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PLANNING COMMISSION MEETING AGENDA REGULAR MEETING

David Lambert, Chairman, Marianna Perakis, Vice Chairman
Toby Buechner, Carlton Faison, Michael W. Hutson, Tom Krent,
Lakshmi Malalahalli, Sadek Rahman and John J. Tagle

December 13, 2022

7:00 P.M.

Council Chambers

1. ROLL CALL
2. APPROVAL OF AGENDA
3. APPROVAL OF MINUTES – October 25, 2022 and November 1, 2022 (Special Meeting)
4. PUBLIC COMMENT – For Items Not on the Agenda

SPECIAL USE APPROVAL

5. SPECIAL USE APPROVAL AND PRELIMINARY SITE PLAN REVIEW (File Number SU JPLN2022-0004) – Proposed 2690 Crooks Road Apartments, East side of Crooks, South of Big Beaver (2690 Crooks), Section 28, Currently Zoned BB (Big Beaver) District.

PRELIMINARY SITE PLAN REVIEW

6. PRELIMINARY SITE PLAN REVIEW (File Number SP JPLN2022-0023) – Proposed 5920 Livernois Office Building, East side of Livernois, South of Square Lake (PIN 88-20-10-101-018), Section 10, Currently Zoned O (Office) District.
7. PRELIMINARY SITE PLAN REVIEW (File Number SP JPLN2022-0025) – Proposed Lange View Townhouses, Southeast corner of Livernois and Leetonia (4080 Livernois), Section 15, Currently Zoned NN Neighborhood Node (Node "H") District.

PLANNED UNIT DEVELOPMENT

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 & 88-20-15-201-033), Section 15, Currently Zoned RT (One Family Attached Residential), R-1C (One Family Residential) and CB (Community Business) District.
9. POTENTIAL PLANNED UNIT DEVELOPMENT (PUD) APPLICATION – Concept Plan discussion, East of Livernois, North of Square Lake (PIN 88-20-03-301-088, 88-20-03-301-025, -024, -023), Section 35, Currently Zoned NN (Neighborhood Node "Q") and R-1B (One Family Residential) Districts.

NOTICE: People with disabilities needing accommodations for effective participation in this meeting should contact the City Clerk by e-mail at clerk@troymi.gov or by calling (248) 524-3317 at least two working days in advance of the meeting. An attempt will be made to make reasonable accommodations

Televised Live, Government Channel WTRY (10 WideOpenWest and 17 Comcast) Replayed Wednesdays 3:00 pm, 6:00 pm and 11:00 pm

OTHER ITEMS

10. PUBLIC COMMENT – For Items on the Agenda
11. PLANNING COMMISSION COMMENT
12. ADJOURN

Chair Lambert called the Regular meeting of the Troy City Planning Commission to order at 7:00 p.m. on October 25, 2022, in the Council Chamber of the Troy City Hall. Chair Lambert and Vice Chair Perakis presented opening remarks relative to the role of the Planning Commission and procedure of tonight's meeting.

1. ROLL CALL

Present:

Toby Buechner
Carlton M. Faison
Michael W. Hutson
Tom Krent
David Lambert
Lakshmi Malalahalli
Marianna Perakis
Sadek Rahman
John J. Tagle

Also Present:

R. Brent Savidant, Community Development Director
Julie Quinlan Dufrane, Assistant City Attorney
Kathy L. Czarnecki, Recording Secretary

2. APPROVAL OF AGENDA

Resolution # PC-2022-10-054

Moved by: Faison
Support by: Krent

RESOLVED, To approve the Agenda as prepared.

Yes: All present (9)

MOTION CARRIED

3. APPROVAL OF MINUTES – September 27, 2022

Resolution # PC-2022-10-055

Moved by: Buechner
Support by: Rahman

RESOLVED, To approve the minutes of the September 27, 2022 Regular meeting as submitted.

Yes: All present (9)

MOTION CARRIED

4. PUBLIC COMMENT – For Items Not on the Agenda

There was no one present who wished to speak.

PRELIMINARY SITE PLAN REVIEW

5. PRELIMINARY SITE PLAN REVIEW (SP JPLN2022-0121) – Proposed Forum Flats 200-Unit Residential Development, South side of Kirts, West of Livernois (295 Kirts; PIN 88-20-28-252-016), Section 28, Currently Zoned BB (Big Beaver) District

Mr. Savidant reviewed the Preliminary Site Plan application for Forum Flats. He addressed the proposed conversion of an existing office building to multi-family residential and construction of two additional apartment buildings as relates to location, number of apartment units and stories, transparency, carports along the west, east and south perimeters, and amenities. Mr. Savidant briefly addressed parking requirements and the applicant's request to reduce the number of spaces and landbank spaces. He encouraged Board members to pose traffic and parking questions to the traffic consultants present this evening.

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

- The use of landbanked parking, and the potential loss of the central site amenity if landbanked parking is constructed.
- If the application meets the Design Standards and Site Plan Standards.
- If building material selection, color selection and architectural style of the two new buildings complement or support the existing building.
- Update landscape plan to show landscaping in landbanked parking area above underground stormwater detention prior to Final Site Plan Approval.
- Consider conditioning approval of landbanked parking on the use of grasscrete parking areas to replace turf grass.
- Provide cut sheet of the proposed lighting fixtures prior to Final Site Plan Approval.

Discussion among administration and Planning Commission:

- Locations of covered and uncovered parking.
- Definition of 'grasscrete'.
- Explanation/purpose of landbanked parking.
- Development permitted by right.
- Traffic generation, as relates to existing office and proposed multi-family.
- Pedestrian connection on southern portion not designated on site plan; include as condition of approval.
- Access to site; one entrance/exit only on Kirts.

Present were Architect Jason Krieger of Krieger Klatt Architects, developers Jeff Parks and Mike Parks of Cypress Partners, Civil Engineer James Butler of PEA Group and Traffic Consultant Julie Kroll of Fleis & Vandenbrink.

Mr. Krieger's presentation included a descriptive PowerPoint presentation including an aerial view and three-dimensional (3D) rendering of the proposed development. He said there is a current trend to repurpose and redesign existing office buildings and shared that the project team considered numerous visionary concepts of the project before its submittal to the City. Mr. Krieger addressed parking calculations, proposed landbanked parking, site amenities, screening of adjacent parcels, underground detention, pedestrian walkway connection, open space, building materials and complementary architectural style of buildings. Mr. Krieger said the development lends to privacy because it faces inward toward the central open space area. Mr. Krieger's presentation displayed various floor plans, a clubhouse, common area lounges, a workout facility, business and work-from-home center and package delivery area.

There was discussion, some comments related to:

- Concerns with only one access point; potential for traffic congestion.
- Patios and/or balconies are not an option.
- Parking.
 - Number of spaces - covered, uncovered, garage – if sufficient to accommodate residents with more than one vehicle and visitors.
 - Parking calculations; data considered in determining number of spaces.
 - Landbanked parking; approach in utilization of spaces if needed in future.
 - Management of parking assignments and fee structure.
- Notification to adjacent parcels of proposed development.
- Pedestrian walkway connections; oversight on site plan to designate sidewalk on south side of development.
- Open space.
 - Calculations justified by Civil Engineer.
 - Requirement would be met even if landbanked spaces are utilized.
- Height of trees at time of planting; 15 to 20 feet.
- Internal trash rooms, external only for bulk items.
- Complimentary comments on the applicant's presentation.

Julie Kroll of Fleis & Vandenbrink addressed in detail the findings of the parking study prepared for Forum Flats, dated September 27, 2022, and their evaluation of the 85% percentile parking demand for the proposed site as calculated in accordance with ITE Parking Generation 5th Edition. She stated various data is used to determine trip generation and parking demands of actual users of sites across the country.

City Traffic Consultant Stephen Dearing of OHM reaffirmed the Fleis & Vandenbrink parking study determinations. He addressed the City parking requirements and the trend to relax current requirements. Mr. Dearing said the trip generation tables provided in the parking study show the proposed multi-family use in three buildings is expected to generate less traffic than the existing single office building if fully occupied. Mr. Dearing said he is comfortable with the proposed reduction in parking and landbanked parking. He said it would be reasonable and prudent to convert one or two areas of the landbanked parking in the future should it be necessary.

Ms. Perakis suggested lowering the building stories to two or converting the first floors of the buildings to garage spaces. She expressed concern with losing open space should it become necessary in the future to utilize the landbanked parking. Ms. Perakis said she is not comfortable with the plan's proposed parking and expressed safety concerns because of the lack of speed bumps, striped pedestrian crosswalks and only one access point.

Mr. Mike Parks addressed management's assignment of carports and garages to the residents and offered to provide a parking plan prior to Final Site Plan Approval should the Board desire. He said the project would not be economically feasible if building floors were eliminated.

Mr. Rahman expressed concerns that parking would be insufficient to accommodate residents who own more than one vehicle, as well accommodate visitor parking. He addressed the blend of providing sufficient parking and offering residents the amenity of open space. Mr. Rahman said there is no clear picture of how management would control the parking.

Mr. Tagle confirmed with the Planning Director that the application meets the Zoning Ordinance parking requirements and there is no requirement in the Zoning Ordinance that an applicant provide a parking plan prior to Final Site Plan Approval. He said he has no problem with the proposed parking and the landbanked spaces act as a safety net. Mr. Tagle suggested approval of the application could be conditioned on providing traffic calming measures and striped pedestrian walkways. He expressed support for the proposed development.

Chair Lambert expressed concern with the height of the building to the east and the visual impact it poses to those on Olympia. He asked if the applicant would consider reducing the height of the building to the east.

Mr. Krieger said he would consider adjusting the parapet height to reduce the visual impact and screen rooftop equipment internally. He noted the building height does meet Zoning Ordinance requirements.

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

Ms. Perakis questioned if the proposed carports would conflict with design standards set forth in Section 5.04, E, 5.b.i (Site Access and Parking, Location). She questioned the safety and look of the carports.

Mr. Savidant replied that design standard does not apply here because the side yard does not front on the building line. He said the Planning Commission should consider the compatibility of the lengthy carports and their relationship to screening adjacent properties.

Ms. Perakis questioned the requirement that the primary entrance of the existing building must be clearly identifiable and usable in the front. She said she is not prepared to approve the project at this time.

Mr. Savidant replied that provision does not apply in this case because there is no front relationship. He said the building is nonconforming and the applicant is not increasing to the non-conformance.

Resolution # PC-2022-10-056

Moved by: Tagle

Seconded by: Krent

RESOLVED, The Planning Commission hereby approves a reduction in the total number of required parking spaces for the proposed Forum Flats residential development to 308 when a total of 366 spaces are required on the site based on the off-street parking space requirements for multi-family residential. This 58-space reduction is sufficient to meet the parking demands based on landbanked parking provided on the site; and,

BE IT FINALLY RESOLVED, That Preliminary Site Plan Approval for the proposed Forum Flats 200-unit residential development, South side of Kirts, West of Livernois, Section 28, Currently Zoned BB (Big Beaver) District, **be granted**, subject to the following conditions:

1. Update the landscape plan to show landscaping in the landbanked parking area above the underground stormwater detention prior to Final Site Plan Approval.
2. Provide grasscrete parking areas to replace turf grass in landbanked areas.
3. Provide a cut sheet of the proposed lighting fixtures prior to Final Site Plan Approval.
4. On the east building, south side, lower the parapets to approximately three (3) feet above the roof line.
5. Address the concerns noted in the OHM memorandum, dated October 19, 2022.
6. Should landbanked parking be necessary in the future, utilize a piecemeal approach beginning at the east side of the building above the underground detention.

Yes: Buechner, Faison, Hutson, Krent, Lambert, Malalahalli, Tagle
No: Perakis, Rahman

MOTION CARRIED

OTHER ITEMS

6. **PUBLIC COMMENT** – For Items on the Agenda

There was no one present in the audience who wished to speak.

7. **PLANNING COMMISSION COMMENT**

There were general comments, some relating to:

- Attendance at the Michigan Association of Planning (MAP) annual conference.
- November 1, 2022 Special Meeting; agenda items.
- Future meeting to discuss potential revisions to the Bylaws.

8. **ADJOURN**

The Regular meeting of the Planning Commission adjourned at 9:07 p.m.

Respectfully submitted,

David Lambert, Chair

Kathy L. Czarnecki, Recording Secretary

[https://d.docs.live.net/2f7ed4fe5f664ea8/Documents/Kathy/COT Planning Commission Minutes/2022/2022 10 25 Draft.docx](https://d.docs.live.net/2f7ed4fe5f664ea8/Documents/Kathy/COT%20Planning%20Commission%20Minutes/2022/2022%2010%2025%20Draft.docx)

Chair Lambert called the Special meeting of the Troy City Planning Commission to order at 7:00 p.m. on November 1, 2022, in the Council Chamber of the Troy City Hall. Chair Lambert and Vice Chair Perakis presented opening remarks relative to the role of the Planning Commission and procedure of tonight's meeting.

1. ROLL CALL

Present:

Toby Buechner
Carlton M. Faison
Michael W. Hutson
Tom Krent
David Lambert
Lakshmi Malalahalli
Marianna Perakis
Sadek Rahman
John J. Tagle

Also Present:

R. Brent Savidant, Community Development Director
Ben Carlisle, Carlisle Wortman Associates
Julie Quinlan Dufrane, Assistant City Attorney
Kathy L. Czarnecki, Recording Secretary

2. APPROVAL OF AGENDA

Resolution # PC-2022-11-057

Moved by: Krent
Support by: Rahman

RESOLVED, To approve the Agenda as prepared.

Yes: All present (9)

MOTION CARRIED

3. PUBLIC COMMENT – For Items Not on the Agenda

There was no one present who wished to speak.

PRELIMINARY SITE PLAN REVIEW

4. PRELIMINARY SITE PLAN REVIEW (SP JPLN2022-0024) – Proposed Jeanne M. Stine Community Park Pavilion and Ice Skating Amenity, Southeast corner of Town Center Drive and Civic Center Drive, City of Troy Civic Center Campus, Section 21, Currently Zoned BB (Big Beaver) District

Mr. Savidant introduced Public Works Director Kurt Bovensiep and Architect Chris Ozog from OHM Advisors. He said a conceptual plan was presented to the Planning Commission at their May 24, 2022 meeting and feedback was supportive. Mr. Savidant said the plan is before the Board this evening for vetting and transparency reasons and, should the Board desire, to forward a Resolution of support to City Council.

A PowerPoint presentation given by Mr. Ozog summarized the following:

- Background and initial concept of project.
- Assessment from other communities with similar amenities.
- Funding.
- Bidding process.
- Site context as relates to Jeanne M. Stine Community Park.
- Goals and objectives; initiatives.
- Design elements.
- Landscape; natural feel, variety of species to accentuate four seasons.
- Renderings; visual of openness, natural feel.
- Building materials.
- Project schedule.

There was discussion on:

- New location for sculpture donated by K-Mart Headquarters.
- Relationship of project to annual Troy Daze festivities.
- Seasonal scope of project.
- Catalyst for future amenities.
- Uniqueness of facility.
- Overall cost and City budget.
- Intent to bid for the operations of ice skating facility.
- Relationship to Lane Drain; impact, provisions.
- Project entrance(s).
- Pedestrian sidewalk as relates to floodplain, topography, connection to Community Center.
- Radiant heating, gas fire pits.
- Lighting concept.
- Wayfinding means.
- Screening of utility equipment.

Resolution # PC-2022-11-058

Moved by: Hutson

Seconded by: Rahman

WHEREAS, The City of Troy established and dedicated 6.3 acres of land now known as the Jeanne M. Stine Community Park in 2022 which is home to the Troy Farmers' Market and other events in the spring and summer seasons; and,

WHEREAS, The City of Troy continually receives requests for year-round public gathering spaces for use by people who reside, work and visit the City;

RESOLVED, The Planning Commission hereby supports the proposed Preliminary Site Plan for the Jeanne M. Stine Community Park Pavilion and Ice Skating Amenity, located on the southeast corner of Town Center Drive and Civic Center Drive, on the City of Troy Civic Center Campus.

Yes: Faison, Hutson, Krent, Lambert, Malalahalli, Perakis, Rahman, Tagle

No: Buechner

MOTION CARRIED

OTHER ITEMS

5. **TROY DDA BIG BEAVER LANDSCAPE IMPROVEMENTS**

Mr. Savidant said the DDA Big Beaver Landscape Improvement conceptual plan was presented to the Board on March 8, 2022 for feedback. He said Mr. Bovensiep is here this evening to present a refined plan.

Mr. Bovensiep's presentation addressed:

- Funding by DDA, project cost and budget through 2025.
- Six phases of 10-year project, timeline.
- Project drivers: high impact, timeless, enjoyable, balanced, adaptive, safe, unique, coordinated.
- Consideration of various studies, on-line survey, stakeholders' engagement.
- Concept development (natural and consistent feel, sufficiency in landscape color).
- Corridor entrances.
- Visualization of vehicular traffic through corridor.
- Lighting; street, holiday season, potential pedestrian lighting in future.
- Plan concentrated on:
 - I-75 diverging diamond.
 - Medians.
 - Western gateway.
 - Major intersections.
 - Corner perspective (crosswalks).
 - Mid-block crossings.
 - Corner park improvement (southwest corner Livernois and Big Beaver).
- Uniqueness of project; no other landscape design in Michigan similar to this plan.
- Landscaping; maintenance, preservation of existing trees, diversity of plantings.
- Pedestrian traffic; comfort level, signalization.

6. PUBLIC COMMENT – For Items on the Agenda

There was no one present in the audience who wished to speak.

7. PLANNING COMMISSION COMMENT

Mr. Savidant announced the next Planning Commission meeting is scheduled for December 13.

Mr. Savidant announced the retirement of City Engineer Bill Huotari. Mr. Huotari has been with the City for 27½ years and will be greatly missed.

8. ADJOURN

The Regular meeting of the Planning Commission adjourned at 8:24 p.m.

Respectfully submitted,

David Lambert, Chair

Kathy L. Czarnecki, Recording Secretary

[https://d.docs.live.net/2f7ed4fe5f664ea8/Documents/Kathy/COT Planning Commission Minutes/2022/2022 11 01 Draft.docx](https://d.docs.live.net/2f7ed4fe5f664ea8/Documents/Kathy/COT%20Planning%20Commission%20Minutes/2022/2022%2011%2001%20Draft.docx)

ITEM #5

DATE: December 7, 2022

TO: Planning Commission

FROM: R. Brent Savidant, Community Development Director

SUBJECT: SPECIAL USE APPROVAL AND PRELIMINARY SITE PLAN REVIEW (File Number SU JPLN2022-0004) – Proposed 2690 Crooks Road Apartments, East side of Crooks, South of Big Beaver (2690 Crooks), Section 28, Currently Zoned BB (Big Beaver) District.

The petitioner Tower Construction, LLC submitted the above referenced Special Use Approval and Preliminary Site Plan Approval application to convert as existing 4-story office building into 62 residential units and construct a new 5-story, 94-unit multiple-family residential building on the parcel.

The attached report prepared by Carlisle/Wortman Associates, Inc. (CWA), the City's Planning Consultant, summarizes the application. 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 recommends approval of the project, as noted.

Attachments:

1. Maps
2. Report prepared by Carlisle/Wortman Associates, Inc.
3. Traffic/parking study, prepared by ROWE, dated February 21, 2022.
4. OHM traffic/parking memo, dated November 29, 2022.
5. RCOC memo, dated November 8, 2022.

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PROPOSED RESOLUTION

SPECIAL USE APPROVAL AND PRELIMINARY SITE PLAN REVIEW (File Number SU JPLN2022-0004) – Proposed 2690 Crooks Road Apartments, East side of Crooks, South of Big Beaver (2690 Crooks), Section 28, Currently Zoned BB (Big Beaver) District.

Resolution # PC-2022-12-

Moved by:

Seconded by:

RESOLVED, The Planning Commission hereby approves a reduction in the total number of required parking spaces for the proposed 2690 Crooks Road residential development to 221 when a total of 312 spaces are required on the site based on the off-street parking space requirements for multi-family residential. This 91-space reduction is sufficient to meet parking demands based on shared parking provided on the abutting site to the north; and,

RESOLVED, That Special Use Approval and Preliminary Site Plan Approval for the proposed 2690 Crooks Road Apartments, east side of Crooks, south of Big Beaver (2690 Crooks), Section 28, Currently Zoned BB (Big Beaver) District, be (granted, subject to the following conditions)

1. Provide shared parking agreement for review and approval of City Attorney, prior to Final Site Plan Approval.
2. Improve pedestrian circulation based on OHM comments.
3. Ensure trash enclosure meets screening requirements.
4. Ensure building lighting meets Zoning Ordinance requirements.
5. Provide transparency calculations.
6. Verify unit numbers.

_____) or

(denied, for the following reasons: _____) or

(postponed, for the following reasons: _____)

Yes:

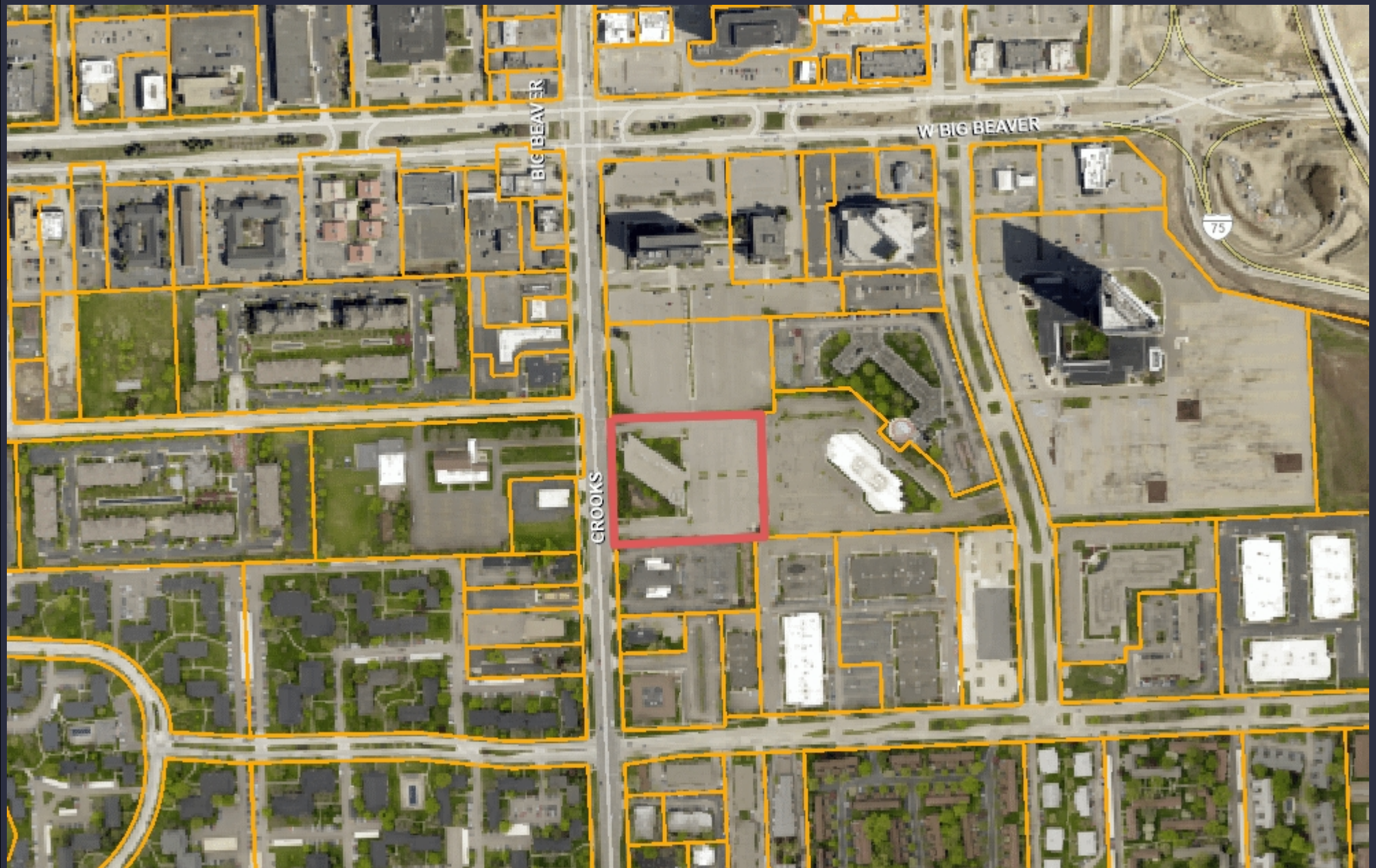
No:

Absent:

MOTION CARRIED / FAILED



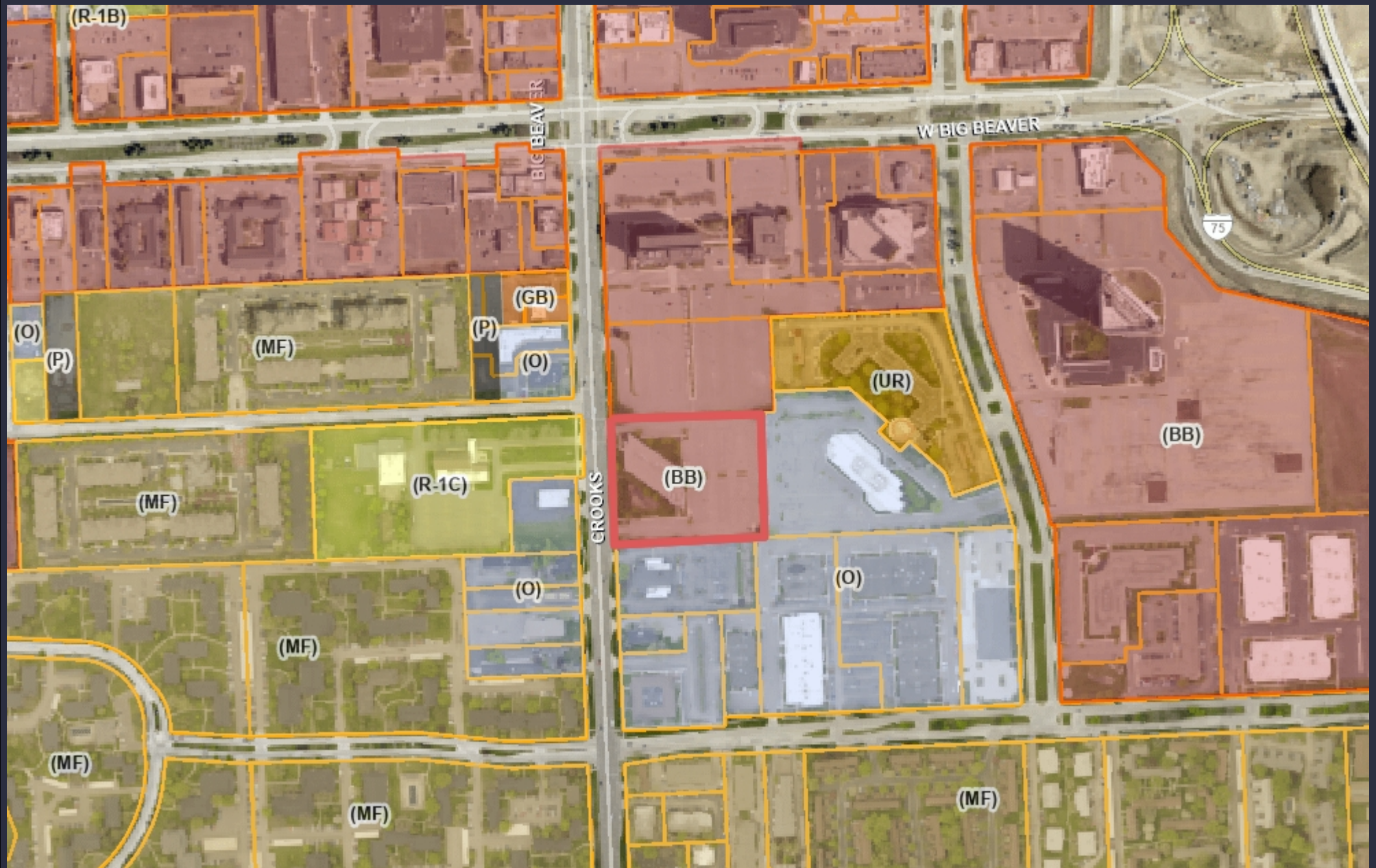
GIS Online



1,154 0 577 1,154 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.



1,154 0 577 1,154 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.



Carlisle | Wortman
ASSOCIATES, INC.

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

Date: June 23, 2022
December 6, 2022

Preliminary Site Plan and Special Use Review For City of Troy, Michigan

Applicant: Jordan Jonna

Project Name: 2690 Crooks Road Multiple Family Residential

Location: 2690 Crooks Road

Plan Date: October 11, 2022

Zoning: BB, Big Beaver

Action Requested: Preliminary Site Plan and Special Use

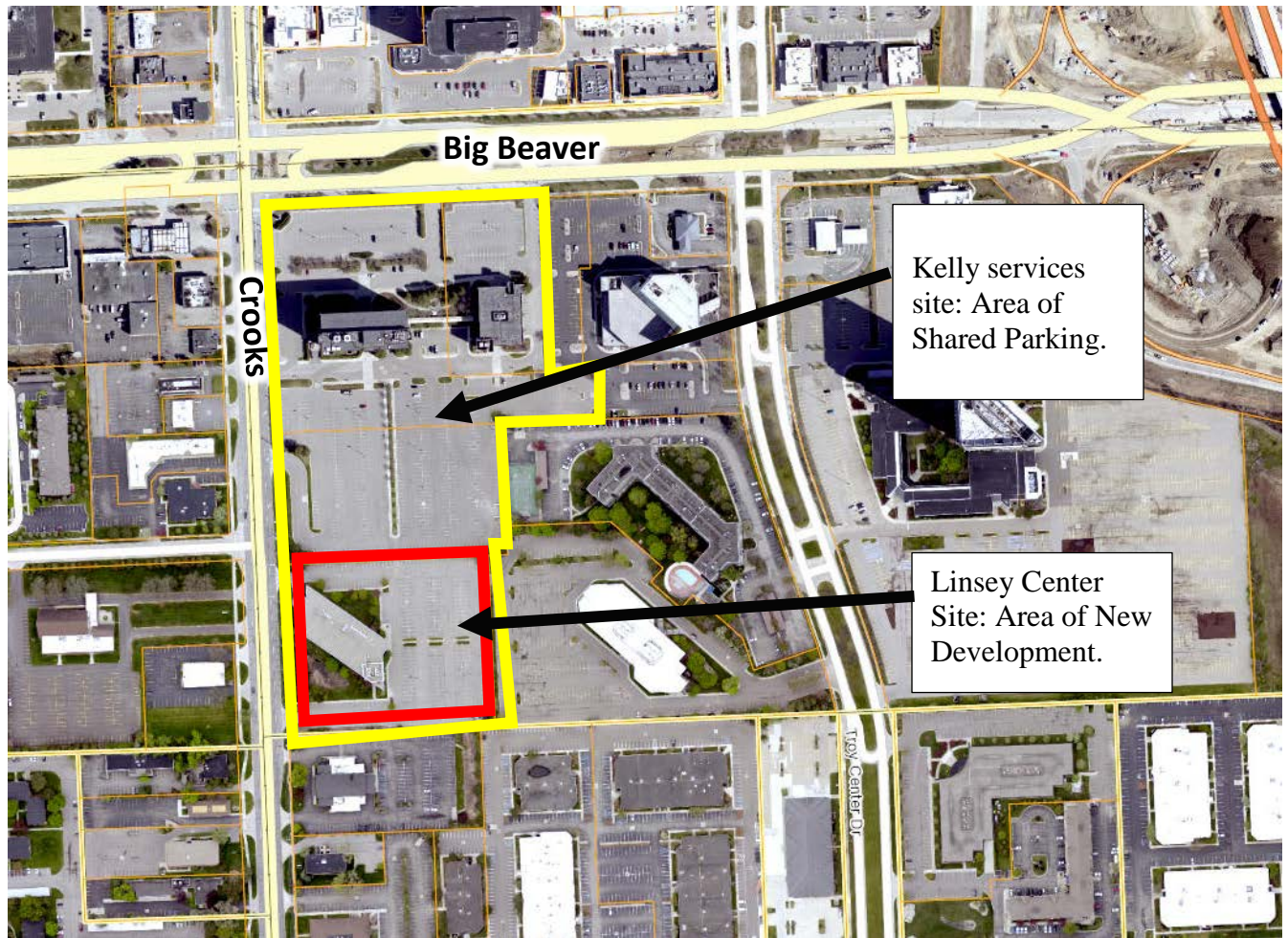
SITE DESCRIPTION

An application has been submitted to repurpose the existing 4-story building on site (Lindsey Center) to create 62 units and construct a new five-story 94-unit multiple-family residential building at 2960 Crooks Road. This represents a total of 156 units. We used 156 units for parking calculations. The new building is located to the east (rear) of the existing four-story building. The area of the newly proposed five-story building is currently a parking lot.

Access will remain as is with two points of access off Crooks Road with cross-access to the north and east. The applicant is proposing shared parking for both buildings at 2690 Crooks with the Kelly Services site (north of proposed building).

The applicant is proposing residential on all five (5) floors. Residential uses on the first floor, not fronting on a public right-of-way, requires a Special Use permit.

Site Location:



Detailed Location:



Proposed Uses of Subject Parcel:

Existing building to be converted to 62 multiple family units and new building to include 94 multiple family dwelling units.

Current Zoning:

The property is currently zoned BB, Big Beaver Form Based District

Surrounding Property Details:

Direction	Zoning	Use
North	BB, Big Beaver	Office Parking
South	O, Office	Funeral Home
East	O, Office	Office
West	O, Office and R1-C, One Family Residential	Office and Place of Worship

REZONING AND ZONING TEXT AMENDMENT

In the summer of 2021, 2690 Crooks was rezoned, in part, to allow for the conversion of the existing four-story building to be converted from office to residential. The previous zoning of O, Office did not permit residential uses. Please see our May 5, 2021 review memo for more information.

In the fall of 2021, a text amendment was adopted which permitted residential uses on the first floor as a Special Use for the section of the building that does not front on a public right-of-way.

NATURAL FEATURES

The site has been graded and improved for an office building and an associated parking lot.

Items to be addressed: None.

SITE ARRANGEMENT

The new five-story building will be placed to the east (rear) of the existing four-story Lindsey Center building lot. Access will remain with two points of access on Crooks, and cross access to the site to the north and east. There is a row of shared parking between the existing and new building.

Access and circulation have been reviewed by the City Fire Marshall who notes that they need the drive aisles around the buildings to be at least 26-feet in width.

In addition, OHM has reviewed site circulation and notes a number of comments. The applicant should review and revised based on OHMs comments.

Items to be addressed: 1). Increase drive-aisle width to at least 26-feet; and 2). Review and revise pedestrian circulation based on OHMs comments.

AREA, WIDTH, HEIGHT, SETBACKS

The applicant does not propose any changes to the footprint of the existing building. The new building is being reviewed as Building Form D as set forth in Table 5.03.B.3:

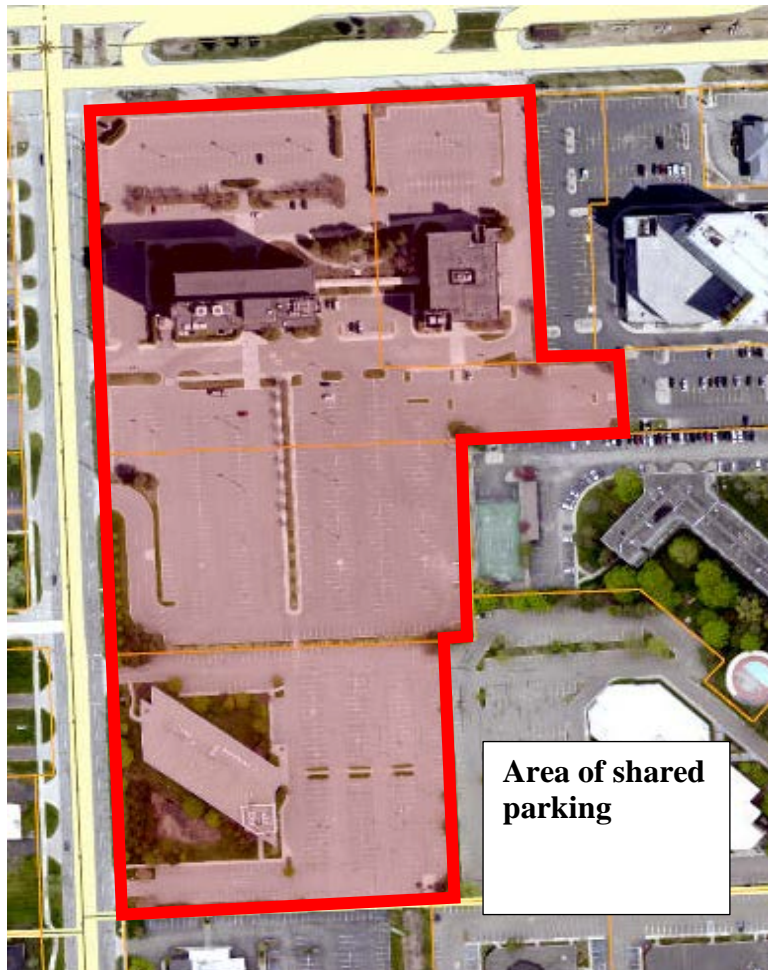
	Required	Provided	Compliance
Front (Crooks)	10-foot build-to-line	Over 10 feet	Complies as Lindsey Center is legal non-conforming and new building is placed behind existing building
Side (north)	N/A, building may be placed up to property line	47.9-feet	Complies
Side (south)	N/A, building may be placed up to property line	57.9-feet	Complies
Rear (South)	30-foot minimum setback	54.4-feet	Complies
Building Height	6 stories, 66 feet	5 stories, 60 feet	Complies
Lot Coverage (Building, overall site)	30%	Unknown	Complies
Minimum Open Space (overall site)	20%	24.1	Complies
Parking Location	Cannot be located in front yard	Parking lots not in front yard	Complies

The applicant is proposing a pedestrian connection between the exiting Lindsey Center building and the new apartment complex.

Items to be addressed: None

PARKING

The applicant proposes shared parking for both buildings with the Kelly service buildings and parking areas.



Section 13.06.G of the Zoning Ordinance requires:

KELLY SERVICES	Required	Provided
Kelly Services Professional Office: 1 space per 300 net floor area	$175,827 / 300 = 587$ spaces	883 spaces
Total	587 spaces	883 spaces

LINDSEY CENTER		
	Required	Provided
Residential (General): 2 spaces per unit	94 units in new building + 62 units in Lindsey Center conversion = 312 spaces	221 spaces
Total	312 spaces*	221 spaces

COMBINED		
	Required	Provided
Kelly Services	587 spaces	883 spaces
Lindsey Centre	312 spaces	221 spaces
Total	899 spaces	1,104 spaces

**Please note that the applicant's civil plans note 151 units but based on the submitted floor plans we count a total of 156 units. We used 156 units for parking calculations. The applicant should verify unit numbers.*

By Zoning Ordinance requirements, the applicant has under parked the Lindsey Center site by 91 spaces. As such the applicant is proposing shared parking to include both sites as noted. As set forth in Section 13.06, off-street parking for uses in all districts shall be on the same lot as the use or building served by the parking, unless joint parking with abutting properties and uses is provided in a form acceptable to the City Attorney and executed and recorded by the parties sharing the parking.

OHM has reviewed the shared parking. Please review and revise based on OHM's memo.

Items to be Addressed: Review OHM's memo regarding shared parking.

TRAFFIC

The applicant submitted a traffic study that was reviewed by both OHM and the Oakland County Road Commission. Please see OHMs and Road Commission review for comments.

Items to be addressed: None

LANDSCAPING

A landscaping plan has been provided on Sheet L101. The following table discusses the development's compliance with the landscape requirements set forth in Section 13.02.

	Required:	Provided:	Compliance:
Greenbelt Planting			
Crooks: 1 tree every 30 feet	$369 / 30 = 13$ trees	+14 trees	Complies
Parking Lot Landscaping			
1 tree per every 8 parking spaces	$221 \text{ spaces} / 8 = 28$ trees	3 in parking lot and 25 on perimeter	Complies, with Planning Commission approval
Overall			
<u>Site landscaping:</u> A minimum of twenty percent (20%) of the site area shall be comprised of landscape material. Up to twenty-five percent (25%) of the required landscape area may be brick, stone, pavers, or other public plaza elements, but shall not include any parking area or required sidewalks.	20%	Applicant notes 29%	Complies

Applicant is required to provide 28 parking lot trees. Three (3) of the required 28 are in parking lot and 25 are along perimeter of parking lot. Planning Commission may allow alternative location of parking lot trees.

Transformer / Trash Enclosure:

The applicant has indicated they propose to reuse the existing trash enclosure. Applicant shall confirm existing screening of the trash enclosure.

Items to be Addressed: 1). Planning Commission to discuss parking lot tree location; and 2). Confirm existing screening of trash enclosure.

PHOTOMETRICS

The applicant is proposing thirteen (13) parking lot lights. The lighting fixture and photometrics meet ordinance requirements.

The applicant did not indicate any building lighting.

Items to be Addressed: *Confirm building lighting.*

FLOOR PLAN AND ELEVATIONS

Existing Lindsey Building:

The applicant proposes the following:

1. Existing metal panel and glass to remain
2. New metal wrap and balconies to be added to exterior skin
3. Exterior metal and glass to be removed for new balcony doors and windows
4. Other elements of current façade to remain.

The proposed color scheme is dark and light greys, and orange accents.

New Building:

Floor plans and elevations have been provided on sheets A.201. The first three floors are utility brick of different grey colors and the fourth and fifth floors are hardie panel siding. The elevations provided show architectural details, variations in material and pattern (brick, hardie panel siding) as well as general color scheme of dark and light greys, and orange accents.

The east, south and north elevations do not appear to meet the 30% transparency requirement.

The applicant has provided a rendering of the buildings; however, it would be helpful if the applicant was able to show a 3-D model of the buildings in context to the site and to each other.

Items to be Addressed: *Confirm transparency for east, south, and north side elevation of new building; and 2). Provide 3-D model.*

DESIGN STANDARDS AND SITE PLAN REVIEW STANDARDS

The Big Beaver Node design standards as well as Site Plan review standards provide the Planning Commission with direction when reviewing the proposed site plan and design features of this development.

Section 5.04.E. outlines Design Standards:

1. *Building Orientation and Entrance*
2. *Ground Story Activation*
3. *Transitional Features*
4. *Site Access, Parking, and Loading*

Please see Section 5.04.E for standard details.

Section 8.06 outlines Site Plan Review Design Standards.

