1743	815
Link Distance (ft)	2792	2792		32	32	3693	3693	
Upstream Blk Time (%)				1	0			
Queuing Penalty (veh)				4	0			
Storage Bay Dist (ft)			650					525
Storage Blk Time (%)		11					36	
Queuing Penalty (veh)		25					79	

Intersection: 30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Movement	EB	EB	SB
Directions Served	T	T	L
Maximum Queue (ft)	170	173	70
Average Queue (ft)	120	122	51
95th Queue (ft)	172	173	64
Link Distance (ft)	123	123	14
Upstream Blk Time (%)	8	9	26
Queuing Penalty (veh)	24	27	57
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 40: Site Drive & Long Lake Rd.

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: 45: WB-to-EB X/O, W. of Rochester Rd & WB Long Lake Rd.

Movement	WB
Directions Served	L
Maximum Queue (ft)	182
Average Queue (ft)	72
95th Queue (ft)	151
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	600
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 416

Intersection: 10: Rochester Rd. & Glaser Dr.

Movement	EB	WB	NB	NB	NB	SB
Directions Served	R	LTR	L	T	TR	L
Maximum Queue (ft)	41	147	31	125	152	42
Average Queue (ft)	12	49	7	11	10	11
95th Queue (ft)	34	128	25	66	66	36
Link Distance (ft)	888	1866		904	904	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			500			500
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 20: Rochester Rd. & EB Long Lake Rd.

Movement	EB	EB	EB	NB	NB	NB	SB
Directions Served	T	T	R	T	T	R	T
Maximum Queue (ft)	409	397	204	594	584	508	23
Average Queue (ft)	231	241	95	401	388	213	2
95th Queue (ft)	357	364	171	582	570	448	14
Link Distance (ft)	737	737		582	582		32
Upstream Blk Time (%)				1	1		2
Queuing Penalty (veh)				12	9		13
Storage Bay Dist (ft)			500			500	
Storage Blk Time (%)		0			4	0	
Queuing Penalty (veh)		0			20	1	

Intersection: 25: Rochester Rd. & WB Long Lake Rd.

Movement	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	T	R	T	T	T	T	R
Maximum Queue (ft)	248	252	202	25	6	344	359	134
Average Queue (ft)	163	151	102	2	0	226	239	54
95th Queue (ft)	225	222	174	14	5	309	324	103
Link Distance (ft)	2792	2792		32	32	3693	3693	
Upstream Blk Time (%)				3	0			
Queuing Penalty (veh)				21	2			
Storage Bay Dist (ft)			650					525
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Movement	EB	EB	SB
Directions Served	T	T	L
Maximum Queue (ft)	175	175	61
Average Queue (ft)	160	156	52
95th Queue (ft)	169	174	57
Link Distance (ft)	123	123	14
Upstream Blk Time (%)	26	22	36
Queuing Penalty (veh)	161	140	91
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 40: Site Drive & Long Lake Rd.

Movement	EB	EB
Directions Served	T	TR
Maximum Queue (ft)	29	14
Average Queue (ft)	1	0
95th Queue (ft)	13	6
Link Distance (ft)	1106	1106
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 45: WB-to-EB X/O, W. of Rochester Rd & WB Long Lake Rd.

Movement	WB
Directions Served	L
Maximum Queue (ft)	238
Average Queue (ft)	118
95th Queue (ft)	204
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	600
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 471

Intersection: 10: Rochester Rd. & Glaser Dr.

Movement	EB	WB	NB	NB	SB
Directions Served	R	LTR	L	TR	L
Maximum Queue (ft)	55	31	35	17	29
Average Queue (ft)	16	5	3	1	1
95th Queue (ft)	41	24	18	12	11
Link Distance (ft)	888	1866		904	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			500		500
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 20: Rochester Rd. & EB Long Lake Rd.

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	T	T	R	T	T	R	T	T
Maximum Queue (ft)	158	158	184	398	392	209	32	32
Average Queue (ft)	90	97	105	249	230	56	7	10
95th Queue (ft)	139	147	170	369	362	137	28	33
Link Distance (ft)	737	737		582	582		32	32
Upstream Blk Time (%)					0		9	13
Queuing Penalty (veh)					0		78	112
Storage Bay Dist (ft)			500			500		
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 25: Rochester Rd. & WB Long Lake Rd.

Movement	WB	WB	WB	NB	SB	SB	SB
Directions Served	T	T	R	T	T	T	R
Maximum Queue (ft)	1043	1046	725	6	1926	1950	600
Average Queue (ft)	491	492	184	0	1139	1155	407
95th Queue (ft)	936	941	568	6	2075	2094	809
Link Distance (ft)	2792	2792		32	3693	3693	
Upstream Blk Time (%)				0			
Queuing Penalty (veh)				2			
Storage Bay Dist (ft)			650				525
Storage Blk Time (%)		10				40	
Queuing Penalty (veh)		24				90	

Intersection: 30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Movement	EB	EB	SB
Directions Served	T	T	L
Maximum Queue (ft)	167	168	60
Average Queue (ft)	125	124	51
95th Queue (ft)	173	179	63
Link Distance (ft)	123	123	14
Upstream Blk Time (%)	10	10	26
Queuing Penalty (veh)	32	33	57
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 40: Site Drive & Long Lake Rd.

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: 45: WB-to-EB X/O, W. of Rochester Rd & WB Long Lake Rd.

Movement	WB
Directions Served	L
Maximum Queue (ft)	183
Average Queue (ft)	78
95th Queue (ft)	167
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	600
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 429

Intersection: 10: Rochester Rd. & Glaser Dr.

Movement	EB	WB	NB	NB	NB	SB
Directions Served	R	LTR	L	T	TR	L
Maximum Queue (ft)	38	142	128	277	320	43
Average Queue (ft)	13	63	15	63	63	8
95th Queue (ft)	34	169	116	329	333	31
Link Distance (ft)	888	1866		904	904	
Upstream Blk Time (%)				0	1	
Queuing Penalty (veh)				0	0	
Storage Bay Dist (ft)			500			500
Storage Blk Time (%)				1		
Queuing Penalty (veh)				0		

Intersection: 20: Rochester Rd. & EB Long Lake Rd.

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	T	T	R	T	T	R	T	T
Maximum Queue (ft)	736	736	550	580	589	511	6	19
Average Queue (ft)	414	426	209	423	413	264	0	1
95th Queue (ft)	722	726	545	616	616	538	6	8
Link Distance (ft)	737	737		582	582		32	32
Upstream Blk Time (%)	1	1		4	3		0	1
Queuing Penalty (veh)	6	5		41	37		2	6
Storage Bay Dist (ft)			500			500		
Storage Blk Time (%)		12	0		9			
Queuing Penalty (veh)		30	0		44			

Intersection: 25: Rochester Rd. & WB Long Lake Rd.

Movement	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	T	R	T	T	T	T	R
Maximum Queue (ft)	278	262	211	32	32	372	405	148
Average Queue (ft)	176	157	113	3	2	232	246	58
95th Queue (ft)	248	233	189	17	15	331	348	120
Link Distance (ft)	2792	2792		32	32	3693	3693	
Upstream Blk Time (%)				4	3			
Queuing Penalty (veh)				29	24			
Storage Bay Dist (ft)			650					525
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Movement	EB	EB	SB
Directions Served	T	T	L
Maximum Queue (ft)	172	179	63
Average Queue (ft)	158	155	52
95th Queue (ft)	171	177	56
Link Distance (ft)	123	123	14
Upstream Blk Time (%)	24	22	42
Queuing Penalty (veh)	155	142	109
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 40: Site Drive & Long Lake Rd.

Movement	EB	EB
Directions Served	T	TR
Maximum Queue (ft)	38	44
Average Queue (ft)	2	3
95th Queue (ft)	26	36
Link Distance (ft)	1106	1106
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 45: WB-to-EB X/O, W. of Rochester Rd & WB Long Lake Rd.