1. *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.*
2. *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.*
3. *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.*

SPECIAL USE STANDARDS

For any special use, according to Section 9.02.D, the Planning Commission shall *“...review the request, supplementary materials either in support or opposition thereto, as well as the Planning Department’s report, at a Public Hearing established for that purpose, and shall either grant or deny the request, take action on the request, or grant the request subject to specific conditions.”*

Section 9.03 states that before approving any requests for Special Use Approval, the Planning Commission shall consider:

1. *Compatibility with Adjacent Uses.*
2. *Compatibility with the Master Plan.*
3. *Traffic Impact.*
4. *Impact on Public Services.*
5. *Compliance with Zoning Ordinance Standards.*
6. *Impact on the Overall Environment. The proposed Special Use shall no*
7. *Special Use Approval Specific Requirements.*

SUMMARY

As part of the deliberation, the Planning Commission and applicant shall discuss:

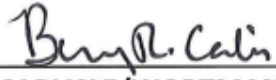
- a. Compliance with Section 5.04.E Big Beaver Design Standards
- b. Compliance with Section 8.06 Site Plan Review Standards
- c. Compliance with 9.02.D Special Use Standards
- d. Architecture and material use:
 - a. Transparency for east, north, and south elevation on new building
 - b. Consideration of a 3-D model of the buildings in context to the site and to each other
- e. Planning Commission to discuss parking lot tree location
- f. Shared parking

If Planning Commission approves preliminary site plan the following conditions shall as part of final site plan submittal:

1. Provide 26-foot wide drive aisles per Fire Department.
2. Improve pedestrian circulation based on OHMs comments.
3. Confirm existing screening of trash enclosure.
4. Confirm building lighting.
5. Provide a shared parking agreement to the satisfaction of the City Attorney.
6. Provide transparency calculations.

2690 Crooks Road
December 6, 2022

Sincerely,

A handwritten signature in cursive script, reading "Ben R. Carlisle".

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



February 21, 2022

Mr. Jason Gekiere
Tower Construction
2093 Orchard Lake Road
Sylvan Lake, MI 48230

RE: Trip Generation Comparison and Shared Parking Analysis for 999 and 991 W. Big Beaver Road and 2690 Crooks Road in Troy, MI

Dear Mr. Gekiere:

Pursuant to your request, ROWE Professional Services Company has completed a trip generation comparison and shared parking analysis for the proposed redevelopment of 999 and 991 W. Big Beaver Road and 2690 Crooks Road in Troy, MI. This analysis is intended to give you, the Road Commission for Oakland County (RCOC) and the City of Troy information regarding the difference in trip generation when comparing the existing site to the proposed site plan traffic forecasts and shared parking analysis for the development.

Trip Generation Comparison for 2690 Crooks Road

Through information you have provided, as well as our review of the materials received via email, we understand the following regarding your proposed project:

- Existing Site:
 - 4-story General Office building with 21,878 square foot (SF) footprint (87,512 SF total area)
- Proposed Site Plan:
 - 5-story Multifamily building with 90 units (Multifamily Housing [Mid-Rise]) – new construction to the east of the existing building
 - 4-story Multifamily building with 61 units (Multifamily Housing [Mid-Rise]) – existing building

Using the information and methodologies specified in the latest version of Trip Generation (Trip Generation Manual, 11th Edition, 2021), ROWE forecast the weekday AM and PM peak hour trips associated with the amended site plan. The results of the trip generation comparison forecasts are provided in Table 1.

Farmington Hills, MI: 27280 Haggerty Road, Suite C-2, 48331 | Phone: (248) 675-1096

Civil Engineering | Surveying | Landscape Architecture | Aerial Imagery/Mapping | Planning

Flint, MI (HQ) | Lapeer, MI | Farmington Hills, MI | Kentwood, MI | Mt. Pleasant, MI | Grayling, MI | Myrtle Beach, SC | www.rowepsc.com

Table 1: Trip Generation Comparison

Land Use	Land Use Code	Units	AM Peak Hour			PM Peak Hour			Week Day	
			In	Out	Total	In	Out	Total		
Existing Land Use										
General Office	710	87,512 SFT	131	18	149	25	124	149	1,033	
Proposed Land Use										
Multifamily Housing (Mid-Rise)	221	151 DU	13	42	55	36	23	59	674	
Difference			-118	24	-94	11	-101	-90	-359	

Compared to the trip generation potential of the proposed site changed to the existing land use, the site is anticipated to generate 94 fewer total trips during the AM peak hour (118 fewer inbound trips and 24 additional outbound trips), 90 fewer total trips during the PM peak hour (11 additional inbound trips and 101 fewer outbound trips), and 359 fewer daily vehicle trips.

Shared Parking for 999 and 991 W. Big Beaver Road and 2690 Crooks Road

A shared parking analysis was completed for the two sites in accordance with both Urban Land Institute (ULI) and City of Troy standards. The City of Troy allows for a shared parking analysis based on parking supply rates specified in the City Ordinance and ULI rates for hourly, daily, and monthly variations in parking demand for the various land uses specified. Additionally, ULI rates for employees versus visitors were also utilized for the various land uses within the proposed site. This analysis was performed to determine the number of parking spaces necessary on site.

The site located at 999 and 991 W. Big Beaver Road includes an existing 168,200 square foot office building and the following proposed uses: 9,200 square feet of Retail space, 2,000 square feet of Bank space with two drive-through lanes, a 300 seat Restaurant, 3,200 square foot Fast Food Restaurant, and a 5-Story Multifamily Housing building containing 166 dwelling units (DU). The site located at 2690 includes a new 5-story Multifamily Housing building containing 90 DU and the renovation of an existing office building into Multifamily Housing containing 61 DU for a total of 151 DU.

Per the City Ordinance, parking requirements for the office space and fast-food restaurant are calculated using the net square footage, which was assumed to be 80 percent of the total square footage areas listed above. Additionally, each of the drive-through lanes at the proposed bank can accommodate four vehicles, which meets the minimum requirement listed in the City Ordinance.

The ULI Shared Parking methodologies were implemented to determine an accurate parking demand for the proposed site. It is common for sites with a mixture of uses to have varying peak hourly and monthly parking demands, as well as being shared destinations (i.e., a shopper may also visit a restaurant). Therefore, a shared parking analysis is necessary to accurately determine the amount in which the number of required parking spaces could be reduced by, as compared to the sum of the individual parking requirements for each land use on the site.

ROWE analyzed the differences in activity patterns, which include monthly and time of day variances, for each land use. This is because the combination of land uses within the site do not have peak utilization during the same time periods. Time-of-Day factors for weekdays and weekends and monthly adjustment factors for the various land uses can be found in the attached ULI Shared Parking spreadsheets.

Mr. Jason Gekiere
February 21, 2022
Page 3

The final step of the analysis was to determine the critical parking periods for the site. All hours of operation from 6 a.m. to midnight were analyzed for each month of the year. The result showed that the month of December has the highest peak demands of the year. Furthermore, the overall peak time of the day for the entire site was determined to be 10 a.m. for weekdays and 11 a.m. for weekends. The overall peak period of the proposed site would be 11 a.m. on a weekend in December, resulting in a maximum demand of 1,208 required parking spaces. Detailed tables can be found in the attached ULI Shared Parking spreadsheet. The proposed site plans show 1,017 parking spaces for 991 and 999 W. Big Beaver Road and 221 parking spaces for 2690 Crooks Road, for a total of 1,238 parking spaces.

We hope that this letter meets your current needs. Please feel free to contact us if you have any questions.

Sincerely,
ROWE Professional Services Company

Michael J. Labadie, PE
Senior Project Manager

R:\Projects\PROPOSAL\M. Labadie\2022\Tower\Tower Trip Gen Comparison-Shared Parking.docx

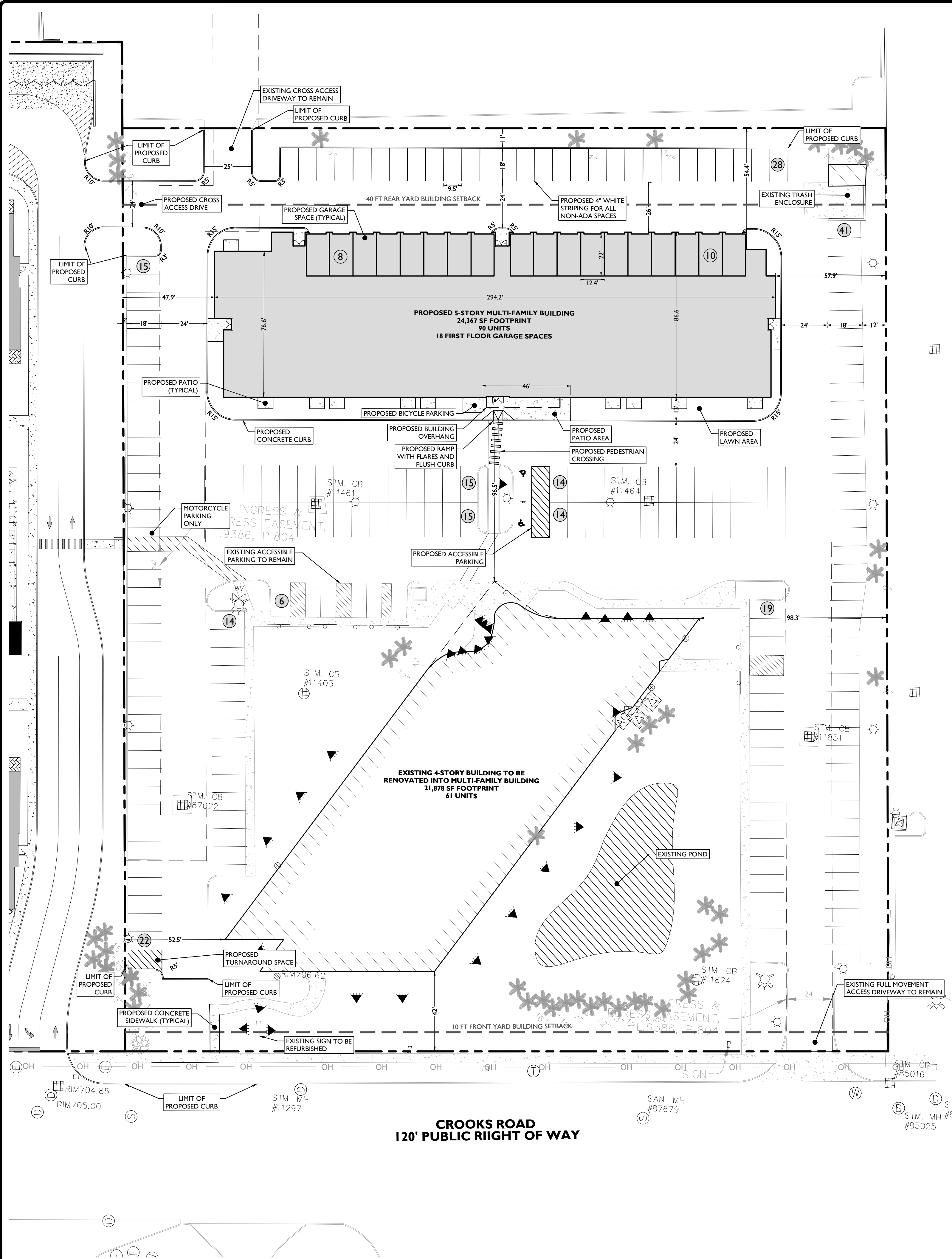


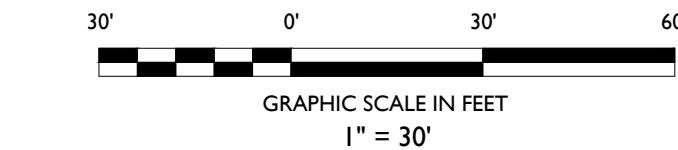
TABLE OF LAND USE AND ZONING		
PARCEL ID: 20-28-101-003		
BIG BEAVER ROAD (BB) - (STREET TYPE: B, BUILDING FORM-D)		
PROPOSED USE		
MULTI-FAMILY APARTMENTS	PERMITTED USE	
GROUND FLOOR UNITS	SPECIAL LAND USE	
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT AREA	N/A	193,599 SF (4.44 AC)
LOT COVERAGE BY ALL BUILDINGS	30% (58,080 SF)	22.8% (44,302 SF)
MINIMUM BUILDING HEIGHT	35 FT (6 STORIES)	60.0 FT (5 STORIES)
MAXIMUM BUILDING HEIGHT	66 FT (6 STORIES)	60.0 FT (5 STORIES)
REQUIRED BUILDING LINE	10 FT	42.0 FT (EN)
MINIMUM SIDE YARD SETBACK	0 FT	44.5 FT
MINIMUM REAR YARD SETBACK	40 FT	64.1 FT

(EN) EXISTING NON-CONFORMITY

OFF-STREET PARKING REQUIREMENTS		
CODE SECTION	REQUIRED	PROPOSED
§ TABLE 13.06-A	MULTI-FAMILY DWELLING: 2 SPACES PER DWELLING UNIT (151 UNITS)(2 SPACES PER UNIT) = 302 SPACES	221 SPACES (V)
§ TABLE 13.06-B	90° PARKING: 9.5 FT X 19 FT W/ 24 FT AISLE	9.5 FT X 19 FT W/ 24 FT AISLE
§ 13.06.F.3	MAXIMUM PARKING: 120% OF REQUIRED PARKING (302 SPACES)(1.2) = 363 SPACES	221 SPACES
§ 13.11.C.4	BICYCLE PARKING: 2 SPACES PER BUILDING (2 BUILDINGS)(2 SPACES/BUILDING) = 4 SPACES	TO BE PROVIDED
§ 13.02.E-1	SITE LANDSCAPING: 15% OF THE SITE AREA SHALL BE LANDSCAPED (193,599 SF)(0.15) = 29,040 SF	29.6% (57,277 SF)
§ 4.09.D.5	RECREATIONAL AREA: 300 SF RECREATIONAL AREA PER UNIT (142 UNITS)(300 SF/UNIT) = 42,600 SF	46,682 SF

(V) VARIANCE

- GENERAL NOTES**
- THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC PRIOR TO THE START OF CONSTRUCTION.
 - THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ENSURE THAT ALL REQUIRED APPROVALS HAVE BEEN OBTAINED PRIOR TO THE START OF CONSTRUCTION. COPIES OF ALL REQUIRED PERMITS AND APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
 - ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC, AND ITS SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEES ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
 - THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC.
 - THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
 - THE CONTRACTOR SHALL NOT PERFORM ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PERSON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
 - THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURE OR SITE FEATURE THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTOR'S EXPENSE.
 - THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW. STONEFIELD ENGINEERING & DESIGN, LLC, WILL REVIEW THE SUBMITTALS IN ACCORDANCE WITH THE DESIGN INTENT AS REFLECTED WITHIN THE PLAN SET.
 - THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
 - THE CONTRACTOR IS REQUIRED TO PERFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE PROCUREMENT OF STREET OPENING PERMITS.
 - THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION & DEMOLITION ACTIVITIES.
 - SHOULD AN EMPLOYEE OF STONEFIELD ENGINEERING & DESIGN, LLC, BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.



SYMBOL	DESCRIPTION
	PROPERTY LINE
	EXISTING BUILDING
	PROPOSED CURB
	PROPOSED BUILDING
	PROPOSED CONCRETE

STONEFIELD
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Princeton, NJ • Tampa, FL • Boston, MA
www.stonefielddesign.com

607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

2690 CROOKS ROAD

PROPOSED MULTI-FAMILY APARTMENTS

20-28-101-003
2690 CROOKS ROAD
CITY OF TROY
OAKLAND COUNTY, MICHIGAN

STATE OF MICHIGAN
NOTAR PUBLIC
MICHAEL J. COOPER
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design

SCALE: 1" = 30'

PROJECT ID: M-19301.01

TITLE: SITE PLAN

DRAWING: C-2

FOR CITY SUBMISSION

FOR SITE PLAN REVIEW & SPECIAL LAND USE SUBMISSION

DATE

BY

ISSUE

DESCRIPTION

Project:

999 & 991 W Big Beaver Rd & 3690 Crooks Rd

Description:

City of Troy Rates

Shared Parking Demand Summary																		
Peak Month: DECEMBER -- Peak Period: 11 AM, WEEKEND																		
Land Use	Project Data		Weekday					Weekend					Weekday			Weekend		
			Base Ratio	Driving Adj	Non-Captive Ratio	Project Ratio	Unit For Ratio	Base Ratio	Driving Adj	Non-Captive Ratio	Project Ratio	Unit For Ratio	Peak Hr Adj	Peak Mo Adj	Estimated Parking Demand	Peak Hr Adj	Peak Mo Adj	Estimated Parking Demand
	Quantity	Unit											10 AM	December		11 AM	December	
Retail																		
Retail (<400 ksf)	9,200	sf GLA	3.22	100%	86%	2.77	ksf GLA	3.22	100%	86%	2.77	ksf GLA	55%	100%	14	85%	100%	22
Employee			0.78	100%	96%	0.75		0.78	100%	94%	0.74		75%	100%	6	95%	100%	7
Food and Beverage																		
Family Restaurant	8,000	sf GLA	16.43	100%	80%	13.16	ksf GLA	16.43	100%	85%	13.97	ksf GLA	85%	100%	90	90%	100%	101
Employee			2.32	100%	96%	2.23		2.32	100%	94%	2.19		100%	100%	18	100%	100%	18
Fast Casual/Fast Food	2,560	sf GLA	12.31	100%	10%	1.23	ksf GLA	12.31	100%	10%	1.23	ksf GLA	55%	96%	2	85%	96%	3
Employee			1.98	100%	96%	1.91		1.98	100%	94%	1.87		75%	100%	4	100%	100%	6
Entertainment and Institutions																		
Hotel and Residential																		
Residential, Suburban																0%		
Studio Efficiency		units	0.00	100%	100%	0.00	unit	0.00	100%	100%	0.00	unit	50%	100%	-	70%	100%	-
1 Bedroom		units	0.00	100%	100%	0.00	unit	0.00	100%	100%	0.00	unit	50%	100%	-	70%	100%	-
2 Bedrooms	317	units	0.00	100%	100%	0.00	unit	0.00	100%	100%	0.00	unit	50%	100%	-	70%	100%	-
3+ Bedrooms		units	0.00	100%	100%	0.00	unit	0.00	100%	100%	0.00	unit	50%	100%	-	70%	100%	-
Reserved	100%	res spaces	1.89	100%	100%	1.89	unit	1.83	100%	100%	1.83	unit	100%	100%	600	100%	100%	581
Visitor	317	units	0.11	100%	100%	0.11	unit	0.17	100%	100%	0.17	unit	20%	100%	7	20%	100%	11
Office																		
Office 100 to 500 ksf	134,560	sf GFA	0.24	100%	100%	0.24	ksf GFA	0.24	100%	100%	0.24	ksf GFA	100%	100%	33	100%	100%	33
Reserved		emp	0.00	100%	100%	0.00		0.00	100%	100%	0.00		100%	100%	-	100%	100%	-
Employee			3.09	100%	100%	3.09		3.09	100%	100%	3.09		100%	100%	416	100%	100%	416
Bank (Drive In Branch)	2,000	sf GFA	2.92	100%	48%	1.42	ksf GFA	2.92	100%	100%	2.92	ksf GFA	100%	100%	3	100%	100%	6
Employee			2.08	100%	97%	2.02		2.08	100%	97%	2.02		100%	100%	5	100%	100%	5
Additional Land Uses																		
													Customer/Visitor	149	Customer		175	
													Employee/Resident	449	Employee/Resident		452	
													Reserved	600	Reserved		581	
													Total	1,198	Total		1,208	

Project: 999 & 991 W Big Beaver Rd & 3690 Crooks Rd
Description: City of Troy Rates

Monthly Comparison Summary								
Month	Weekday							
	Overall Pk		AM Peak Hr		PM Peak Hr		Eve Peak Hr	
	Time	Demand	Time	Demand	Time	Demand	Time	Demand
January	10 AM	1,180	10 AM	1,180	2 PM	1,133	6 PM	853
February	10 AM	1,179	10 AM	1,179	2 PM	1,133	6 PM	853
March	10 AM	1,192	10 AM	1,192	2 PM	1,142	6 PM	867
April	10 AM	1,187	10 AM	1,187	2 PM	1,139	6 PM	862
May	10 AM	1,193	10 AM	1,193	2 PM	1,143	6 PM	868
June	10 AM	1,189	10 AM	1,189	2 PM	1,141	6 PM	864
July	10 AM	1,167	10 AM	1,167	2 PM	1,119	6 PM	859
August	10 AM	1,167	10 AM	1,167	2 PM	1,167	6 PM	859
September	10 AM	1,182	10 AM	1,182	2 PM	1,136	6 PM	857
October	10 AM	1,187	10 AM	1,187	2 PM	1,139	6 PM	862
November	10 AM	1,185	10 AM	1,185	2 PM	1,139	6 PM	860
December	10 AM	1,198	10 AM	1,198	2 PM	1,153	6 PM	877
Late December	10 AM	1,097	10 AM	1,097	2 PM	1,060	6 PM	843

Monthly Comparison Summary								
Month	Weekend							
	Overall Pk		AM Peak Hr		PM Peak Hr		Eve Peak Hr	
	Time	Demand	Time	Demand	Time	Demand	Time	Demand
January	11 AM	1,185	11 AM	1,185	12 PM	1,151	6 PM	748
February	11 AM	1,185	11 AM	1,185	12 PM	1,150	6 PM	748
March	11 AM	1,199	11 AM	1,199	12 PM	1,166	6 PM	759
April	11 AM	1,194	11 AM	1,194	12 PM	1,161	6 PM	755
May	11 AM	1,200	11 AM	1,200	12 PM	1,167	6 PM	760
June	11 AM	1,196	11 AM	1,196	12 PM	1,163	6 PM	757
July	11 AM	1,174	11 AM	1,174	12 PM	1,143	6 PM	755
August	11 AM	1,174	11 AM	1,174	12 PM	1,143	6 PM	756
September	11 AM	1,188	11 AM	1,188	12 PM	1,154	6 PM	751
October	11 AM	1,193	11 AM	1,193	12 PM	1,160	6 PM	755
November	11 AM	1,192	11 AM	1,192	12 PM	1,158	6 PM	754
December	11 AM	1,208	11 AM	1,208	12 PM	1,178	6 PM	766
Late December	11 AM	1,103	11 AM	1,103	12 PM	1,082	7 PM	756

Project: 999 & 991 W Big Beaver Rd & 3690 Crooks Rd
Description City of Troy Rates

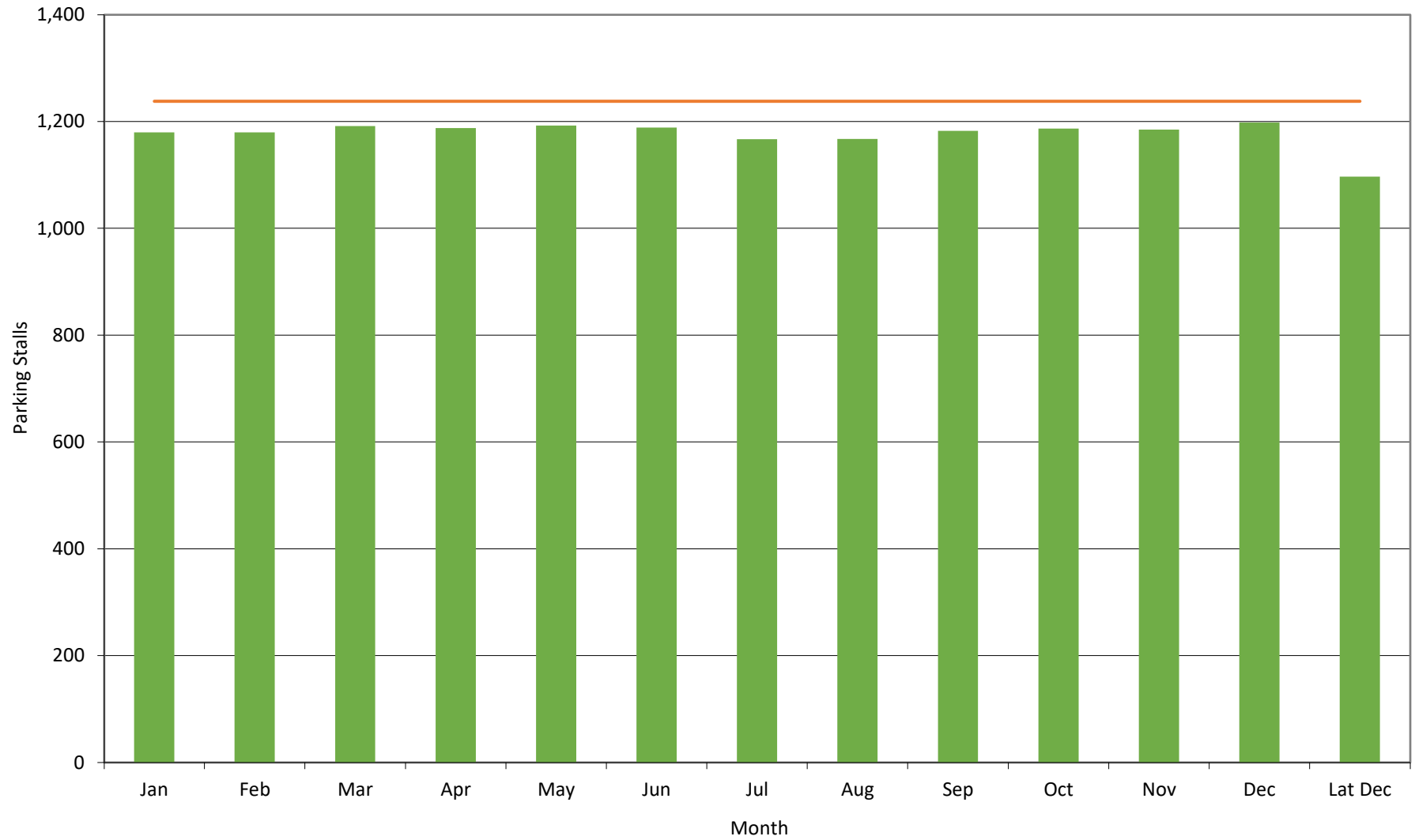
Land Use		Distribution of Weekday Demand by Zone								
		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Total
Retail										
Retail (<400 ksf)		14	0	0	0	0	0	0	0	14
Employee		6	0	0	0	0	0	0	0	6
Food and Beverage										
Family Restaurant		90	0	0	0	0	0	0	0	90
Employee		18	0	0	0	0	0	0	0	18
Fast Casual/Fast Food		2	0	0	0	0	0	0	0	2
Employee		4	0	0	0	0	0	0	0	4
Entertainment and Institutions										
Hotel and Residential										
Residential, Suburban										
Studio Efficiency		0	0	0	0	0	0	0	0	0
1 Bedroom		0	0	0	0	0	0	0	0	0
2 Bedrooms		0	0	0	0	0	0	0	0	0
3+ Bedrooms		0	0	0	0	0	0	0	0	0
Reserved		314	286	0	0	0	0	0	0	600
Visitor		4	3	0	0	0	0	0	0	7
Office										
Office 100 to 500 ksf		33	0	0	0	0	0	0	0	33
Reserved		0	0	0	0	0	0	0	0	0
Employee		416	0	0	0	0	0	0	0	416
Bank (Drive In Branch)		3	0	0	0	0	0	0	0	3
Employee		5	0	0	0	0	0	0	0	5
Additional Land Uses										
		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Total
Parking Demand	Customer/Visitor	146	3	0	0	0	0	0	0	149
	Employee/Resident	449	0	0	0	0	0	0	0	449
	Reserved	314	286	0	0	0	0	0	0	600
	Total	909	289	0	0	0	0	0	0	1198
Parking Supply	Customer/Visitor									0
	Employee/Resident									0
	Reserved									0
	Total	0	0	0	0	0	0	0	0	0
Surplus (+)/Deficit (-)	Customer/Visitor	-146	-3	0	0	0	0	0	0	-149
	Employee/Resident	-449	0	0	0	0	0	0	0	-449
	Reserved	-314	-286	0	0	0	0	0	0	-600
	Total	-909	-289	0	0	0	0	0	0	-1198

Note: Zone 1 adjusted to have totals equal values on Summary Sheets

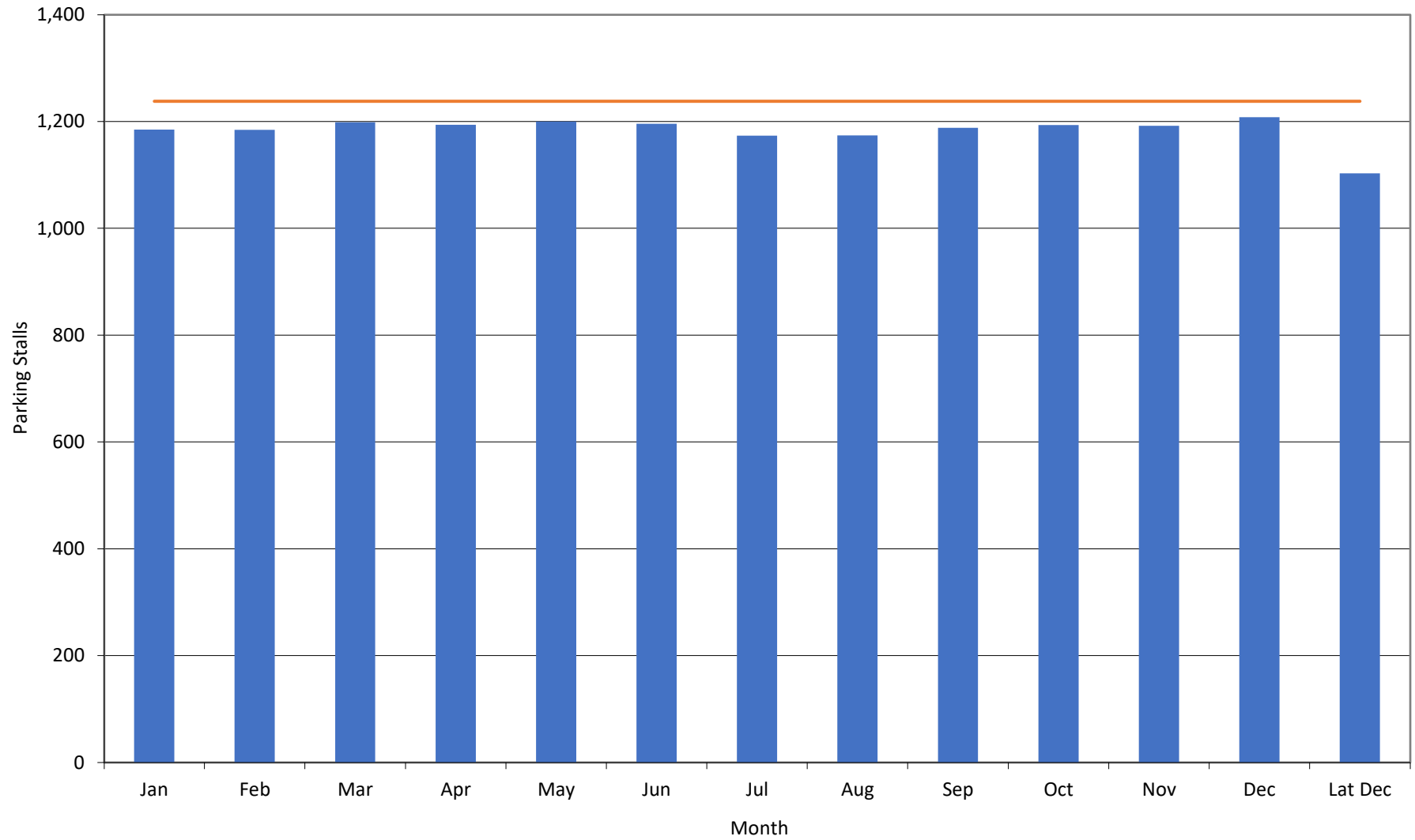
Distribution of Weekend Demand by Zone										
Land Use		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Total
Retail										
Retail (<400 ksf)		22	0	0	0	0	0	0	0	22
Employee		7	0	0	0	0	0	0	0	7
Food and Beverage										
Family Restaurant		101	0	0	0	0	0	0	0	101
Employee		18	0	0	0	0	0	0	0	18
Fast Casual/Fast Food		3	0	0	0	0	0	0	0	3
Employee		6	0	0	0	0	0	0	0	6
Entertainment and Institutions										
Hotel and Residential										
Residential, Suburban										
Studio Efficiency		0	0	0	0	0	0	0	0	0
1 Bedroom		0	0	0	0	0	0	0	0	0
2 Bedrooms		0	0	0	0	0	0	0	0	0
3+ Bedrooms		0	0	0	0	0	0	0	0	0
Reserved		304	277	0	0	0	0	0	0	581
Visitor		6	5	0	0	0	0	0	0	11
Office										
Office 100 to 500 ksf		33	0	0	0	0	0	0	0	33
Reserved		0	0	0	0	0	0	0	0	0
Employee		416	0	0	0	0	0	0	0	416
Bank (Drive In Branch)		6	0	0	0	0	0	0	0	6
Employee		5	0	0	0	0	0	0	0	5
Additional Land Uses										
		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Total
Parking Demand	Customer/Visitor	171	5	0	0	0	0	0	0	176
	Employee/Resident	452	0	0	0	0	0	0	0	452
	Reserved	304	277	0	0	0	0	0	0	581
	Total	927	282	0	0	0	0	0	0	1209
Parking Supply	Customer/Visitor	0	0	0	0	0	0	0	0	0
	Employee/Resident	0	0	0	0	0	0	0	0	0
	Reserved	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Surplus (+)/Deficit (-)	Customer/Visitor	-171	-5	0	0	0	0	0	0	-176
	Employee/Resident	-452	0	0	0	0	0	0	0	-452
	Reserved	-304	-277	0	0	0	0	0	0	-581
	Total	-927	-282	0	0	0	0	0	0	-1209

Note: Zone 1 adjusted to have totals equal values on Summary Sheets

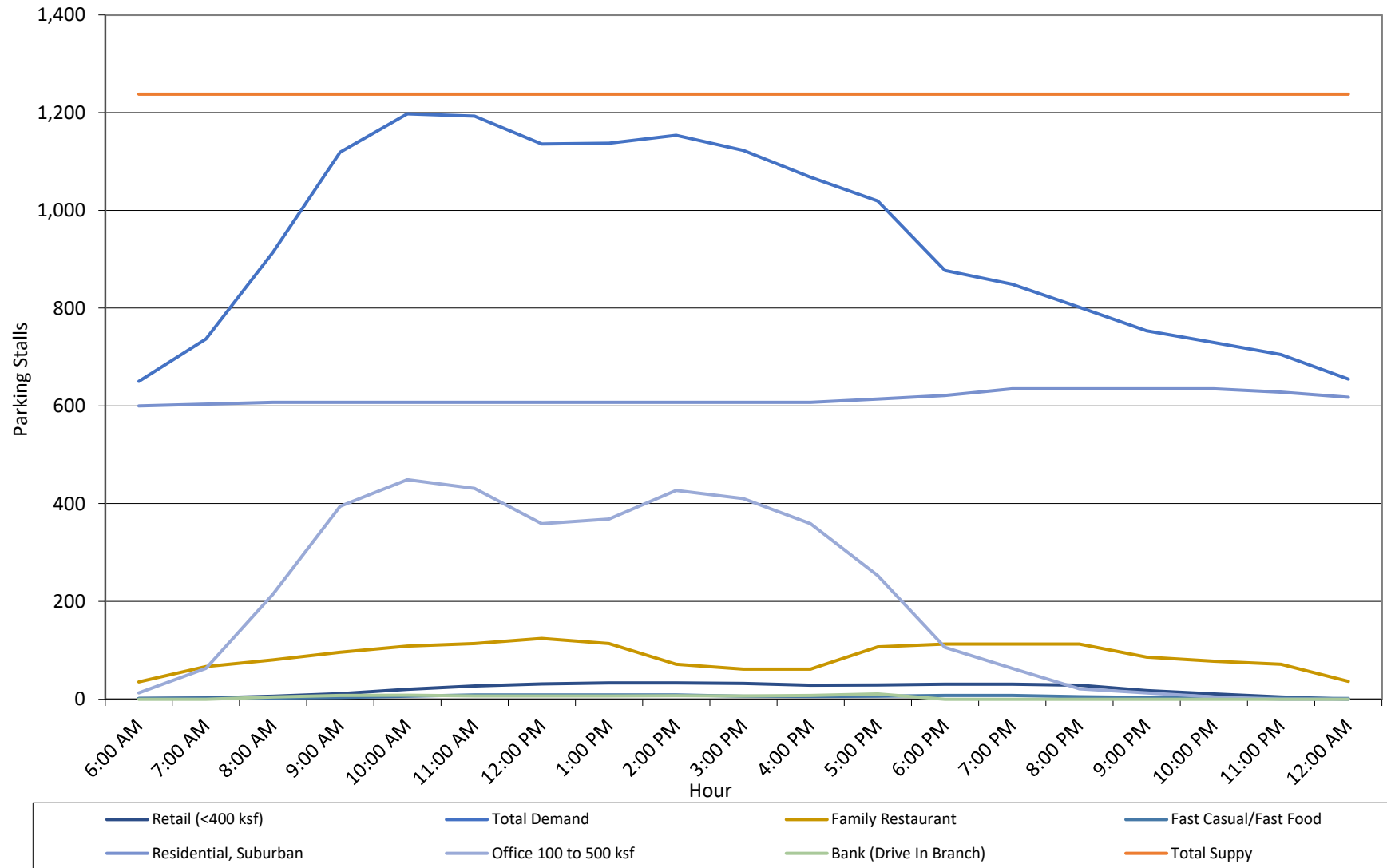
Weekday Month-by-Month Estimated Parking Demand



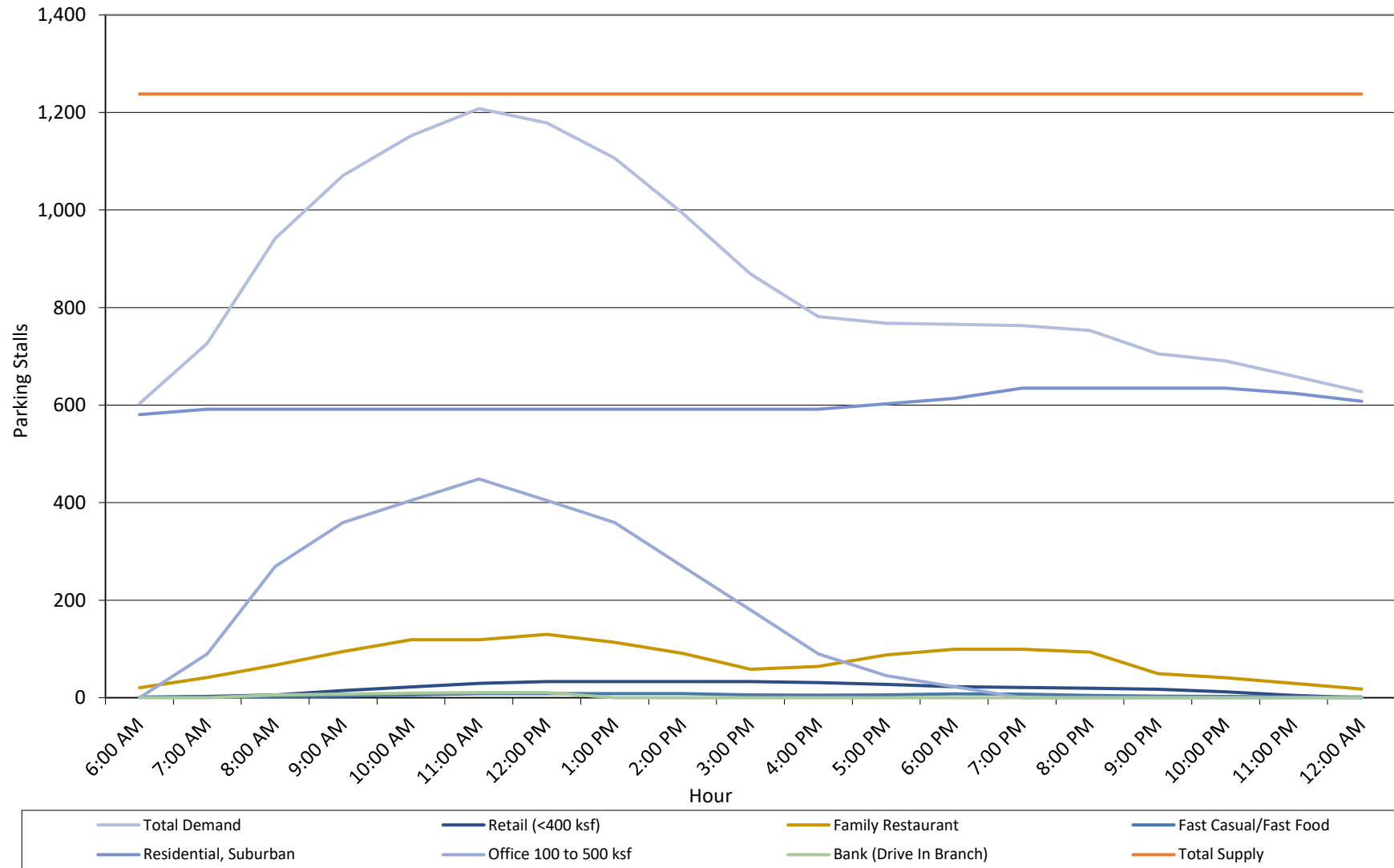
Weekend Month-by-Month Estimated Parking Demand



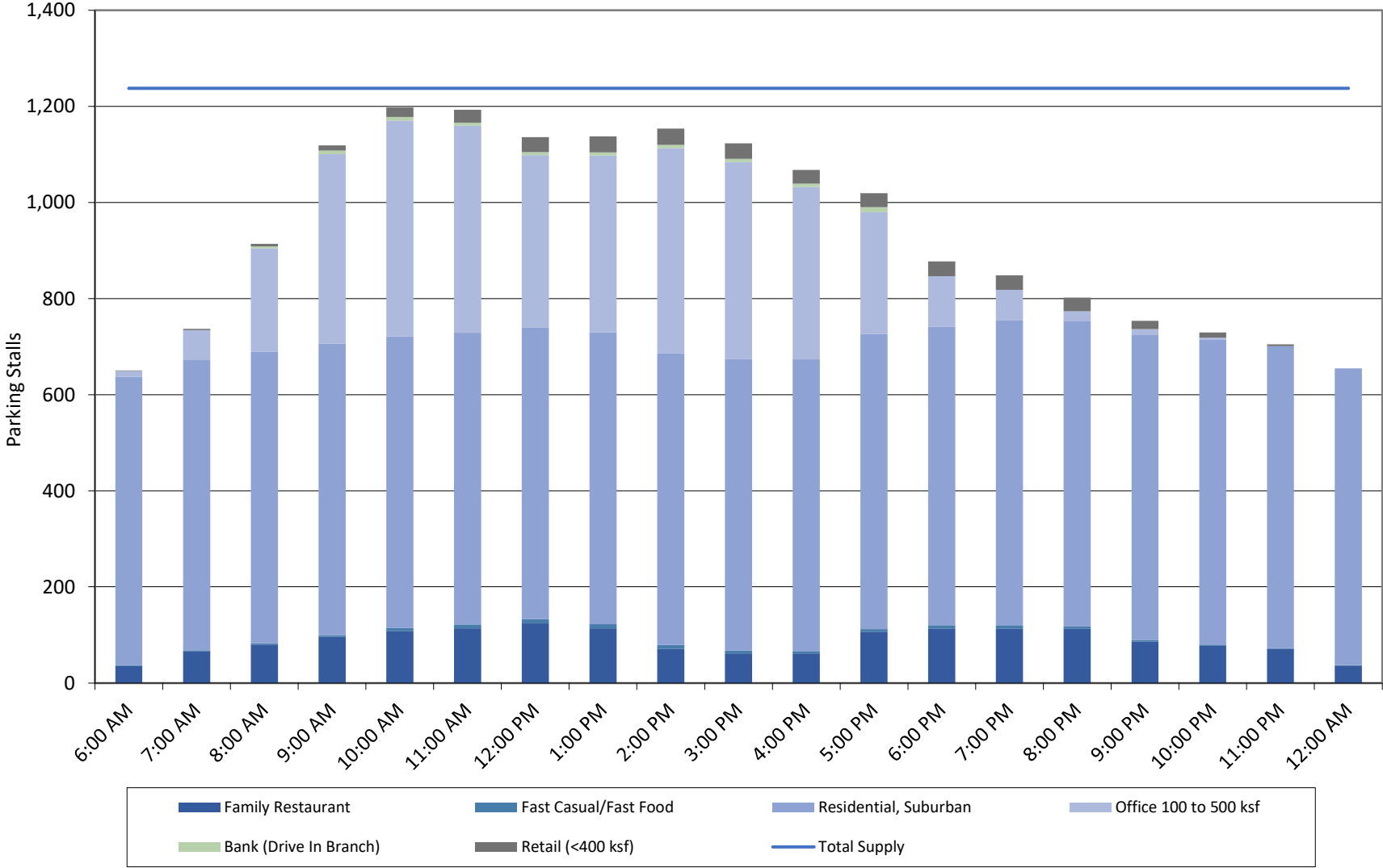
Peak Month Daily Parking Demand by Hour (Weekday)



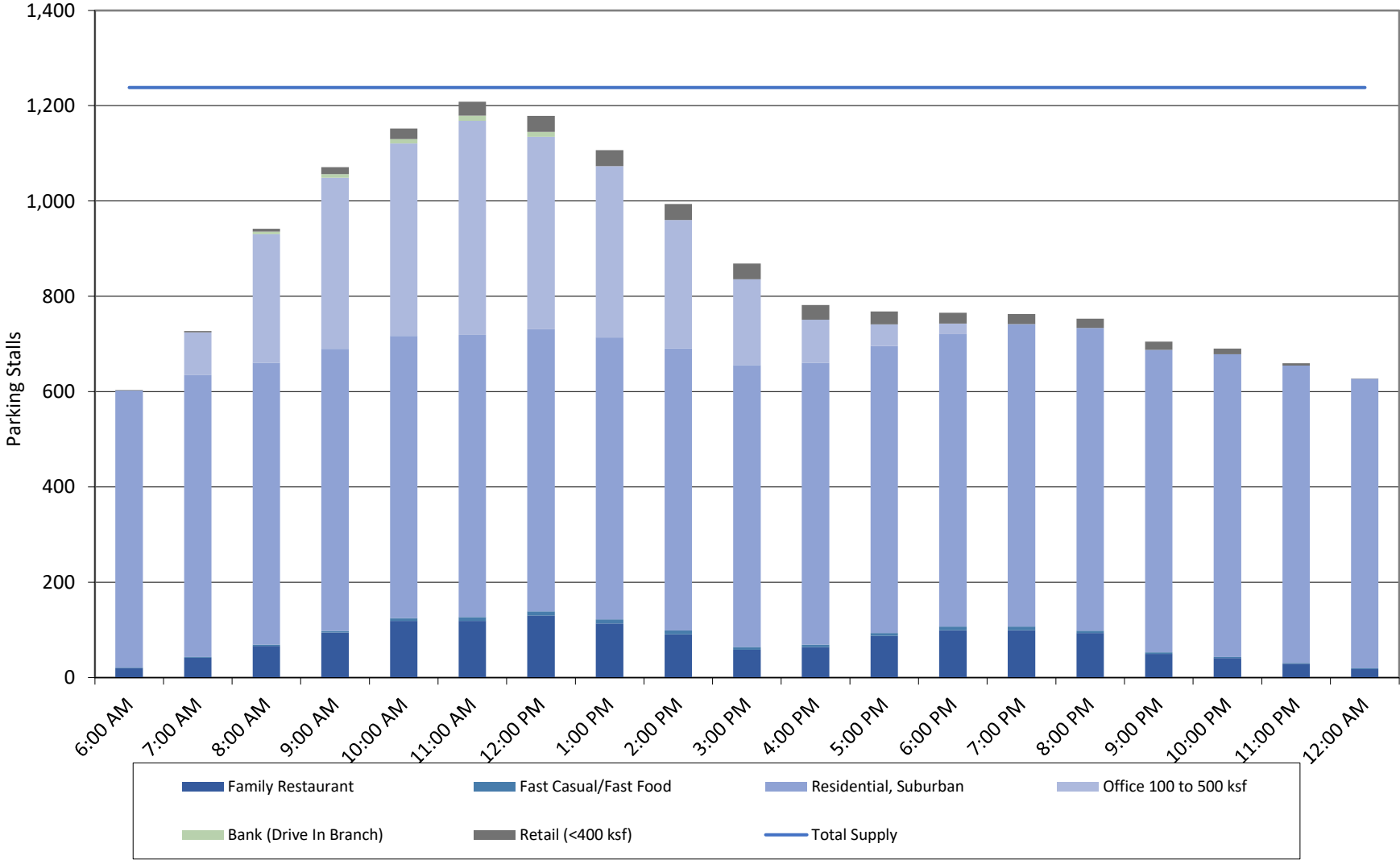
Peak Month Daily Parking Demand by Hour (Weekend)



Peak Month Daily Parking Demand by Hour (Weekday)



Peak Month Daily Parking Demand by Hour (Weekend)



memorandum

Date: November 29, 2022

To: Scott Finlay, PE

From: Lauren Hull & Sara Merrill, PE, PTOE

Re: 2690 Crooks Multi-Family Apartments
Traffic Review

I have reviewed the preliminary site plans for 2690 Crooks Road. The plans propose renovating and repurposing the existing 4-story office building into a Multi-Family Apartment building (62-units), and also constructing a new proposed 5-story Multi-Family Apartment building (94-units) to the east of the existing building. Previous plan submittals were based on a total of 151 units. The plans were prepared by Stonefield Engineering & Design and are dated November 11, 2022.

A shared parking analysis (for 991 & 999 Big Beaver and 2690 Crooks) was previously submitted; no updates to the parking study were provided for this review. The original parking study was prepared by Rowe and dated February 21, 2022.

OHM offers the following comments:

1. Shared Parking:
 - a. It appears there is uncertainty as to the configuration of the adjacent site as it relates to shared parking. OHM requests clarification whether the Applicant is seeking shared parking based on the existing or future configuration of the adjacent site (999 Big Beaver). Discrepancies between plans and shared parking analysis should be resolved.
 - b. This development has a parking deficit of 91 spaces and proposes to utilize shared parking at the adjacent site to the north. The shared parking analysis (previously reviewed) from February 2022 was based on 151 units, instead of the 156 units currently proposed. The parking study also presumed the redevelopment of 999 Big Beaver, which was to include a new parking structure and substantial changes to the site. An updated shared parking analysis, reflecting the existing parking capacity of the adjacent site, is necessary.
 - c. The proposed shared parking area is located on a separate parcel, regardless of ownership. A shared parking agreement must be in place in case either parcel is sold at a later date, as well as to preserve appropriate parking facilities in the event either parcel is redeveloped.
2. Improve pedestrian connectivity.
 - a. The proposed sidewalk connection to the north is noted on the plans: "...to be installed during adjacent site construction." Since this development proposes shared parking on the adjacent site, there must be suitable pedestrian connections constructed as part of this development. Additionally, we note that the proposed connection on the adjacent site contains stairs and



therefore is not ADA-accessible.

- b. The pedestrian connection to the property to the North should not remain as-is. Visually impaired pedestrians experience unnecessary difficulty navigating unusual geometry. The stairs can be relocated further west to create a perpendicular crossing.
- c. Existing sidewalks abutting parking spaces (on the north and east side of the existing building) must be widened to 7 feet, to avoid vehicle bumper overhang obstructing the sidewalk.
- d. We strongly recommend adding sidewalks along the north and south side of the proposed Building B. The purpose of the sidewalk is to provide a dedicated space for pedestrians.



Board of Road Commissioners

Ronald J. Fowkes
Commissioner

Andrea LaLonde
Commissioner

Nancy Quarles
Commissioner

Dennis G. Kolar, P.E.
Managing Director

Gary Piotrowicz, P.E., P.T.O.E.
Deputy Managing Director
County Highway Engineer

**Department of
Customer Services
Permits**

**2420 Pontiac Lake Road
Waterford, MI 48328**

248-858-4835

**FAX
248-858-4773**

**TDD
248-858-8005**

www.rcocweb.org

November 8, 2022

Jason Gekiere
314 Lakeside Drive
White Lake, MI 48386

RE: 999 BIG BEAVER ROAD TRAFFIC IMPACT DISCUSSION

Dear Mr. Gekiere:

Thank you for taking the time to meet with the City of Troy and the Road Commission for Oakland County (RCOC) to discuss this matter. In light of that meeting, and after discussing this matter internally, RCOC is willing to approve this development in concept, under the following conditions:

- A) The existing traffic signal heads facing outbound traffic from the easterly driveway should be relocated to the north side of eastbound Big Beaver Road and modernized. In lieu of that, RCOC is also willing to accept relocation of the stop bar for outbound traffic, with prohibition of right turns on red.
- B) The westerly driveway and access can remain as existing, with right-in ingress and dual right turn lane egress.
- C) Outbound left turns will be prohibited from the northerly driveway to Crooks Road. All other ingress and egress will continue to be allowed.

These conditions are required for conceptual approval. A detailed field and engineering review of the final plans will be conducted during the permit application process.

If you have any questions or require additional information, please feel free to contact me at 248-858-4835.

Respectfully,

Scott Sintkowski, P.E.
Permit Engineer
Department of Customer Services

Copied via e-mail:

Mark Soma – Tower Construction
Paula Arwady – Tower Construction
Julie M. Kroll, PE, PTOE – Fleis & Vandenbrink
Eric Williams, PE – Stonefied Engineering
Jordan Jonna – A.F. Jonna
Dennis Cowan – Plunkett Cooney
Bill Huotari, PE, City Engineer – City of Troy
Brent Savidant, AICP, Community Development Director – City of Troy
Gary Piotrowicz, PE, PTOE, Deputy Managing Director – RCOC
Dave Czerniakowski, Director of Customer Services – RCOC
Danielle Deneau, PE, Director of Traffic and Safety – RCOC
Alex Rucinski, PE, Traffic Engineer - RCOC



SCALE: 1" = 2,000'±



SCALE: 1" = 200'±

PARCEL ID: 20-28-101-003

2690 CROOKS ROAD

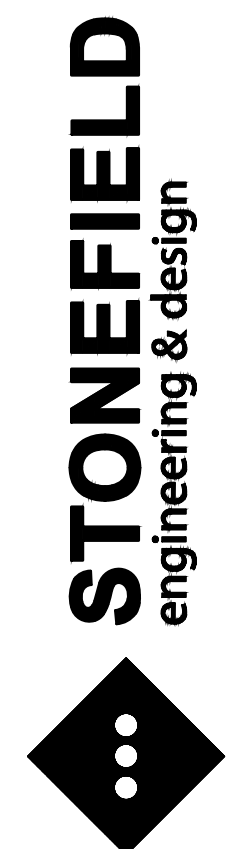
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

APPLICANT

TROY KS DEVELOPMENT, LLC
4036 TELEGRAPH ROAD, SUITE 201
BLOOMFIELD HILLS, MI 48302

[illegible]

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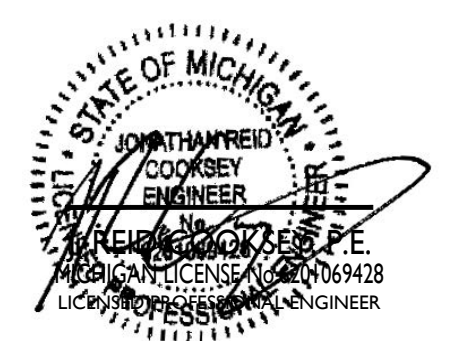
www.stonefieldeng.com

607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

2690 CROOKS ROAD
EXISTING BUILDING RENOVATION &
PROPOSED MULTI-FAMILY APARTMENTS

20-28-101-003
2690 CROOKS ROAD
CITY OF TROY
OAKLAND COUNTY, MICHIGAN



SCALE: AS SHOWN	PROJECT ID: M-19301.01
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TITLE:	
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COVER SHEET

DRAWING:

C-1

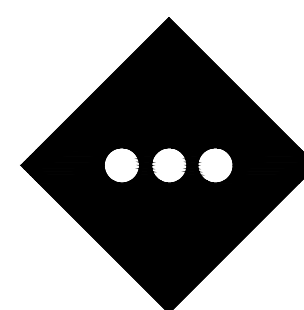
PLAN REFERENCE MATERIALS:

1. THIS PLAN SET REFERENCES THE FOLLOWING DOCUMENTS INCLUDING, BUT NOT LIMITED TO:
- ALTA/TOPOGRAPHIC SURVEY PREPARED BY KEM-TEC SURVEY DATED 03/16/2022
 - ARCHITECTURAL DRAWINGS PREPARED BY BIDDISON ARCHITECTURE + DESIGN, DATED 06/03/2022
 - AERIAL MAP OBTAINED FROM GOOGLE EARTH PRO
 - LOCATION MAP OBTAINED FROM USGS ONLINE
 - ZONING INFORMATION OBTAINED FROM CITY OF TROY ZONING MAP
2. ALL REFERENCE MATERIAL LISTED ABOVE SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THESE MATERIALS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF EACH REFERENCE AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.



Know what's **below**
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PLANS PREPARED BY:



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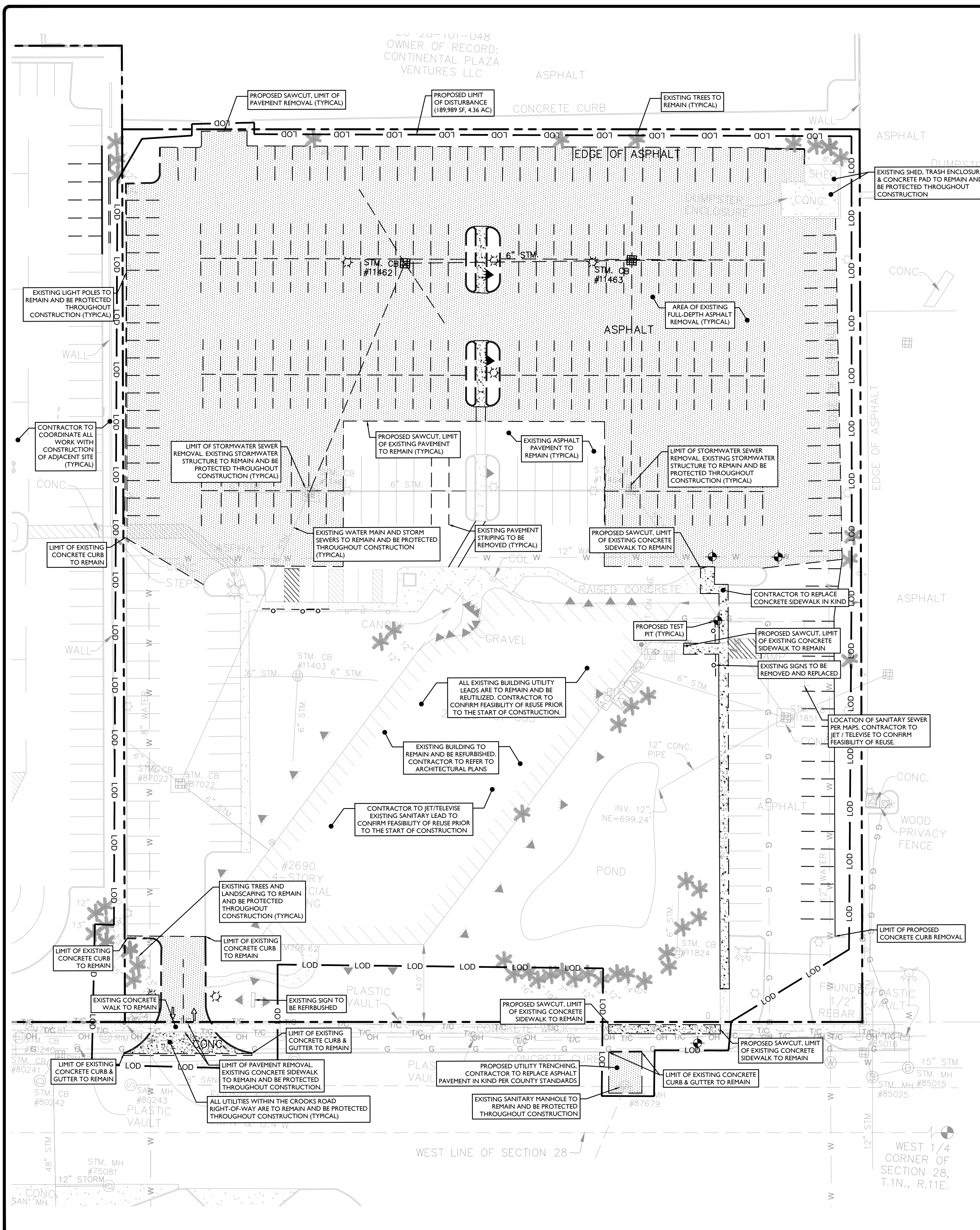
Phone 248.247.1115

SHEET INDEX

DRAWING TITLE	SHEET #
COVER SHEET	C-1
DEMOLITION PLAN	C-2
SITE PLAN	C-3
OVERALL SITE PLAN	C-4
GRADING PLAN	C-5
STORMWATER MANAGEMENT PLAN	C-6
UTILITY PLAN	C-7
LIGHTING PLAN	C-8
LANDSCAPING PLAN	C-9
LANDSCAPING DETAILS	C-10
SOIL EROSION AND SEDIMENT CONTROL PLAN	C-11
CONSTRUCTION DETAILS	C-12 & C-13

ADDITIONAL SHEETS

DRAWING TITLE	SHEET #
ALTA / TOPOGRAPHIC SURVEY	1 OF 1
CITY OF TROY - STANDARD SANITARY SEWER DETAILS	2 OF 2
CITY OF TROY - STANDARD WATER MAIN DETAILS	1 OF 1
CITY OF TROY - STANDARD STORM SEWER DETAILS	1 OF 1
CITY OF TROY - STANDARD SOIL EROSION CONTROL DETAILS	1 OF 1



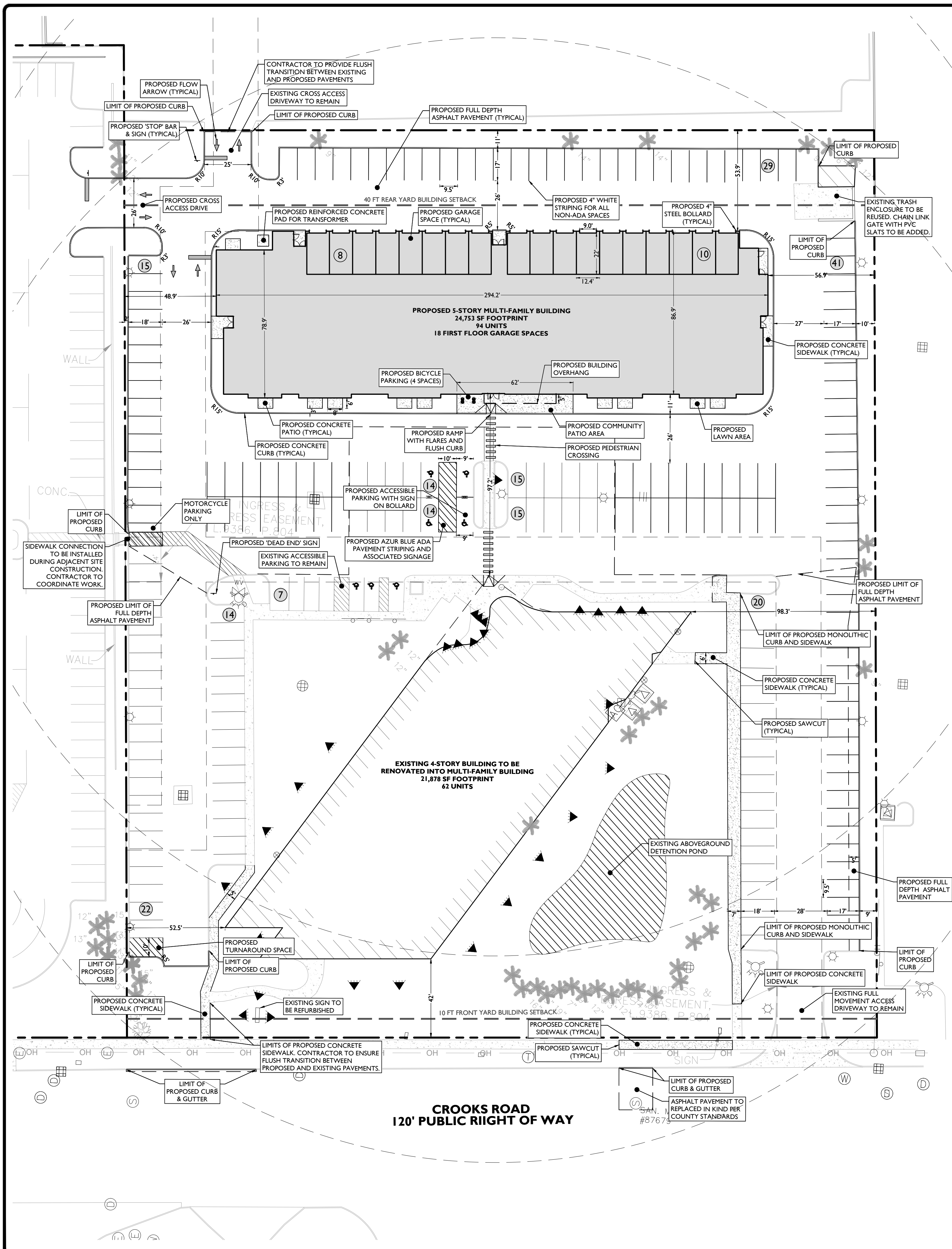

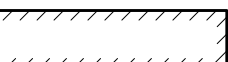




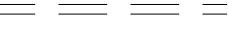

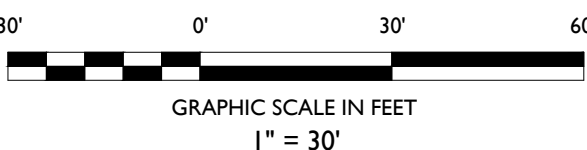


TABLE OF LAND USE AND ZONING		
PARCEL ID: 20-28-101-003		
BIG BEAVER ROAD (BB) - (STREET TYPE: B, BUILDING FORM-D)		
PROPOSED USE		
MULTI-FAMILY APARTMENTS	PERMITTED USE	
GROUND FLOOR UNITS	SPECIAL LAND USE	
ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT AREA	N/A	193,599 SF (4.44 AC.)
LOT COVERAGE BY ALL BUILDINGS	30% (58,080 SF)	24.1% (46,631 SF)
MINIMUM BUILDING HEIGHT	35 FT	60.0 FT (5 STORIES)
MAXIMUM BUILDING HEIGHT	66 FT (6 STORIES)	60.0 FT (5 STORIES)
REQUIRED BUILDING LINE	10 FT	42.0 FT (EN)
MINIMUM SIDE YARD SETBACK	0 FT	48.9 FT
MINIMUM REAR YARD SETBACK	40 FT	53.9 FT

SYMBOL	DESCRIPTION
	PROPERTY LINE
	EXISTING BUILDING
	PROPOSED CURB
	PROPOSED BUILDING
	PROPOSED CONCRETE
	PROPOSED FLUSH CURB
	PROPOSED SIGNS / BOLLARDS
	PROPOSED BIKE RACK



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SITE DEVELOPMENT PLANS

2690 CROOKS ROAD

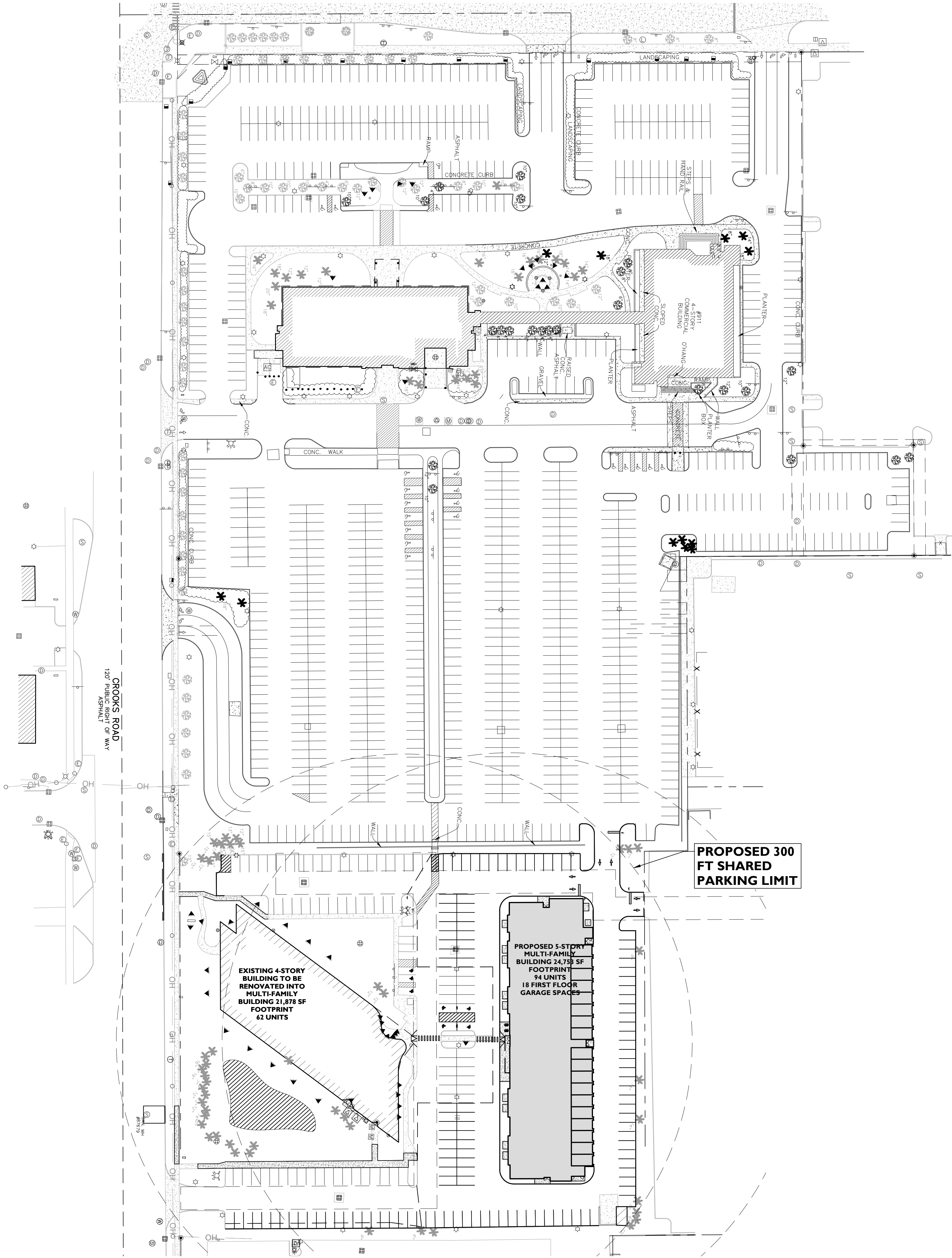
**EXISTING BUILDING RENOVATION &
PROPOSED MULTI-FAMILY APARTMENTS**



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SITE PLAN

V:\MIDWEST\19301.01_MIDWEST\2690 CROOKS ROAD\2690 CROOKS ROAD_170111\CDR\01525601.044512.DWG



OFF-STREET PARKING REQUIREMENTS - KELLY		
CODE SECTION	REQUIRED	PROPOSED
§ TABLE 13.06-A	PROFESSIONAL OFFICE 1 SPACE PER 300 NFA (175,827 NFA)/(1/300 NFA) = 586 SPACES	883 SPACES

(*) NET FLOOR AREA IS ASSUMED TO BE 80% GROSS FLOOR AREA
(168,200 SF + 51,584 SF)(0.8) = 175,827 SF

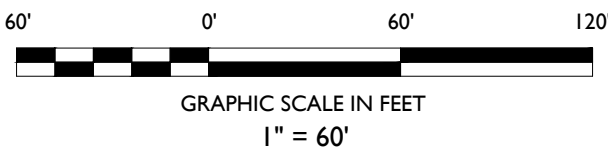
OFF-STREET PARKING REQUIREMENTS - LINDSEY CENTRE		
CODE SECTION	REQUIRED	PROPOSED
§ TABLE 13.06-A	MULTI-FAMILY DWELLING: 2 SPACES PER DWELLING UNIT (156 UNITS)(2 SPACES PER UNIT) = 312 SPACES	224 SPACES (V)

(V) VARIANCE

OFF-STREET PARKING REQUIREMENTS - COMBINED		
PARCEL	REQUIRED	PROPOSED
KELLY PARCEL	586 SPACES	883 SPACES
LINDSEY CENTRE	312 SPACES	224 SPACES
	TOTAL: 586 + 312 = 898 SPACES	TOTAL: 1,107 SPACES

SYMBOL	DESCRIPTION
	PROPERTY LINE
	EXISTING BUILDING
	PROPOSED CURB
	PROPOSED BUILDING
	PROPOSED CONCRETE

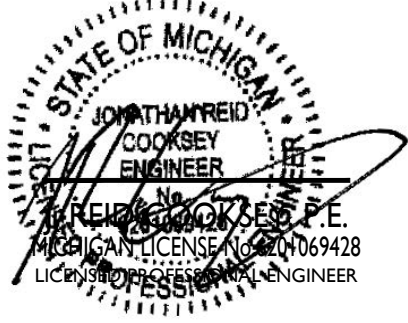
- GENERAL NOTES**
- THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC PRIOR TO THE START OF CONSTRUCTION.
 - THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ENSURE THAT ALL REQUIRED APPROVALS HAVE BEEN OBTAINED PRIOR TO THE START OF CONSTRUCTION. COPIES OF ALL REQUIRED PERMITS AND APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
 - ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC, AND ITS SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEES ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
 - THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC.
 - THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
 - THE CONTRACTOR SHALL NOT PERFORM ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PERSON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
 - THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURE OR SITE FEATURE THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTOR'S EXPENSE.
 - CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW. STONEFIELD ENGINEERING & DESIGN, LLC, WILL REVIEW THE SUBMITTALS IN ACCORDANCE WITH THE DESIGN INTENT AS REFLECTED WITHIN THE PLAN SET.
 - THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
 - THE CONTRACTOR IS REQUIRED TO PERFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE PROCUREMENT OF STREET OPENING PERMITS.
 - THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION & DEMOLITION ACTIVITIES.
 - SHOULD AN EMPLOYEE OF STONEFIELD ENGINEERING & DESIGN, LLC, BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.



SITE DEVELOPMENT PLANS

2690 CROOKS ROAD
EXISTING BUILDING RENOVATION &
PROPOSED MULTI-FAMILY APARTMENTS

20-28-101-003
2690 CROOKS ROAD
CITY OF TROY
OAKLAND COUNTY, MICHIGAN



SCALE: 1" = 60' PROJECT ID: M-19301.01

TITLE:

OVERALL SITE PLAN

DRAWING:

C-4

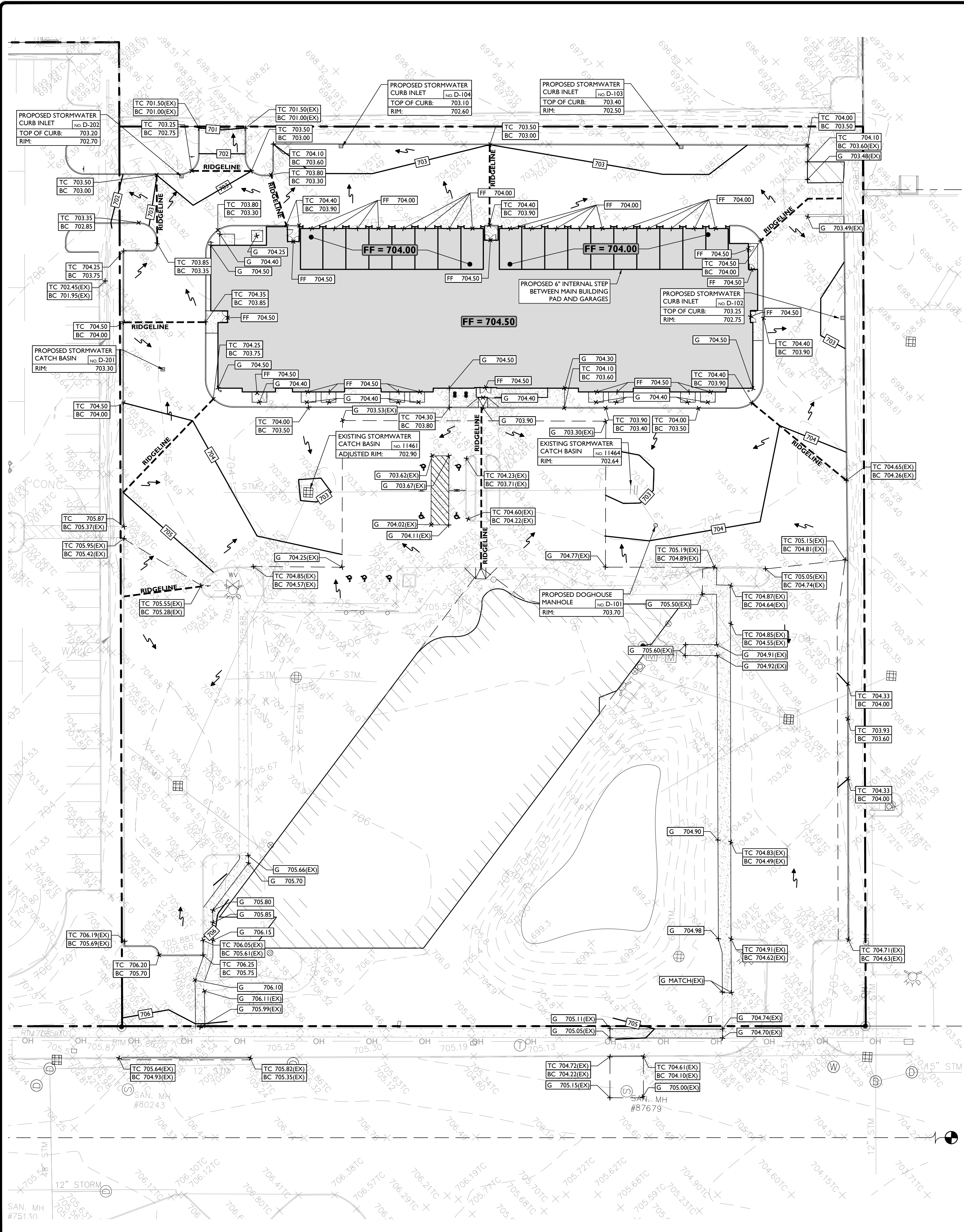
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FOR RCOC / PLANNING APPROVAL	FOR ENGINEERING APPROVAL	FOR SITE PLAN APPROVAL	FOR SITE PLAN REVIEW & SPECIAL LAND USE SUBMISSION	FOR CITY SUBMISSION	ISSUE	DATE	BY	DESCRIPTION
					5	10/11/2022	KTH	
					4	07/11/2022	KTH	
					3	05/31/2022	KTH	
					2	02/14/2022	KTH	
					1	03/09/2021	RAC	



SYMBOL	DESCRIPTION
	PROPERTY LINE
	PROPOSED GRADING CONTOUR
	PROPOSED GRADING RIDGE LINE
	PROPOSED DIRECTION OF DRAINAGE FLOW
	PROPOSED GRADE SPOT SHOT
	PROPOSED TOP OF CURB / BOTTOM OF CURB SPOT SHOT
	PROPOSED FINISHED FLOOR SPOT SHOT

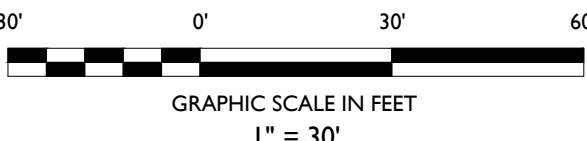
MANHOLE SCHEDULE									
#	TYPE	RIM (FT)	SIZE (IN)	DIRECTION	DIP	INVERT (FT)			
11297	STORM MANHOLE	705.38	12	N	4.2	701.18			
11355	CATCH BASIN	704.21	6	NE	3.7	700.51			
			6	SW	3.95	700.26			
			6	SE	3.8	700.41			
11403	BEEHIVE CATCH BASIN	704.55	6	S	3.85	700.70			
			6	W	3.9	700.65			
			6	NW	4.05	700.50			
11461	CATCH BASIN	702.66	6	N	2.75	699.91			
			6	SE	2.85	699.81			
			6	NW	3	699.66			
			6	S	3.2	699.46			
11462	CATCH BASIN	702.51	6	NE	3.2	699.31			
			6	S	3.15	699.36			
			6	SW	3.25	699.26			
			6	NW	3.05	699.46			
11463	CATCH BASIN	702.57	6	N	3.25	699.32			
			6	E	3.15	699.42			
			6	S	3.05	699.52			
11464	CATCH BASIN	702.64	6	W	3.15	699.32			
			6	E	4.4	698.24			
			6	SW	3.85	698.80			
11824	BEEHIVE CATCH BASIN	703.48	6	NW	3.75	698.89			
			6	E	6	697.48			
			T/PIPE		4.2	699.28			
			T/WATER		4.25	699.23			
			B/STRUCTURE		7.4	696.08			
11851	CATCH BASIN	702.9	6	NE	4.25	698.65			
			6	N	4.15	698.75			
			12	NW	5.8	697.10			
			6	SE	4.3	698.60			
85015	STORM MANHOLE	703.39	12	NW	5	698.39			
			15	S	6.5	696.89			
85016	CATCH BASIN	703.37	12	SW	4.45	698.92			
85025	STORM MANHOLE	703.59	12	S	4	699.59			
			12	W	5.2	698.39			
			12	E	4.85	698.74			
			6	NE	4.6	698.99			
87679	SANITARY MANHOLE	705.04	8	N	11.45	693.59			
			8	S	11.5	693.54			
			8	NW	11	694.04			

SITE BENCHMARK #3
ARROW ON HYDRANT, 140' SW OF SW
CORNER OF POND.
ELEVATION = 707.24' (NAVD 88 DATUM)

SITE BENCHMARK #4
ARROW ON HYDRANT, NEAR NE
CORNER OF BUILDING.
ELEVATION = 708.34' (NAVD 88 DATUM)

- GRADING NOTES**
- ALL SOIL AND MATERIAL REMOVED FROM THE SITE SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS. ANY GROUNDWATER DE-WATERING PRACTICES SHALL BE PERFORMED UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL. THE CONTRACTOR IS REQUIRED TO OBTAIN ALL NECESSARY PERMITS FOR THE DISCHARGE OF DE-WATERED GROUNDWATER. ALL SOIL IMPORTED TO THE SITE SHALL BE CERTIFIED CLEAN FILL. CONTRACTOR SHALL MAINTAIN RECORDS OF ALL FILL MATERIALS BROUGHT TO THE SITE.
 - THE CONTRACTOR IS REQUIRED TO PROVIDE TEMPORARY AND/OR PERMANENT SHORING WHERE REQUIRED DURING EXCAVATION ACTIVITIES INCLUDING BUT NOT LIMITED TO UTILITY TRENCHES TO ENSURE THE STRUCTURAL INTEGRITY OF NEARBY STRUCTURES AND STABILITY OF THE SURROUNDING SOILS.
 - PROPOSED TOP OF CURB ELEVATIONS ARE GENERALLY 4 INCHES TO 7 INCHES ABOVE EXISTING GRADES UNLESS OTHERWISE NOTED. THE CONTRACTOR WILL SUPPLY ALL STAKEOUT CURB GRADE SHEETS TO STONEFIELD ENGINEERING & DESIGN, LLC. FOR REVIEW AND APPROVAL PRIOR TO POURING CURBS.
 - THE CONTRACTOR IS RESPONSIBLE TO SET ALL PROPOSED UTILITY COVERS AND RESET ALL EXISTING UTILITY COVERS WITHIN THE PROJECT LIMITS TO PROPOSED GRADE IN ACCORDANCE WITH ANY APPLICABLE MUNICIPAL, COUNTY, STATE AND/OR UTILITY AUTHORITY REGULATIONS.
 - MINIMUM SLOPE REQUIREMENTS TO PREVENT PONDING SHALL BE AS FOLLOWS:
 - CURB GUTTER: 0.50%
 - CONCRETE SURFACES: 1.00%
 - ASPHALT SURFACES: 1.00%
 - A MINIMUM SLOPE OF 1.00% SHALL BE PROVIDED AWAY FROM ALL BUILDINGS. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE FROM THE BUILDING IS ACHIEVED AND SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IF THIS CONDITION CANNOT BE MET. FOR PROJECTS WHERE BASEMENTS ARE PROPOSED, THE DEVELOPER IS RESPONSIBLE TO DETERMINE THE DEPTH TO GROUNDWATER AT THE LOCATION OF THE PROPOSED STRUCTURE. IF GROUNDWATER IS ENCOUNTERED WITHIN THE BASEMENT AREA, SPECIAL CONSTRUCTION METHODS SHALL BE UTILIZED AND REVIEWED/APPROVED BY THE CONSTRUCTION CODE OFFICIAL. IF SUMP PUMPS ARE UTILIZED, ALL DISCHARGES SHALL BE CONNECTED DIRECTLY TO THE PUBLIC STORM SEWER SYSTEM WITH APPROVAL FROM THE GOVERNING STORM SEWER SYSTEM AUTHORITY.