Movement	WB
Directions Served	L
Maximum Queue (ft)	267
Average Queue (ft)	136
95th Queue (ft)	232
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	600
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 631

Intersection: 10: Rochester Rd. & Glaser Dr.

Movement	EB	WB	NB	SB
Directions Served	R	LTR	L	L
Maximum Queue (ft)	84	44	36	16
Average Queue (ft)	26	8	8	1
95th Queue (ft)	56	35	26	8
Link Distance (ft)	888	1866		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			500	500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 20: Rochester Rd. & EB Long Lake Rd.

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	T	T	R	T	T	R	T	T
Maximum Queue (ft)	173	153	207	402	415	138	36	32
Average Queue (ft)	88	95	107	267	248	56	7	9
95th Queue (ft)	146	144	185	373	358	111	28	31
Link Distance (ft)	737	737		582	582		32	32
Upstream Blk Time (%)							10	12
Queuing Penalty (veh)							82	98
Storage Bay Dist (ft)			500			500		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 25: Rochester Rd. & WB Long Lake Rd.

Movement	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	T	R	T	T	T	T	R
Maximum Queue (ft)	1370	1369	725	4	20	1894	1902	600
Average Queue (ft)	744	743	381	0	1	1206	1219	432
95th Queue (ft)	1371	1370	901	3	12	2455	2459	828
Link Distance (ft)	2792	2792		32	32	3693	3693	
Upstream Blk Time (%)				0	1			
Queuing Penalty (veh)				2	3			
Storage Bay Dist (ft)			650					525
Storage Blk Time (%)		27					42	
Queuing Penalty (veh)		68					97	

Intersection: 30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Movement	EB	EB	SB
Directions Served	T	T	L
Maximum Queue (ft)	168	181	71
Average Queue (ft)	123	131	52
95th Queue (ft)	175	177	63
Link Distance (ft)	123	123	14
Upstream Blk Time (%)	9	11	25
Queuing Penalty (veh)	28	34	56
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 40: Site Drive & Long Lake Rd.

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	23	57
Average Queue (ft)	2	21
95th Queue (ft)	12	48
Link Distance (ft)		660
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 45: WB-to-EB X/O, W. of Rochester Rd & WB Long Lake Rd.

Movement	WB	WB
Directions Served	L	T
Maximum Queue (ft)	184	8
Average Queue (ft)	75	0
95th Queue (ft)	155	6
Link Distance (ft)		768
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	600	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 469

Intersection: 10: Rochester Rd. & Glaser Dr.

Movement	EB	WB	NB	NB	NB	SB
Directions Served	R	LTR	L	T	TR	L
Maximum Queue (ft)	51	255	232	367	351	43
Average Queue (ft)	17	102	38	143	145	10
95th Queue (ft)	41	257	220	645	652	34
Link Distance (ft)	888	1866		904	904	
Upstream Blk Time (%)				3	6	
Queuing Penalty (veh)				0	0	
Storage Bay Dist (ft)			500			500
Storage Blk Time (%)				6		
Queuing Penalty (veh)				2		

Intersection: 20: Rochester Rd. & EB Long Lake Rd.

Movement	EB	EB	EB	NB	NB	NB	SB
Directions Served	T	T	R	T	T	R	T
Maximum Queue (ft)	644	656	481	592	590	509	19
Average Queue (ft)	372	379	187	445	435	287	1
95th Queue (ft)	707	707	496	624	630	569	12
Link Distance (ft)	737	737		582	582		32
Upstream Blk Time (%)	0	0		5	5		2
Queuing Penalty (veh)	3	4		54	54		12
Storage Bay Dist (ft)			500			500	
Storage Blk Time (%)		11	0		11		
Queuing Penalty (veh)		26	0		56		

Intersection: 25: Rochester Rd. & WB Long Lake Rd.

Movement	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	T	R	T	T	T	T	R
Maximum Queue (ft)	283	264	209	19	19	358	368	154
Average Queue (ft)	177	160	116	3	2	232	248	61
95th Queue (ft)	246	231	186	17	15	323	340	121
Link Distance (ft)	2792	2792		32	32	3693	3693	
Upstream Blk Time (%)				3	3			
Queuing Penalty (veh)				27	21			
Storage Bay Dist (ft)			650					525
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Movement	EB	EB	SB
Directions Served	T	T	L
Maximum Queue (ft)	183	184	63
Average Queue (ft)	160	158	52
95th Queue (ft)	173	179	58
Link Distance (ft)	123	123	14
Upstream Blk Time (%)	30	28	37
Queuing Penalty (veh)	197	184	96
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 40: Site Drive & Long Lake Rd.

Movement	EB	EB	WB	NB
Directions Served	T	TR	L	LR
Maximum Queue (ft)	72	46	39	70
Average Queue (ft)	8	5	14	22
95th Queue (ft)	43	30	40	56
Link Distance (ft)	1106	1106		660
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			150	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 45: WB-to-EB X/O, W. of Rochester Rd & WB Long Lake Rd.

Movement	WB
Directions Served	L
Maximum Queue (ft)	244
Average Queue (ft)	123
95th Queue (ft)	216
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	600
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 734