- ADA NOTES**
- THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION WITHIN THE ADA PARKING SPACES AND ACCESS AISLES.
 - THE CONTRACTOR SHALL PROVIDE COMPLIANT SIGNAGE AT ALL ADA PARKING AREAS IN ACCORDANCE WITH STATE GUIDELINES.
 - THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 5.00% RUNNING SLOPE AND A MAXIMUM OF 2.00% CROSS SLOPE ALONG WALKWAYS WITHIN THE ACCESSIBLE PATH OF TRAVEL (SEE THE SITE PLAN FOR THE LOCATION OF THE ACCESSIBLE PATH). THE CONTRACTOR IS RESPONSIBLE TO ENSURE THE ACCESSIBLE PATH OF TRAVEL IS 36 INCHES WIDE OR GREATER UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
 - THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION AT ALL LANDINGS. LANDINGS INCLUDE, BUT ARE NOT LIMITED TO, THE TOP AND BOTTOM OF AN ACCESSIBLE RAMP. AT ACCESSIBLE BUILDING ENTRANCES AT AN AREA IN FRONT OF A WALK-UP ATM, AND AT TURNING SPACES ALONG THE ACCESSIBLE PATH OF TRAVEL, THE LANDING AREA SHALL HAVE A MINIMUM CLEAR AREA OF 60 INCHES BY 60 INCHES UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
 - THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 8.33% RUNNING SLOPE AND A MAXIMUM 2.00% CROSS SLOPE ON ANY CURB RAMPS ALONG THE ACCESSIBLE PATH OF TRAVEL, WHERE PROVIDED. CURB RAMP FLARES SHALL NOT HAVE A SLOPE GREATER THAN 10.00% IF A LANDING AREA IS PROVIDED AT THE TOP OF THE RAMP. FOR ALTERATIONS, A CURB RAMP FLARES SHALL NOT HAVE A SLOPE GREATER THAN 8.33% IF A LANDING AREA IS NOT PROVIDED AT THE TOP OF THE RAMP. CURBS RAMPS SHALL NOT RISE MORE THAN 6 INCHES IN ELEVATION WITHOUT A HANDRAIL. THE CLEAR WIDTH OF A CURB RAMP SHALL BE NO LESS THAN 36 INCHES WIDE.
 - ACCESSIBLE RAMPS WITH A RISE GREATER THAN 6 INCHES SHALL CONTAIN COMPLIANT HANDRAILS ON BOTH SIDES OF THE RAMP AND SHALL NOT RISE MORE THAN 30" IN ELEVATION WITHOUT A LANDING AREA IN BETWEEN RAMP RUNS. LANDING AREAS SHALL ALSO BE PROVIDED AT THE TOP AND BOTTOM OF THE RAMP.
 - A SLIP RESISTANT SURFACE SHALL BE CONSTRUCTED ALONG THE ACCESSIBLE PATH AND WITHIN ADA PARKING AREAS.
 - THE CONTRACTOR SHALL ENSURE A MAXIMUM OF 1/4 INCHES VERTICAL CHANGE IN LEVEL ALONG THE ACCESSIBLE PATH, WHERE A CHANGE IN LEVEL BETWEEN 1/4 INCHES AND 1/2 INCHES EXISTS. CONTRACTOR SHALL ENSURE THAT THE TOP 1/4 INCH CHANGE IN LEVEL IS BEVELED WITH A SLOPE NOT STEEPER THAN 1 UNIT VERTICAL AND 2 UNITS HORIZONTAL (2:1 SLOPE).
 - THE CONTRACTOR SHALL ENSURE THAT ANY OPENINGS (GAPS OR HORIZONTAL SEPARATIONS) ALONG THE ACCESSIBLE PATH SHALL NOT ALLOW PASSAGE OF A SPHERE GREATER THAN 1/4 INCH.



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2690 CROOKS ROAD
EXISTING BUILDING RENOVATION &
PROPOSED MULTI-FAMILY APARTMENTS

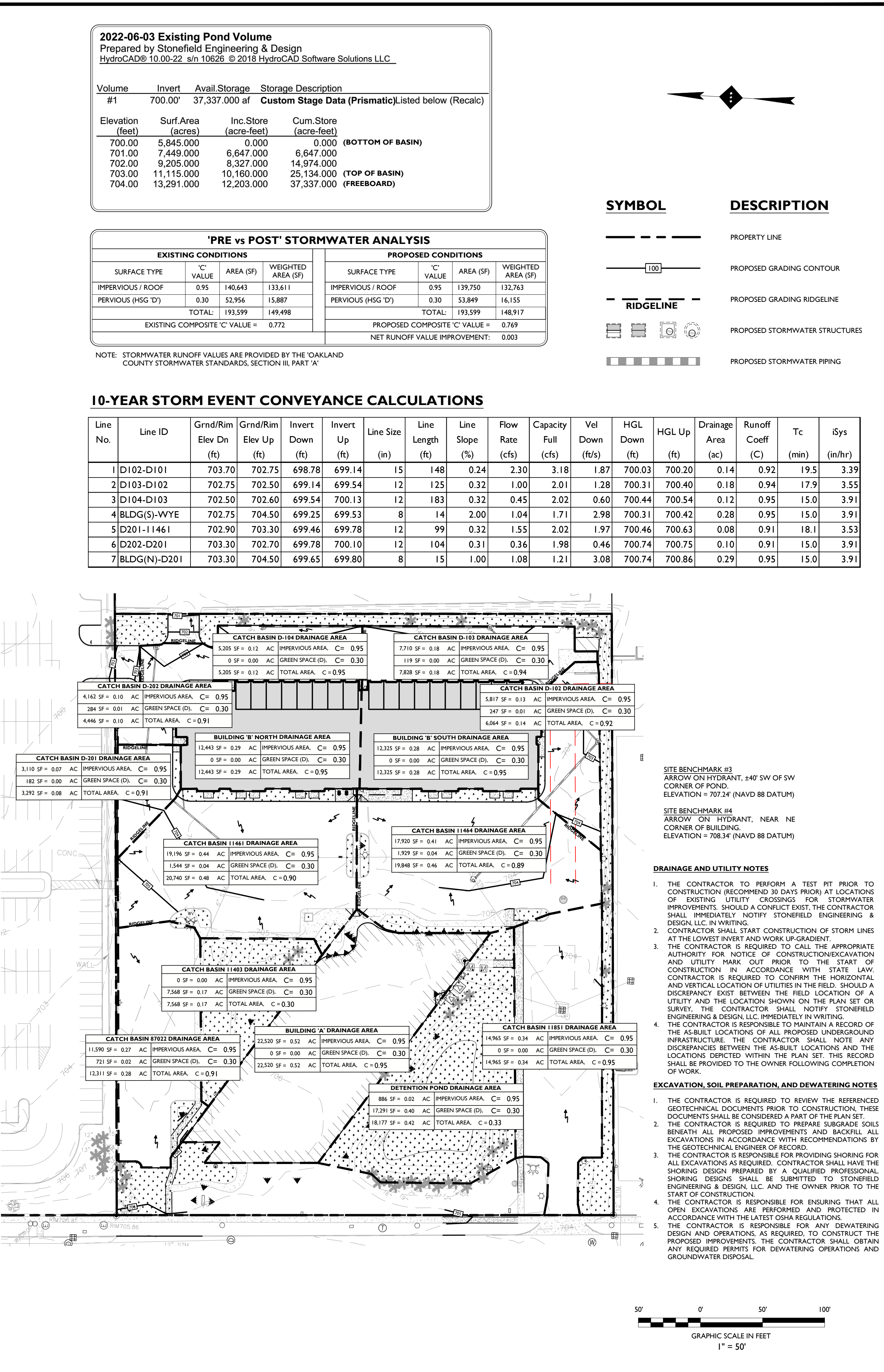
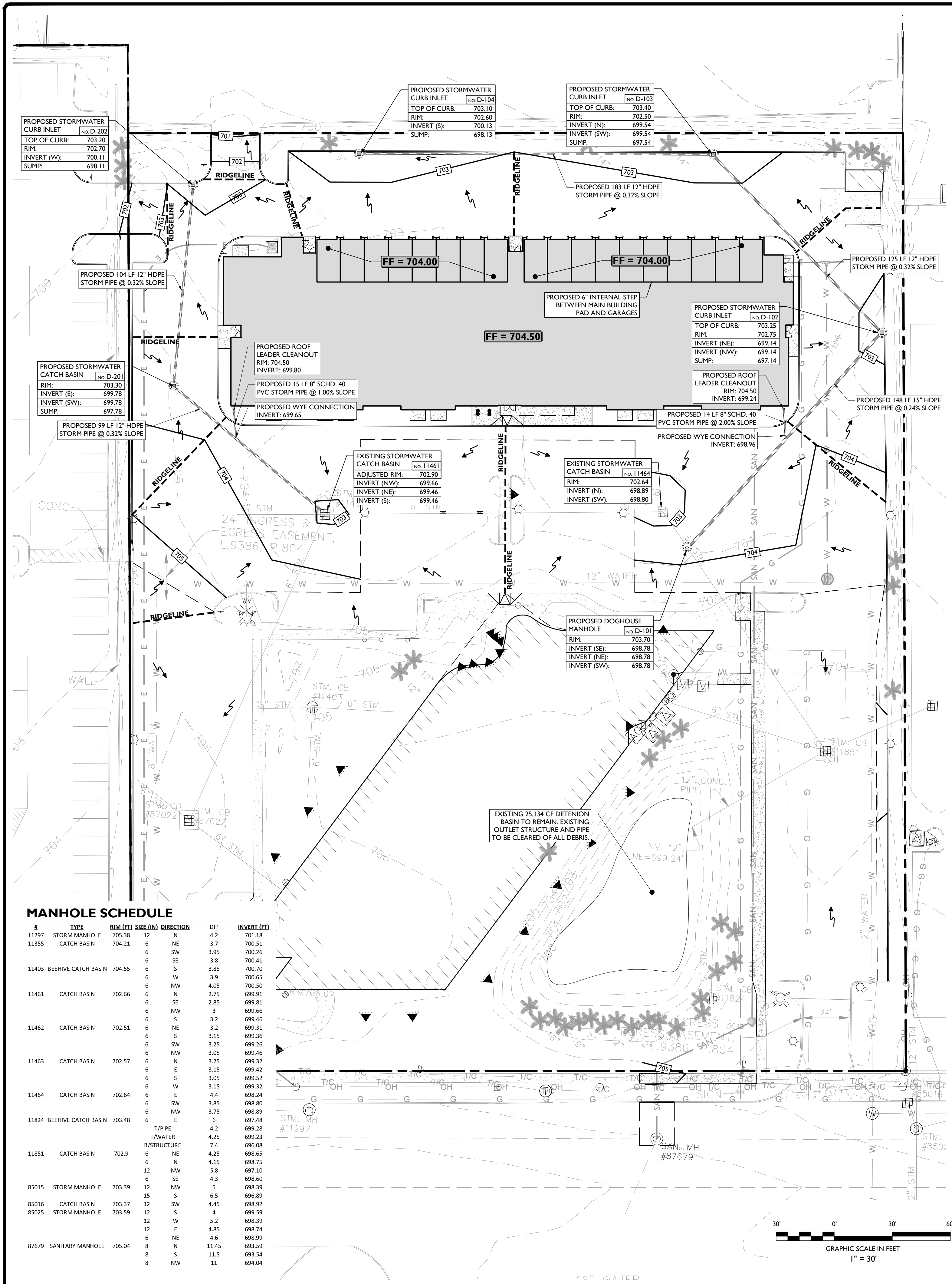
20-28-101-003
CITY OF TROY
OAKLAND COUNTY, MICHIGAN

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SCALE: 1" = 30' PROJECT ID: M-19301.01

TITLE: **GRADING PLAN**

DRAWING: **C-5**



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20-28-101-003
CITY OF TROY
OAKLAND COUNTY, MICHIGAN

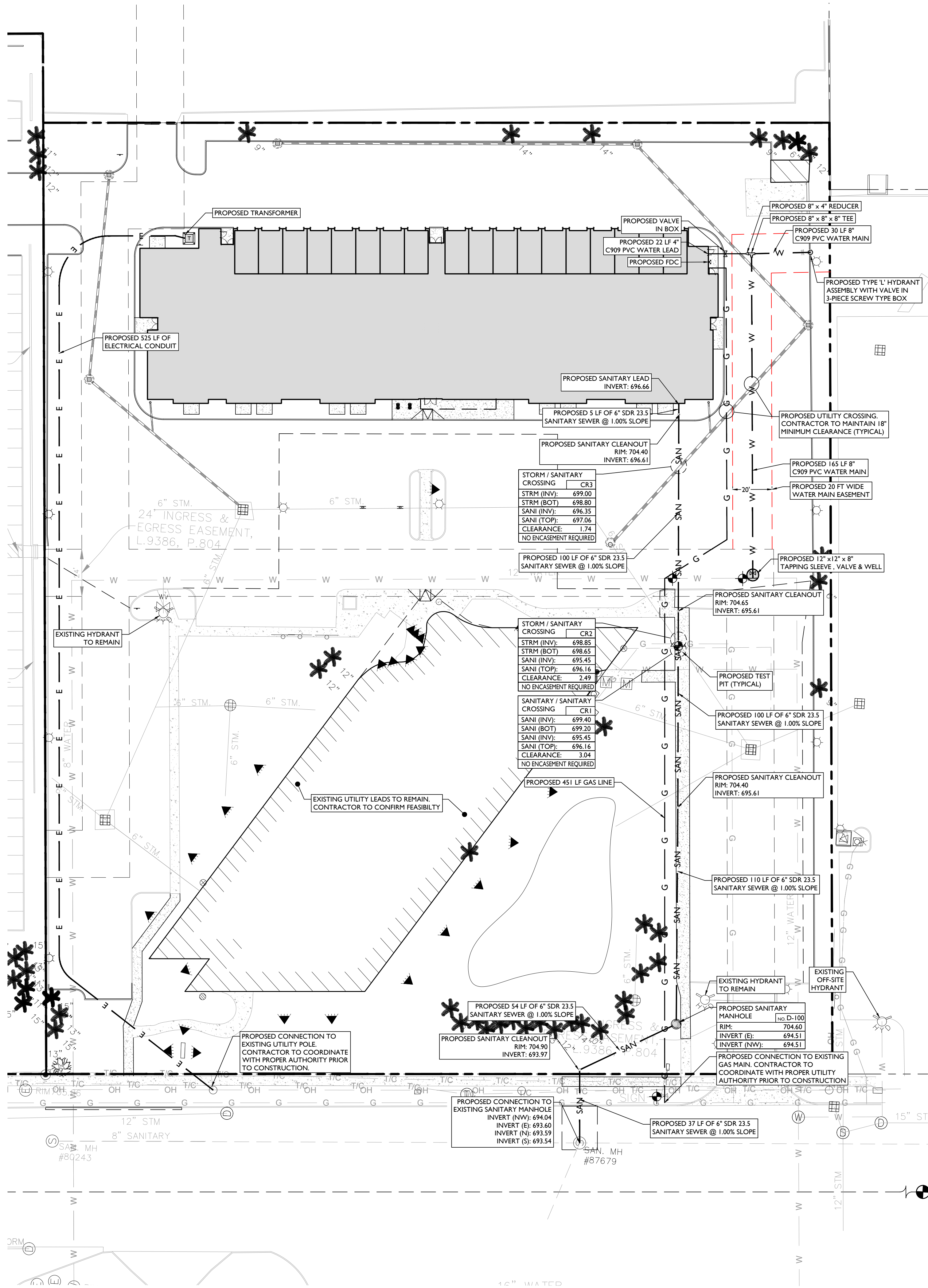
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STORMWATER
MANAGEMENT PLAN

DRAWING:

C-6

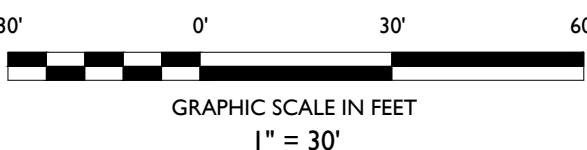
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SYMBOL	DESCRIPTION
---	PROPERTY LINE
SAN	PROPOSED SANITARY LATERAL
W	PROPOSED DOMESTIC WATER SERVICE
E	PROPOSED ELECTRIC CONDUITS
G	PROPOSED GAS LINE
⊗	PROPOSED VALVE
T, 90° bend	PROPOSED WATER TEE / BEND
⊙	PROPOSED FIRE HYDRANT
⬇	PROPOSED FIRE DEPARTMENT CONNECTION (FDC)
⊙	PROPOSED SANITARY MANHOLE / CLEANOUT
T in square	PROPOSED TRANSFORMER ON CONCRETE PAD WITH BOLLARDS
⊙ with cross	PROPOSED TEST PIT
---	PROPOSED EASEMENT

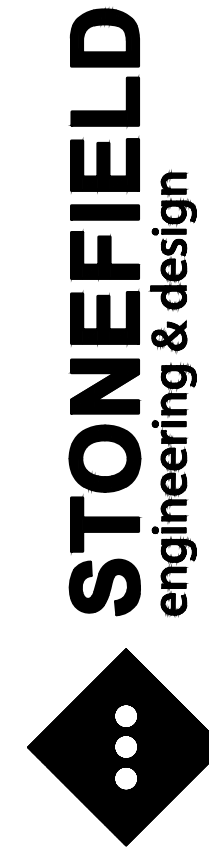
DRAINAGE AND UTILITY NOTES

- THE CONTRACTOR IS REQUIRED TO CALL THE APPROPRIATE AUTHORITY FOR NOTICE OF CONSTRUCTION/EXCAVATION AND UTILITY MARK OUT PRIOR TO THE START OF CONSTRUCTION IN ACCORDANCE WITH STATE LAW. CONTRACTOR IS REQUIRED TO CONFIRM THE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES IN THE FIELD. SHOULD A DISCREPANCY EXIST BETWEEN THE FIELD LOCATION OF A UTILITY AND THE LOCATION SHOWN ON THE PLAN SET OR SURVEY, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IMMEDIATELY IN WRITING.
- THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN IN OPERATION ALL UTILITIES NOT DESIGNATED TO BE REMOVED.
- THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO ANY EXISTING UTILITY IDENTIFIED TO REMAIN WITHIN THE LIMITS OF THE PROPOSED WORK DURING CONSTRUCTION.
- A MINIMUM HORIZONTAL SEPARATION OF 10 FEET IS REQUIRED BETWEEN ANY SANITARY SEWER SERVICE AND ANY WATER LINES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
- ALL WATER LINES SHALL BE VERTICALLY SEPARATED ABOVE SANITARY SEWER LINES BY A MINIMUM DISTANCE OF 18 INCHES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
- THE CONTRACTOR TO PERFORM A TEST PIT PRIOR TO CONSTRUCTION (RECOMMEND 30 DAYS PRIOR) AT LOCATIONS OF EXISTING UTILITY CROSSINGS FOR WATER AND SANITARY SEWER CONNECTION IMPROVEMENTS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IN WRITING.
- THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING GAS, ELECTRIC AND TELECOMMUNICATION CONNECTIONS WITH THE APPROPRIATE GOVERNING AUTHORITY.
- CONTRACTOR SHALL START CONSTRUCTION OF ANY GRAVITY SEWER AT THE LOWEST INVERT AND WORK UP-GRADE.
- THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD SET OF PLANS REFLECTING THE LOCATION OF EXISTING UTILITIES THAT HAVE BEEN CAPPED, ABANDONED, OR RELOCATED BASED ON THE DEMOLITION/REMOVAL ACTIVITIES REQUIRED IN THIS PLAN SET. THIS DOCUMENT SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.
- THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD OF THE AS-BUILT LOCATIONS OF ALL PROPOSED UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN THE AS-BUILT LOCATIONS AND THE LOCATIONS DEPICTED WITHIN THE PLAN SET. THIS RECORD SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.



FOR RCOC / PLANNING APPROVAL	FOR ENGINEERING APPROVAL	FOR SITE PLAN APPROVAL	FOR SITE PLAN REVIEW & SPECIAL LAND USE SUBMISSION	FOR CITY SUBMISSION	BY	DATE	ISSUE	DESCRIPTION
	KTH	KTH	KTH	RAC				
5	10/11/2022	4	07/11/2022	2				
		3	05/31/2022	1				
			02/14/2022					

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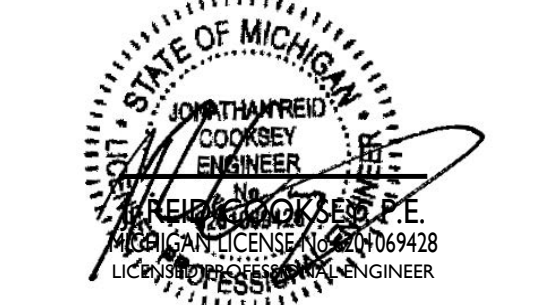
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SITE DEVELOPMENT PLANS

2690 CROOKS ROAD
 EXISTING BUILDING RENOVATION &
 PROPOSED MULTI-FAMILY APARTMENTS

20-28-101-003
 2690 CROOKS ROAD
 CITY OF TROY
 OAKLAND COUNTY, MICHIGAN



SCALE: 1" = 30' PROJECT ID: M-19301.01

TITLE:

UTILITY PLAN

DRAWING:

C-7

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1. FOR CONTAINER-GROWN TREES, USE FINGERS OR SMALL HAND TOOLS TO PULL THE ROOTS OUT OF THE OUTER LAYER OF POTTING SOIL; THEN CUT OR PULL APART ANY ROOTS CIRCULING THE PERIMETER OF THE CONTAINER
2. THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
3. SOIL AMENDMENTS:
 - **MODIFY HEAVY CLAY OR SILT SOILS (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) OR GYPSUM**
 - **MODIFY EXTREMELY SANDY SOILS (MORE THAN 85% SAND) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX**



1. FOR CONTAINER-GROWN TREES, USE FINGERS OR SMALL HAND TOOLS TO PULL THE ROOTS OUT OF THE OUTER LAYER OF POTTING SOIL; THEN CUT OR PULL APART ANY ROOTS CIRCLING THE PERIMETER OF THE CONTAINER.
2. THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
3. SOIL ADJUSTMENTS:
 - **MODIFY HEAVY CLAY OR SILT SOILS (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) OR GYPSSUM.**
 - **MODIFY EXTREMELY SANDY SOILS (MORE THAN 85% SAND) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.**



1. THE LANDSCAPE CONTRACTOR SHALL FURNISH ALL MATERIALS AND PERFORM ALL WORK IN ACCORDANCE WITH THESE SPECIFICATIONS, APPROVED OR FINAL DRAWINGS, AND INSTRUCTIONS PROVIDED BY THE PROJECT LANDSCAPE DESIGNER, MUNICIPAL OFFICIALS, OR OWNER/OWNER'S REPRESENTATIVE. ALL WORK COMPLETED AND MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH THE INTENTION OF THE SPECIFICATIONS, DRAWINGS, AND INSTRUCTIONS PROVIDED BY THE PROJECT LANDSCAPE DESIGNER, MUNICIPAL OFFICIALS, OR OWNER/OWNER'S REPRESENTATIVE.
2. WORK MUST BE CARRIED OUT ONLY DURING WEATHER CONDITIONS FAVORABLE TO LANDSCAPE CONSTRUCTION AND TO THE HEALTH AND WELFARE OF PLANTS. THE SUITABILITY OF SUCH WEATHER CONDITIONS SHALL BE DETERMINED BY THE PROJECT LANDSCAPE DESIGNER OR GOVERNING MUNICIPAL OFFICIAL.
3. THE PROJECT LANDSCAPE DESIGNER OR GOVERNING MUNICIPAL OFFICIAL MAY, BEFORE ORDERING OR PURCHASING MATERIALS, TO PROVIDE TO THE LANDSCAPE CONTRACTOR, BEFORE ORDERING OR PURCHASING MATERIALS, SAMPLES OF THE MATERIALS TO THE PROJECT LANDSCAPE DESIGNER OR GOVERNING MUNICIPAL OFFICIAL FOR APPROVAL. IF SO REQUESTED.
4. IF SAMPLES ARE REQUESTED, THE LANDSCAPE CONTRACTOR IS TO SUBMIT CERTIFICATION TAGS FROM TREES, SHRUBS AND SEED VERIFIING TYPE AND PURITY.
5. UNLESS OTHERWISE SPECIFIED BY THE PROJECT LANDSCAPE DESIGNER OR GOVERNING MUNICIPAL OFFICIAL, THE LANDSCAPE CONTRACTOR SHALL PROVIDE NOTICE AT LEAST FORTY-EIGHT HOURS (48 HRS) IN ADVANCE OF THE ANTICIPATED DELIVERY DATE OF ANY PLANT MATERIALS TO THE PROJECT SITE. A LEGIBLE COPY OF THE INVOICE, SHOWING VARIETIES AND SIZES OF MATERIALS INCLUDED FOR EACH SHIPMENT SHALL BE FURNISHED TO THE PROJECT LANDSCAPE DESIGNER, OR GOVERNING MUNICIPAL OFFICIAL.
6. THE PROJECT LANDSCAPE DESIGNER OR GOVERNING MUNICIPAL OFFICIAL RESERVES THE RIGHT TO INSPECT AND REJECT PLANTS AT ANY TIME AND AT ANY PLACE.

1. BEFORE COMMENCING WORK, ALL EXISTING VEGETATION WHICH COULD BE IMPACTED AS A RESULT OF THE PROPOSED CONSTRUCTION ACTIVITIES MUST BE PROTECTED FROM DAMAGE BY THE INSTALLATION OF TREE PROTECTION FENCING. FENCING SHALL BE LOCATED AT THE DRIPLINE OR LIMIT OF DISTURBANCE AS DEPICTED WITHIN THE APPROVED OR FINAL PLAN SET, ESTABLISHING THE TREE PROTECTION ZONE. FENCE INSTALLATION SHALL BE IN ACCORDANCE WITH THE PROVIDED "TREE PROTECTION FENCE DETAIL." NO WORK MAY BEGIN UNTIL THIS REQUIREMENT IS FULFILLED. THE FENCING SHALL BE INSPECTED REGULARLY BY THE LANDSCAPE CONTRACTOR AND MAINTAINED UNTIL ALL CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.

- MATERIALS SHALL BE DRIVEN, PARKED OR PLACED WITHIN THE TREE PROTECTION ZONE. ALL ON-SITE CONTRACTORS SHALL USE ANY AND ALL PRECAUTIONARY MEASURES WHEN PERFORMING WORK AROUND TREES, WALKS, PAVEMENTS, UTILITIES, AND ANY OTHER FEATURES EITHER EXISTING OR PREVIOUSLY INSTALLED UNDER THIS CONTRACT.
3. IN AREAS IDENTIFIED FOR EXCAVATING, FILL, OR GRADING IS REQUIRED WITHIN THE DRIP-LINE OF TREES TO REMAIN, THE FOLLOWING SHALL BE OBSERVED:
- TRENCING: WHEN TRENCING OCCURS AROUND TREES TO REMAIN, THE TREE ROOTS SHALL NOT BE CUT, BUT THE TRENCH SHALL BE TUNNELED UNDER OR AROUND THE ROOTS BY CAREFUL HAND DIGGING AND WITHOUT INJURY TO THE ROOTS. NO ROOTS, LIMBS, OR WOODS ARE TO HAVE ANY PAINT OR MATERIAL APPLIED TO ANY SURFACE.
 - GRADING: WHEN GRADING IS REQUIRED, THE GRADING SHALL BE TO THE FINISH GRADE. THE GRADING SHALL NOT EXCEEDING 6 INCHES (6") IS REQUIRED, CLEAN, WASHED GRAVEL FROM ONE TO TWO INCHES (1" - 2") IN SIZE SHALL BE PLACED DIRECTLY AROUND THE TREE TRUNK. THE GRAVEL SHALL EXTEND OUT FROM THE TRUNK ON ALL SIDES A MINIMUM OF 18 INCHES (18") AND FINISH APPROXIMATELY TWO INCHES (2") ABOVE THE FINISH GRADE AT TREE. INSTALL GRAVEL BEFORE ANY EARTH FILL IS PLACED. NEW EARTH FILL SHALL NOT BE LEFT IN CONTACT WITH THE TRUNK OF ANY TREE. THE GRAVEL FILL SHALL BE PLACED TO THE FINISH GRADE. THE GRAVEL SHALL BE CONSTRUCTED AS INSTRUCTED.
 - IF APPLICABLE, TREE WELL INSTALLATION SHALL BE IN ACCORDANCE WITH THE PROVIDED "TREE WELL DETAIL".
 - LOWERING GRADES: EXISTING TREES LOCATED IN AREAS WHERE THE NEW FINISHED GRADE IS TO BE LOWERED, SHALL HAVE RE-GRADING WORK DONE BY HAND TO THE INDICATED ELEVATION, NO GREATER THAN SIX INCHES (6"), ROOTS SHALL BE CUT BY CLEANING THE GRADE (3") TO THE FINISH GRADE. THE DRAINAGE OF THE DRAINAGE DITCHES AND DRAINAGE ROOSTS SHALL BE EXCEEDING 6 INCHES (6") IS REQUIRED, DRY LAID RETAINING WALLS BE CONSTRUCTED, IF APPLICABLE.
 - THE RETAINING WALL INSTALLATION SHALL BE IN ACCORDANCE WITH THE PROVIDED "TREE RETAINING WALL DETAIL".

- LANDSCAPE CONTRACTOR SHALL OBTAIN A SOIL TEST OF THE IN-SITU TOPSOIL BY A CERTIFIED SOIL LABORATORY PRIOR TO PLANTING. LANDSCAPE CONTRACTOR SHALL ALLOW FOR A TWO WEEK TURNAROUND TIME FROM SUBMITTAL OF SAMPLE TO NOTIFICATION OF RESULTS.
- BASIN FILL SHALL BE ADJUSTED RATES OF LINE AND FERTILIZER THAT SHALL BE MIXED INTO THE TOP SIX INCHES (6") OF TOPSOIL. THE LINE AND FERTILIZER RATES PROVIDED WITHIN THE "SEED SPECIFICATION" OR "SOD SPECIFICATION" IS APPROXIMATE AND FOR BIDDING PURPOSES ONLY. IF ADDITIONAL AMENDMENTS ARE NECESSARY, ADJUST THE TOPSOIL AS FOLLOWS:
 - * MEDIUM HEAVY CLAY OR SILT SILTS (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED NINE BARK (UP TO 30% BY VOLUME) OR GYPSUM.
 - * MODERATELY SANDY SILTS (MORE THAN 85%) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.
- TOPSOIL SHALL BE PROTECTED FROM EROSION, NATURAL TOPSOIL OF LOAMING CHARACTER, WITHOUT ADMIXTURE OF SUBSOL, MULCH, OR OTHER MATERIAL FROM A WELL-DRAINING ARABLE SITE, FREE FROM ALL CLAY, LUMPS, COARSE SANDS, STONES, PLANTS, ROOTS, STICKS, AND ANY OTHER FOREIGN MATERIAL GREATER THAN ONE INCH (1").
- TOPSOIL SHALL HAVE A pH RANGE OF 5.0-7.0 AND SHALL NOT CONTAIN LESS THAN 6% ORGANIC MATTER BY WEIGHT.
- OBTAIN TOPSOIL ONLY FROM LOCAL SOURCES OR FROM AREAS HAVING SIMILAR SOIL CHARACTERISTICS TO THAT FOUND AT THE PROJECT SITE.
- CONTRACTOR SHALL PROVIDE A SIX INCH (6") DEEP LAYER OF TOPSOIL IN ALL PLANTING AREAS. TOPSOIL SHALL BE SPREAD OVER EXISTING SUBGRADE SURFACE USING A BACKHOE OR EQUIVALENT. TOPSOIL COMPACTED THICKNESS. THE SPREADING OF TOPSOIL SHALL NOT BE CONDUCTED UNDER MUDDY OR FROZEN SOIL CONDITIONS.
- UNLESS OTHERWISE NOTED IN THE CONTRACT, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF TOPSOIL AND THE ESTABLISHMENT OF FINE-GRAIDING WITHIN THE DISTURBED AREA OF THE SITE.
- AND FINISHED GRADE SHALL BE MAINTAINED AT THE SAME ELEVATION AS THE FINISHED GRADE ELEVATION (SEE THE REQUIRED TOPSOIL), IN ACCORDANCE WITH THE APPROVED OR FINAL GRADING PLAN.
- ALL LAWN AND PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN AND UNIFORM PLANE WITH NO ABRUPT CHANGE OF SURFACE AS DEPICTED WITHIN THE APPROVED OR FINAL CONSTRUCTION SET UNLESS OTHERWISE DIRECTED BY THE ARCHITECT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER SURFACE AND SUBSURFACE PLANT BED DRAINAGE PRIOR TO THE INSTALLATION OF PLANTINGS. IF POOR DRAINAGE CONDITIONS EXIST, CORRECTIVE ACTION SHALL BE TAKEN PRIOR TO INSTALLATION. ALL PLANTING AND LAWN AREAS SHALL BE GRADED AND MAINTAINED TO ALLOW A FREE FLOW OF SURFACE WATER.
- DOUBLE SHREDED HARDWOOD MULCH OR APPROVED EQUAL SHALL BE USED AS A THREE INCH (3") TOP DRESSING IN ALL SHRUB PLANTING BEDS AND AROUND ALL TREES PLANTED BY A LANDSCAPE CONTRACTOR. GROUND COVER, PERENNIAL, AND ANNUALS SHALL BE REFINISHED WITH MULCH TO A TWO INCH (2") TOP DRESSING. SINGLE TRUNK OR SHRUBS SHALL BE MULCHED TO GOOD CONTACT WITH TRUNK OR PLANT STEM. MULCH SHALL BE OF SUFFICIENT CHUCKINESS AS NOT TO BE EASILY DISPLACED BY WIND OR RUNOFF RUNOFF.
- WHENEVER POSSIBLE, THE SOIL PREPARATION AREA SHALL BE CONNECTED FROM PLANTING TO PLANTING.
- MULCH SHALL BE REFINISHED WITH MULCH TO A TWO INCH (2") TOP DRESSING. THE TOPSOIL IS FROZEN OR OTHERWISE EXCESSIVELY WET, TILING THAT PRODUCES LARGE, COARSE CHUNKS OF SOIL IS PREFERABLE TO TILING THAT RESULTS IN FINE GRAINS UNIFORM IN TEXTURE. AFTER THE AREA IS LOOSENED IT SHALL NOT BE DRIVEN OVER BY ANY VEHICLE.
- APPLY PRE-EMERGENT WEED CONTROL TO ALL PLANT BEDS PRIOR TO MULCHING. ENSURE COMPATIBILITY BETWEEN PRODUCT AND PLANTING MATERIALS.
- ALL PLANTING SOIL SHALL BE AMENDED WITH THE FOLLOWING:

MYCRO® TREE SAVER - A DRY GRANULAR MYCORRHIZAL FUNGI INOCULANT THAT IS MIXED IN THE BACKFILL WHEN PLANTING TREES AND SHRUBS. IT CONTAINS SPORES OF BOTH ECTOMYCORRHIZAL AND VA MYCORRHIZAL FUNGI (VAM), BENEFICIAL RHIZOSPHERE BACTERIA, TERRA-SORB SUPERABSORBENT HYDROGEL TO REDUCE WATER LEACHING, AND SELECTED ORGANIC MICROBIAL NUTRIENTS.

- DIRECTIONS FOR USE: USE 3.0Z PER EACH FOOT DIAMETER OF THE ROOT BALL OR 3.0Z PER INCH CALIPER. MIX INTO THE TOP SOIL OF THE TRANSPLANT. DO NOT APPLY TO THE SOIL SURFACE. DO NOT APPLY TO THE SOIL SURFACE OF THE PLANT. UPPER PORTION OF THE ROOT BALL, EXTENDING FROM THE SOIL SURFACE TO A DEPTH OF ABOUT 8 INCHES AND EXTENDING OUT FROM THE ROOT BALL ABOUT 8 INCHES INTO THE BACKFILL. APPLY WATER TO SOIL SATURATION. THIS PRODUCT WILL SAVE THE ROOT BALL FROM DRYING OUT. THIS PRODUCT IS NOT TO BE USED ON ANY OF THE MOUNTAIN LAUREL, WHICH REQUIRE ERICOID MYCORRHIZAE.
- SOIL PH: THE FUNGI IN THIS PRODUCT WERE CHOSEN BASED ON THEIR ABILITY TO SURVIVE AND COLONIZE PLANT ROOTS. THE PH RANGE OF 7 TO 8 IS RECOMMENDED.
- FUNGICIDES: THE USE OF CERTAIN FUNGICIDES CAN HAVE A DETRIMENTAL EFFECT ON THE INOCULATION PROGRAM. SOILS APPLICATION OF ANY FUNGICIDE IS NOT RECOMMENDED FOR TWO WEEKS AFTER APPLICATION.
- PLANT SPECIES: THIS PRODUCT IS NOT TO BE USED ON ANY OF THE MOUNTAIN LAUREL, MYCORRHIZAL FUNGAL DEVELOPMENT, BUT MAY INHIBIT THE GROWTH OF SOME TREE AND SHRUB SPECIES IF NOT USED PROPERLY.

- TABLETS ARE FORMULATED FOR LONG-TERM RELEASE BY SLOW BIODEGRADATION, AND LAST UP TO 2 YEARS AFTER PLANTING. TABLETS CONTAIN 12-8 NPK FERTILIZER, AS WELL AS A MINIMUM OF SEVEN PERCENT (7%) HUMIC ACID BY WEIGHT, MICROBIAL NUTRIENTS DERIVED FROM SEA KELP, PROTEIN BYPRODUCTS, AND YUCCA SCHIDIGERA, AND A COMPLEMENT OF BENEFICIAL RHIZOSPHERE BACTERIA. THE STANDARD 21 GRAM TABLET IS SPECIFIED HERE. DIRECTIONS FOR USE: FOR PLANTING BALLED & BURLAPPED (B&B) TREES AND SHRUBS, MEASURE THE THICKNESS OF THE TRUNK, AND USE ABOUT 1 TABLET (21-G) PER HALF-INCH. PLACE THE TABLETS DIRECTLY NEXT TO THE ROOT BALL, EVENLY DISTRIBUTED AROUND ITS PERIMETER, AT A DEPTH OF ABOUT 4 INCHES.

2. ALL PLANT MATERIAL SHALL CONFORM TO THE AMERICAN STANDARD FOR NURSEY STOCK (ANSI Z660-2004) OR LATEST REVISION AS PUBLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.
3. IN ALL CASES, BOTANICAL NAMES LISTED WITHIN THE APPROVED OR FINAL PLANT LIST SHALL TAKE PRECEDENCE OVER COMMON NAMES.
4. ALL PLANTS SHALL BE OF SELECTED SPECIMEN QUALITY, EXCEPTIONALLY HEAVY, TIGHTLY KNIT, SO TRAINED OR FAVORED IN THEIR DEVELOPMENT AND APPEARANCE AS TO BE SUPERIOR IN FORM, NUMBER OF BRANCHES, COMPACTNESS AND SYMMETRY.
5. ALL PLANTS MUST HAVE A HEALTHY, VIGOROUS, WELL-DEVELOPED ROOT SYSTEM.
6. ALL PLANTS SHALL BE FREE OF DISEASE, INSEST PESTS, EGGS OR LARVAE.
7. PLANTS SHALL NOT BE PRUNED BEFORE DELIVERY. TREES WITH ABRASION OF THE BARK, SUNSCALDS, DISFIGURING KNOTS OR FRESH CUTS OF LIMBS OVER ONE AND ONE-FOURTH INCHES (1-1/4") WHICH HAVE NOT BEEN COMPLETELY CALLOUSED SHALL BE REJECTED.
8. ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY AND SHALL HAVE A NORMAL HABIT OF GROWTH AND BE LEGIBLY TAGGED WITH THE PROPER NAME AND SIZE.
9. THE HEART SYSTEMS OF EACH PLANT SHALL BE WELL PROVIDED WITH FIBROUS ROOTS. PLANTS SHALL BE SOUND AND VIGOROUS, WELL-BRANCHED AND DENSELY FOLIATED WHEN IN LEAF.
10. ALL PLANTS DESIGNATED BALL AND BURLAP (B&B) MUST BE MOVED WITH THE ROOT SYSTEM AS SOLID UNITS WITH BALLS OF EARTH FIRMLY WRAPPED WITH BURLAP. THE DIAMETER AND DEPTH OF THE BALLS OF EARTH MUST BE SUFFICIENT TO PROTECT THE ROOT SYSTEM OF THE PLANT. PLANTS WITH B&B SHALL BE PLANTED IMMEDIATELY. IF INSTALLED BURLAP SHALL BE ACCEPTED WHEN THE BALL OF EARTH SURROUNDING ITS ROOTS HAS BEEN BADLY CRACKED OR BROKEN.
11. PREPARATORY TO OR DURING THE PROCESS OF PLANTING, THE BALLS SHALL REMAIN INTACT DURING ALL OPERATIONS. ALL PLANTS THAT CANNOT BE PLANTED AT ONCE MUST BE HEEL-ING BY SETTING IN THE GROUND AND COVERING THE BALLS WITH MULCH OR CHISEL-CUTTED COTTON BURLAP. PLANTS THAT ARE HEEL-ING SHALL BE PLANTED IMMEDIATELY. IF INSTALLED BURLAP SHALL BE ACCEPTED WHEN THE BALL OF EARTH SURROUNDING ITS ROOTS HAS BEEN BADLY CRACKED OR BROKEN.
12. TWINE IS TO BE CUT FROM AROUND THE TRUNK AND ALL BURLAP IS TO BE REMOVED.
13. PLANTS TRANSPORTED TO THE PROJECT IN OPEN VEHICLES SHALL BE COVERED WITH TARP OR OTHER SUITABLE COVERS TO PROTECT THEM FROM EXCESSIVE HEAT OR COLD.
14. PLANTS TO BE PLANTED IN TEMPORARY STORAGE SHALL BE COVERED WITH TARP OR OTHER SUITABLE COVERS TO PROTECT THEM FROM EXCESSIVE HEAT OR COLD. ADEQUATELY VENTILATED TO PREVENT OVERHEATING OF THE PLANTS. EVIDENCE OF INADEQUATE PROTECTION FOLLOWING UNLOADING, CARELESSNESS WHILE IN TRANSIT, OR IMPROPER HANDLING OR STORAGE SHALL BE CAUSE FOR REJECTION OF PLANT MATERIAL. ALL PLANTS SHALL BE KEPT MOIST, FRESH, AND PROTECTED. SUCH PROTECTION SHALL ENCOMPASS THE ENTIRE PLANT, INCLUDING THE ROOT SYSTEM.
15. PLANT MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE CORRESPONDING LANDSCAPE PLAN AND PLANTING

- LANDSCAPE CONTRACTOR SHALL MAKE BEST EFFORT TO INSTALL PLANTINGS ON THE SAME DAY AS DELIVERY. IF PLANTS ARE NOT PLANTED IMMEDIATELY ON SITE, PROPER CARE SHALL BE TAKEN TO PLACE THE PLANTINGS IN PARTIAL SHADE WHEN POSSIBLE. THE ROOT BALL SHALL BE KEPT MOIST AT ALL TIME AND COVERED WITH MOISTENED MULCH OR GEOTEXTILE. IF WETTER OR IRRIGATED AREAS ARE REQUIRED SO AS TO NOT ALLOW THE ROOT BALL TO DRY OUT, PLANTINGS SHALL BE UNITED AND PROPER SPACING SHALL BE ALLOTTED FOR AIR CIRCULATION AND TO PREVENT DISEASE, WILTING AND LEAF LOSS. PLANTS THAT REMAIN UNPLANTED FOR A PERIOD OF TIME GREATER THAN THREE (3) DAYS SHALL BE HEALED IN WITH TOPSOIL OR MULCH AND WATERED AS REQUIRED TO PRESERVE ROOT MOISTURE.
11. PLANTS THAT REMAIN UNPLANTED SHALL BE PLANTED IN MUDDY OR FROZEN AREAS.
12. PLANTS WITH INJURED ROOTS OR BRANCHES SHALL BE PRUNED PRIOR TO PLANTING UTILIZING CLEAN, SHARP TOOLS. ONLY DISEASED OR INJURED PLANTS SHALL BE REMOVED.
13. IF ROCK OR OTHER UNDERGROUND OBSTRUCTION IS ENCOUNTERED, THE LANDSCAPE DESIGNER RESERVES THE RIGHT TO RELOCATE OR REMOVE OBSTRUCTION AND TO REPLACE PLANTING WITH LIKE PLANT MATERIAL FROM THE CONTACT.
14. IF PLANTS ARE PROPOSED WITHIN SIGHT TRIANGLES, TREES SHALL BE LIMBED AND MAINTAINED TO A HEIGHT OF EIGHT FEET ABOVE GRADE, AND SHRUBS, GROUND COVER, PERENNIALS, AND ANNUALS SHALL BE MAINTAINED TO A HEIGHT NOT TO EXCEED TWO FEET (2) ABOVE GRADE UNLESS OTHERWISE NOTED OR SPECIFIED BY THE GOVERNING MUNICIPALITY OR AGENCY.
15. INSTALLATION SHALL OCCUR DURING THE FOLLOWING SEASONS:
PLANTS (MARCH 15 - DECEMBER 15)
LAWNS (MARCH 15 - JUNE 15 OR SEPTEMBER 1 - DECEMBER 1)
16. THE FOLLOWING TREES ARE SUSCEPTIBLE TO TRANSPORT SHOCK AND SHALL NOT BE PLANTED DURING THE FALL SEASON (STARTING SEPTEMBER 15):
- | | | |
|--------------------------|---------------------------|--------------------------------------|
| ABIES CONCOLOR | CORNUS VARIETIES | OSTREA VIRGINIANA |
| ACER BURGERSIANUM | CRATAEGUS VARIETIES | PISTIA NIGRA |
| ACER FREEMAN | CUPRESSOCYPERUS LEYLANDII | PLATANUS VARIETIES |
| ACER RUBRUM | FAGUS VARIETIES | PONULUS VARIETIES |
| ACER SACCHARINUM | HALESIA VARIETIES | PURNUS VARIETIES |
| BETULA VARIETIES | ILEX X POSTER | QUERCUS VARIETIES (NOT Q. PALUSTRIS) |
| CAMPNUS VARIETIES | LEX NELLIE STEVENS | SALIX WEEPING VARIETIES |
| CEDRUS DEODARA | LEX X FOSTER | SORBUS VARIETIES |
| CELTIS VARIETIES | JUNIPERUS VIRGINIANA | TAXODIUM VARIETIES |
| CERCIDIPHYLLUM VARIETIES | KOELERUTERA PANICULATA | ULMUS VARIETIES |
| CERCIS CANADENSIS | LIQUIDAMBAR VARIETIES | ULMUS PARVIFOLIA VARIETIES |
| CORNUS VARIETIES | LIRODENDRON VARIETIES | ULMUS VARIETIES |
| CRATAEGUS VARIETIES | MULB IN LEAF | ZELEKOVA VARIETIES |
| | NYSSA SYLVESTICA | |
17. IF A PROPOSED PLANT IS UNSTAINABLE OR ON THE ORIGINAL PLANNING HAZARD LIST, AN EQUIVALENT SPECIES OF THE SAME SIZE MAY BE REQUESTED FOR SUBSTITUTION OF THE ORIGINAL PLANT. ALL SUBSTITUTIONS SHALL BE APPROVED BY THE PROJECT LANDSCAPE DESIGNER OR MUNICIPAL OFFICIAL PRIOR TO ORDERING AND INSTALLATION.
18. DURING THE COURSE OF CONSTRUCTION, PLANTINGS SHALL BE PROTECTED. ALL PLANT MATERIALS SHALL BE CONTINUOUSLY AND PROMPTLY RECOVERED AT THE END OF EACH WORK DAY. ALL DEBRIS, MATERIALS, AND TOOLS SHALL BE PROPERLY STORED, STOCKPILED OR DISPOSED OF AND ALL PAVED AREAS SHALL BE CLEANED.
19. THE LANDSCAPE CONTRACTOR SHALL DISPOSE OF ALL RUBBISH AND EXCESS SOIL AT HIS/HER OWN AN OFF-SITE LOCATION AS APPROVED BY THE LOCAL MUNICIPALITY.
20. THE PROJECT MAINTENANCE SHALL BE IMMEDIATELY AFTER ALL PLANTS HAVE BEEN SATISFACTORILY INSTALLED.
21. MAINTENANCE SHALL INCLUDE, BUT NOT BE LIMITED TO, REPLACING MULCH THAT HAS BEEN DISPLACED BY BROSION OR OTHER MEANS, REPAIRING AND RESHAPING WATER RINGS OR SAUCERS, MAINTAINING STAKES AND GUY'S IF ORIGINALLY REQUIRED, WATERING WHEN NEEDED OR DIRECTED, WEEDING, PRUNING, SPRAYING, FERTILIZING, MOVING THE LAWN, AND PERFORMING ANY OTHER WORK REQUIRED TO KEEP THE PLANTS IN A HEALTHY CONDITION.
22. MOWING AND REPAIR MAINTENANCE SHALL BE ESTABLISHED. IF MOWING IS NOT AVAILABLE AT THE PROJECT LOCATION, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEP THE EXCEEDING THREE INCHES (3") MOWING. MOWING SHALL BE PERFORMED ONLY WHEN GRASS IS DRY. MOWER BLADE SHALL BE SET TO REMOVE NO MORE THAN ONE THIRD (1/3) OF THE GRASS LENGTH, WHEN THE AMOUNT OF GRASS IS HEAVY, IT SHALL BE REMOVED TO PREVENT DESTRUCTION OF THE UNDERLYING TURF. MOW GRASS AREAS IN SUCH A MANNER AS TO PREVENT CLIPPINGS FROM BLOWING ON PAVED AREAS/SLABS AND CLEAR THEM FROM MOWING DEBRIS.
23. GRASSSED AREAS DAMAGED DURING THE PROCESS OF THE WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, WHO SHALL RESTORE THE DISTURBED AREAS TO A CONDITION SATISFACTORY TO THE PROJECT LANDSCAPE DESIGNER, MUNICIPAL OFFICIAL OR OWNER/OWNER'S REPRESENTATIVE. THIS MAY INCLUDE FILLING TO GRADE, FERTILIZING, SEEDING, AND MULCHING.
24. SHOULD THE OWNER REQUIRE MAINTENANCE BEYOND THE STANDARD 90-DAY MAINTENANCE PERIOD, A SEPARATE CONTRACT SHALL BE ESTABLISHED.
25. LANDSCAPE CONTRACTOR SHALL WATER NEW PLANTINGS FROM TIME OF INSTALL AND THROUGHOUT REQUIRED 90-DAY MAINTENANCE PERIOD. WATERING SHALL BE ESTABLISHED. IF ON-SITE WATER IS NOT AVAILABLE AT THE PROJECT LOCATION, THE LANDSCAPE CONTRACTOR SHALL FURNISH IT BY MEANS OR A WATERING TRUCK OR OTHER ACCEPTABLE MEANS.
26. THE QUANTITY OF WATER APPLIED AT ONE TIME SHALL BE SUFFICIENT TO PENETRATE THE SOIL TO A MINIMUM OF EIGHT INCHES (8") IN SHRUB BEDS AND SIX INCHES (6") IN TURF AREAS AT A RATE WHICH WILL PREVENT SATURATION OF THE SOIL.
27. IF AN AUTOMATIC IRRIGATION SYSTEM HAS BEEN INSTALLED, IT CAN BE USED FOR WATERING PLANT MATERIAL. HOWEVER, FUTURE MAINTENANCE SYSTEM DOES NOT ELIMINATE THE LANDSCAPE CONTRACTOR'S RESPONSIBILITY OF PLANT HEALTH AND ESTABLISHMENT.

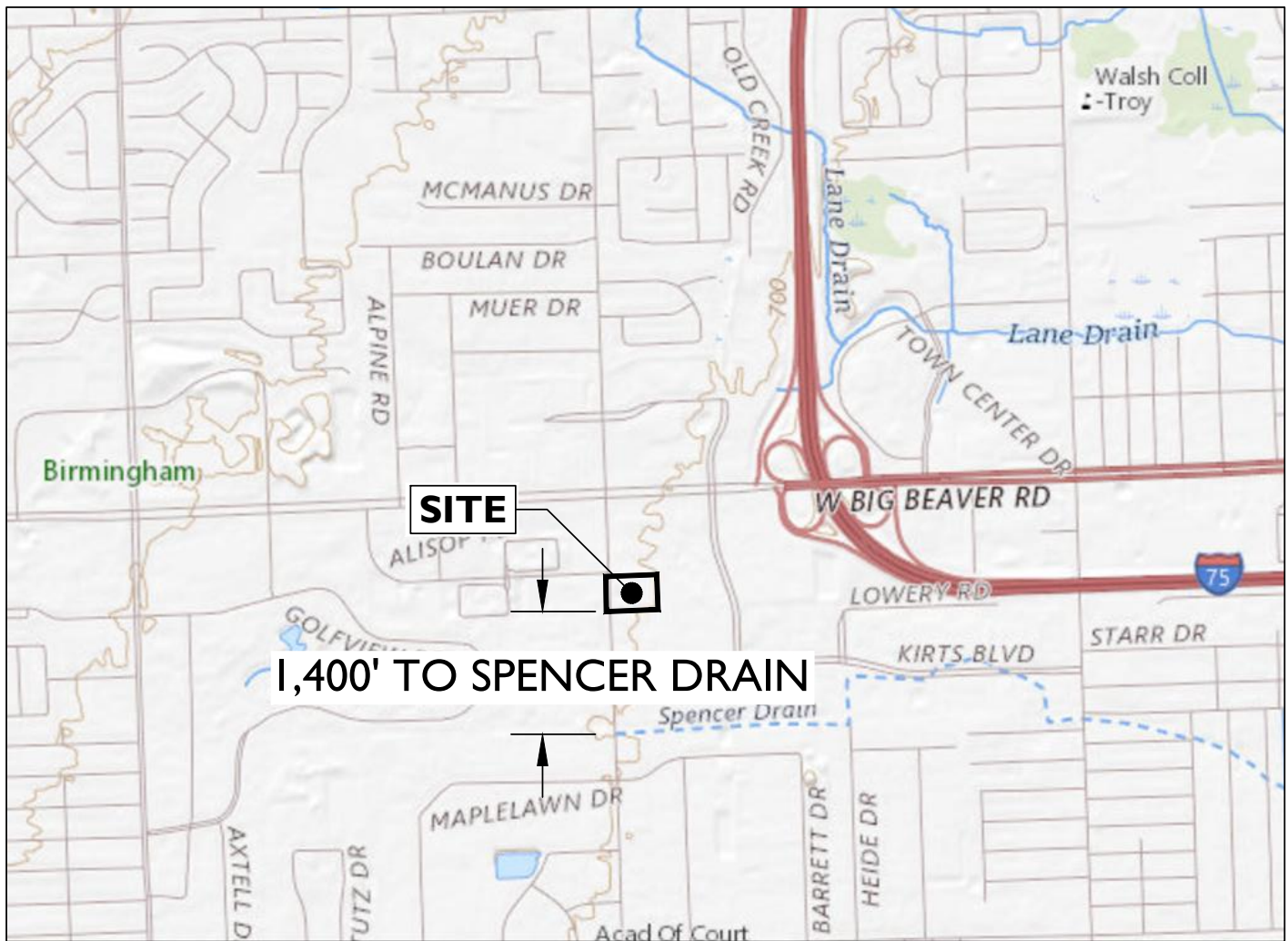
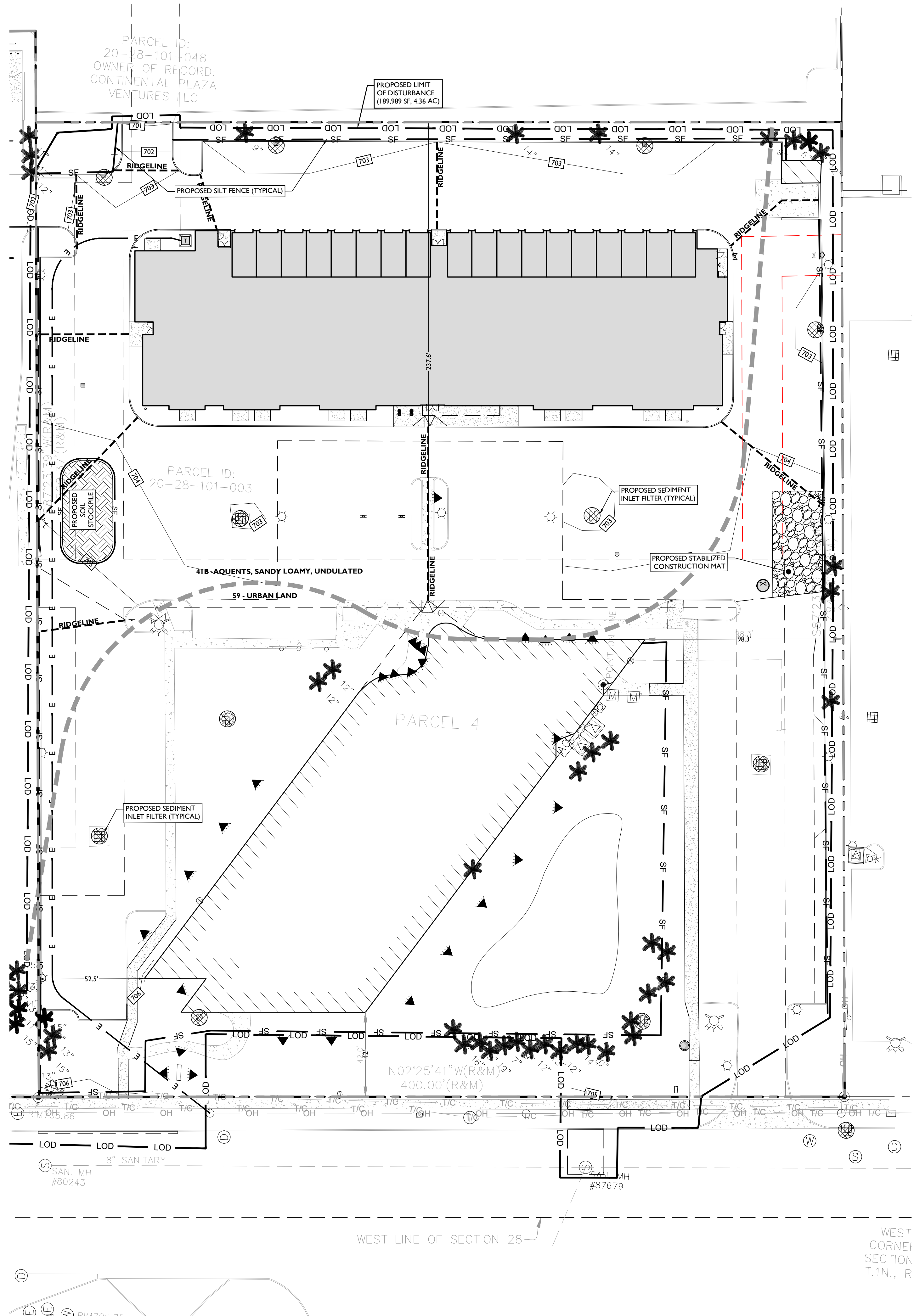
1. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIAL, FOR A PERIOD OF ONE YEAR (1 YR) FROM APPROVAL OF LANDSCAPE INSTALLATION BY THE PROJECT LANDSCAPE DESIGNER, MUNICIPAL OFFICIAL, OR OWNER/OWNER'S REPRESENTATIVE.
2. THE LANDSCAPE CONTRACTOR SHALL REMOVE AND REPLACE DYING, DEAD, OR DEFECTIVE PLANT MATERIAL AT HIS EXPENSE.
3. THE LANDSCAPE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS COMPANY'S OPERATIONS.
4. REPLACEMENT PLANTS SHALL BE OF THE SAME SPECIES AND SIZE AS SPECIFIED ON THE APPROVED OR FINAL PLANT LIST.
5. REPLACEMENTS RESULTING FROM REMOVAL, LOSS, OR DAMAGE DUE TO OCCUPANCY OF THE PROJECT IN ANY PART OF THE PROJECT SHALL BE THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR. LOSSES DUE TO CURTAINMENT OF WATER BY LOCAL AUTHORITIES SHALL BE APPROVED AND PAID FOR BY THE OWNER.
6. THE CONTRACTOR SHALL INSTRUCT THE OWNER AS TO THE PROPER CARE AND MAINTENANCE OF ALL PLANTINGS.

1. SEED MIXTURE SHALL BE FRESH LIME, NEW CROP SEED. SOD SHALL BE STRONGLY ROOTED, UNIFORM IN THICKNESS, AND FREE OF WEEDS, DISEASE, AND PESTS.
2. SEED OR SOD SHALL BE PURCHASED FROM A RECOGNIZED DISTRIBUTOR AND SHALL BE COMPOSED OF THE MIX OR BLEND WITHIN THE PROVIDED "SEED SPECIFICATION" OR "SOD SPECIFICATION."
3. REFERENCE LANDSCAPE PLAN FOR AREAS TO BE SEED OR LAID WITH SOD.
4. SEEDING SHALL NOT BE CARRIED OUT UNTIL AFTER THE SEEDING PERIOD HAS BEEN ESTABLISHED BY THE LANDSCAPE CONTRACTOR AT THE PROJECT COMPLETION PROHIBITS PERMANENT STABILIZATION. TEMPORARY STABILIZATION SHALL BE PROVIDED IN ACCORDANCE WITH THE "TEMPORARY SEEDING SPECIFICATION."
5. PROTECT NEW LAWN AREAS AGAINST TRESPASSING WHILE THE SEED IS GERMINATING. FURNISH AND INSTALL FENCES, SIGNS, BARRIERS OR ANY OTHER NECESSARY TEMPORARY PROTECTIVE DEVICES. DAMAGE RESULTING FROM TRESPASS, EROSION, WASHOUT OR OTHER CAUSES IN VIOLET OF THE LANDSCAPE CONTRACTOR AT HIS EXPENSE. REMOVE AND REPAIR ALL FENCES, SIGNS, BARRIERS OR OTHER TEMPORARY PROTECTIVE DEVICES ONCE LAWN HAS BEEN ESTABLISHED.

1. THOROUGHLY SOAK THE GRASS/COVER ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
2. SOIL AMENDMENTS:
 - MODIFY HEAVY CLAY OR SILT SOILS (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) OR GYPSUM
 - MODIFY EXTREMELY SANDY SOILS (MORE THAN 85% SAND) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX
3. ALL GROUND COVER AREAS SHALL BE TREATED WITH A PRE-EMERGENT PER MANUFACTURER'S SPECIFICATIONS



V:\P\2028-101-003.dwg (P) 2690 CROOKS ROAD & COLORADO ROAD, TROY, MI CAD PROJECTS - 11-25-2023



SOURCE: USGS MAPS

LOCATION MAP

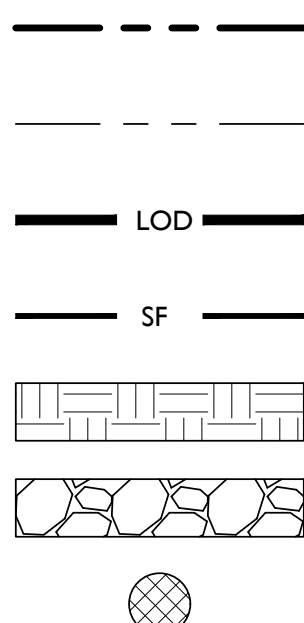
SCALE: 1" = 2,000'±

PROPERTY DESCRIPTION

THE LAND SITUATED IN THE TROY, COUNTY OF OAKLAND, STATE OF MICHIGAN, IS DESCRIBED AS FOLLOWS:

PARCEL 4:
THE EAST 484 FEET OF THE WEST 544 FEET OF THE SOUTH 400 FEET OF THE NORTH 1/2 OF THE NORTHWEST 1/4 CORNER OF SECTION 28, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN.

SYMBOL



DESCRIPTION

PROPERTY BOUNDARY
ADJACENT PROPERTY BOUNDARY
PROPOSED LIMIT OF DISTURBANCE
PROPOSED SILT FENCE
PROPOSED STOCKPILE & EQUIPMENT STORAGE
PROPOSED STABILIZED CONSTRUCTION ENTRANCE
PROPOSED INLET PROTECTION FILTER

SOIL EROSION AND SEDIMENT CONTROL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR SOIL EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
2. THE CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL IN COMPLIANCE WITH LOCAL, STATE, AND FEDERAL AIR QUALITY STANDARDS.
3. THE CONTRACTOR IS RESPONSIBLE TO INSPECT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES WEEKLY AND AFTER A PRECIPITATION EVENT GREATER THAN 1 INCH. THE CONTRACTOR SHALL MAINTAIN AN INSPECTION LOG ON SITE AND DOCUMENT CORRECTIVE ACTION TAKEN THROUGHOUT THE COURSE OF CONSTRUCTION AS REQUIRED.

ENVIRONMENTAL NOTES:

1. THERE ARE NO RIPARIAN ZONES ON SITE
2. NO PORTION OF THIS SITE LIES WITHIN A FLOOD HAZARD AREA
3. THERE ARE NO WETLANDS ON SITE
4. ALL ELEVATIONS SHOWN ARE BASED ON NAVD 1988 DATUM

SITE BENCHMARK #3
ARROW ON HYDRANT, ±40' SW OF SW CORNER OF POND.
ELEVATION = 707.24' (NAVD 88 DATUM)

SITE BENCHMARK #4
ARROW ON HYDRANT, NEAR NE CORNER OF BUILDING.
ELEVATION = 708.34' (NAVD 88 DATUM)

SEQUENCE OF CONSTRUCTION

1. INSTALL SILT FENCE AND CONSTRUCTION ENTRANCE (2 DAYS).
2. SITE DEMOLITION (20 DAYS).
3. ROUGH GRADING AND TEMPORARY SEEDING (20 DAYS).
4. EXCAVATE AND INSTALL DRAINAGE PIPING AND INLETS (10 DAYS).
5. INSTALL INLET FILTERS (1 DAY).
6. BUILDING CONSTRUCTION AND SITE IMPROVEMENTS (100 DAYS).
7. LANDSCAPING IMPROVEMENTS AND FINAL SEEDING (10 DAYS).
8. REMOVE SOIL EROSION MEASURES (1 DAY).

NOTE: TIME DURATIONS ARE APPROXIMATE AND ARE INTENDED TO ACT AS A GENERAL GUIDE TO THE CONSTRUCTION TIMELINE. ALL DURATIONS ARE SUBJECT TO CHANGE BY CONTRACTOR. CONTRACTOR SHALL SUBMIT CONSTRUCTION SCHEDULE TO TOWNSHIP AND ENGINEER. CONTRACTOR SHALL PHASE CONSTRUCTION ACCORDINGLY.

SOIL CHARACTERISTICS CHART

TYPE OF SOIL	59 - URBAN LAND
PERCENT OF SITE COVERAGE	47.3%
HYDROLOGIC SOIL GROUP	D
DEPTH TO RESTRICTIVE LAYER	> 80 INCHES
SOIL PERMEABILITY	0.00 TO 0.00 IN / HR
DEPTH TO WATER TABLE	> 80 INCHES

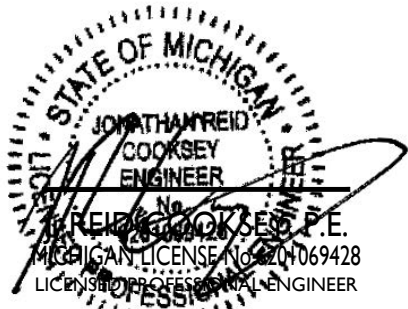
SOIL CHARACTERISTICS CHART

TYPE OF SOIL	41B - AQUENTS, SANDY LOAMY, UNDULATED
PERCENT OF SITE COVERAGE	52.6%
HYDROLOGIC SOIL GROUP	A/D
DEPTH TO RESTRICTIVE LAYER	> 80 INCHES
SOIL PERMEABILITY	5.95 TO 19.98 IN
DEPTH TO WATER TABLE	ABOUT 0 INCHES

SITE DEVELOPMENT PLANS

2690 CROOKS ROAD EXISTING BUILDING RENOVATION & PROPOSED MULTI-FAMILY APARTMENTS

20-28-101-003
2690 CROOKS ROAD
CITY OF TROY
OAKLAND COUNTY, MICHIGAN



SCALE: 1" = 30' PROJECT ID: M-19301.01

TITLE:

SOIL EROSION &
SEDIMENT CONTROL
PLAN

DRAWING:

C-11

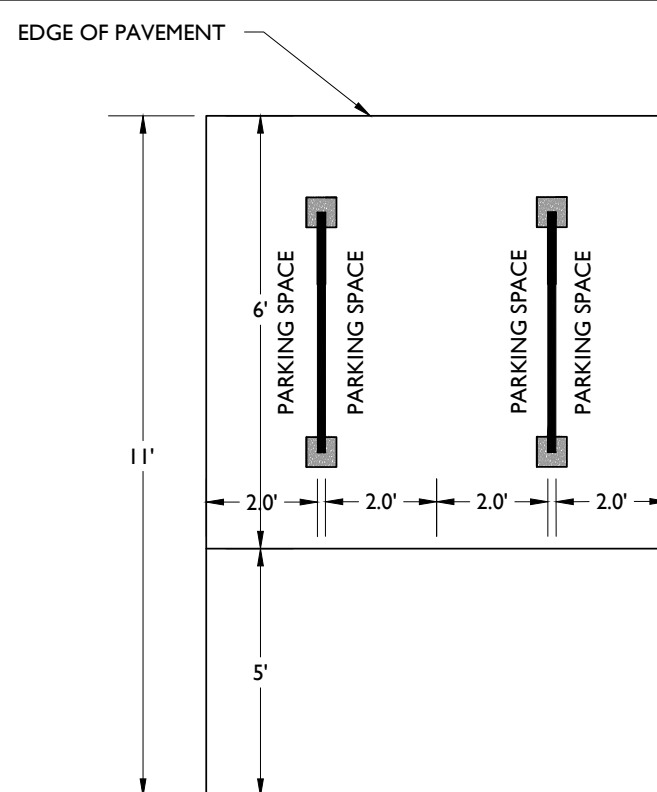
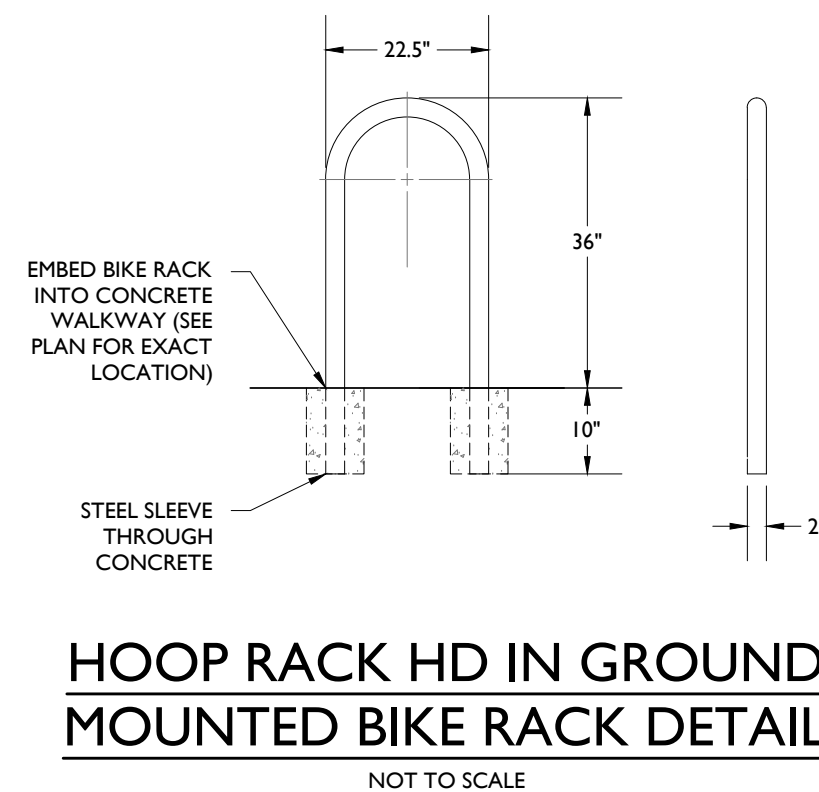
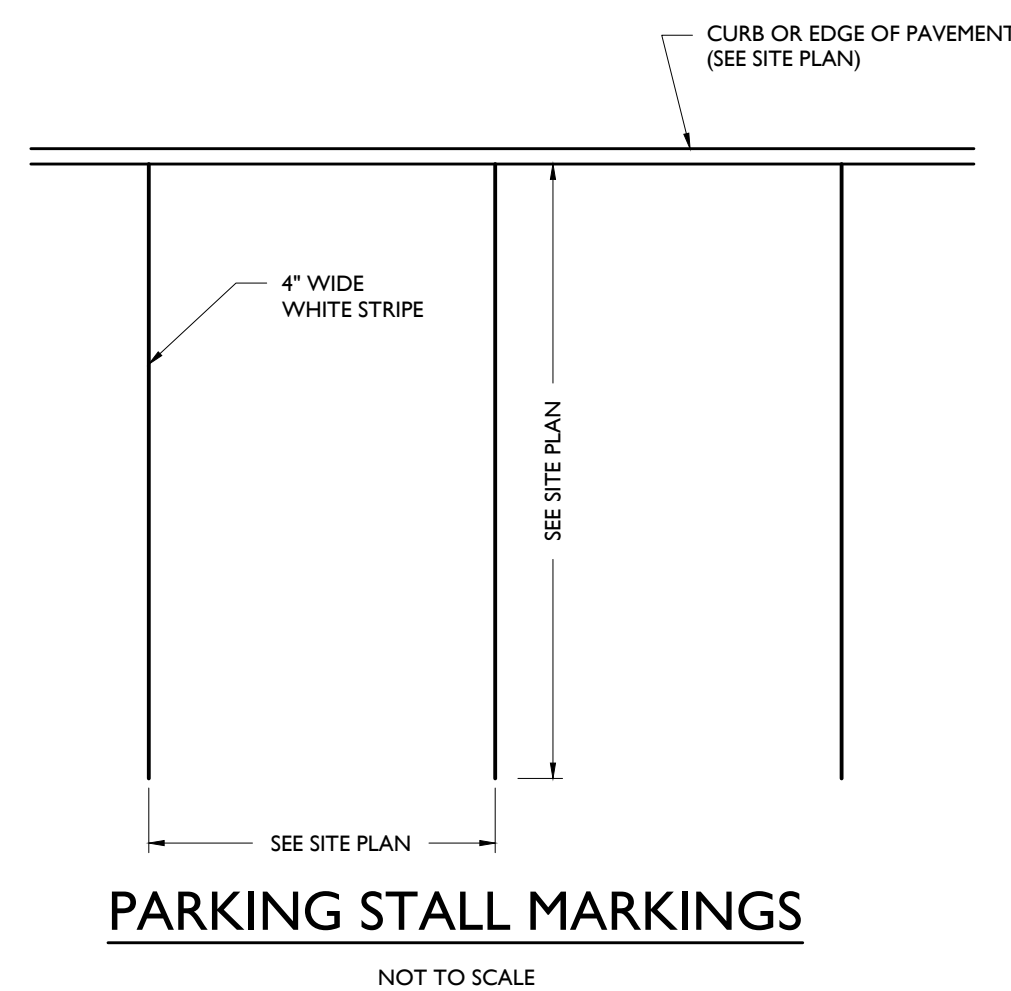
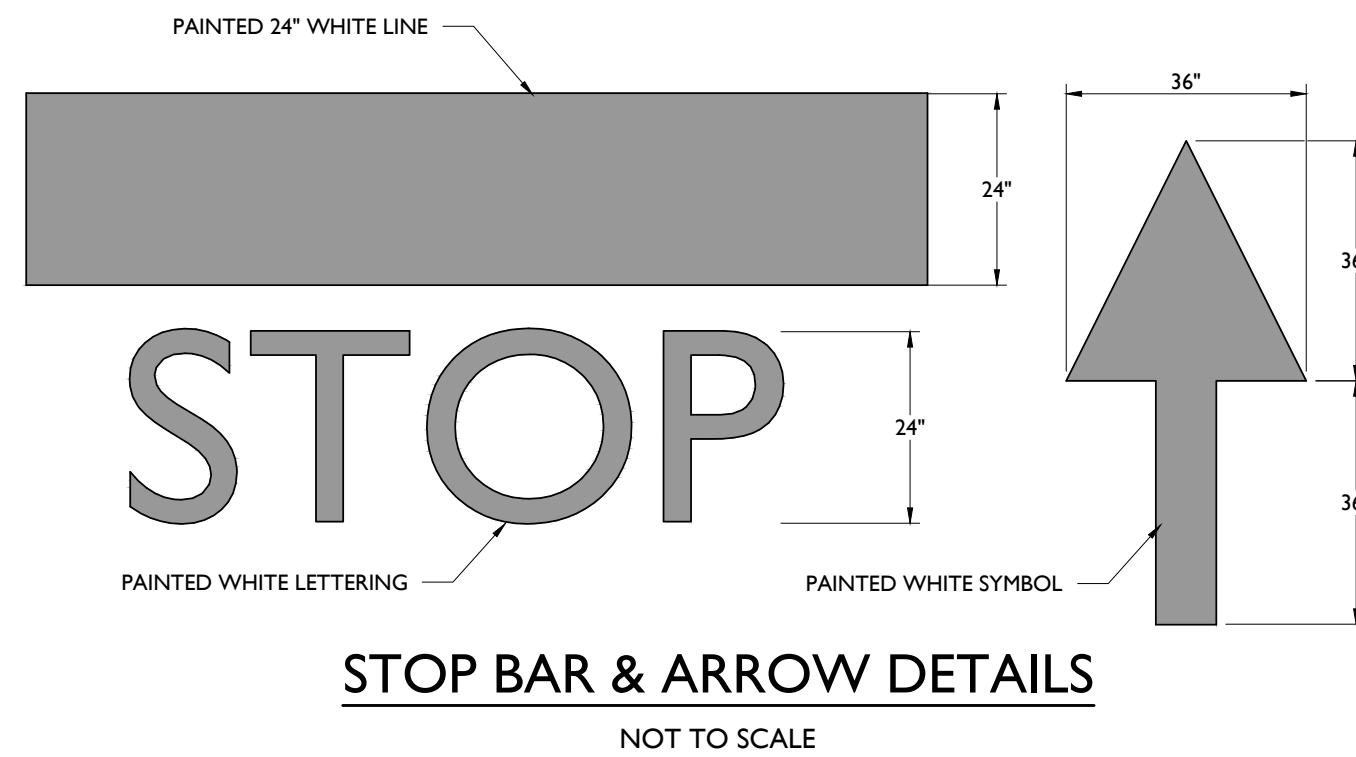
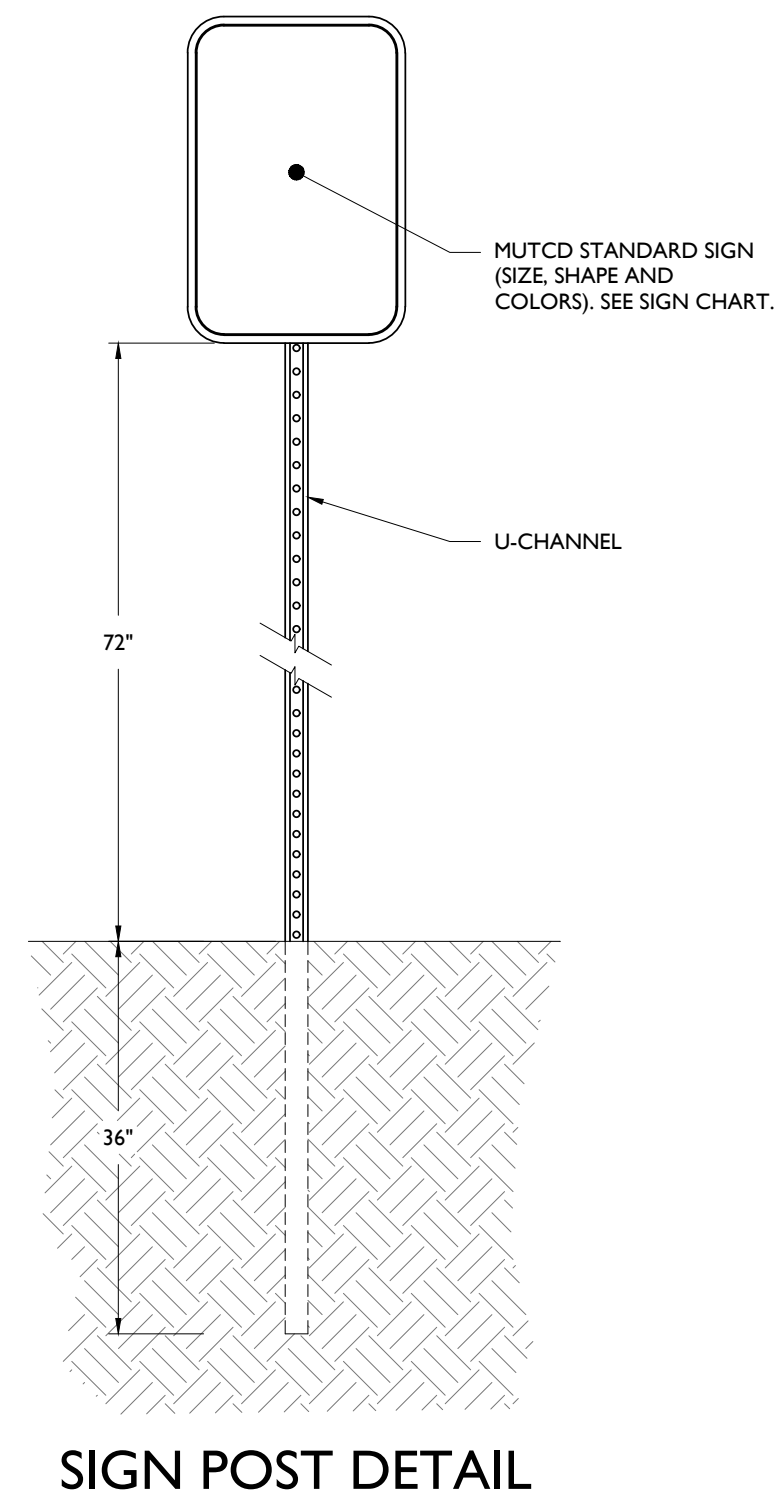
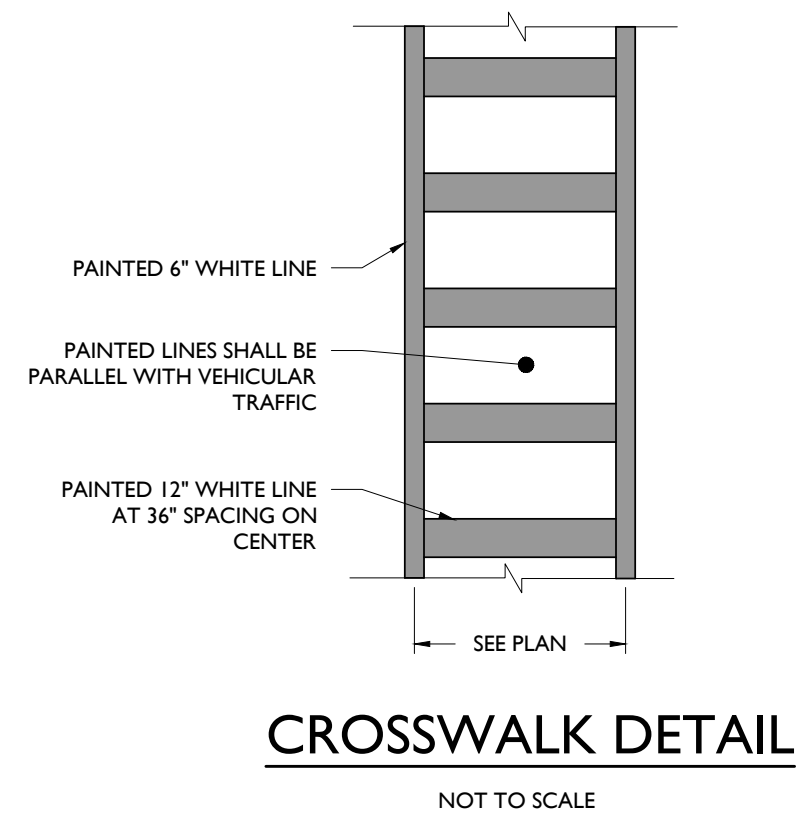
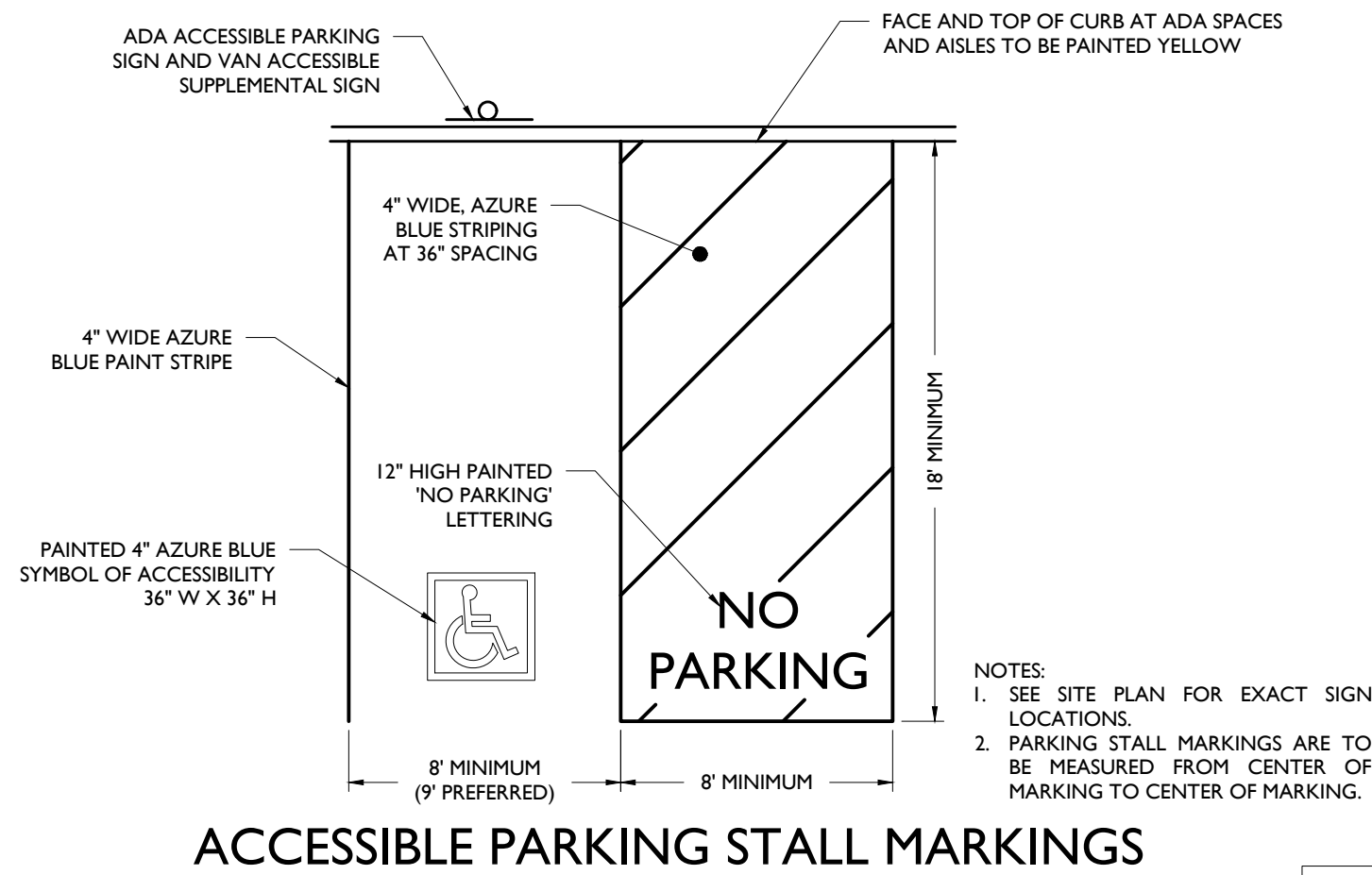
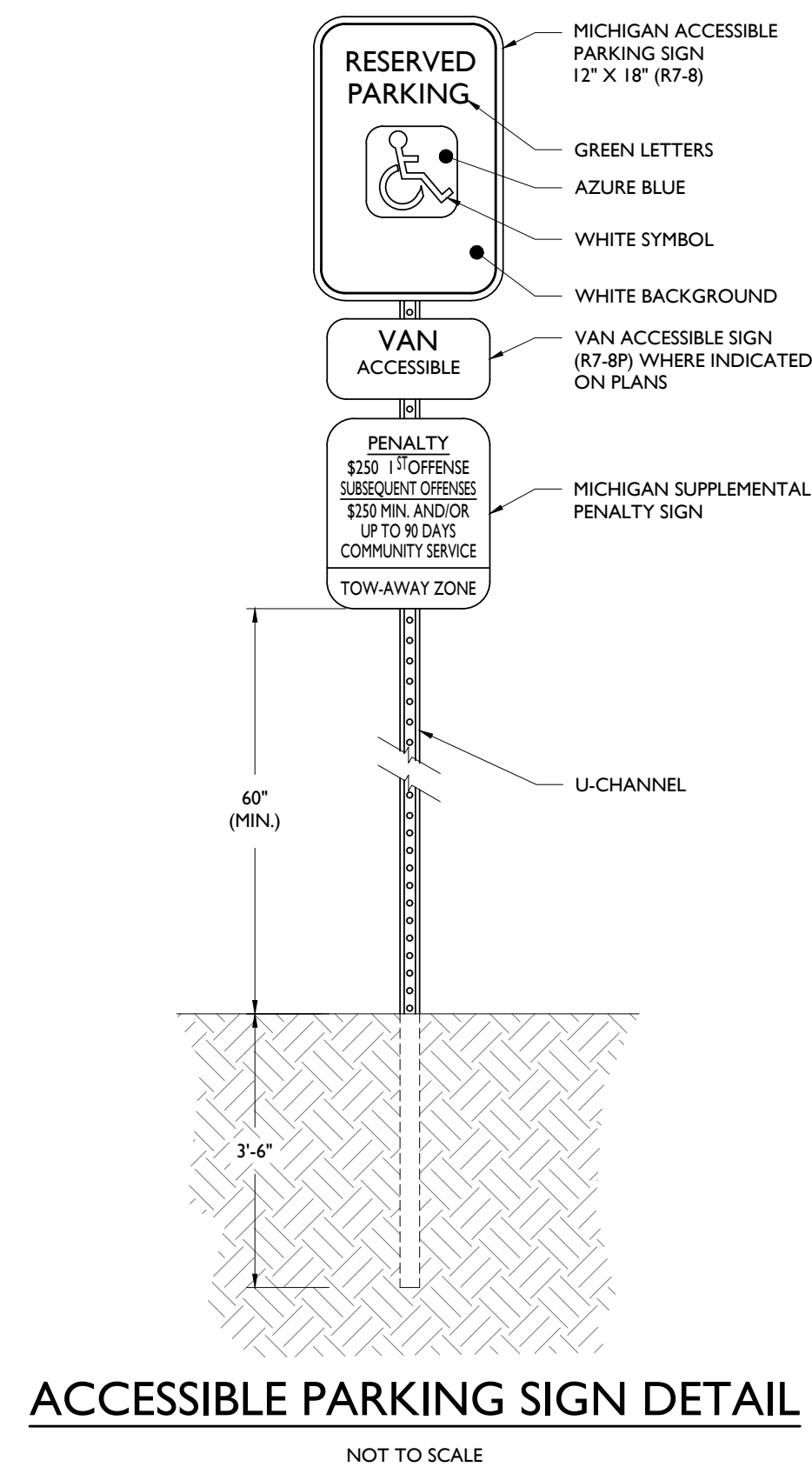
NOT APPROVED FOR CONSTRUCTION