WARRANTS FOR RIGHT TURN DECELERATION LANE OR TAPER

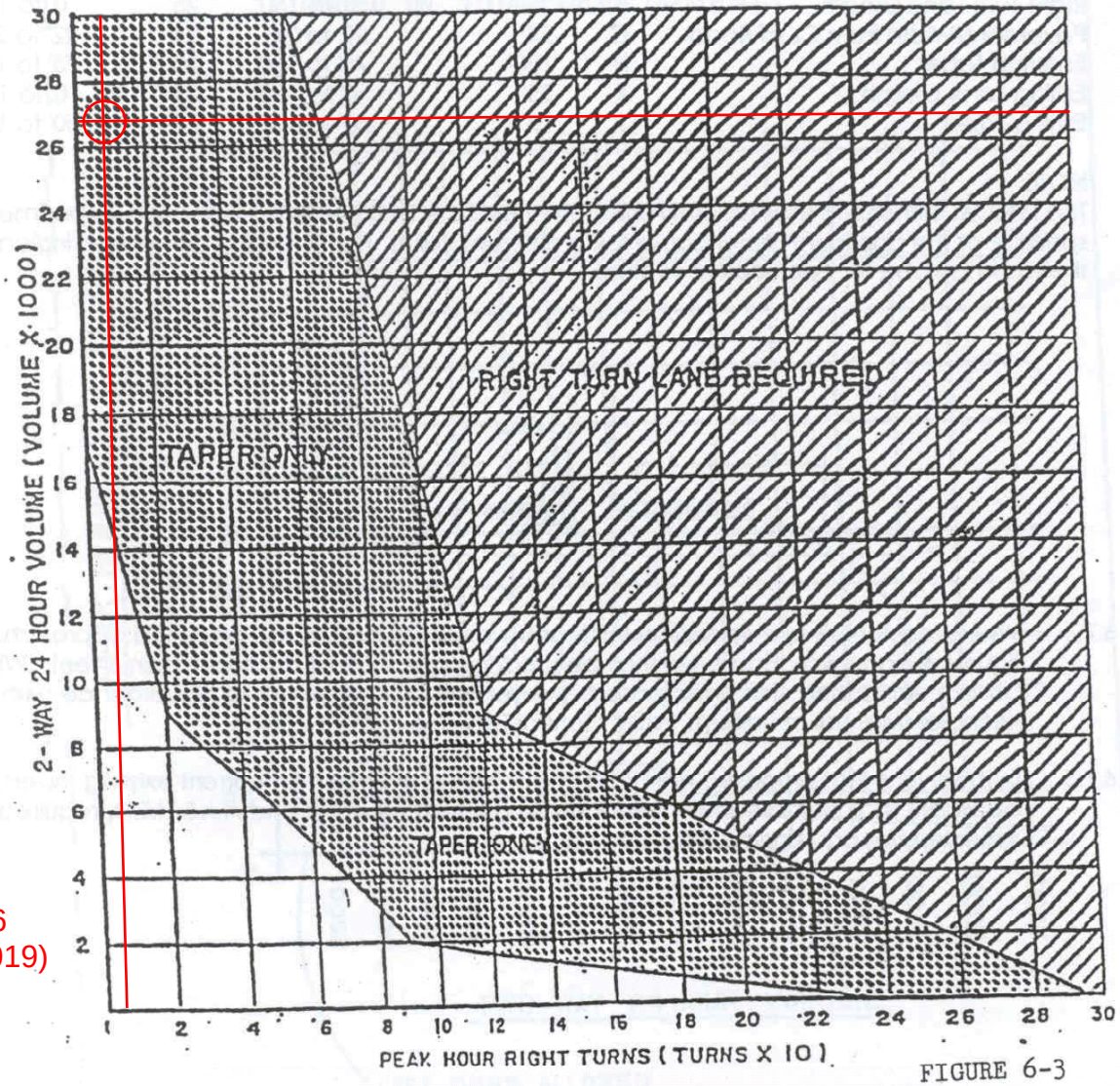


FIGURE 6-3

AADT: 26,696
(SEMCOG 2019)

PEAK HOUR RIGHT TURNS:
AM: 6
PM: 12

RIGHT-TURN TAPER REQUIRED

memorandum

Date: November 23, 2022

To: Scott Finlay, PE
From: Stephen Dearing, PE, PTOE &
Sara Merrill, PE, PTOE &
Lauren Hull, EIT

Re: Village of Troy
Site Plan Review

We have reviewed the site plan for the proposed Village of Troy residential development, located on the south side of Long Lake Road west of Rochester Road. The proposed site includes 20 single-family residential homes, 56 two-story townhomes, and 70 three-story townhomes, for a combined total of 146 dwelling units. There are two proposed access points, one on Long Lake Road and one on Rochester Road. The plans were prepared by Nowak & Fraus Engineers and dated November 7th, 2022.

At this time, OHM recommends approval of the site plan, subject to revisions for the following minor comments.

1. Site Access:

    a. Proposed curb radii must be clearly dimensioned. At the new roads, proposed curb return radii must be at least 30' minimum radius.

2. Fire department approval for not providing Tee-turnarounds at the end of each aisle in the multi-family townhome area (near Buildings #1-8).

OHM Advisors
34000 PLYMOUTH ROAD
LIVONIA, MICHIGAN 48150
T 734.522.6711
F 734.522.6427
OHM-Advisors.com

From:	Harpreet Singh
To:	Jackie Ferencz; Clerks
Subject:	Re: Site Plans for proposed development Village of Troy
Date:	Thursday, September 1, 2022 1:28:20 AM
Attachments:	image001.png image002.png image003.png image004.png image005.png image006.png

Jackie,

Thanks for providing the information. I am concerned about this building plan's impact on my property and my neighborhood is also concerned in a similar manner.

1) New home's backyard will face my home's front yard area, Back yard area are a loud area for outside play, This is not acceptable and decrease our property value. Houses on opposite sides of the road should not face other people's back yard. I request to be fixed on the proposed planning with the front yards facing each other.

2) Current tree line is not on the map, it's part of each property sold and no guarantee they will be there. Boundry line between "River bend court" and "Village of Troy" property line. Confirmation in writing is required from the builder to the new homeowner to keep the tree line in place all the time.

3) 108 mixed home housing planned by the builder with an entry point at Long Lake road. Even "River bank" road is with no outlet and a lot of traffic by mistake to entry. During property sale activity and even after that time, As the map updates will not be available to the public. Concern with around 17 years old River bank street get damage and required unplanned repair.

- What Troy city can support us for this type of passive damage by this housing approval? Troy city to repair the street just like another city street?

4) " Village of Troy" zoning review date and time are not clear from online information. Please share this confirmation to join virtually or in person.

Thanks

On Fri, Aug 19, 2022 at 11:32 AM Jackie Ferencz <Jackie.Ferencz@troymi.gov> wrote:

> Thank you for the inquiry.
>
> The proposed development, Village of Troy, documents are attached for your review. Should you like to view additional items related to this proposed development please email me and I will send a link since the file size is large.
>
> Thank you,

Jackie Ferencz
Administrative Assistant |

City of Troy Planning Dept
O: 248.524.3364

VILLAGE OF TROY

PLANNED UNIT DEVELOPMENT AGREEMENT

Entered into between:

City of Troy, a Michigan Municipal Corporation

and

Robertson Village of Troy, LLC, a Michigan limited liability company

Dated: _____, 2023

TABLE OF CONTENTS

VILLAGE OF TROY PLANNED UNIT DEVELOPMENT AGREEMENT

THIS VILLAGE OF TROY PLANNED UNIT DEVELOPMENT AGREEMENT (the "Development Agreement") is made and entered into this __th day of _____, 2023, by and between THE CITY OF TROY ("City") a Michigan municipal corporation, with offices located at 500 W. Big Beaver Rd, Troy, MI 48084, and Robertson Village of Troy, LLC, ("Developer"), a Michigan limited liability company, with offices located at 6905 Telegraph Rd, Suite 200, Bloomfield Hills, Michigan 48301.

RECITALS

The purpose and intent of this Development Agreement is to document the agreements between the parties and to regulate the placement of units within the property. This development shall be known as Village of Troy. The proposed community of twenty (20) detached single family homes, fifty-six (56) attached single family homes, and seventy (70) three-story townhomes (collectively, the "Development") is set on vacant land owned by Good Development Holdings, LLC. Several amenities, including open space parks and a trail connection, are included as part of the plan.

The property is adjacent to the Rochester Road commercial corridor and is located south and west of the southwest corner of Long Lake Road and Rochester Road, more particularly described in Exhibit A attached to this Development Agreement ("Property"). -

Village of Troy is a unique community of detached and attached style homes set in a village concept to meet the needs of multiple demographics currently found in Troy.

The Property is currently underutilized vacant property.

The proposed Development will be a benefit to the community through the redevelopment of an underutilized property and will provide for a regional storm pond Special Assessment District. The Development will provide an immediate increase in tax base. The Development will be a for-sale community that will include residents that have pride in ownership and are responsible homeowners. The plan includes an amenity overlook and connection to an extension to the existing City pathway system which will provide direct access to schools and parks.

Prior to execution of this Development Agreement, the Property was split zoned RT, R-1C, and CB. Upon execution of this Development Agreement the Property shall be rezoned by the City to PUD, Planned Unit Development, which meets the City's goal of transitional density from industrial and commercial uses to the south and east of the site to the single family community to the west.

Subject to execution and recording of this Development Agreement, the Development illustrated and described in this Development Agreement and in the Exhibits attached hereto, is hereby approved in accordance with the authority granted to and vested in the City Board pursuant to Michigan Public Act 110 of 2006, as amended (the Michigan Zoning Enabling Act);

Michigan Public Act 33 of 2008, as amended (the Michigan Planning Enabling Act); Michigan Public Act 59 of 1978, as amended (the Michigan Condominium Act); and in accordance with the Zoning Ordinance of the City, as amended, except as modified herein and subject to the terms of this Development Agreement. The approval of the Village of Troy Planned Unit Development does not relieve the Developer from compliance with applicable provisions of the Michigan Condominium Act and the City Zoning Ordinance, except as modified herein, nor shall it be deemed to confer any approval other than required by law.