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MICHIGAN

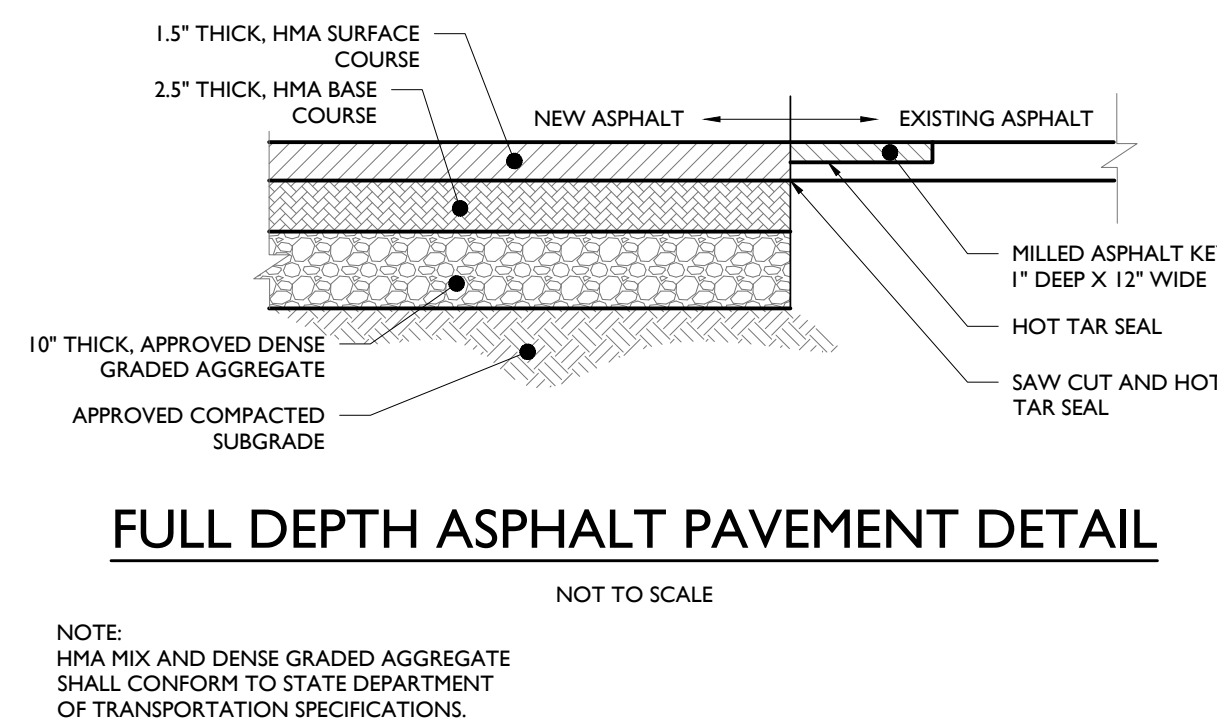
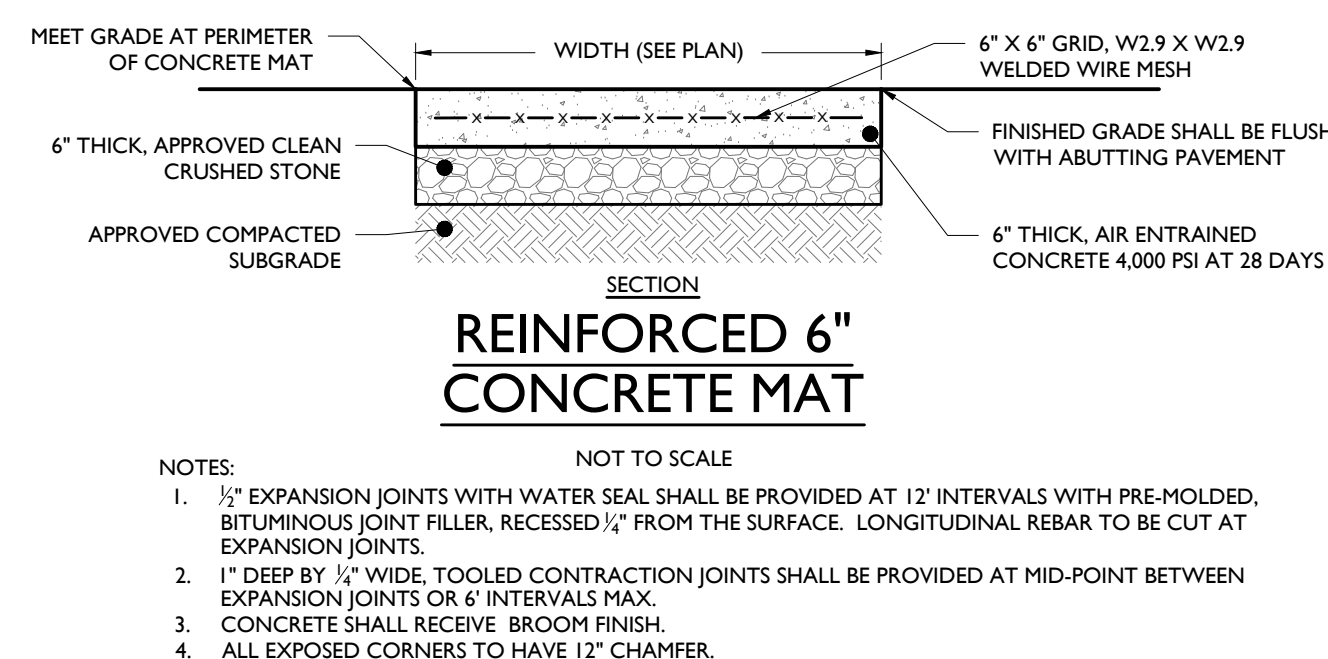
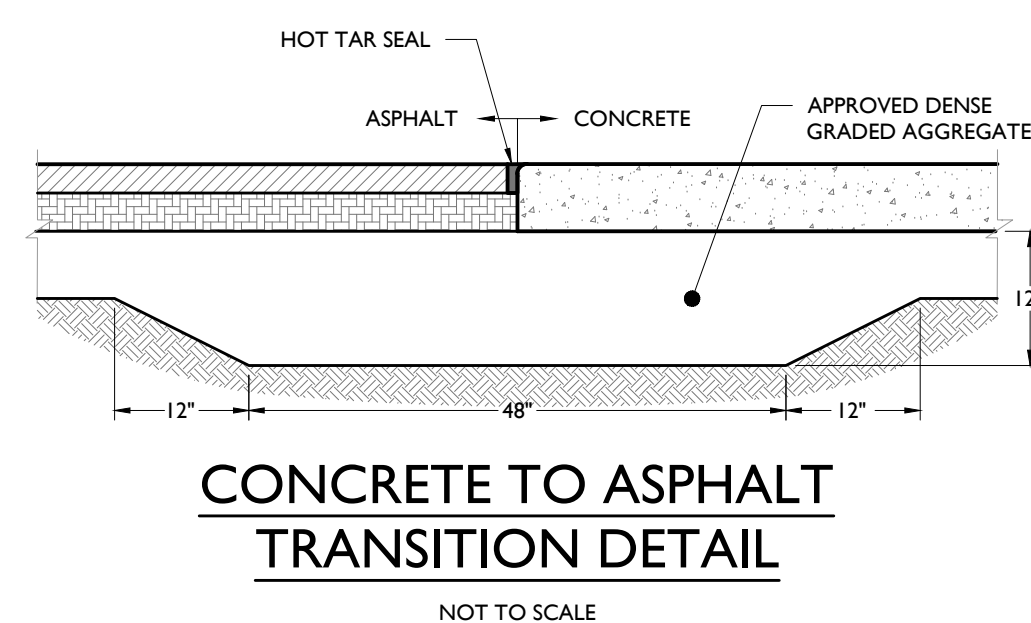
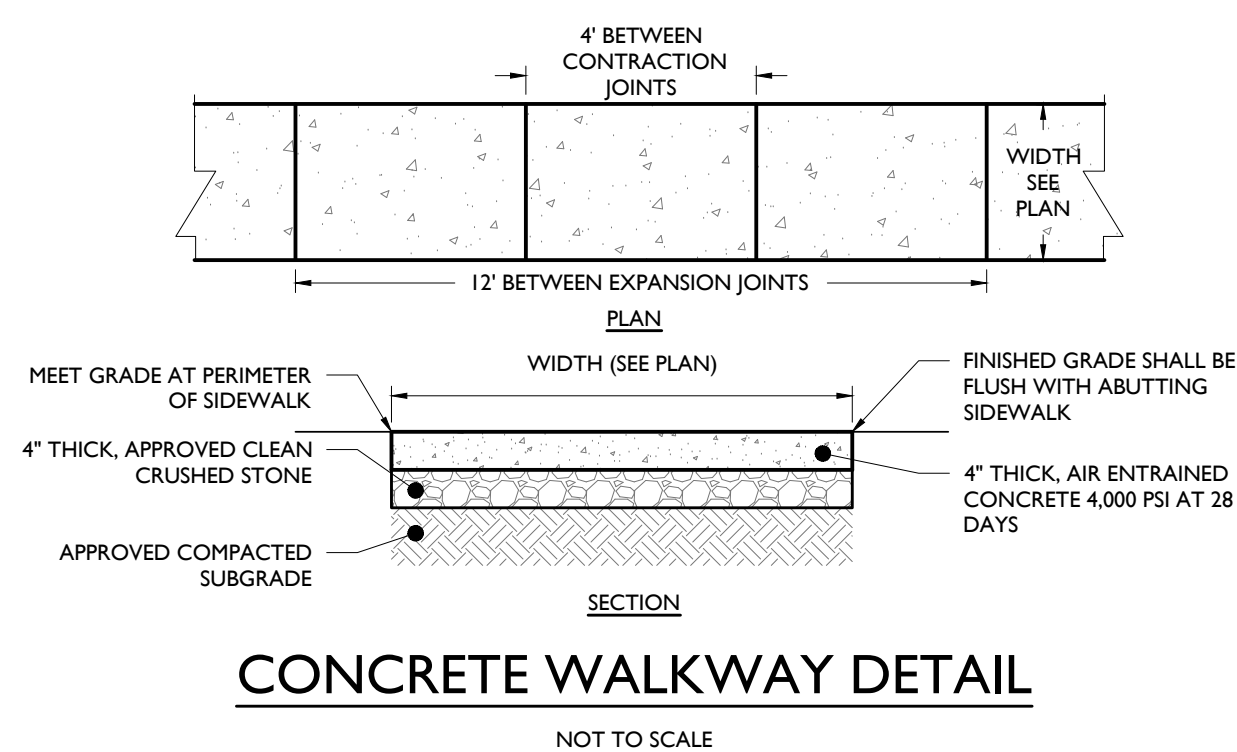


M.U.T.C.D. NUMBER	TEXT	COLOR		SIZE OF SIGN (WIDTH X HEIGHT)	TYPE OF MOUNT
		LEGEND	BACKGROUND		
STOP SIGN (RI-1)		WHITE	RED	36"x36"	GROUND
NO OUTLET - DEAD END (K2-0540)		TEXT: BLACK	YELLOW	24"x24"	GROUND


NOTE:

1. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), EXCEPT AS NOTED.
2. ALL SIGNS SHALL BE MOUNTED AS TO NOT OBSTRUCT THE SHAPE OF "STOP" (R1-1) AND "YIELD" (R1-2) SIGNS.

SIGN DATA TABLE

[illegible]

NOT APPROVED FOR CONSTRUCTION



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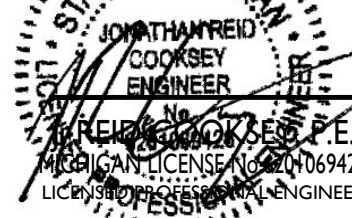

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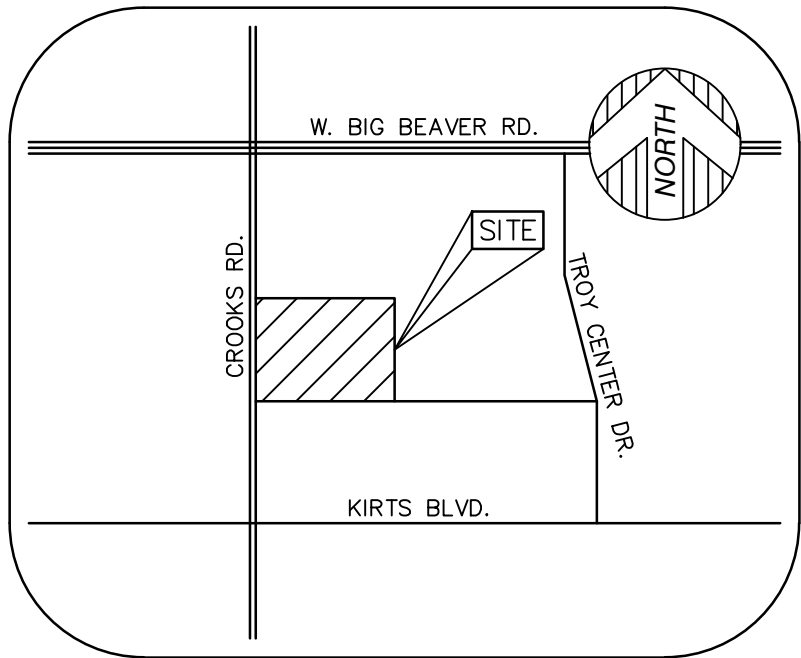
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SITE DEVELOPMENT PLANS

22690 CROOKS ROAD

EXISTING BUILDING RENOVATION & PROPOSED MULTI-FAMILY APARTMENTS

	
	STONEFIELD engineering & design
SCALE: AS SHOWN	PROJECT ID: M-1930.10
TITLE:	
CONSTRUCTION DETAILS	
DRAWING:	
C-12	



VICINITY MAP
(NOT TO SCALE)

LEGEND

	FOUND MONUMENT (AS NOTED)
	FOUND SECTION CORNER (AS NOTED)
	RECORD AND MEASURED DIMENSION
	RECORD DIMENSION
	MEASURED DIMENSION
	ELECTRIC MANHOLE
	ELECTRIC PANEL
	TRANSFORMER
	UTILITY POLE
	GAS METER
	GAS VALVE
	TELEPHONE MANHOLE
	ELECTRIC OUTLET
	CABLE TV RISER
	TRAFFIC SIGNAL
	CROSSWALK SIGNAL
	CLEANOUT
	SANITARY MANHOLE
	ROUND CATCH BASIN
	SQUARE CATCH BASIN
	DRAIN
	STORM DRAIN MANHOLE
	FIRE HYDRANT
	FIRE DEPARTMENT CONNECTION
	WATER GATE MANHOLE
	WATER VALVE
	AIR CONDITIONING UNIT
	BOLLARD
	FLAGPOLE
	FLOOD LIGHT
	LIGHTPOST/LAMP POST
	MAIL BOX
	SINGLE POST SIGN
	DOUBLE POST SIGN
	HANDICAP PARKING
	PARCEL BOUNDARY LINE
	ADJOINER PARCEL LINE
	SECTION LINE
	EASEMENT (AS NOTED)
	BUILDING
	BUILDING OVERHANG
	ASPHALT CURB
	CONCRETE CURB
	RAISED CONCRETE
	PARKING
	EDGE OF CONCRETE (CONC.)
	EDGE OF ASPHALT (ASPH.)
	EDGE OF GRAVEL
	FENCE (AS NOTED)
	WALL (AS NOTED)
	LANDSCAPING (AS NOTED)
	OVERHEAD UTILITY LINE
	UNDERGROUND PIPE (AS NOTED)
	BUILDING AREA
	ASPHALT
	CONCRETE

PARKING

HANDICAP PARKING = 8 STALLS
STANDARD PARKING = 328 STALLS

PARCEL AREA

PARCEL 4:
193,599± SQUARE FEET = 4.444± ACRES

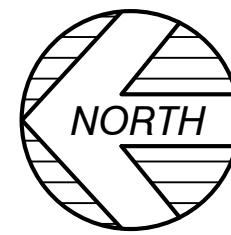
SURVEYOR'S NOTE

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES OTHER THAN THE STRUCTURE INVENTORY SHOWN HEREON.

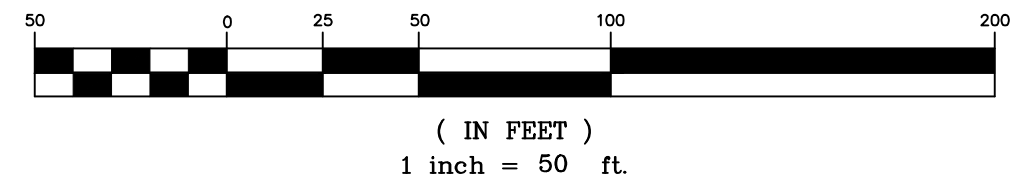
BENCHMARK

SITE BENCHMARK #3
ARROW ON HYDRANT, ±40' SW OF SW CORNER OF POND.
ELEVATION = 707.24' (NAVD 88 DATUM)

SITE BENCHMARK #4
ARROW ON HYDRANT, NEAR NE CORNER OF BUILDING.
ELEVATION = 708.34' (NAVD 88 DATUM)



GRAPHIC SCALE



PROPERTY DESCRIPTION

THE LAND SITUATED IN THE TROY, COUNTY OF OAKLAND, STATE OF MICHIGAN, IS DESCRIBED AS FOLLOWS:

PARCEL 4:
THE EAST 484 FEET OF THE WEST 544 FEET OF THE SOUTH 400 FEET OF THE NORTH 1/2 OF THE NORTHWEST 1/4 CORNER OF SECTION 28, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN.

TITLE REPORT NOTE

ONLY THOSE EXCEPTIONS CONTAINED WITHIN THE STEWART TITLE GUARANTY COMPANY FILE NO. 63-19650824-SCM, REVISION 4, DATED SEPTEMBER 03, 2019, AND RELISTED BELOW WERE CONSIDERED FOR THIS SURVEY. NO OTHER RECORDS RESEARCH WAS PERFORMED BY THE CERTIFYING SURVEYOR.

27. TERMS AND PROVISIONS CONTAINED WITHIN, AND EASEMENTS CREATED BY CROSS-ACCESS OR JOINT-DRIVE EASEMENT RECORDED IN LIBER 9386, PAGE 804, OAKLAND COUNTY RECORDS (AFFECTS PARCELS 4). (AS SHOWN)

28. TERMS AND PROVISIONS CONTAINED WITHIN, AND EASEMENTS CREATED BY CROSS-ACCESS OR JOINT-DRIVE EASEMENT RECORDED IN LIBER 9630, PAGE 559, OAKLAND COUNTY RECORDS (AFFECTS PARCELS 4). (AS SHOWN)

MANHOLE SCHEDULE

#	TYPE	RIM (FT)	SIZE (IN)	DIRECTION	DIP	INVERT (FT)
11297	STORM MANHOLE	705.38	12	N	4.2	701.18
11355	CATCH BASIN	704.21	6	NE	3.7	700.51
			6	SW	3.95	700.26
			6	SE	3.8	700.41
11403	BEEHIVE CATCH BASIN	704.55	6	S	3.85	700.70
			6	W	3.9	700.65
			6	NW	4.05	700.50
11461	CATCH BASIN	702.66	6	N	2.75	699.91
			6	SE	2.85	699.81
			6	NW	3	699.66
			6	S	3.2	699.46
11462	CATCH BASIN	702.51	6	NE	3.2	699.31
			6	S	3.15	699.36
			6	SW	3.25	699.26
			6	NW	3.05	699.46
11463	CATCH BASIN	702.57	6	N	3.25	699.32
			6	E	3.15	699.42
			6	S	3.05	699.52
			6	W	3.15	699.32
11464	CATCH BASIN	702.64	6	E	4.4	698.24
			6	SW	3.85	698.80
			6	NW	3.75	698.89
11824	BEEHIVE CATCH BASIN	703.48	6	E	6	697.48
			T/PIPE		4.2	699.28
			T/WATER		4.25	699.23
			B/STRUCTURE		7.4	696.08
11851	CATCH BASIN	702.9	6	NE	4.25	698.65
			6	N	4.15	698.75
			12	NW	5.8	697.10
			6	SE	4.3	698.60
85015	STORM MANHOLE	703.39	12	NW	5	698.39
			15	S	6.5	696.89
85016	CATCH BASIN	703.37	12	SW	4.45	698.92
85025	STORM MANHOLE	703.59	12	S	4	699.59
			12	W	5.2	698.39
			12	E	4.85	698.74
			6	NE	4.6	698.99
87679	SANITARY MANHOLE	705.04	8	N	11.45	693.59
			8	S	11.5	693.54
			8	NW	11	694.04

SURVEYOR'S CERTIFICATION

TO A.F. JONNA; CIBC BANK USA, AN ILLINOIS CHARTERED BANK, ITS SUCCESSORS AND/OR ASSIGNS; STEWART TITLE GUARANTY COMPANY; AND ATA NATIONAL TITLE GROUP, LLC:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDED ITEMS 2, 4, 7A, 8, AND 9 OF TABLE A, THEREOF. THE FIELD WORK WAS COMPLETED ON DECEMBER 05, 2019.

DATE OF PLAT OR MAP: DECEMBER 10, 2019

DRAFT

ANTHONY T. SYCKO, JR., P.S.
PROFESSIONAL SURVEYOR
MICHIGAN LICENSE NO. 47976
22556 GRATIOT AVE., EASTPOINTE, MI 48021
TSycko@kemtec-survey.com

ALTA / NSPS LAND TITLE SURVEY
PREPARED FOR: A.F. JONNA
991 & 999 W. BIG BEAVER RD. & 2690 CROOKS RD.,
TROY, MICHIGAN,
PART OF SECTION 28,
TOWN 2 NORTH, RANGE 11 EAST

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DRAWN BY:	JDM	12/12/19
CHECKED BY:	ATS	12/12/19
DATE	DECEMBER 12, 2019	
PROJECT NO:	19-03620	SCALE: 1" = 50'

STONEFIELD

November 16, 2022

R. Brent Savidant, AICP
Community Development Director
City of Troy
500 W. Big Beaver Road
Troy, MI 48084

**RE: Preliminary Site Plan & Special Use Review
Proposed Multi-Family Apartments
Parcel ID: 20-28-101-003
2690 Crooks Road
City of Troy, Oakland County, Michigan**

Brent:

Our office is submitting documents on behalf of the Applicant to address the outstanding conditions contained within Carlisle Wortman's review letter, dated November 7, 2022. Please find the following items enclosed:

ITEM DESCRIPTION	DATED	COPIES	PREPARED BY
Site Development Plans	11-16-2022	2	Stonefield Engineering & Design
Architectural Plans Building A	10-11-2022	2	Biddison Architecture
Architectural Plans Building B	10-11-2022	2	Biddison Architecture
Response to Traffic Comments	11-16-2022	1	Stonefield Engineering & Design
Architectural Design Narrative		2	Biddison Architecture
Parking Study	11-16-2022	2	Fleis & Vandenbrink

The following is an itemized response to the comments contained within the Preliminary Site Plan and Special Use Review Letter dated November 7, 2022. For the sake of brevity, any comments that are statements of fact or have been previously addressed are not included in the response below:

1. Increase drive-aisle width to at least 26-feet

The drive-aisle widths have been widened to accommodate fire access on Sheet C-3 of the Site Development Plans.

2. Review and revise circulation based on OHMs comments.

Noted.

STONEFIELDENG.COM

607 SHELBY STREET, SUITE 200, DETROIT, MI 48226 248.247.1115 T. 201.340.4472 F.

3. Confirm existing screening of trash enclosure.

The existing trash enclosure screening shall remain as-is. The plans have noted a new gate will be added on Sheet C-3 of the Site Development Plans.

4. Confirm building lighting.

There are no proposed building mounted light fixtures.

5. Provide a 3-D model of the buildings and site context.

The 3D model will be submitted under separate cover.

6. Description of architectural intent and how materials and architecture relate to other buildings in area.

The design narrative has been included in this submission.

7. Transparency calculations.

The new building does not abut the public roadway and is residential in nature, transparency requirements should not be applicable to this building.

8. Verify unit numbers.

The number of units has been confirmed to be 156 units on Sheet C-3 of the Site Development Plans.

9. Provide a shared parking agreement to the satisfaction of the City Attorney.

The properties are owned by the same parent entity, no shared parking agreement should be necessary.

Should you have any questions regarding the submission items or responses above please do not hesitate to contact our office.

Best regards,



Eric Williams, PE
ewilliams@stonefieldeng.com
Stonefield Engineering and Design, LLC



Kevin Heffernan, PE
kheffernan@stonefieldeng.com
Stonefield Engineering and Design, LLC

Design Impact:

- a. *Foster a lasting impact on the community through the provision of high-quality design, construction, and detailing.*

Response #1. *We feel the development will have a lasting positive impact on the Troy community, by taking an vacant 4 story office building and vast parking lot into a vibrant residential community. The overall, scale, high quality of design, materials, construction, will bring a balanced composition to the development, which will enhance and compliment the overall surrounding area both in its compatible uses, aesthetics and connection to the community at large.*

- 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.*

Response #2. *The design, materials and detailing will be complimentary throughout the development with colors and detail materials added to the existing office building again used on the new structure to create a campus environment. Metal canopies, vertical and horizontal metal details designate the building entries and accent the design aesthetic. The second building will use brick and masonry materials along with metal accents and balcony elements common to both buildings.*

- c. *Develop buildings with creativity that includes balanced compositions and forms.*

Response #3. *The design of the two buildings while different will blend together through the use of common materials and design features.*

- 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.*

Response #4. *The design of the existing office building roof is flat and the second building will be flat as well at a slightly higher level with the 5th floor. This will be consistent with the surrounding sites and the proposed Kelly development to the north.*

- 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.*

Response #5. *The design of the existing office building two story entry will remain The building entry for the second building will incorporate a long horizontal metal canopy attached to a larger vertical building element, both appropriate to the context, activity and scale of each building.*

- f. *Include community amenities that add value to the development such as patio/seating areas, water features, artwork or sculpture, clock towers, pedestrian plazas with park benches or other features located in areas accessible to the public.*

Response #6. *Both buildings will have outdoor patio seating and possibilities for artwork, sculpture and benches. The existing office building has extensive green space surrounding it providing the potential for many outdoor activities for the new residential occupants.*

NOTE:
ALL APPLIANCES TO BE PROVIDED TO COMPLY WITH ADA REQUIREMENTS. DISHWASHERS MUST FIT UNDER A 34" HIGH (32-1/4" CLEAR UNDER) COUNTERTOP, FULL HT. REFRIGERATORS MUST BE A SIDE-BY-SIDE OR BOTTOM FREEZER UNIT, AND ALL MICROWAVE CONTROLS TO BE NO HIGHER THAN 48" A.F.F. TO MEET OBSTRUCTED HIGH SIDE REACH REQUIREMENTS.

NOTE: ALL ENTRANCE AND EXIT DOORS HAVE BARRIER FREE ACCESSIBILITY.

NOTE: ALL GYP. BD. AT WET WALL LOCATIONS AND TOILET ROOM INTERIORS SHALL BE GREEN BOARD

NOTE: SAFETY GLAZING MUST HAVE PERMANENT IDENTIFICATION IN ACCORDANCE WITH SECTION 2406.1.1 OF THE 2015 MICHIGAN BUILDING CODE.

NOTE: INTERIOR FINISHES IN EXIT ACCESS CORRIDORS, OTHER EXITWAYS, ROOMS, AND ENCLOSED SPACES IN USE GROUPS "B" AND "S" IN SPRINKLED BUILDINGS ARE REQUIRED TO HAVE AT LEAST A CLASS C, FLAME SPREAD 75-200; SMOKE DEVELOPED 0-450; RATING AS LISTED IN TABLE 803.4 OF THE 2015 MICHIGAN BUILDING CODE.

NOTE:
■ DENOTES FIRE EXTINGUISHER

NOTE: ALL SILLS TO BE CLEAR ANNO. BREAKMETAL ALUM. PROVIDE

NOTE: CONFIRM SIZES OF ALL APPLIANCES WITH TENANT AND/OR OWNER PRIOR TO ORDERING CABINETS.

NOTE: ALL INTERIOR PARTITION WALLS TO BE PAINTED GYP. BD. ON STUD FRAMING / FURRING

NOTE: ALL OFFICE FURNITURE & EQUIPMENT TO BE PROVIDED BY TENANT- SHOWN FOR LAYOUT PURPOSES ONLY. TO COMPLY WITH ADA REQUIREMENTS, A MINIMUM OF 5%, BUT NOT LESS THAN (1) OF THE LUNCHROOM TABLES AND EMPLOYEE WORKSTATIONS (CUBICLES) SHALL BE ACCESSIBLE. ACCESSIBLE TABLE AND WORKSTATION TOPS SHALL BE 28" MIN. TO 34" MAX. A.F.F. KNEE AND TOE CLEARANCES AS FOLLOWS SHALL ALSO APPLY: TOE: 9" MIN. HIGH, 17" MIN. TO 25" MAX. DEPTH, AND 30" MIN. WIDE. KNEE: 27" MIN. HIGH, 11" DEEP @ 9" HIGH TO 8" DEEP @ 27" HIGH, AND 30" MIN. WIDE.

FIRE EXTINGUISHER NOTE:
TYPE 2A FIRE EXTINGUISHERS SHALL BE PROVIDED AND SPACED A MAX. OF 75' APART PER SECTION 906.1 OF THE 2015 INTERNATIONAL FIRE CODE AND / OR BY THE DIRECTION OF THE FIRE MARSHAL.



(5) 1 BEDROOM UNITS

(7) 2 BEDROOM UNITS



BUILDING A
1st FLOOR PLAN

SCALE: 3/32"=1'-0"

ALL APPLIANCES TO BE PROVIDED TO COMPLY WITH ADA REQUIREMENTS. DISHWASHERS MUST FIT UNDER A 34" HIGH (32-1/4" CLEAR UNDER) COUNTERTOP, FULL HT. REFRIGERATORS MUST BE A SIDE-BY-SIDE OR BOTTOM FREEZER UNIT, AND ALL MICROWAVE CONTROLS TO BE NO HIGHER THAN 48" A.F.F. TO MEET OBSTRUCTED HIGH SIDE REACH REQUIREMENTS.

ALL ENTRANCE AND EXIT DOORS HAVE BARRIER FREE ACCESSIBILITY.

ALL GYP. BD. AT WET WALL LOCATIONS AND TOILET ROOM INTERIORS SHALL BE GREEN BOARD

SAFETY GLAZING MUST HAVE PERMANENT IDENTIFICATION IN ACCORDANCE WITH SECTION 2406.1.1 OF THE 2015 MICHIGAN BUILDING CODE.

INTERIOR FINISHES IN EXIT ACCESS CORRIDORS, OTHER EXITWAYS, ROOMS, AND ENCLOSED SPACES IN USE GROUPS "B" AND "S" IN SPRINKLED BUILDINGS ARE REQUIRED TO HAVE AT LEAST A CLASS C: FLAME SPREAD 75-200; SMOKE DEVELOPED 0-450; RATING AS LISTED IN TABLE 803.4 OF THE 2015 MICHIGAN BUILDING CODE.

NOTE:

■ DENOTES FIRE EXTINGUISHER

FIRE EXTINGUISHER NOTE:

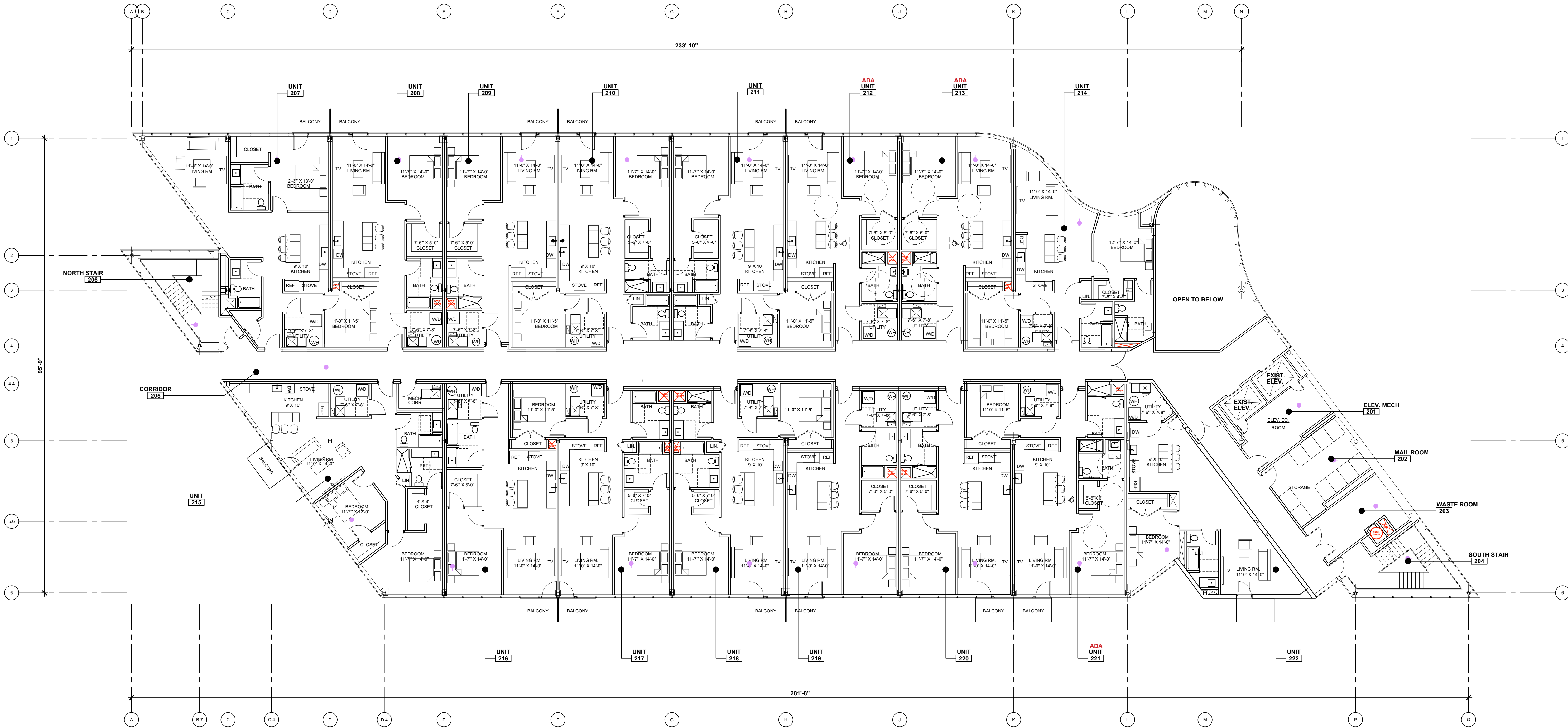
TYPE 2A FIRE EXTINGUISHERS SHALL BE PROVIDED AND SPACED A MAX. OF 75' APART PER SECTION 906.1 OF THE 2015 INTERNATIONAL FIRE CODE AND / OR BY THE DIRECTION OF THE FIRE MARSHAL.

ALL SILLS TO BE CLEAR ANNO. BREAKMETAL ALUM. PROVIDE

CONFIRM SIZES OF ALL APPLIANCES WITH TENANT AND/OR OWNER PRIOR TO ORDERING CABINETS.

ALL INTERIOR PARTITION WALLS TO BE PAINTED GYP. BD. ON STUD FRAMING / FURRING

ALL OFFICE FURNITURE & EQUIPMENT TO BE PROVIDED BY TENANT- SHOWN FOR LAYOUT PURPOSES ONLY. TO COMPLY WITH ADA REQUIREMENTS, A MINIMUM OF 5%, BUT NOT LESS THAN (1) OF THE LUNCHROOM TABLES AND EMPLOYEE WORKSTATIONS (CUBICLES) SHALL BE ACCESSIBLE. ACCESSIBLE TABLE AND WORKSTATION TOPS SHALL BE 28" MIN. TO 34" MAX. A.F.F. KNEE AND TOE CLEARANCES AS FOLLOWS SHALL ALSO APPLY: TOE: 9" MIN. HIGH, 17" MIN. TO 25" MAX. DEPTH, AND 30" MIN. WIDE. KNEE: 27" MIN. HIGH, 11" DEEP @ 9" HIGH TO 8" DEEP @ 27" HIGH, AND 30" MIN. WIDE.



(8) 1 BEDROOM UNITS

(8) 2 BEDROOM UNITS



BUILDING A
2nd FLOOR PLAN

SCALE: 3/32"=1'-0"

ALL APPLIANCES TO BE PROVIDED TO COMPLY WITH ADA REQUIREMENTS. DISHWASHERS MUST FIT UNDER A 34" HIGH (32-1/4" CLEAR UNDER) COUNTERTOP, FULL HT. REFRIGERATORS MUST BE A SIDE-BY-SIDE OR BOTTOM FREEZER UNIT, AND ALL MICROWAVE CONTROLS TO BE NO HIGHER THAN 48" A.F.F. TO MEET OBSTRUCTED HIGH SIDE REACH REQUIREMENTS.

ALL ENTRANCE AND EXIT DOORS HAVE BARRIER FREE ACCESSIBILITY.

ALL GYP. BD. AT WET WALL LOCATIONS AND TOILET ROOM INTERIORS SHALL BE GREEN BOARD

SAFETY GLAZING MUST HAVE PERMANENT IDENTIFICATION IN ACCORDANCE WITH SECTION 2406.1.1 OF THE 2015 MICHIGAN BUILDING CODE.

INTERIOR FINISHES IN EXIT ACCESS CORRIDORS, OTHER EXITWAYS, ROOMS, AND ENCLOSED SPACES IN USE GROUPS "B" AND "S" IN SPRINKLED BUILDINGS ARE REQUIRED TO HAVE AT LEAST A CLASS C-1 FLAME SPREAD 76-200; SMOKE DEVELOPED 0-450; RATING AS LISTED IN TABLE 803.4 OF THE 2015 MICHIGAN BUILDING CODE.

NOTE:

■ DENOTES FIRE EXTINGUISHER

FIRE EXTINGUISHER NOTE:

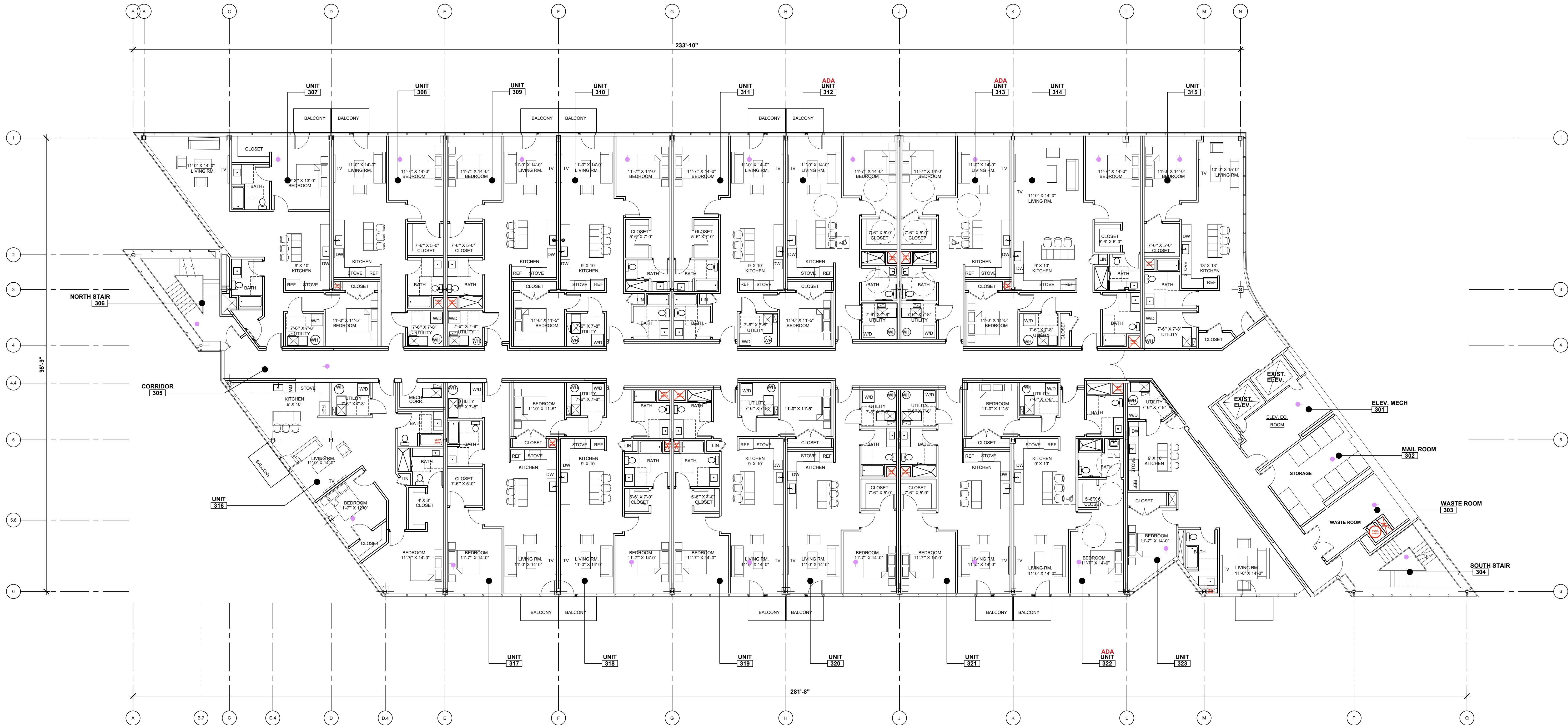
TYPE 2A FIRE EXTINGUISHERS SHALL BE PROVIDED AND SPACED A MAX. OF 75' APART PER SECTION 906.1 OF THE 2015 INTERNATIONAL FIRE CODE AND / OR BY THE DIRECTION OF THE FIRE MARSHAL.

ALL OFFICE FURNITURE & EQUIPMENT TO BE PROVIDED BY TENANT- SHOWN FOR LAYOUT PURPOSES ONLY. TO COMPLY WITH ADA REQUIREMENTS, A MINIMUM OF 85%, BUT NOT LESS THAN (1) OF THE LUNCHROOM TABLES AND EMPLOYEE WORKSTATIONS (CUBICLES) SHALL BE ACCESSIBLE. ACCESSIBLE TABLE AND WORKSTATION TOPS SHALL BE 28" MIN. TO 34" MAX. A.F.F. KNEE AND TOE CLEARANCES AS FOLLOWS SHALL ALSO APPLY- TOE: 9" MIN. HIGH, 17" MIN. TO 25" MAX. DEPTH, AND 30" MIN. WIDE. KNEE: 27" MIN. HIGH, 11" DEEP @ 9" HIGH TO 8" DEEP @ 27" HIGH, AND 30" MIN. WIDE.

ALL SILLS TO BE CLEAR ANNO. BREAKMETAL ALUM. BRZ/ALUM.

CONFIRM SIZES OF ALL APPLIANCES WITH TENANT AND/OR OWNER PRIOR TO ORDERING CABINETS.

ALL INTERIOR PARTITION WALLS TO BE PAINTED GYP. BD. ON STUD FRAMING / FURRING



Project title

PROPOSED RENOVATION FOR:

Lindsey Centre
Redevelopment

2690 Crooks Road
Troy, Michigan

Issued dr/ch

SITE PLAN 10.11.22

Sheet title

Building A
3rd FLOOR PLAN

Project no.

2068.20

Sheet no.

A.103

(9) 1 BEDROOM UNITS

(8) 2 BEDROOM UNITS

BUILDING A
3rd FLOOR PLAN

SCALE: 3/32"=1'-0"

NOTE:
ALL APPLIANCES TO BE PROVIDED TO COMPLY WITH ADA REQUIREMENTS. DISHWASHERS MUST FIT UNDER A 34" HIGH (32-1/4" CLEAR UNDER) COUNTERTOP. FULL HT. REFRIGERATORS MUST BE A SIDE-BY-SIDE OR BOTTOM FREEZER UNIT, AND ALL MICROWAVE CONTROLS TO BE NO HIGHER THAN 48" A.F.F. TO MEET OBSTRUCTED HIGH SIDE REACH REQUIREMENTS.

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INTERIOR FINISHES IN EXIT ACCESS CORRIDORS, OTHER EXITWAYS, ROOMS, AND ENCLOSED SPACES IN USE GROUPS "B" AND "S" IN SPRINKLED BUILDINGS ARE REQUIRED TO HAVE AT LEAST A CLASS C, FLAME SPREAD 76-200; SMOKE DEVELOPED 0-450; RATING AS LISTED IN TABLE 803.4 OF THE 2015 MICHIGAN BUILDING CODE.

NOTE:
■ DENOTES FIRE EXTINGUISHER

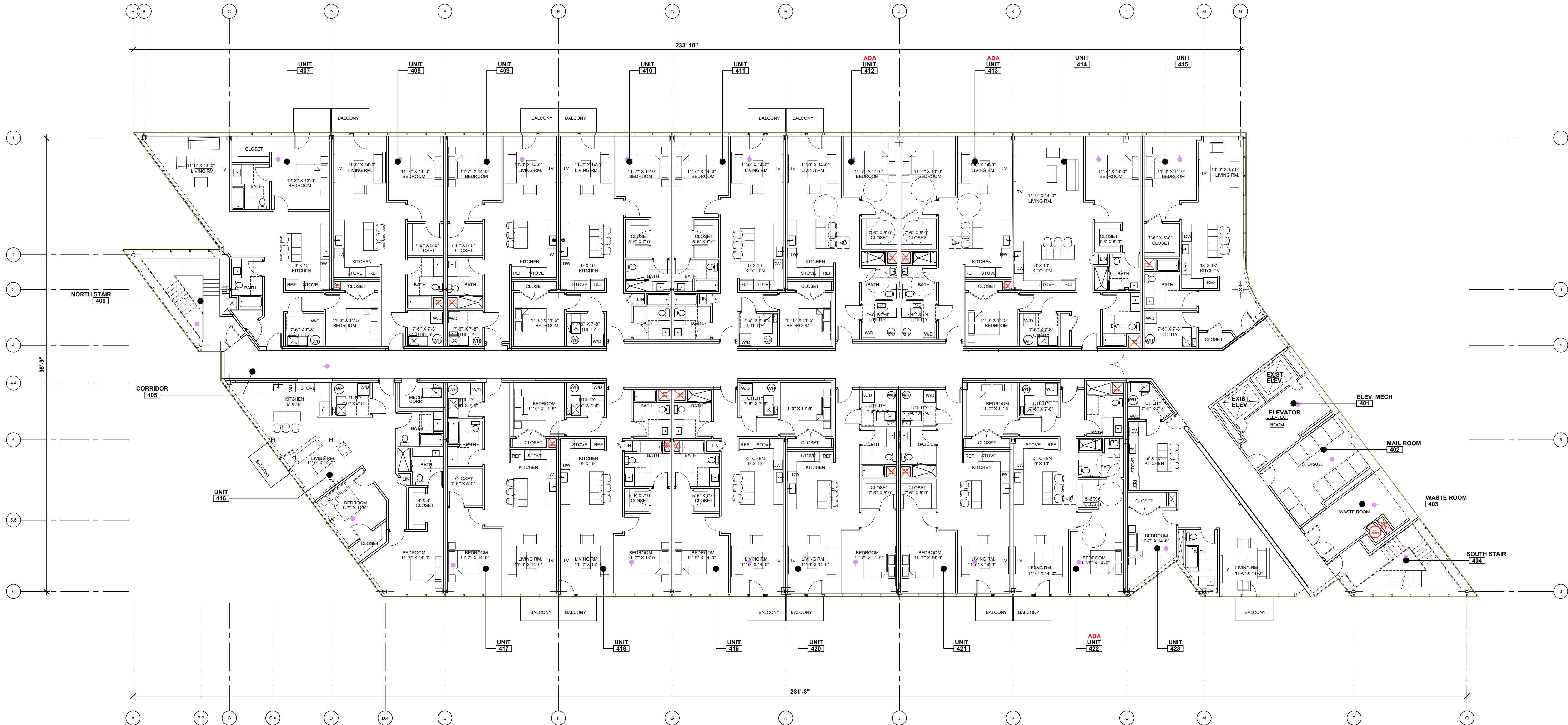
ALL SILLS TO BE CLEAR ANNO. BREAKMETAL ALUM. PROVIDE

CONFIRM SIZES OF ALL APPLIANCES WITH TENANT AND/OR OWNER PRIOR TO ORDERING CABINETS.

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FIRE EXTINGUISHER NOTE:
TYPE 2A FIRE EXTINGUISHERS SHALL BE PROVIDED AND SPACED A MAX. OF 75' APART PER SECTION 906.1 OF THE 2015 INTERNATIONAL FIRE CODE AND / OR BY THE DIRECTION OF THE FIRE MARSHAL.



Project title

PROPOSED REDEVELOPMENT FOR:

Lindsey Centre
Redevelopment

2690 Crooks Road
Troy, Michigan

Issued dr/ch

SITE PLAN 10.11.22

Sheet title

Building A
4th FLOOR PLAN



Project no.

2068.20

Sheet no.

A.104

(9) 1 BEDROOM UNITS

(8) 2 BEDROOM UNITS

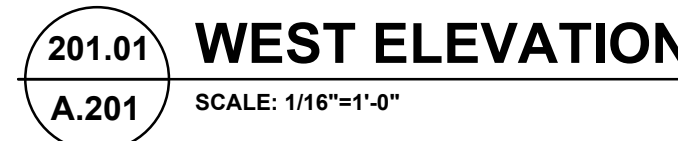
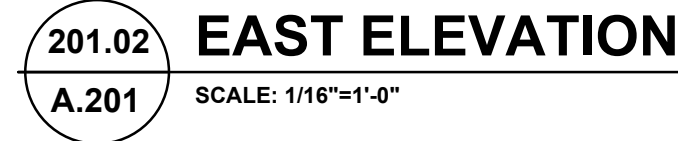
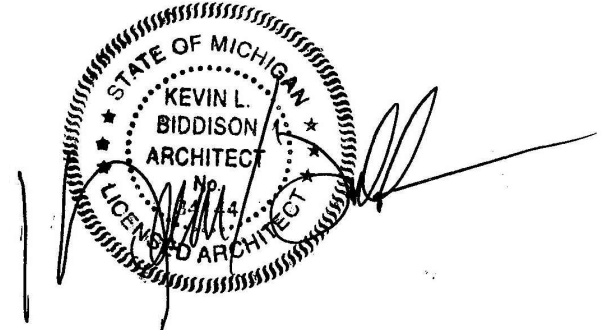
BUILDING A
4th FLOOR PLAN

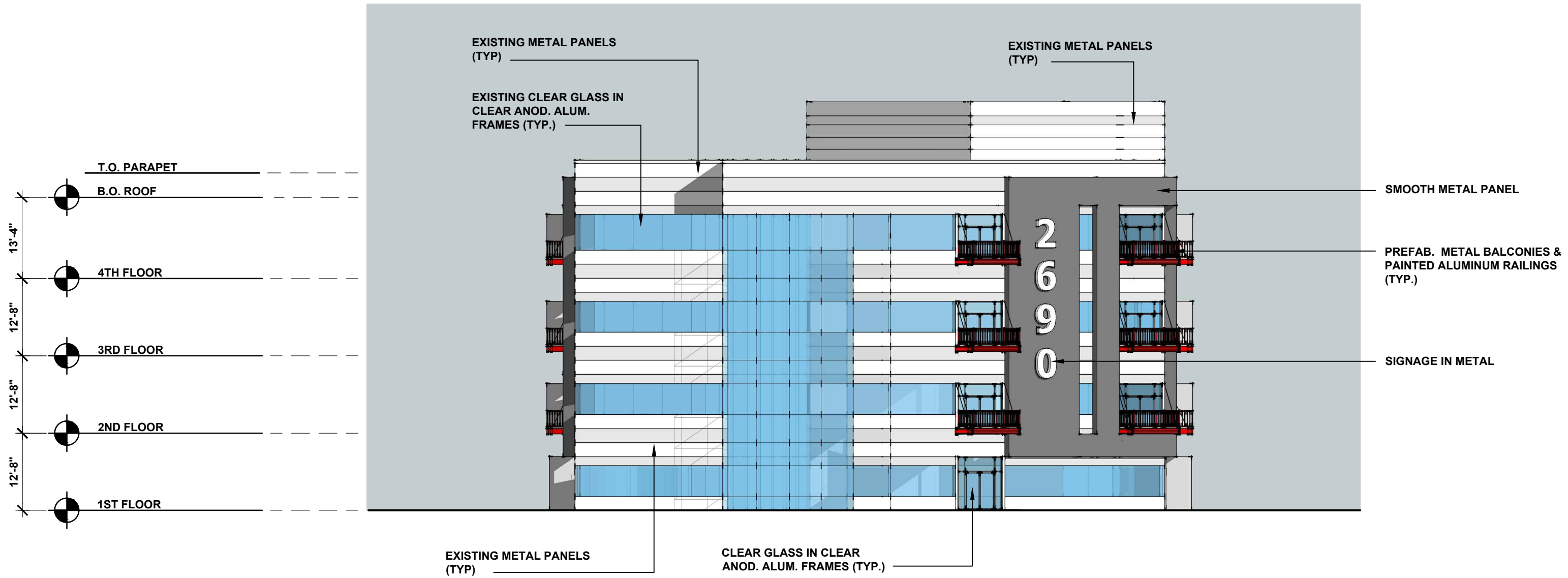
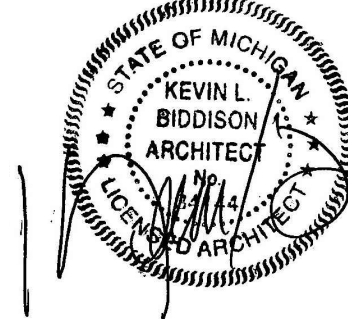
SCALE: 3/32"=1'-0"

Lindsey Centre
Redevelopment

GENERAL PROJECT NOTES:

- 1) EXISTING METAL PANEL AND GLASS TO REMAIN
- 2) NEW METAL WRAP AND BALCONIES TO BE ADDED TO EXTERIOR SKIN
- 3) EXTERIOR METAL AND GLASS TO BE REMOVED FOR NEW BALCONY DOORS AND WINDOWS
- 4) OTHER ELEMENTS OF CURRENT FACADE TO REMAIN AS EXISTING

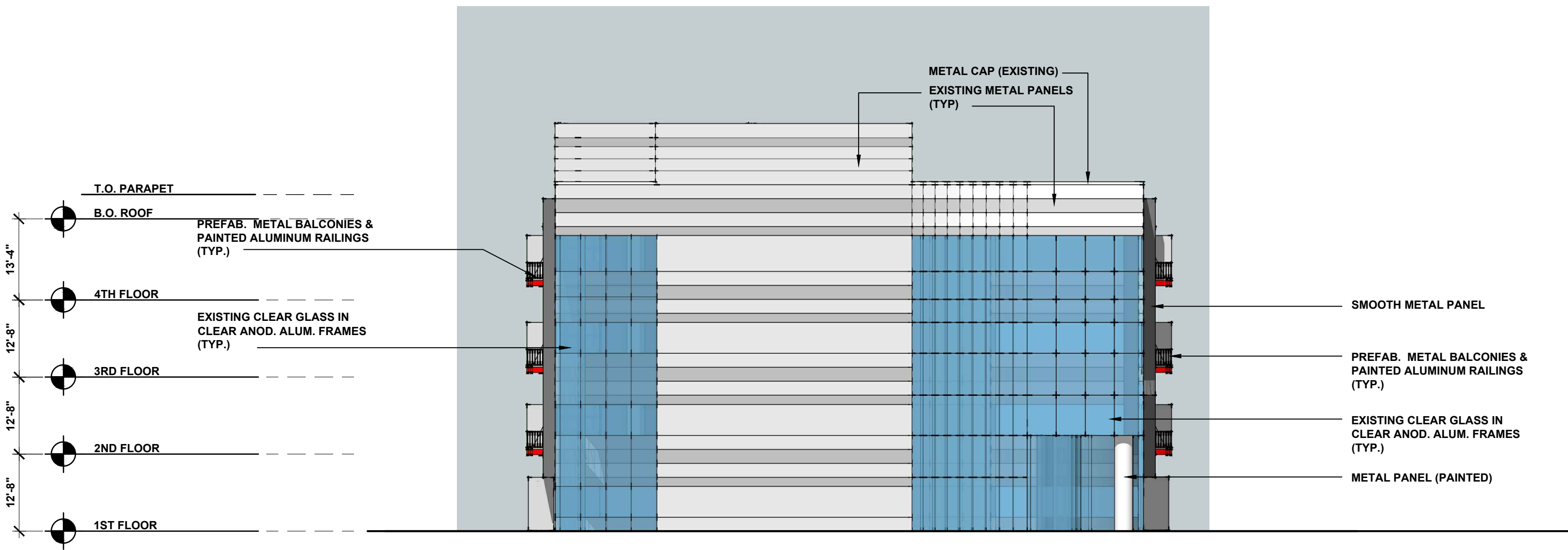




201.02 NORTH ELEVATION
A.202 SCALE: 1/16"=1'-0"

GENERAL PROJECT NOTES:

- 1) EXISTING METAL PANEL AND GLASS TO REMAIN
- 2) NEW METAL WRAP AND BALCONIES TO BE ADDED TO EXTERIOR SKIN
- 3) EXTERIOR METAL AND GLASS TO BE REMOVED FOR NEW BALCONY DOORS AND WINDOWS
- 4) OTHER ELEMENTS OF CURRENT FACADE TO REMAIN AS EXISTING



201.01 SOUTH ELEVATION
A.202 SCALE: 1/16"=1'-0"



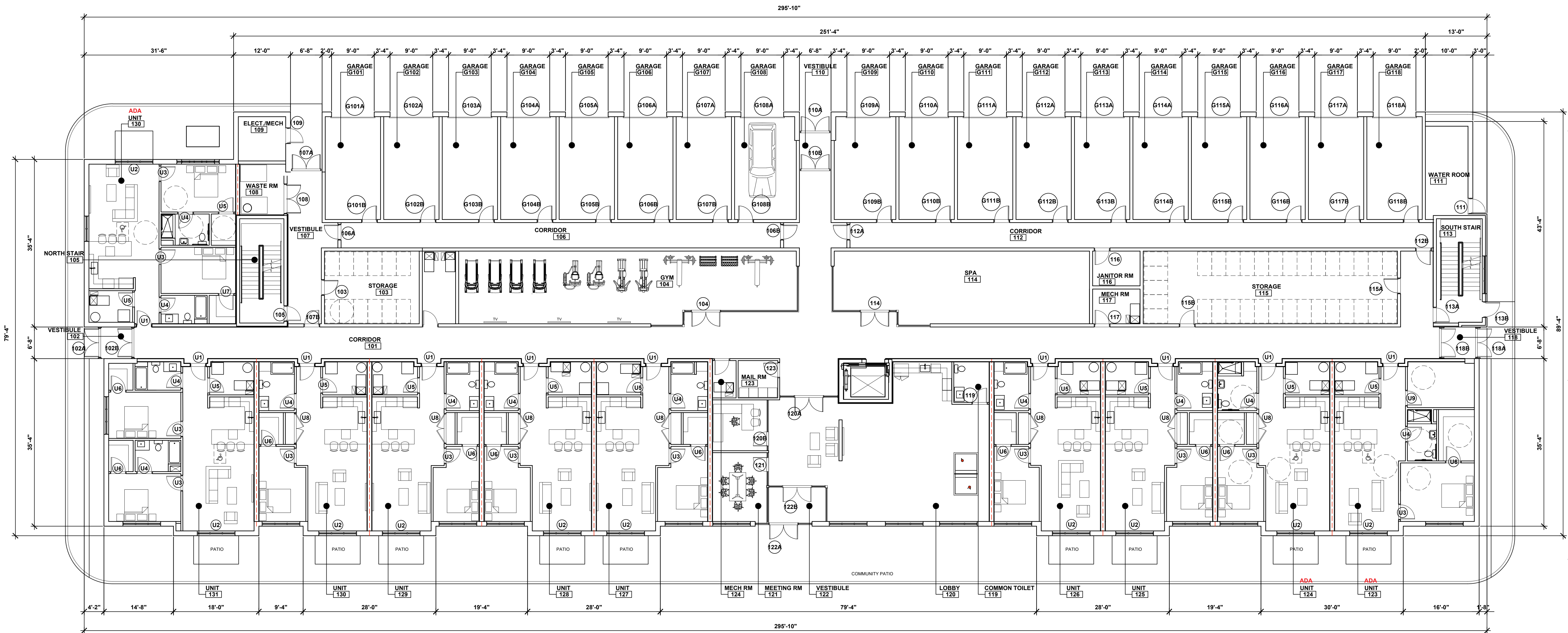
SOUTHWEST FACADE



SOUTHWEST FACADE



NORTHEAST FACADE

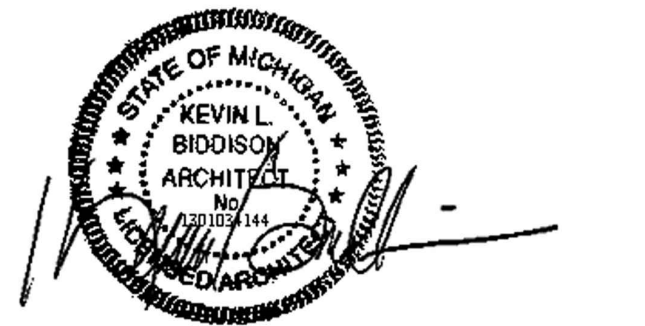


PROPOSED BUILDING FOR:
**Crooks & Big Beaver
Mixed Use
Redevelopment**

2690 CROOKS RD
TROY, MICHIGAN

SITE PLAN 10.11.22

**Building B
1st FLOOR PLAN**

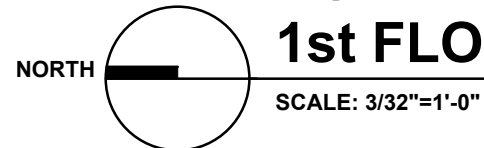


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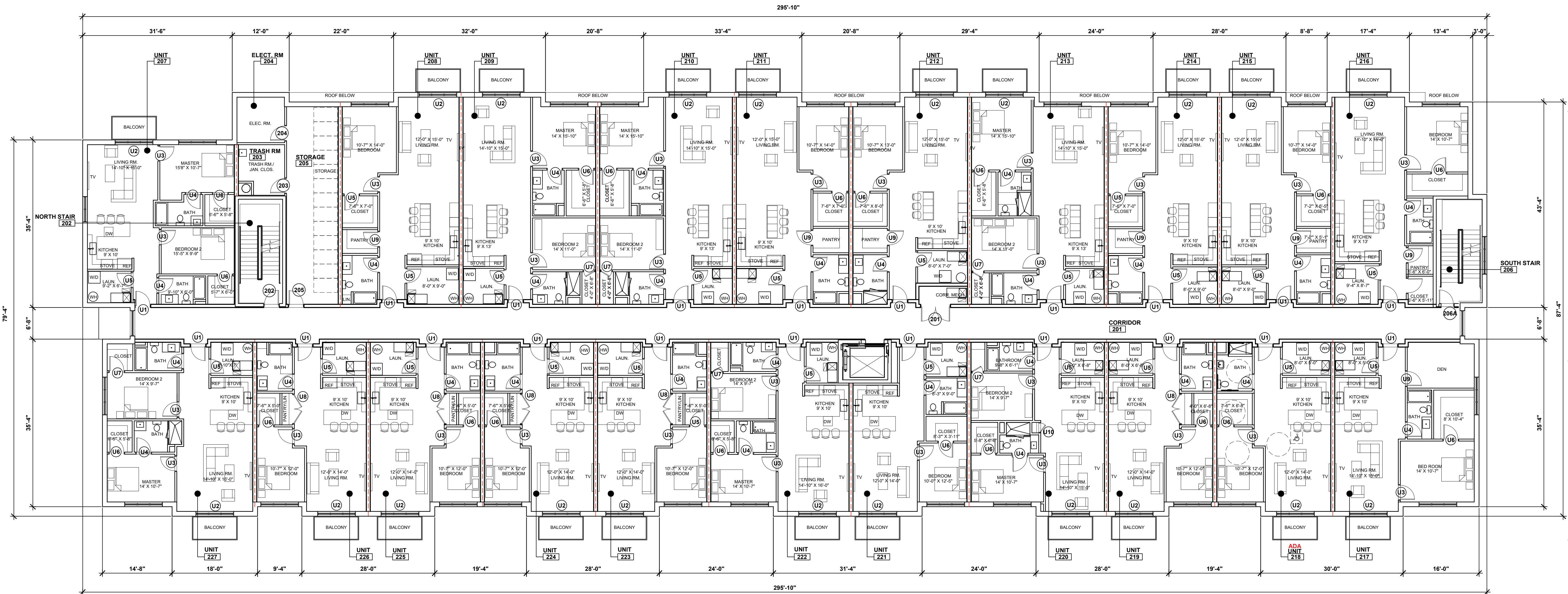
A.101

**1BR - 07 UNITS
2BR - 03 UNITS**

**BUILDING B OVERALL
1st FLOOR PLAN**



SCALE: 3/32"=1'-0"

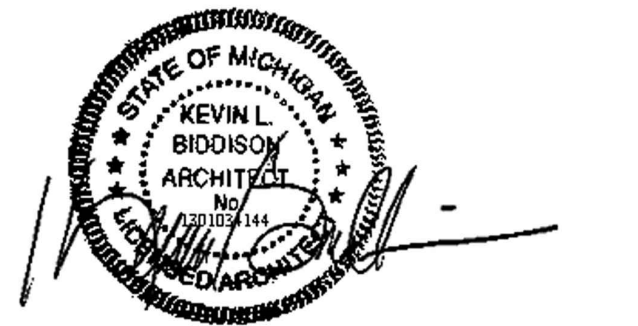


PROPOSED BUILDING FOR:
**Crooks & Big Beaver
Mixed Use
Redevelopment**

2690 CROOKS RD
TROY, MICHIGAN

SITE PLAN 10.11.22

**Building B
2nd FLOOR PLAN**



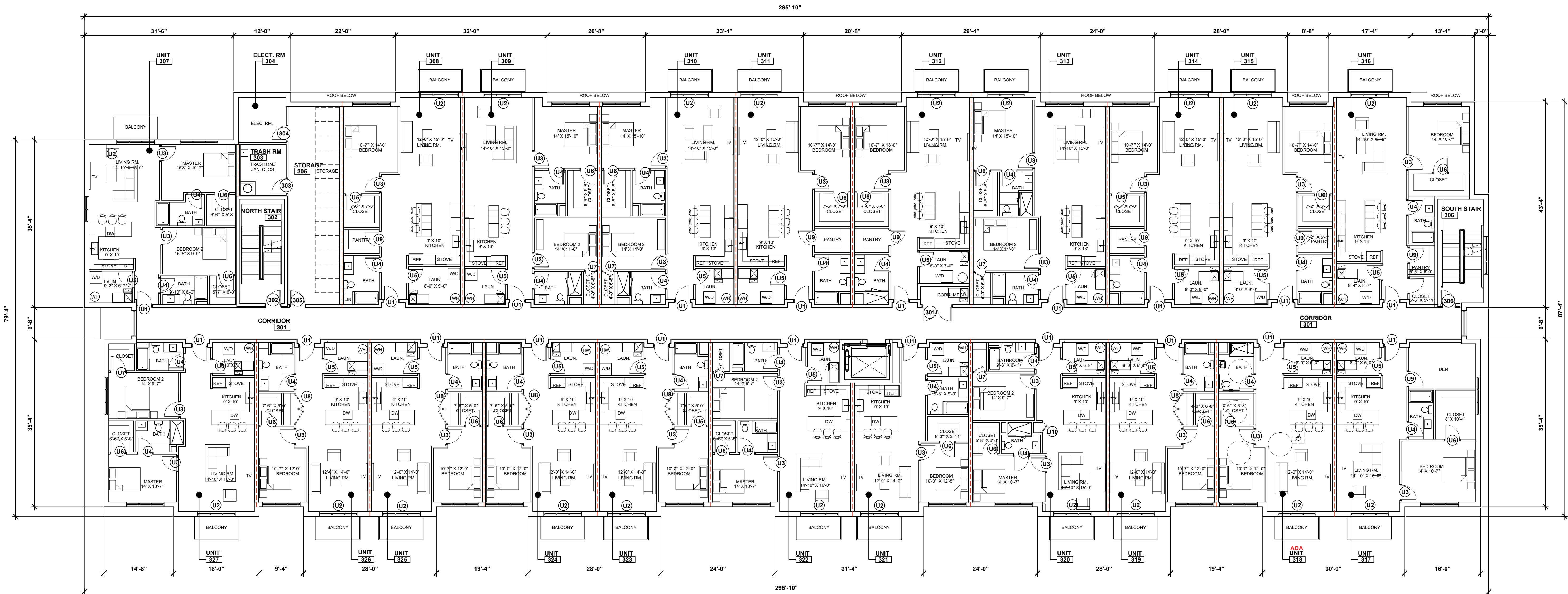
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A.102

**1BR - 13 UNITS
2BR - 08 UNITS**

**BUILDING B OVERALL
2nd FLOOR PLAN**





Project title

PROPOSED BUILDING FOR:
**Crooks & Big Beaver
Mixed Use
Redevelopment**

2690 CROOKS RD
TROY, MICHIGAN

Issued dr/ch

SITE PLAN 10.11.22

Sheet title

**Building B
3rd FLOOR PLAN**



Project no.

2068.20

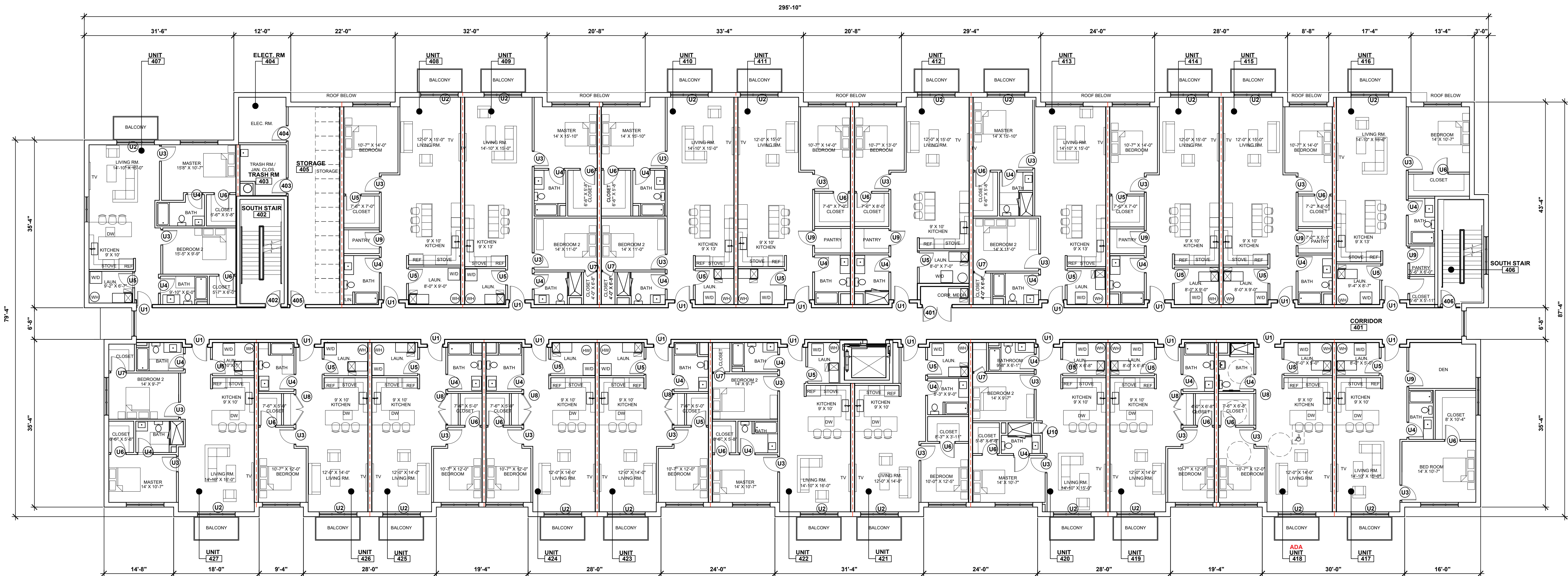
Sheet no.

A.103

**1BR - 13 UNITS
2BR - 08 UNITS**

**BUILDING B OVERALL
3rd FLOOR PLANS**





Project title

PROPOSED BUILDING FOR:
**Crooks & Big Beaver
Mixed Use
Redevelopment**

2690 CROOKS RD
TROY, MICHIGAN

Issued dr/ch

SITE PLAN 10.11.22

Sheet title

**Building B
4th FLOOR PLAN**



Project no.

2068.20

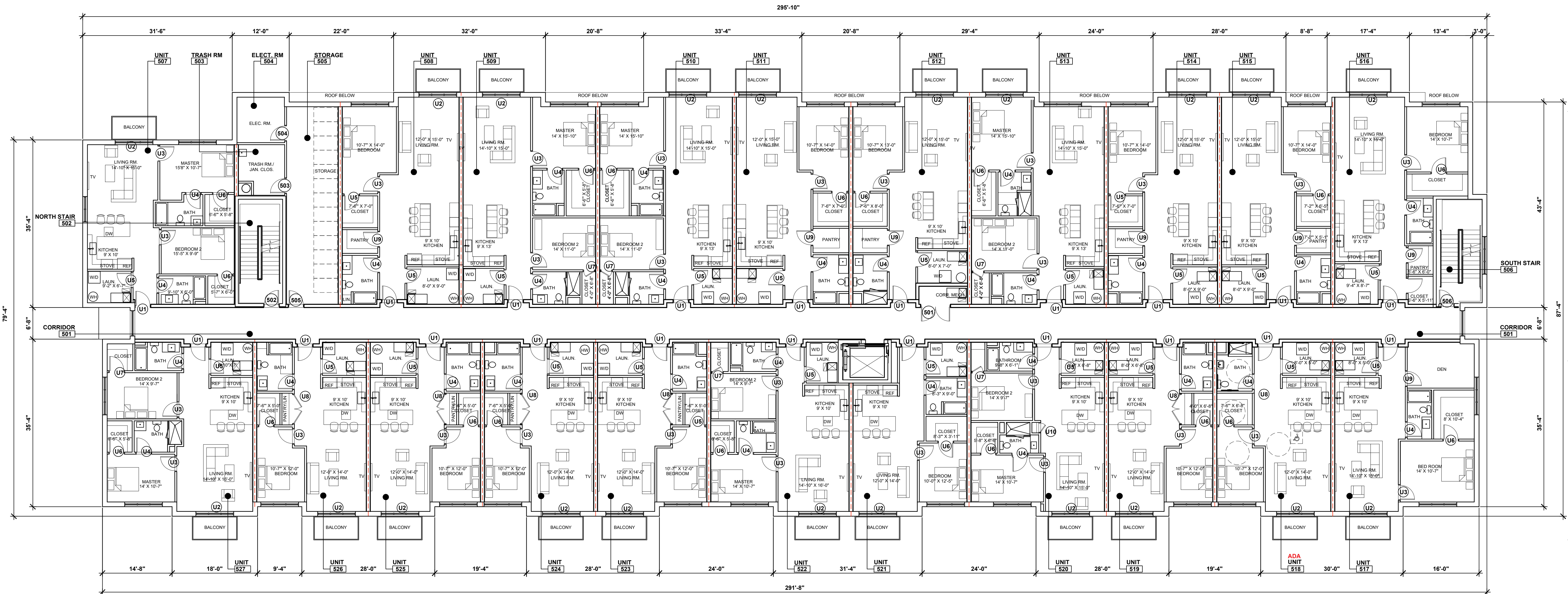
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A.104

**1BR - 13 UNITS
2BR - 08 UNITS**

**BUILDING B OVERALL
4TH FLOOR PLANS**





Project title

PROPOSED BUILDING FOR:
**Crooks & Big Beaver
Mixed Use
Redevelopment**

2690 CROOKS RD
TROY, MICHIGAN

Issued dr/ch

SITE PLAN 10.11.22

Sheet title

**Building B
5TH FLOOR PLAN**



Project no.