The City and the Developer now desire to enter into this Agreement which, among other things, shall set forth the mutual and respective covenants, obligations, and undertakings of the City and Developer with respect to the Development. All successors and assigns of Developer shall be bound by the terms of this Agreement.

NOW, THEREFORE, it is hereby agreed as follows:

1. SUMMARY DESCRIPTION OF THE DEVELOPMENT

The Development covers an area comprising 20.55 acres. The Property is located south and west of the southwest corner of Long Lake Road and Rochester Road in the City of Troy. Developer is proposing to construct a detached and attached residential community. The proposed use is as follows:

a. One hundred and forty-six (146) residential homes as follows: Twenty (20) detached single family homes ranging in size from approximately 1,834 to 3,100 square feet, fifty-six (56) attached single family homes approximately 1,850 square feet, and seventy (70) three-story townhomes ranging in size from approximately 1,200 to 1,600 square feet in size, the latter which will be permitted to serve as a buffer to the existing industrial uses to the south of the site. The homes will be built with attached one or two-car garages. A homeowner's association will be responsible for maintenance of all common areas as well as building exterior maintenance of the townhomes.

a. The project will be built in two or more phases of development.

b. The project will be the catalyst for a new Troy regional detention pond to be sized to accommodate the Village of Troy and several other developments that will be developed in the vicinity. The City agrees to design and permit the expanded regional pond. The pond shall be constructed by the City expeditiously in order to allow for the development of the Village of Troy community to commence in the Spring of 2023. For an agreed upon construction management fee, Robertson agrees to supervise construction of the pond and installation of the landscaping that will surround the pond.

c. Significant construction fill dirt exists on the Property as a result of its use as a temporary staging site for various road and freeway improvements over the years. As part of the development plan of the Village of Troy, the fill dirt will be placed onsite in the southwest corner of the Development to be utilized as an additional buffer to the salt dome and programmed as a scenic overlook.

d. The Development will include amenities throughout, including an overlook and a public trail that will traverse the Development to connect Long Lake Road with a future City trail extension that will connect to the City's existing trail system. The Development will include a small public parking area for a public trailhead to encourage the public to use the trail.

2. ADHERENCE TO REQUIREMENTS FOR DEVELOPMENT

The Property shall be developed and improved in full compliance with the following ("Development Documents"):

a. The Code of Ordinances for the City of Troy.

b. The Final Plan for Village of Troy prepared by Nowak & Fraus Engineering dated and signed by the Planning Commission Chairman on _____. The Final Plan is attached as Exhibit B, and is otherwise referred to as the General Development Plan ("GDP"). The GDP shall correlate to the Exhibit B condominium subdivision plan attached to the condominium master deed.

c. Conditions imposed on the Development by the City Planning Commission in its _____ recommendation to the City Council, including the conditions recommended by the City's Planner and Engineer, and any other reasonable conditions which may be subsequently imposed by the City Council with respect to Village of Troy PUD approval and the Planning Commission with respect to the Site Plan or other required approvals.

d. The City of Troy Engineering Design Standards and any other reasonable conditions which might be required by the City's Engineer.

e. The recorded Regional Pond Maintenance Cost Sharing Agreement as established on a per rata basis based on cubic feet per second generated by the surrounding developments and existing City DPW yard.

f. This Development Agreement and any conditions imposed herein.

The Developer and City acknowledge and agree that rezoning of the Property to PUD constitutes approval of the GDP for general configuration, road layout, location and amount of

land occupied by permitted uses, building separation and setbacks, subject to final site plan review and condominium approval.

All future owner(s) of the Property shall be bound by the terms of this Development Agreement and the Developer's authority and responsibilities stated herein. It shall be the responsibility of the Developer to provide notice of these requirements to all future owner(s) of the Property. A homeowner's association shall accept responsibility for maintenance of its portion of the regional storm pond, internal streets, landscaping and amenities.

3. INTENT OF DEVELOPMENT

The Village of Troy will be a quality residential community designed to appeal to prospective Troy home buyers looking for several new home options, including both single family living and maintenance free living, all set in a village atmosphere accompanied by integrated amenities and open spaces. It is the Developer's intent to construct quality units that will be targeted toward buyers seeking housing products that are severely lacking in the area. Homeowners who are looking to have a sense of community will find the offerings to be an attractive housing option. This Development will provide a vibrant diverse community that builds off our success over the years.

4. ADHERENCE TO ORDINANCES

Developer shall comply with the Zoning Ordinance of the City in effect at the time of construction of the Development, except where modified by this Development Agreement. Developer acknowledges that certain provisions of this Development Agreement may exceed the requirements of the Zoning Ordinance, and the City acknowledges that items shown in the GDP may be less than the requirements of the Zoning Ordinance. Developer shall fully comply with all engineering and other local, state and federal codes and regulations in effect at the time of construction of the Development, unless superseded or otherwise covered in this Development Agreement and the GDP. Permitted uses shall be limited to single family and condominium residences and all accessory uses thereof as regulated by the City of Troy Zoning Ordinance.

Development standards will generally conform to the GDP as shown on Exhibit B and established per the Schedule of Regulations and Modifications within the City of Troy PUD Ordinance. Specific waivers being sought from the PUD provisions are as follows:

Maximum density as follows:7.10 dwelling units per acre as per plan

Front setback as follows:

20' for detached single family units

20' (to curb) for attached single family unitsBuilding separation as follows:13' between single family units - 5'/8' side setbacks (13' Total)

40' between attached single family buildings15' between townhome buildings

Rear setback as follows:

35' to property line for detached single family units (15' for deck or patios)

Maximum building height as follows:

30’ to midpoint for detached single family units

30’ to midpoint for attached single family units

35’ to midpoint for townhomes

Shared stormwater conveyance and offsite stormwater retention

5. PERMITS AND AUTHORIZATIONS

The City shall grant to Developer and its contractors and subcontractors all City permits and authorizations necessary to modify the existing utilities including electric, telephone, gas, cable television, water, storm and sanitary sewer to the Property and to otherwise develop and improve the Property in accordance with approved plans, provided the Developer has first made all requisite applications for permits, complied with the requirements for said permits, and paid all required fees. Any applications for permits from the City will be processed in the customary manner. The City will cooperate with Developer in connection with Developer’s applications for any necessary county, state, federal or utility company approvals, permits or authorizations to the extent that such applications and/or discussions are consistent with the GDP, and this Development Agreement.

The Developer may install, occupy, and operate one temporary sales trailer(s) on the Property, subject to Building Inspector approval, in a location to be selected by the Developer. Installation of a sales trailer(s) shall be permitted when the Developer completes general grading of the lot on which the sales trailers(s) will be located, and has provided gravel access to the trailer. Use and occupancy of the trailer shall terminate thirty (30) days after the certificate of occupancy has been issued for a model home in the development, at which time the trailer(s) shall be removed. One construction trailer shall be permitted at a location determined by Developer and shall be permitted through the duration of the project.

The Developer is permitted to sell units in Village of Troy from an offsite location within the City or the surrounding area in lieu of a temporary sales trailer, if desired by the Developer.

Building Permits: With the exception of the model home as described in this Development Agreement, building permits shall not be issued until all public site improvements have been accepted and approved by the governmental agency having jurisdiction. Alternatively, the Developer may post sufficient bonding or a letter of credit to obtain building permits prior to final installation and acceptance of such facilities.

Other governmental approvals: It is understood that construction of some of the improvements included in the Development will require the approval from other governmental agencies.

Model units: One model unit per building type shall be permitted at locations to be determined by the Developer. The model units may be staffed by licensed real estate agents during normal daytime hours up to seven days a week. One lot may be established as a temporary parking lot at each model at a location to be determined by the Developer. At the risk to the Developer, construction of the model homes shall be permitted prior to the completion and acceptance of land

development. The model building permit shall be expeditiously reviewed by the City immediately following final engineering plan approval.

6. DEVELOPMENT SEQUENCE/PHASING

The parties agree and acknowledge that the approved plans represent the current intent of the Developer to develop the Property, with the knowledge and market condition information possessed by the Developer as of the present date. The parties acknowledge that housing market conditions may change over time, which could cause the Developer to change its plans or timing with respect to the Development. The parties further acknowledge that the buildings and improvements as shown on the approved plans may be constructed, if at all, at different dates in the future, and that the Developer may elect to develop such improvements in the order and at such times as it determines necessary and appropriate in its discretion, if at all. Site improvements reasonably necessary or reasonably related to any particular building, including without limitation road improvements, storm drainage facilities, sidewalks and landscaping, will be made at the time of construction of such particular building, as determined through the site plan process. Provided that the Developer is proceeding in good faith and with due diligence to develop the Project in light of existing economic conditions, and is otherwise in compliance with this Development Agreement and City ordinances, the City will not unreasonably refuse to extend any time periods for Project completion for a reasonable time to enable the Developer to complete the Development. The Developer shall provide City Staff with a written report of the status of the development of the Project on an annual basis commencing one year from the date of this Development Agreement until project development is completed. Time is of the essence to this Development Agreement. The GDP shall be in effect for a period of 5 years, during which time Developer shall obtain building permits and commence construction of the Development within 18 months following approval of the GDP and substantially complete construction of the Development within 42 months once commenced. The Development shall be completed in one phase.

7. ENGINEERING PLAN

The Developer shall prepare and submit for review and approval detailed engineering plans for improvements. Such plans shall be reviewed by the City Engineer to ensure that they are substantially consistent with the GDP and other applicable requirements. The Developer will make diligent and good faith efforts to obtain all approvals and permits on a timely basis, and the City will, in a timely manner, process all reviews and approvals required of it.

8. WATER, SANITARY AND STORM SEWER SYSTEMS

Developer shall, at its sole expense, construct and install all connections tying into the municipal water and sanitary sewer systems. The Developer shall convey to the City

easements necessary for the City's access to sewer and water facilities within the Development or such facilities will be installed in City rights-of-way.

The City shall be required to make necessary improvements to the City's DPW storm pond in order to accommodate the project stormwater detention requirements and bring the pond to compliance. All necessary governmental permits shall be obtained by the City. The City shall prepare a maintenance agreement for the detention pond based on pro rata storm water volume in a form acceptable to the Developer and City to be executed and recorded with the Register of Deeds. The maintenance agreement shall allow for the assumption by the Homeowner's Association at the time of Developer turnover of the community. The Developer shall pay its proportional share of the design and legal costs for the regional pond and creation of the SAD.

The Developer shall be permitted a self-help option in order to construct the regional stormwater pond as to not delay the development timeline

9. ROADS, DRIVES AND PARKING

a) The Developer shall construct the roads as depicted on **Exhibit B**. The roads shall be private and will be maintained by an established homeowner's association.

b) Parking shall be provided onsite in the designated spaces as shown on **Exhibit B** and on street parking shall be permitted as depicted.

10. ARCHITECTURAL AND SITE DESIGN GUIDELINES

Dependent on specific housing product, building elevation materials will consist primarily of brick, stone, hardieboard siding and/or high-quality vinyl siding as shown on the conceptual architecture drawings (**Exhibit C**).

Development standards will generally conform to the Site Plan GDP as shown on **Exhibit B** and established per the City of Troy PUD Ordinance. Unless otherwise described in this Planned Development Agreement, all architectural and site design guidelines shall meet City Ordinances and regulations.

11. LANDSCAPING AND MAILBOXES

a) Developer shall provide frontage and internal landscaping which shall meet or exceed replacement requirements as depicted on **Exhibit B**.

b) Mailboxes shall be installed in cluster boxes, as approved by the United States Postal Office.

12. SIGNAGE

a) Developer shall be permitted to install one monument sign at each main entrance within the development as indicated on the approved Landscape Plan (**Exhibit B**). The signs shall meet the requirements of the City Code of Ordinances.

b) One temporary onsite marketing sign each up to (72) square feet may be installed on the main frontages immediately following approval of this Development Agreement and shall be able to remain to the end of the five –year period the GDP is in effect. The sign shall be maintained by Developer in good repair during the five-year period.

13. AMENITY AND IMPROVEMENT COMPLETION

a) Amenities shall be installed per the Landscape Plan (**Exhibit B**).

b) In the event of a home closing in a time of year that does not allow for certain exterior items to be completed (i.e. concrete during the winter season) then a temporary certificate of occupancy shall be issued. In the event a bond is required to be posted by the Developer with First American Title Company to secure these incomplete items to facilitate a closing of the home then the evidence of the bond shall be provided by the Developer to the City to serve as security with the City so the Developer is not posted a bond twice for the same incomplete items. The bond shall not be released until the City issues a certificate of occupancy on the home.

14. MINOR MODIFICATIONS TO APPROVED PUD SITE PLANS.

Minor modifications to the approved PUD Site Plan for the Project, including, but not limited to, minor shifting of roads, which are consistent with the intent of this Development Agreement may be approved by the City Planning and Zoning Administrator, which approval shall not be unreasonably withheld. Minor modifications which are approved by the City Manager shall not require an amendment to this Development Agreement, but shall become a part of this Development Agreement. For purposes of this Development Agreement, "minor modifications" shall mean that the City Manager may consider the factors listed in the City Zoning Ordinance. Minor modifications do not include, for example, any change that would alter the specific use allowed by this Development Agreement, any change that would relieve the Developer of its obligations to construct improvements including roads, stormwater system, or any change that would result in a decrease or elimination of open space or preserved areas.

15. CONDOMINIUM ASSOCIATIONS

The Developer shall have the responsibility to legally organize condominium associations for all parts of the residential development. The Master Deeds and Bylaws for the condominium shall set forth the restrictions and regulations contained in this Development Agreement; prescribe the responsibilities of the condominium association; set forth the manner, method and timing of transferal of maintenance responsibilities for common areas, and other facilities to the association; provide a feasible method of funding maintenance activities, such as annual dues and/or assessments; and reserve rights to the City to assess private property owners for the cost of maintenance of any common areas and roads.

The Developer shall be responsible initially for maintenance of roads, walkways, landscaped areas, open space areas, and drains over which jurisdiction has not been assumed by the City or other agency, until the Developer assigns such responsibilities either to the City or to the condominium associations to be organized. Following the assignment of such maintenance responsibilities to the City or condominium associations, the Developer shall have no further maintenance obligations for such improvements.

16. REIMBURSABLE COSTS

a. Developer shall reimburse the City for the following costs:

   i. All reasonable planning, engineering and any consultant fees incurred in connection with the review and approval of the Development, in accordance with the City's Planning Services Fee Schedule.

   ii. All reasonable planning, engineering and any consultant fees, along with applicable permit and inspection fees, which may be incurred throughout the construction of the Project as a result of any required inspections or actions taken to ensure compliance with the Development documents.

b. In addition, Developer shall be responsible for all costs associated with the submission to the City and consideration of all plans and documents associated with the Development, including, but not limited to, site plans, landscaping plans, engineering plans and conveyances on park land, as-built plans, permits, inspections, etc. Further, Developer shall be responsible for all costs related to variance requests, special use requests, and review and approval of any other agreements associated with the Development, including but not limited to, petition for any special assessments district, and other similar documents, plans and costs.

17. REMEDIES.

In the event that a party believes that the other party is not acting reasonably or in conformity with this Development Agreement, then the aggrieved party may petition the Oakland County Circuit Court to resolve such dispute and the parties shall make themselves immediately available for a hearing on a date to be set by the Court. In the event that the Court finds that party has not acted in good faith or in conformity with this Development Agreement, then the Court may order reasonable costs and attorney fees incurred to the prevailing party. All remedies afforded in this Development Agreement shall be taken and construed as cumulative, that is, in addition to every other remedy provided by law and in equity.

18. MISCELLANEOUS

a. Binding Effect

This Development Agreement shall be binding upon and inure to the benefit of the parties and their heirs, successors and assigns. The rights and obligations contained in this Development Agreement shall run with the Property.

b. Authority

This Development Agreement has been duly authorized by all necessary action of Developer and the City, through the public hearing held on _____, the recommendation of the Planning Commission on _____ and approval of the City Council at the public meeting held_____, 2022 in accordance with the laws of the State of Michigan, and the Ordinances of the City. By the execution of this Development Agreement, the parties each warrant that they have the authority to execute this Development Agreement and bind the Property in its respective entities to its terms and conditions.

c. Amendment

This Development Agreement may not be modified, replaced, amended, or terminated, without the prior written consent of the City Council and the Developer or its successors in title to the Property as of the date of the modification, replacement, amendment, or termination. The City of Troy Zoning Board of Appeals shall not have any authority to grant any variances for any of the subject matter contained within this Development Agreement. Modifications to the General Development Plan shall be made in accordance with the requirements and procedures set forth in City zoning ordinance.

The Developer and the City agree to amend this Development Agreement and the Exhibits attached hereto as may be necessary or required to comply with the requirements of any federal, state or county statue, ordinance, rule, regulation, or requirement relating

to the Planned Unit Development, and that any such amendment shall be effective as if originally set forth herein. In addition, the Developer and the City agree to amend this Development Agreement and the Exhibits attached hereto as may be appropriate, necessary, or required in order to conform to any final surveys and engineering requirements and any final plats or plans that shall have been approved by The City of Troy from time to time.

d. City Not Responsible for Damages

The Developer agrees that, absent gross negligence or willful misconduct on the part of the City, its employees, agents, representatives or contractors, or by reason of the City's course of conduct resulting in a continuing or material default of its obligations under this Development Agreement, the City shall not be responsible to the Developer for damages arising out of a claimed breach of this Development Agreement. In such event, the Developer's sole remedy (except in the event of a material defect) shall be a claim for specific performance in the Oakland County Circuit Court. In the event of any litigation relating to this Development Agreement, the prevailing party (as determined by the trial Court) will be entitled to reimbursement of reasonable attorney fees and costs.

e. Entire Development Agreement: Termination

This Development Agreement constitutes the entire agreement between the parties relating to the subject matter herein and may not be modified replaced or amended, without the prior written consent of the Developer and The City of Troy.

f. Modification.

Except as provided in section 14 above, this Development Agreement may not be modified, replaced, amended or terminated without the prior written consent of the parties to this Development Agreement.

g. Governing Law.

This Development Agreement shall be governed by and construed in accordance with the laws of the State of Michigan.

h. Counterparts.

This Development Agreement may be executed in multiple counterparts, each of which shall be deemed an original and all of which shall constitute one agreement. The signature of any party to any counterpart shall be deemed to be a signature to, and may be appended to, any other counterpart.

i. Successors and Assigns.

The terms, provisions and conditions of this Development Agreement are and shall be deemed to be of benefit to the Property and shall run with and bind the Property, and shall bind and inure to the benefit of the successors and assigns of the parties to this Development Agreement. Developer shall record, at its sole cost, a copy of this Development Agreement in the Oakland County Register of Deeds, and provide a recorded copy to the City.

j. Partial Invalidity.

Invalidation of any of the provisions contained in this Development Agreement or of the application thereof to any person by judgment or court order shall in no way affect any of the other provisions hereof or the application thereof to any other person and the same shall remain in full force and effect.

k. No Partnership.

None of the terms or provisions of this Development Agreement shall be deemed to create a partnership or joint venture between Developer and the City.

l. Notice

Unless later information is provided, notices under this Development Agreement will be provided to:

To Owner and Developer

Robertson Village of Troy, LLC
Attention: Tim Loughrin
6905 Telegraph Rd, Suite 200
Bloomfield Hills, MI 48301
Phone: 248-282-1428
Fax: 248-282-1429
Email: tloughrin@robertsonhomes.com

Williams Williams Rattner & Plunkett, PC
Attention: C. Kim Shierk
380 North Old Woodward Avenue, Suite 300

Birmingham, Michigan 48009
Email: cks@wwrplaw.com

To City:

City of Troy
Attention: Aileen Dickson, City Clerk
500 W. Big Beaver
Troy, MI 48084
Email: aileen.dickson@troymi.gov

m. Integration Clause.

This Development Agreement is intended as the complete integration of all understandings between the parties related to the subject matter herein. No prior contemporaneous addition, deletion or other amendment shall have any force or effect whatsoever, unless referenced in this Development Agreement. No subsequent notation, renewal, addition, deletion or other amendment shall have any force or effect unless embodied in a written amendatory or other agreement executed by the parties required herein, other than conditions which may be attached to final site plan approval by the Planning Commission.

(BALANCE OF PAGE INTENTIONALLY LEFT BLANK)

IN WITNESS WHEREOF, the parties have caused this Development Agreement to be executed on the day and year recited above.

CITY OF TROY
a Michigan municipal corporation

_____
By:
Its: Mayor

_____
By:
Its: Clerk

ACKNOWLEDGEMENT

STATE OF MICHIGAN)
) ss
COUNTY OF OAKLAND)

The foregoing Development Agreement was acknowledged before me by _____, the Mayor of the City of Troy, on the ____day of _____, 2023.

_____
_____, Notary Public
Oakland County, Michigan
My Commission Expires: _____
Acting in Oakland County

STATE OF MICHIGAN)
) ss
COUNTY OF OAKLAND)

The foregoing Development Agreement was acknowledged before me by _____, the Clerk of the City of Troy, on the ____day of _____, 2023.

_____
_____, Notary Public
Oakland County, Michigan
My Commission Expires: _____
Acting in Oakland County

(Signatures continued on next page)

ROBERTSON VILLAGE OF TROY, LLC, a Michigan corporation

By: Robertson Brothers, Co., a Michigan corporation, Manager

_____

By: James V. Clarke
Its: President

ACKNOWLEDGEMENT

STATE OF MICHIGAN)
) ss
COUNTY OF OAKLAND)

The foregoing Development Agreement was acknowledged before me in Oakland County, Michigan by James V. Clarke, the President of Robertson Brothers Co., a Michigan corporation, the Manager of ROBERTSON VILLAGE OF TROY, LLC, on the __ day of _____, 2023.

_____
_____, Notary Public
____ County, Michigan
My Commission expires: _____
Acting in Oakland County

This Instrument Drafted By:
C. Kim Shierk
Williams, Williams, Rattner & Plunkett, P.C.
380 North Old Woodward Avenue, Suite 300
Birmingham, Michigan 48009
When recorded, return to drafter.

Recording Fee $_____
County Transfer Tax: Exempt pursuant to MCL 207.505(a)
State Transfer Tax: Exempt pursuant to MCL 207.526(a)

Table of Exhibits

Exhibit A

Property Description

Description:

LEGAL DESCRIPTION - AS SURVEYED (COMBINED)

PART OF THE NORTHEAST 1/4 OF SECTION 15, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHEAST CORNER OF SAID SECTION 15; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST ALONG THE EAST LINE OF SAID SECTION 15, 660.00 FEET; THENCE SOUTH 89 DEGREES 39 MINUTES 01 SECONDS WEST, 43.00 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 80.01 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 332.00 FEET; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 100.00 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 75.00 FEET; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 80.00 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 870.40 FEET; THENCE SOUTH 00 DEGREES 35 MINUTES 00 SECONDS EAST, 400.00 FEET; THENCE SOUTH 89 DEGREES 37 MINUTES 30 SECONDS WEST, 329.61 FEET; THENCE NORTH 00 DEGREES 36 MINUTES 00 SECONDS WEST, 630.34 FEET TO THE SOUTHWEST CORNER OF RIVER BEND OF TROY, OAKLAND COUNTY CONDOMINIUM SUBDIVISION PLAN No. 1577, ACCORDING TO THE MASTER DEED RECORDED IN LIBER 33439, PAGE 586, OAKLAND COUNTY RECORDS; THENCE ALONG THE SOUTH AND EAST LINES OF SAID RIVER BEND OF TROY THE FOLLOWING FIVE (5) COURSES: 1) NORTH 88 DEGREES 33 MINUTES 08 SECONDS EAST, 30.18 FEET AND 2) NORTH 00 DEGREES 56 MINUTES 30 SECONDS WEST, 29.66 FEET AND 3) NORTH 89 DEGREES 37 MINUTES 05 SECONDS EAST, 269.80 FEET AND 4) NORTH 00 DEGREES 11 MINUTES 35 SECONDS EAST, 29.63 FEET AND 5) NORTH 88 DEGREES 56 MINUTES 07 SECONDS EAST, 29.60 FEET; THENCE NORTH 00 DEGREES 35 MINUTES 00 SECONDS WEST ALONG THE EAST LINE OF SAID RIVER BEND OF TROY, IN PART, 570.00 FEET TO THE NORTHEAST CORNER OF SAID RIVER BEND OF TROY; THENCE NORTH 89 DEGREES 39 MINUTES 01 SECONDS EAST ALONG THE SOUTH RIGHT OF WAY LINE OF E. LONG LAKE ROAD (60 FEET 1/2 WIDTH), 684.03; THENCE SOUTH 00 DEGREES 36 MINUTES 30 SECONDS EAST, 600.00 FEET; THENCE NORTH 89 DEGREES 39 MINUTES 01 SECONDS EAST, 593.00 FEET TO THE POINT OF BEGINNING.

CONTAINING 895,001.06 SQUARE FEET OR 20.55 ACRES OF LAND.

TAX ID NUMBER: 20-15-201-046 AND 20-15-201-033

ADDRESS: VACANT

Exhibit B

Final Site Plan

Exhibit C

Conceptual Architecture Drawings

CLAREMONT

ELEVATIONS

ROBERTSON BROTHERS HOMES

Artistic conceptual rendering should be used as a reference only and not be relied upon as the final details of the residences. Images featured are samples and may not reflect your home site's garage handing, elevation conditions or color package materials. Physical material board signed off will be required during your purchase process. Any specifications in this depiction may change at developer's sole discretion without notice. All information herein was accurate at the time of publication. We reserve the right to make changes in specification, or materials, or to change or discontinue models without notice or obligation.

EQUAL HOUSING OPPORTUNITY

HAWTHORNE

ELEVATIONS

ROBERTSON BROTHERS HOMES

Artistic conceptual rendering should be used as a reference only and not be relied upon as the final details of the residences. Images featured are samples and may not reflect your home site's garage handing, elevation conditions or color package materials. Physical material board signed off will be required during your purchase process. Any specifications in this depiction may change at developer's sole discretion without notice. All information herein was accurate at the time of publication. We reserve the right to make changes in specification, or materials, or to change or discontinue models without notice or obligation.

EQUAL HOUSING OPPORTUNITY

NORWOOD

ELEVATIONS

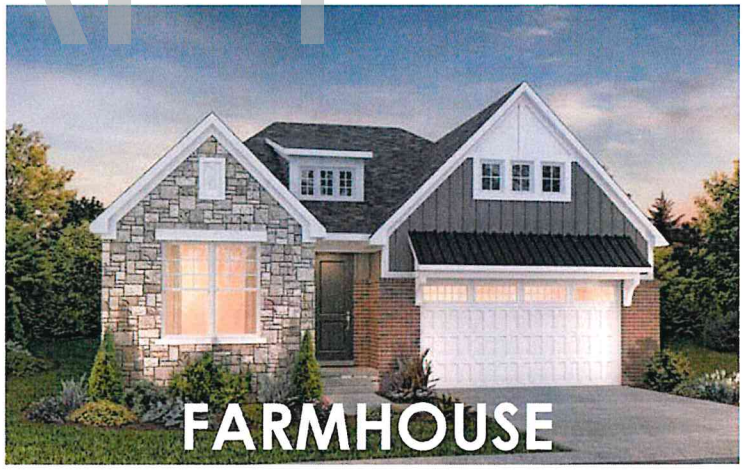
ROBERTSON BROTHERS HOMES

Artistic conceptual rendering should be used as a reference only and not be relied upon as the final details of the residences. Images featured are samples and may not reflect your home site's garage handing, elevation conditions or color package materials. Physical material board signed off will be required during your purchase process. Any specifications in this depiction may change at developer's sole discretion without notice. All information herein was accurate at the time of publication. We reserve the right to make changes in specification, or materials, or to change or discontinue models without notice or obligation.

EQUAL HOUSING OPPORTUNITY

RALEIGH

ELEVATIONS



ROBERTSON BROTHERS HOMES

Artistic conceptual rendering should be used as a reference only and not be relied upon as the final details of the residences. Images featured are samples and may not reflect your home site's garage handing, elevation conditions or color package materials. Physical material board signed off will be required during your purchase process. Any specifications in this depiction may change at developer's sole discretion without notice. All information herein was accurate at the time of publication. We reserve the right to make changes in specification, or materials, or to change or discontinue models without notice or obligation.

EQUAL HOUSING OPPORTUNITY

SHERIDAN

ELEVATIONS

ROBERTSON BROTHERS HOMES

Artistic conceptual rendering should be used as a reference only and not be relied upon as the final details of the residences. Images featured are samples and may not reflect your home site's garage handing, elevation conditions or color package materials. Physical material board signed off will be required during your purchase process. Any specifications in this depiction may change at developer's sole discretion without notice. All information herein was accurate at the time of publication. We reserve the right to make changes in specification, or materials, or to change or discontinue models without notice or obligation.

EQUAL HOUSING OPPORTUNITY

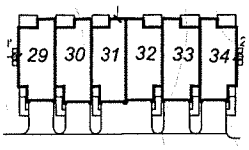
WHITMORE

ELEVATIONS

ROBERTSON BROTHERS HOMES

Artistic conceptual rendering should be used as a reference only and not be relied upon as the final details of the residences. Images featured are samples and may not reflect your home site's garage handing, elevation conditions or color package materials. Physical material board signed off will be required during your purchase process. Any specifications in this depiction may change at developer's sole discretion without notice. All information herein was accurate at the time of publication. We reserve the right to make changes in specification, or materials, or to change or discontinue models without notice or obligation.

EQUAL HOUSING OPPORTUNITY



"D" "C" "B" "C" "E" "F"

6 UNIT BUILDING ELEVATION

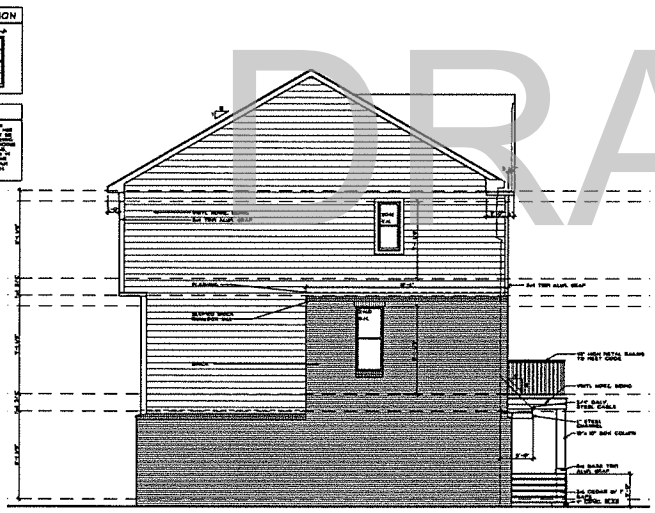
WINDOW SILLS

OVERHANGS & DRAINAGE

STEEL LINTEL SCHEDULE

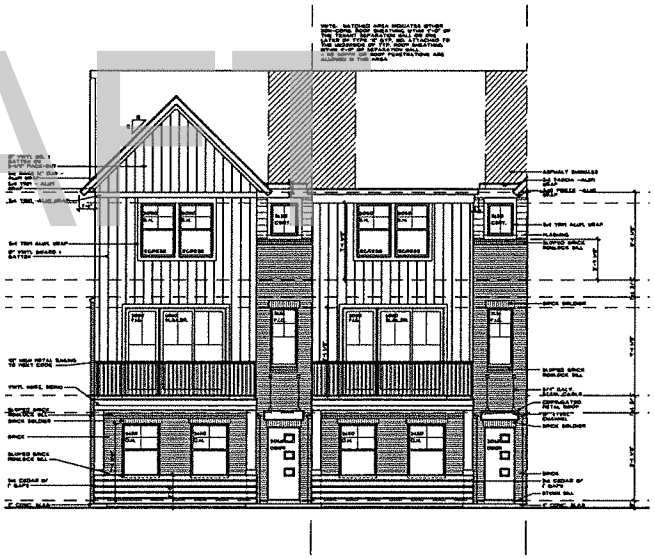
TYP. WINDOW DESIGNATION

EGRESS WINDOW



SIDE ELEVATION

OPPOSITE HAND REVERSE
SCALE: 1/4" = 1'-0"



FRONT ELEVATION

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

BRIAN HEEFER ARCHITECTURE P.C.
DESIGN PLANNING INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANHEEFER.COM
248.259.1784

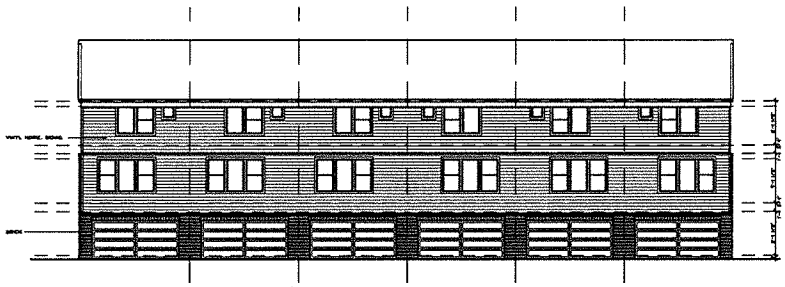
ARCHITECTURE

ELEVATIONS

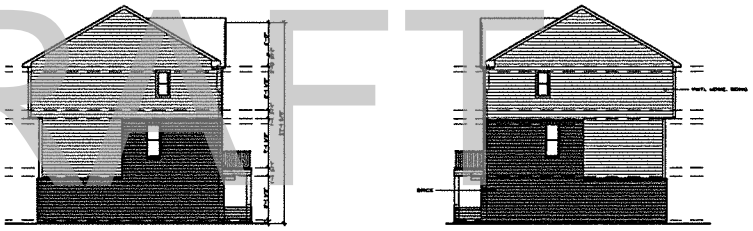
PRELIMINARY

ROBERTSON HOMES
HUDSON TOWNS
30 TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

A-3



REAR ELEVATION
6 UNIT BUILDING



LEFT SIDE ELEVATION

RIGHT SIDE ELEVATION

FRONT ELEVATION
6 UNIT BUILDING

BRIAN HEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS MICHIGAN
BRIANHEEPER.COM
248.259.1784

6 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

ROBERTSON HOMES
HUDSON POINTE
20 TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

A-13

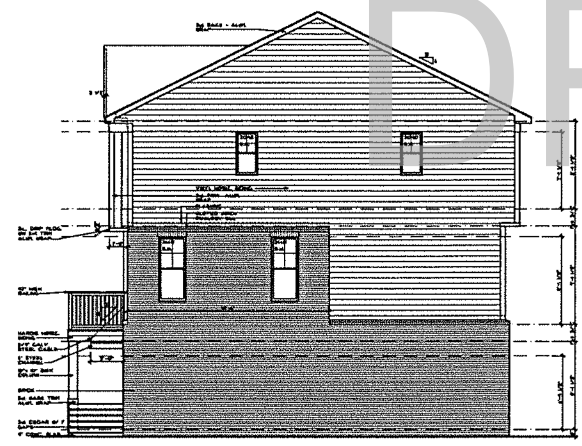
WINDOW SILLS

TYP. WINDOW DESIGNATION

OVERHANGS & DRAINAGE

EGRESS WINDOW

STEEL LINTEL SCHEDULE



RIGHT SIDE ELEVATION

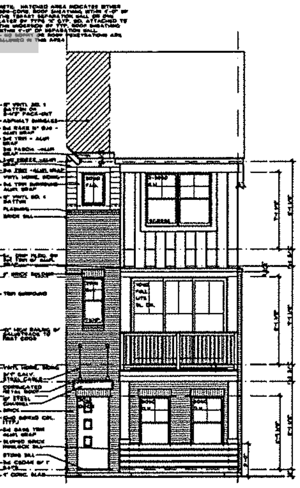
LEFT SIDE ELEVATION - OPPOSITE - SIMILAR SCALE: 1/4" = 1'-0"

ELEVATION 'C'

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

ELEVATION 'B'

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



ELEVATION 'A'

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

ARCHITECTURE

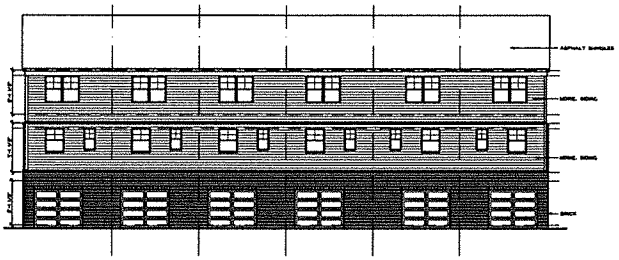
BRIAN NEEPER ARCHITECTURE P.C.

DESIGN - PLANNING - INTERIORS

UNIT ELEVATIONS
FRONTS AND SIDE
PRELIMINARY

ROBERTSON HOMES
HUDSON TOWNS
14' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

A-3

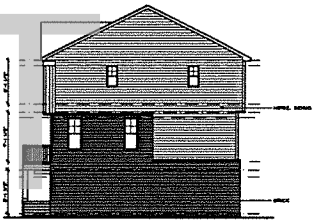


REAR ELEVATION
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"

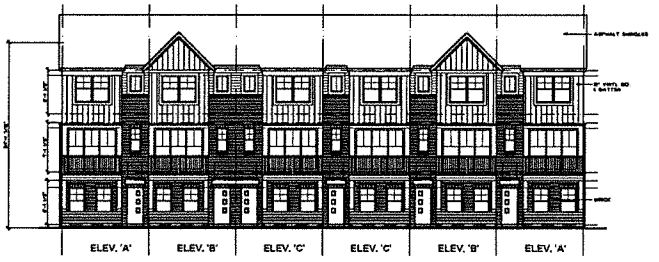
LEFT SIDE ELEVATION

SCALE: 1/8" = 1'-0"



RIGHT SIDE ELEVATION

SCALE: 1/8" = 1'-0"



FRONT ELEVATION
6 UNIT BUILDING

SCALE: 1/8" = 1'-0"

BRIAN MEEPER ARCHITECTURE P.C.
DESIGN + PLANNING + INTERIORS
246.258.1784

6 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

ROBERTSON HOMES
HUDSON TOWNS
16' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

9-19-20

A-9

Exhibit D

Planning Commission Minutes

[Following]