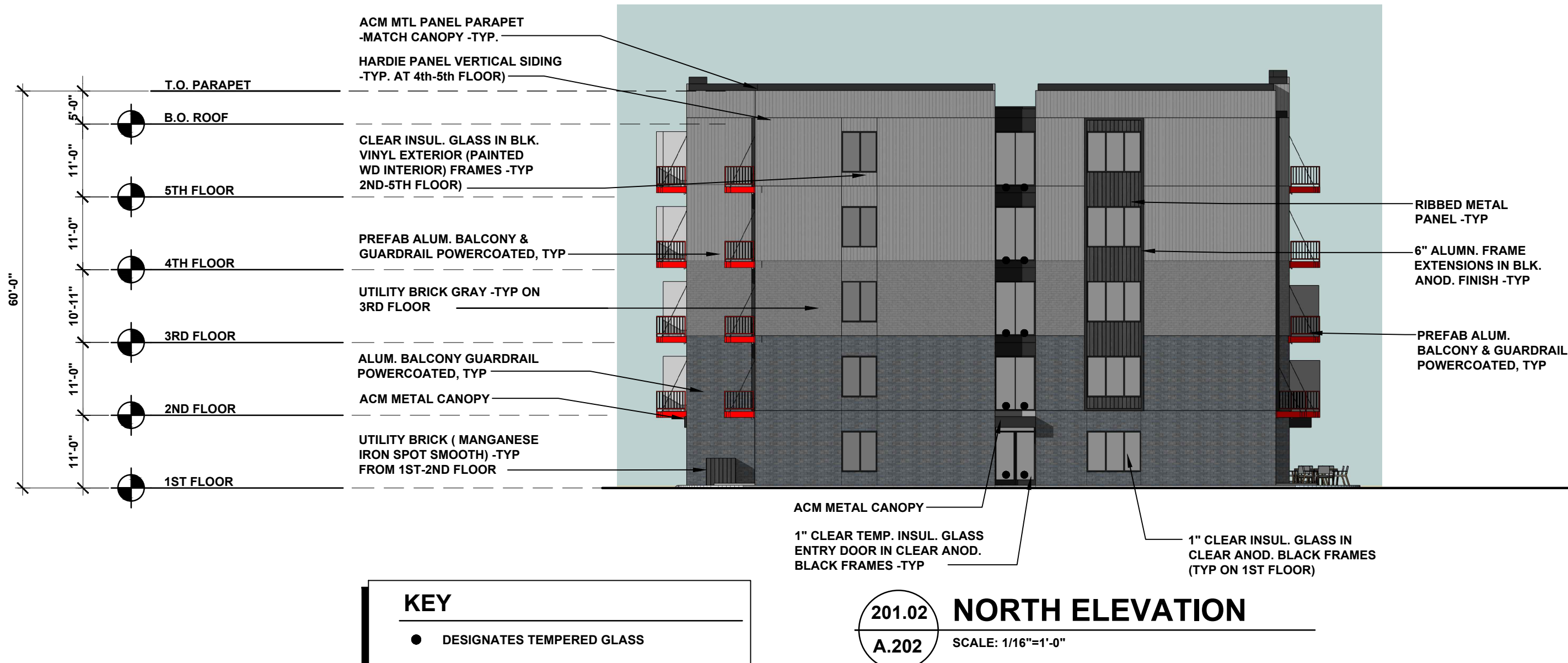
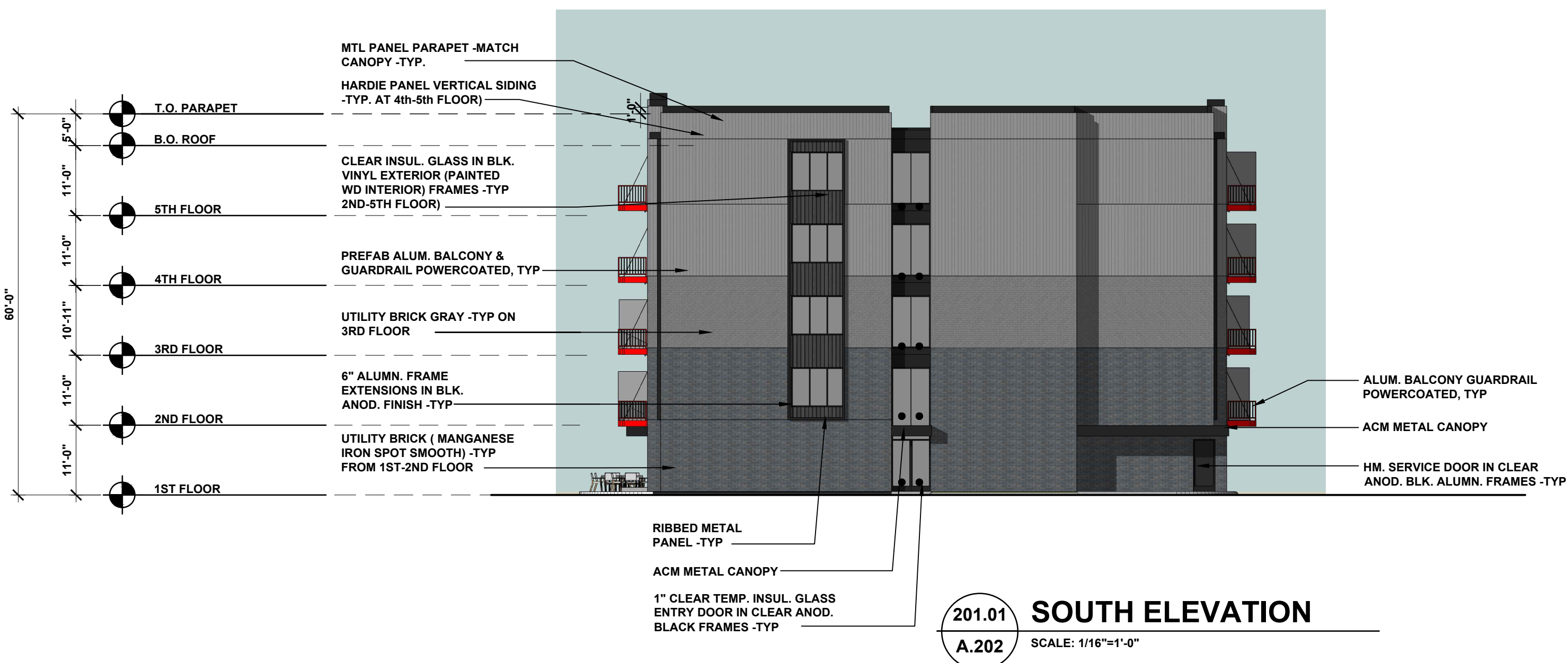
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Sheet no.

A.105

**BUILDING B OVERALL
5TH FLOOR PLANS**

NORTH
SCALE: 3/32"=1'-0"



KEY

● DESIGNATES TEMPERED GLASS



PERSPECTIVE IMAGE

N.T.S. FOR REFERENCE

BIDDISON
ARCHITECTURE

320 MARTIN ST. LL 10 BIRMINGHAM MI 48009
248.554.9500

Consultants

Project title

PROPOSED BUILDING FOR

**CROOK & BIG BEAVER
MIXED USE
REDEVELOPMENT**

2690 CROOKS ROAD,
TROY, MI



PERSPECTIVE IMAGE

N.T.S. FOR REFERENCE

Issued dr/ch

SITE PLAN APPROVAL

12.06.22

Sheet title

SITE PERSPECTIVES

Project no.

2068-20

Sheet no.

A.301



PERSPECTIVE IMAGE

N.T.S. FOR REFERENCE



PERSPECTIVE IMAGE

N.T.S. FOR REFERENCE

PROPOSED BUILDING FOR

**CROOK & BIG BEAVER
MIXED USE
REDEVELOPMENT**

2690 CROOKS ROAD,
TROY, MI

SITE PLAN APPROVAL

12.06.22

SITE PERSPECTIVES

2068-20

A.302



PERSPECTIVE IMAGE

N.T.S. FOR REFERENCE

BIDDISON
ARCHITECTURE

320 MARTIN ST. LL 10 BIRMINGHAM MI 48009
248.554.9500

Consultants

Project title

PROPOSED BUILDING FOR

**CROOK & BIG BEAVER
MIXED USE
REDEVELOPMENT**

2690 CROOKS ROAD,
TROY, MI

Issued dr/ch

SITE PLAN APPROVAL 12.06.22

Sheet title

SITE PERSPECTIVES

Project no.

2068-20

Sheet no.

A.303



PERSPECTIVE IMAGE

N.T.S. FOR REFERENCE



PERSPECTIVE IMAGE

N.T.S. FOR REFERENCE

BIDDISON
ARCHITECTURE

320 MARTIN ST. LL 10 BIRMINGHAM MI 48009
248.554.9500

Consultants

Project title

PROPOSED BUILDING FOR

**CROOK & BIG BEAVER
MIXED USE
REDEVELOPMENT**

2690 CROOKS ROAD,
TROY, MI



PERSPECTIVE IMAGE

N.T.S. FOR REFERENCE

Issued dr/ch

SITE PLAN APPROVAL

12.06.22

Sheet title

SITE PERSPECTIVES

Project no.

2068-20

Sheet no.

A.304

ITEM #6

DATE: December 7, 2022

TO: Planning Commission

FROM: R. Brent Savidant, Community Development Director

SUBJECT: PRELIMINARY SITE PLAN REVIEW (File Number SP JPLN2022-0023) – Proposed 5920 Livernois Office Building, East side of Livernois, South of Square Lake (PIN 88-20-10-101-018), Section 10, Currently Zoned O (Office) District.

The petitioner Eureka Building Co. submitted a Preliminary Site Plan application for a proposed office building at 5920 Livernois. A two-story, 2,531 square foot building is proposed for the 14,641 square foot site. The site is currently vacant.

The Planning Commission is responsible for granting Preliminary Site Plan approval for this item.

The attached report prepared by Carlisle/Wortman Associates, Inc. (CWA), the City's Planning Consultant, summarizes the project. 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. Report prepared by Carlisle/Wortman Associates, Inc.

G:\SITE PLANS\SP JPLN2022-0023 5920 LIVERNOIS OFFICE BUILDING\PC Memo 2022 12 13.docx

PROPOSED RESOLUTION

PRELIMINARY SITE PLAN REVIEW (File Number SP JPLN2022-0023) – Proposed 5920 Livernois Office Building, East side of Livernois, South of Square Lake (PIN 88-20-10-101-018), Section 10, Currently Zoned O (Office) District.

Resolution # PC-2022-13-

Moved by:

Seconded by:

RESOLVED, That Preliminary Site Plan Approval, pursuant to Article 8 of the Zoning Ordinance, as requested for the proposed office building located on the east side of Livernois, south of Square Lake (5920 Livernois), Section 21, within the O (Office) District, be granted, subject to applicant the following:

1. The second story shall remain storage for the first-floor use and shall not be used for purposes that require parking.
2. The loading space is not required due to the proposed office use.
3. Allowance for parking lot trees outside of parking lot.

_____) or

(denied, for the following reasons: _____) or

(postponed, for the following reasons: _____)

Yes:

No:

MOTION CARRIED/FAILED



577 0 288 577 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.



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Carlisle | Wortman
ASSOCIATES, INC.

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

Date: November 29, 2022
December 8, 2022

Preliminary Site Plan Review For City of Troy, Michigan

Applicant: Eureka Building Company

Project Name: Cutting and Livernois Office Building

Location: Southeast corner of Livernois Road and Cutting Boulevard

Plan Date: December 1, 2022

Current Zoning: O, Office

Action Requested: Preliminary Site Plan Review

PROJECT AND SITE DESCRIPTION

The applicant is proposing a 5,000 sq.ft office building, on the 0.34 acre site located at the southeast corner of Livernois Road and Cutting Boulevard. The site is currently vacant. There is no direct access off Livernois Road and access will be via Cutting Boulevard. The first floor of the building is proposed for general office use, the second floor for storage.

The site is zoned O, Office, and a office building is a permitted use. The site is adjacent to single-family uses to the south and east, a townhome development across Livernois, and a medical office across Cutting Boulevard.

Table 1. – Adjacent Zoning/Land Use

Direction	Zoning	Use
North	NN, Neighborhood Node	Medical Office
South	R1-B	Single-Family Residential
East	R1-B	Single-Family Residential
West	NN, Neighborhood Node	Townhouse Development



View of site from Livernois Road

BUILDING ORIENTATION AND OVERALL SITE LAYOUT

The applicant has placed the building at the hard corner of Cutting Boulevard and Livernois Road. Parking is located to the side and rear of the building.

Items to be Addressed: None

SITE ACCESS and CIRCULATION

Access to the site is provided off Cutting Boulevard. Access and circulation are sufficient.

Items to be Addressed: None

AREA, WIDTH, HEIGHT, SETBACKS

O, Office zoning district regulations are set forth in section 4.16:

	Required / Allowed	Provided	Compliance
Front (Livernois)	10-foot setback	10 feet	Complies
Front (Cutting)	10-foot setback	10 feet	Complies
Side	20-foot setback	50 feet	Complies
Rear	30- foot minimum	+ 30 feet	Complies
Single-family residential district setback	50-foot minimum	50-foot (south) + 50-foot (east)	Complies
Building Height	Minimum 2-stories, 36 feet	1-story	Complies

Due to the required 50-foot residential setback, the applicant has placed the building in the only location that would not require a variance.

Items to be Addressed: None

PARKING

Section 13.06.G of the Zoning Ordinance requires:

	Required	Provided
General Office : 1 space per 200 sq/ft	2,531 seats / 300 = 9	14 spaces
Barrier Free	1 space	1 space
Bicycle parking	2	2
Loading	1	0
Total	9 spaces + 2 bicycle	14 spaces + bicycle

The applicant has noted that the upper floor is solely for the use of storage. Based solely on parking requirements for the first-floor use, the applicant has overparked the site; however the proposed second story is indicated as storage. If the storage is associated for uses on the first floor, no additional parking is necessary. If the second floor is converted to useable and functional space, the site is under parked. A condition of approval should note that the second story shall remain storage for the first-floor use.

The applicant has not provided a loading space. The Planning Commission may waive the loading space requirement if the applicant can justify to the satisfaction of the Commission that a loading space is not necessary.

Items to be Addressed: 1). Provide evidence to the satisfaction of the Planning Commission that a loading space is not necessary; and 2). Condition that second story shall remain storage for the first-floor use.

LANDSCAPING

Applicant has submitted a landscape plan:

	Required:	Provided:	Compliance:
<u>(Livernois and Cutting) Street Trees:</u> The Ordinance requires that the greenbelt shall be landscaped with a minimum of one (1) deciduous tree for every thirty (30) lineal feet, or fraction thereof, of frontage abutting a public road right-of-way.	Livernois: 88 feet = 3 trees Cutting: 162 feet = 6 trees	Livernois: 88 feet = 3 trees Cutting: 162 feet = 6 trees	Complies
<u>Site landscaping:</u> A minimum of twenty (20%) of the site area shall be comprised of landscape material. Up to twenty-five percent	20%	+20%	Complies

(25%) of the required landscape area may be brick, stone, pavers, or other public plaza elements, but shall not include any parking area or required sidewalks.			
<u>Interior Parking Lot Landscaping:</u> 1 tree for every 8 spaces.	17 spaces = 18 trees	2 trees	Complies but trees located outside of parking lot
<u>Screening Between Land Uses</u>	Alternative 2 or 3 and/or wall. One (1) tree per ten (10) lineal feet.	59 evergreen trees	Complies
Tree Protection: Section 13.07	Not Applicable	Not Applicable	Not Applicable

Trash Enclosure:

The applicant has provided a trash enclosure and screened with masonry wall.

Items to be Addressed: Planning Commission to discuss parking lot trees outside of parking lot

FLOOR PLAN AND ELEVATIONS

The applicant has submitted floor plans and perspectives. The proposed materials are brick and stone. The color scheme is grey and white. Planning Commission to consider architectural and material details.

Items to be Addressed: Planning Commission to consider architectural and material details.

LIGHTING

The applicant has provided a lighting and photometric plan. The applicant is proposing seven (7) building mounted lights. The photometric plan and fixtures comply with ordinance requirements.

Items to be Addressed: None

STANDARDS

Section 8.06 outlines Site Plan Review Design Standards.

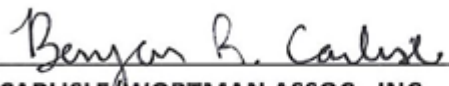
1. Development shall ensure compatibility to existing commercial districts and provide a transition between land uses.

- 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.*
2. *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.*
3. *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.*

SUMMARY

As part of the Planning Commission discussion, deliberation shall include:

1. *Condition that second story shall remain storage for the first-floor use*
2. *Allowance of loading space waiver*
3. *Allowance for parking lot trees outside of parking lot*
4. *Architectural and material details*
5. *Compliance with Site Plan standards set forth in Section 8.06*



CARLISLE WORTMAN ASSOC., INC.

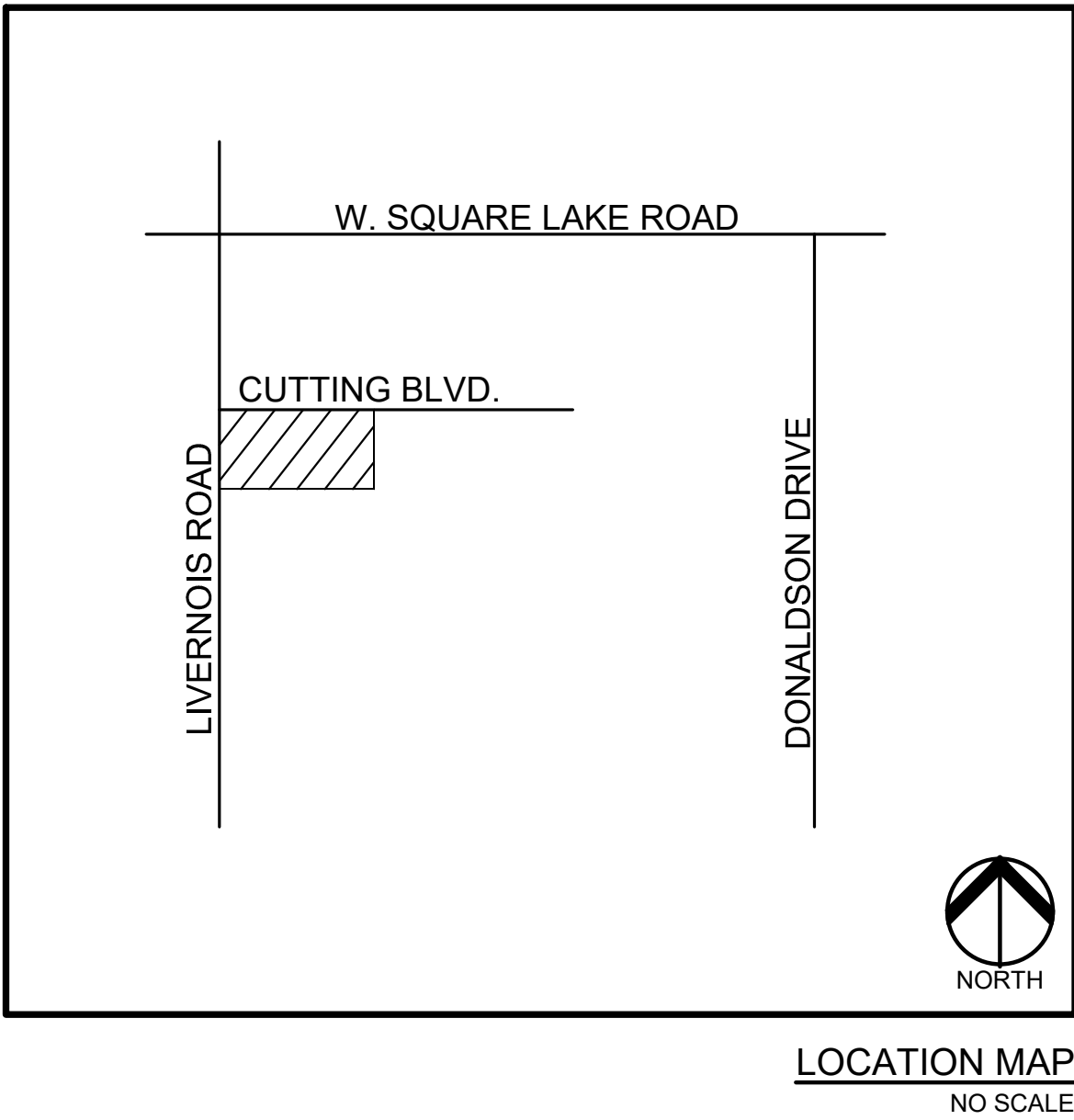
Benjamin R. Carlisle, AICP, LEED AP
Principal

PRELIMINARY SITE PLANS

OFFICE - CUTTING & LIVERNOIS

SOUTHEAST CORNER OF LIVERNOIS ROAD & CUTTING BOULEVARD
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

PERMIT / APPROVAL SUMMARY		
DATE SUBMITTED	DATE APPROVED	PERMIT / APPROVAL



INDEX OF DRAWINGS	
NUMBER	TITLE
	COVER SHEET
C-1.0	TOPOGRAPHIC SURVEY
C-3.0	PRELIMINARY SITE PLAN
C-4.0	PRELIMINARY GRADING PLAN
C-6.0	PRELIMINARY UTILITY PLAN
C-9.1	NOTES AND DETAILS
C-9.2	DETAILS
C-9.3	DETAILS
L-1.0	PRELIMINARY LANDSCAPE PLAN
L-1.1	LANDSCAPE DETAILS
	ARCHITECTURAL PLANS
T.1	PROJECT DATA
A.1	FOUNDATION PLAN
A.2	FLOOR PLANS
A.3	EXTERIOR ELEVATIONS

DESIGN TEAM

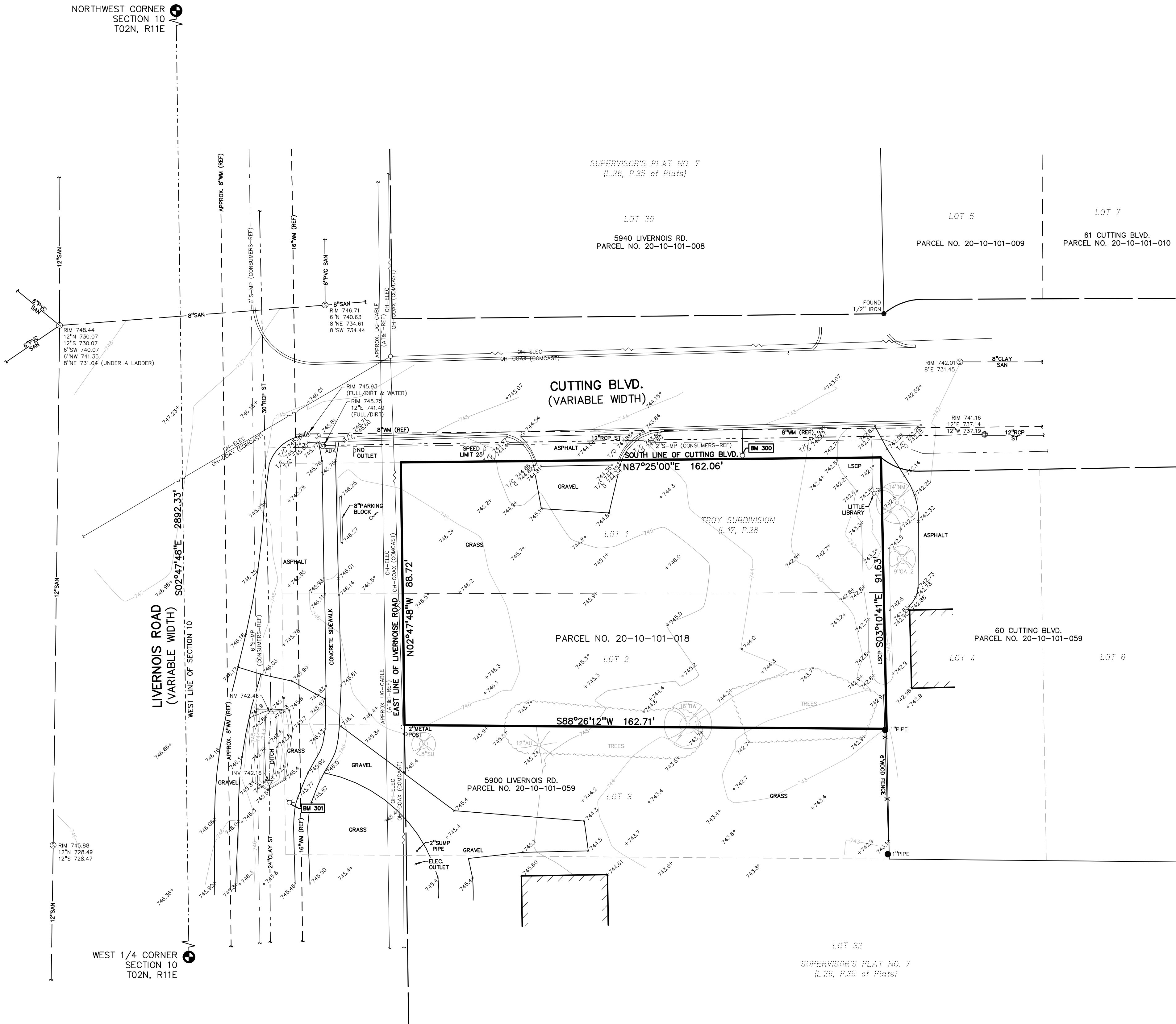
OWNER/APPLICANT/DEVELOPER	CIVIL ENGINEER
EUREKA BUILDING COMPANY 5960 LIVERNOIS TROY, MI 48098 CONTACT: ERION NIKOLLA PHONE: 588.405.4080 EMAIL: E.NIKOLLA@EUREKABUILDINGCOMPANY.COM	PEA GROUP 1849 POND RUN AUBURN HILLS, MI 48326 CONTACT: JAMES P. BUTLER, PE PHONE: 844.813.2949 EMAIL: JBUTLER@PEAGROUP.COM
ARCHITECT	LANDSCAPE ARCHITECT
ARKO DESIGN ASSOCIATES 2298 YASMIN DRIVE COMMERCE TWP, MI 48382 CONTACT: ARTUR KOKAJ PHONE: 248.802.8409 EMAIL: ARKODESIGNASSOCIATES.COM	PEA GROUP 7927 NEMCO WAY, STE. 115 BRIGHTON, MI 48116 CONTACT: JANET EVANS, PLA PHONE: 844.813.2949 EMAIL: JEVANS@PEAGROUP.COM

PEA
GROUP

REVISIONS	
DESCRIPTION	DATE
ORIGINAL ISSUE DATE	10/10/2022
REVISED PRELIMINARY SPA	12/1/2022

NOT FOR CONSTRUCTION

S:\PROJECTS\2022\2022-1127 OFFICE - LIVERNOIS AND CUTTING\DWG\SITE_PLAN\20-101000-22-1127.dwg PLOT
DATE: 10/17/2022 11:47 AM 01/20/2022



LEGEND:

- OH-ELEC-W-O EX. OH. ELEC. POLE & GUY WIRE
- UG-CATV EX. U.G. CABLE TV & PEDESTAL
- UG-COMM EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- UG-ELEC EX. U.G. ELEC. MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND, & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- EX. MAILBOX, SIGN & LIGHTPOLE
- EX. FENCE
- EX. GUARD RAIL
- EX. SPOT ELEVATION
- EX. CONTOUR
- EX. WETLAND
- IRON FOUND / SET
- NAIL FOUND / NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND / SET
- SECTION CORNER FOUND
- RECORDED / MEASURED / CALCULATED

REFERENCE DRAWINGS:

- CABLE AT&T MAP A1, DATED 08/24/2022
COMCAST MAP, EMAIL DATED 08/26/2022
- GAS CONSUMERS ENERGY MAP 02-61-10-2,
DATED 08/01/22
- WATER MAIN CITY OF TROY GIS MAPS, DATED 08/29/2022 &
09/01/2022
- SANITARY SEWER CITY OF TROY GIS MAPS, DATED 08/29/2022 &
09/01/2022
- STORM SEWER CITY OF TROY GIS MAPS, DATED 08/29/2022 &
09/01/2022
- ELECTRIC HAVE NOT RECEIVED MAPS AS OF 09/01/2022

BENCHMARKS:

BM #300
ARROW W/ DIMPLE ON A HYDRANT LOCATED ON THE SOUTH SIDE OF
CUTTING BLVD., APPROX. 189' EAST FROM THE CENTERLINE OF
LIVERNOIS ROAD.
ELEV. - 747.86

BM #301
ARROW W/ DIMPLE ON A HYDRANT LOCATED ON THE EAST SIDE OF
LIVERNOIS ROAD, APPROX. 138' SOUTH FROM THE CENTERLINE OF
CUTTING BLVD.
ELEV. - 745.70

LEGAL DESCRIPTION:

PARCEL ID 20-10-101-018
Land in the City of Troy, Oakland County, Michigan, described as follows:
T2N, R11E, SEC 10 TROY SUB LOTS 1 & 2 EXC W 40.70 FT

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AN
AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL
CHANCE FLOODPLAIN, PER FLOOD INSURANCE RATE MAP
NUMBER 26126C0532F, DATED SEPTEMBER 28, 2006.

PEA GROUP
t: 844.813.2949
www.peagroup.com

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

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND
UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY
APPROXIMATE. NO GUARANTEE OR OTHER EXPRESSED OR
IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF.
THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR
DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS
PRIOR TO THE START OF CONSTRUCTION.

LEGEND:

- W. SQUARE LAKE ROAD
- CUTTING BLVD.
- LIVERNOIS ROAD
- DOUGLASS DRIVE

EUREKA BUILDING COMPANY
53976 DESAND
SHELBY TOWNSHIP, MICHIGAN 48315

OFFICE - CUTTING & LIVERNOIS
SOUTHEAST CORNER OF LIVERNOIS
ROAD & CUTTING BLVD.
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

REVISIONS	
REVISED PRELIMINARY SPA	12-01-22

ORIGINAL ISSUE DATE:
OCTOBER 10, 2022

DRAWING TITLE
TOPOGRAPHIC SURVEY

PEA JOB NO.	2022-1127
P.M.	JPB
DN.	SS
DES.	SS

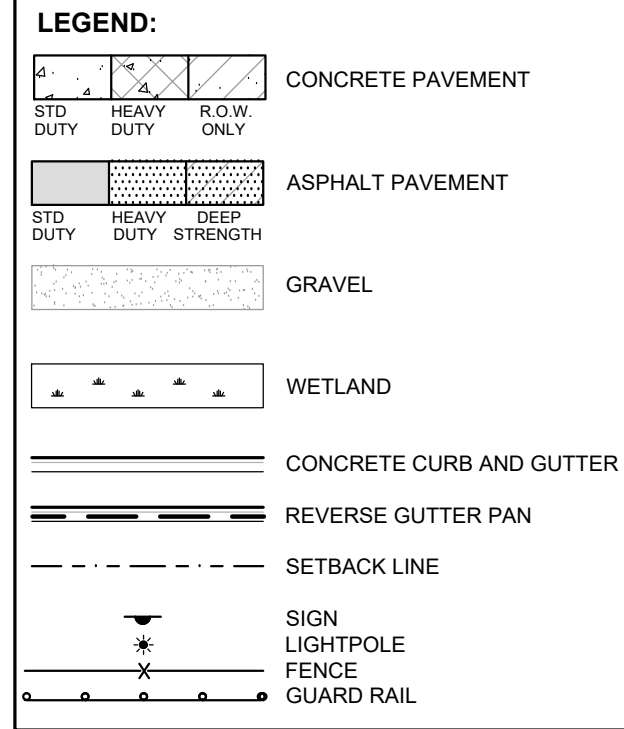
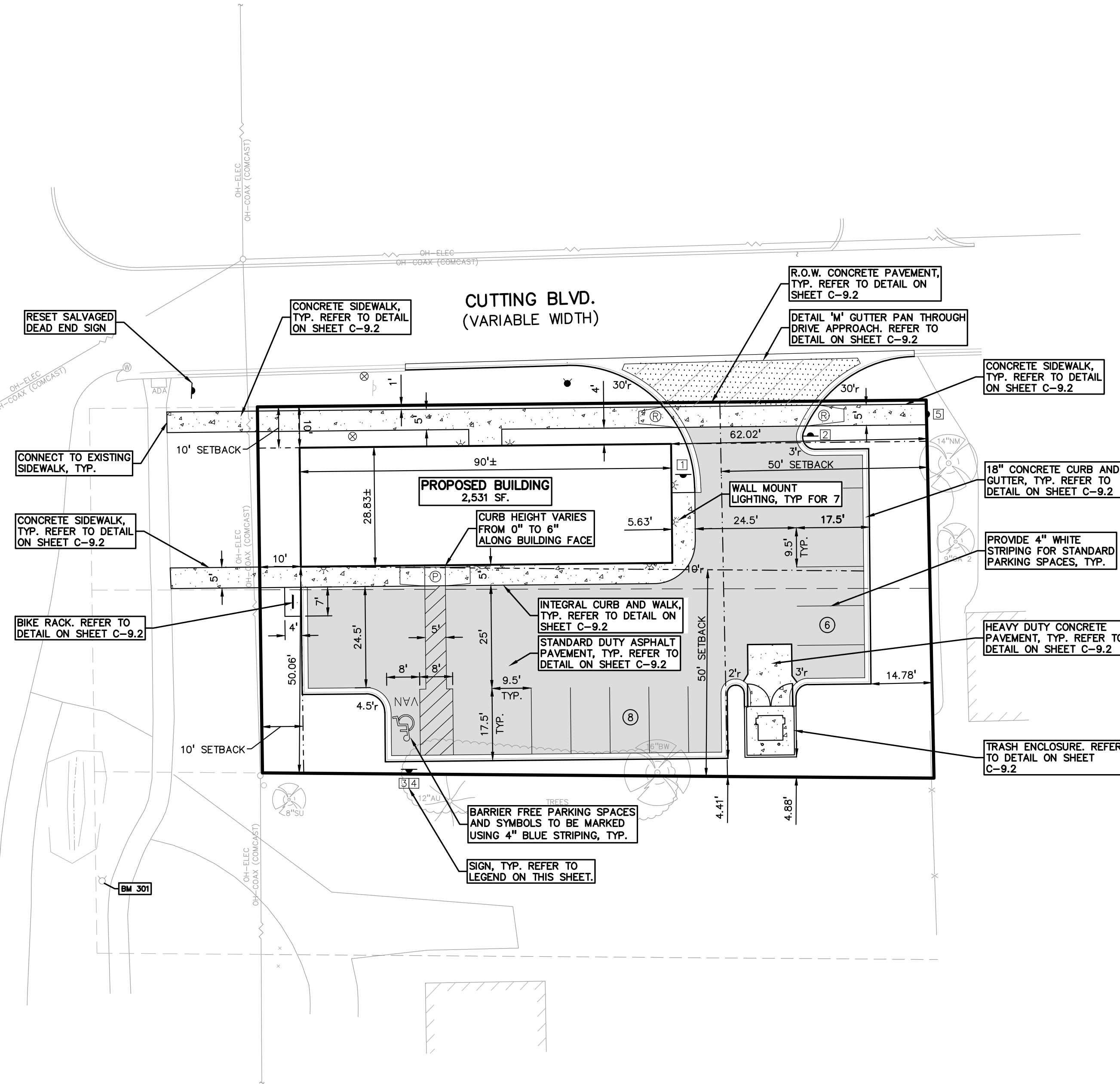
DRAWING NUMBER:

S:\PROJECTS\2022\2022-1127 OFFICE - LIVERNOIS AND CUTTING\DWG\SITE_PLAN\1(C-3.0)DW-22-1127.dwg PLOT
DATE: 10/17/2022 3:41 PM DES:SSN 104

NORTHWEST CORNER
SECTION 10
T02N, R11E

WEST 1/4 CORNER
SECTION 10
T02N, R11E

LIVERNOIS ROAD
(VARIABLE WIDTH)



- GENERAL NOTES:**
- THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.
- ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
 - 'NO PARKING-FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100 FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
 - REFER TO NOTES & DETAILS SHEET FOR ON-SITE PAVING DETAILS.
 - REFER TO NOTES & DETAILS SHEET FOR ON-SITE SIDEWALK RAMP DETAILS

SITE DATA TABLE:

SITE AREA: 0.34 ACRES (14,641 SF.) NET AND GROSS

ZONING: OFFICE BUILDING DISTRICT

PROPOSED USE: MEDICAL (2,531 SF)

BUILDING INFORMATION:
MAXIMUM ALLOWABLE BUILDING HEIGHT = 36 FT. (3 STORIES)
PROPOSED BUILDING HEIGHT = 2 STORY

BUILDING LOT COVERAGE = 17.3%

SETBACK REQUIREMENTS:

	REQUIRED	PROPOSED
FRONT (NORTH)	10'	10.00'
SIDE (EAST)	20'	62.02'
FRONT (WEST)	10'	10.00'
REAR (SOUTH)	30'	50.06'

PARKING CALCULATIONS:
OFFICE = 1 SPACE PER 300 SF.
TOTAL OFFICE PARKING REQUIRED = 2,531/300 = 8.44 OR 9 SPACES

TOTAL REQUIRED PARKING = 9 SPACES

TOTAL PROPOSED PARKING SPACES = 14 SPACES INC. 1 H/C SPACES

BICYCLE PARKING:
TOTAL REQUIRED = 2 SPACES
TOTAL PROVIDED ~2 SPACES

OPEN SPACE:
MINIMUM OPEN SPACE REQUIRED = 30%
PROVIDED OPEN SPACE = 82.7%

SITE SOILS INFORMATION:
ACCORDING TO THE USDA NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY FOR OAKLAND COUNTY, THE SITE CONSISTS OF THE FOLLOWING SOIL TYPES:
SHEBON-URBAN LAND COMPLEX, 0 TO 4 PERCENT SLOPES

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP TYPE R'	Ⓡ
SIDEWALK RAMP TYPE P'	Ⓟ

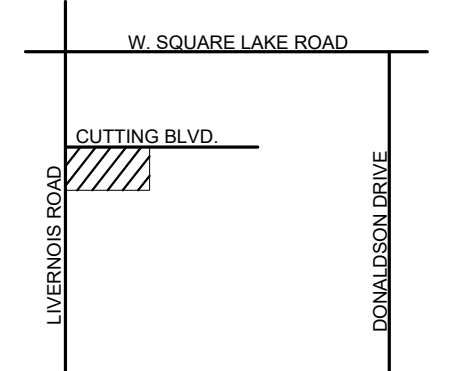
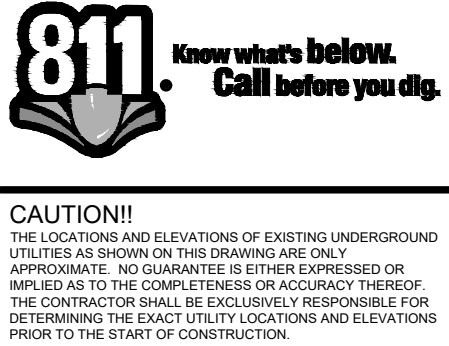
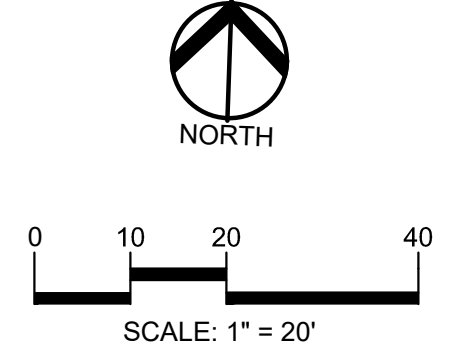
REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	1
'STOP' SIGN	2
'BARRIER FREE PARKING' SIGN	3
'VAN ACCESSIBLE' SIGN	4
'SIDEWALK ENDS' SIGN	5

REFER TO DETAIL SHEET FOR SIGN DETAILS

PEA GROUP
t: 844.813.2949
www.peagroup.com



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63976 DESAND
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CITY OF TROY, OAKLAND COUNTY, MICHIGAN

REVISIONS

REVISED PRELIMINARY SPA	12-01-22
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ORIGINAL ISSUE DATE:
OCTOBER 10, 2022

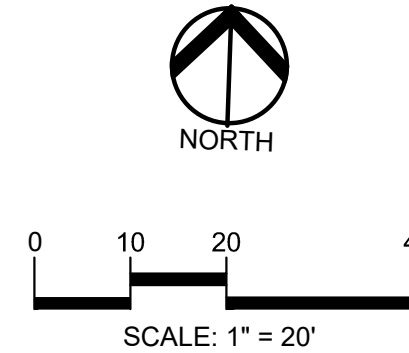
DRAWING TITLE
PRELIMINARY SITE PLAN

PEA JOB NO.	2022-1127
P.M.	JPB
DN.	SS
DES.	SS

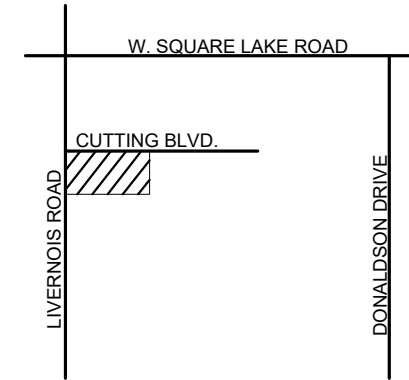
DRAWING NUMBER:

NOT FOR CONSTRUCTION

C-3.0



CAUTION!!
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REVISIONS	
REVISED PRELIMINARY SPA	12-01-22

ORIGINAL ISSUE DATE:
OCTOBER 10, 2022

DRAWING TITLE
PRELIMINARY GRADING PLAN

PEA JOB NO.	2022-1127
P.M.	JPB
DN.	SS
DES.	SS

DRAWING NUMBER:

GRADING LEGEND:

EXISTING SPOT ELEVATION
PROPOSED SPOT ELEVATION:
TYPICALLY TOP OF PAVEMENT
IN PAVED AREAS, GUTTER GRADE
IN CURB LINES.

EXISTING CONTOUR
PROPOSED CONTOUR
PROPOSED REVERSE GUTTER PAN
PROPOSED RIDGE LINE
PROPOSED SWALE/DITCH

ABBREVIATIONS

T/C = TOP OF CURB
T/P = TOP OF PAVEMENT
T/S = TOP OF SIDEWALK
T/W = TOP OF WALL

G = GUTTER GRADE
F.G. = FINISH GRADE
RM = RIM ELEVATION
BW = BOTTOM OF WALL

REFER TO GRADING NOTES ON SHEET C-9.0

RETAINING WALL NOTE:

TOP OF WALL (TW) AND BOTTOM OF WALL (BW) GRADES ARE THE FINISH GRADE AT THE TOP AND BOTTOM OF THE RETAINING WALL, NOT ACTUAL TOP AND BOTTOM OF THE WALL STRUCTURE.

EARTHWORK BALANCING NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPORTING OR EXPORTING ALL MATERIALS AS REQUIRED TO PROPERLY GRADE THIS PROJECT TO THE FINISHED ELEVATIONS SHOWN ON THE APPROVED PLANS. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION OF CUT AND FILL QUANTITIES AND ALLOW FOR REMOVAL OF EXCESS OR IMPORTATION OF ADDITIONAL MATERIAL AT NO ADDITIONAL COST TO THE OWNER.

BENCHMARKS:
(ENTER DATUM HERE)

BM #300 (REMOVED DURING CONSTRUCTION)
ARROW WIDIMPLE ON A HYDRANT LOCATED ON THE SOUTH SIDE OF CUTTING BLVD., APPROX. 189' EAST FROM THE CENTERLINE OF LIVERNOIS ROAD.
ELEV. - 747.86

BM #301
ARROW WIDIMPLE ON A HYDRANT LOCATED ON THE EAST SIDE OF LIVERNOIS ROAD, APPROX. 138' SOUTH FROM THE CENTERLINE OF CUTTING BLVD.
ELEV. - 745.70

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP "TYPE R"
SIDEWALK RAMP "TYPE P"

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

NORTHWEST CORNER
SECTION 10
T02N, R11E

RM 748.44
12°N 730.07
12°S 730.07
6°SW 740.07
6°NW 741.35
8°NE 731.04 (UNDER A LADDER)

RM 746.60
RM 746.71
6°N 740.63
8°NE 734.61
8°SW 734.44

5940 LIVERNOIS RD.
PARCEL NO. 20-10-101-008

PARCEL NO. 20-10-101-009

61 CUTTING BLVD.
PARCEL NO. 20-10-101-010

LIVERNOIS ROAD
(VARIABLE WIDTH)

60 CUTTING BLVD.
PARCEL NO. 20-10-101-059

5900 LIVERNOIS RD.
PARCEL NO. 20-10-101-059

WEST 1/4 CORNER
SECTION 10
T02N, R11E

RM 746.88
12°N 738.49
12°S 728.47

CUTTING BLVD.
(VARIABLE WIDTH)

PROPOSED BUILDING
2,531 SF.

DO NOT EXCEED 2%
SLOPE WITHIN BARRIER
FREE PARKING AREAS.

DO NOT EXCEED 2%
CROSS SLOPE ON
ALL WALKWAYS, TYP.

DO NOT EXCEED 2%
CROSS SLOPE ON
ALL WALKWAYS, TYP.

MATCH EX. ±746.10

MATCH EX. ±745.90

MATCH EX. ±744.00

MATCH EX. ±742.90

MATCH EX. ±743.00

EXISTING ±745.00

EXISTING ±745.80

EXISTING ±743.85

EXISTING ±743.50

EXISTING ±742.85

EXISTING ±742.40

MATCH EX. ±745.90

MATCH EX. ±745.80

MATCH EX. ±744.95

MATCH EX. ±744.35

MATCH EX. ±742.90

MATCH EX. ±742.60

MATCH EX. ±746.05

MATCH EX. ±745.90

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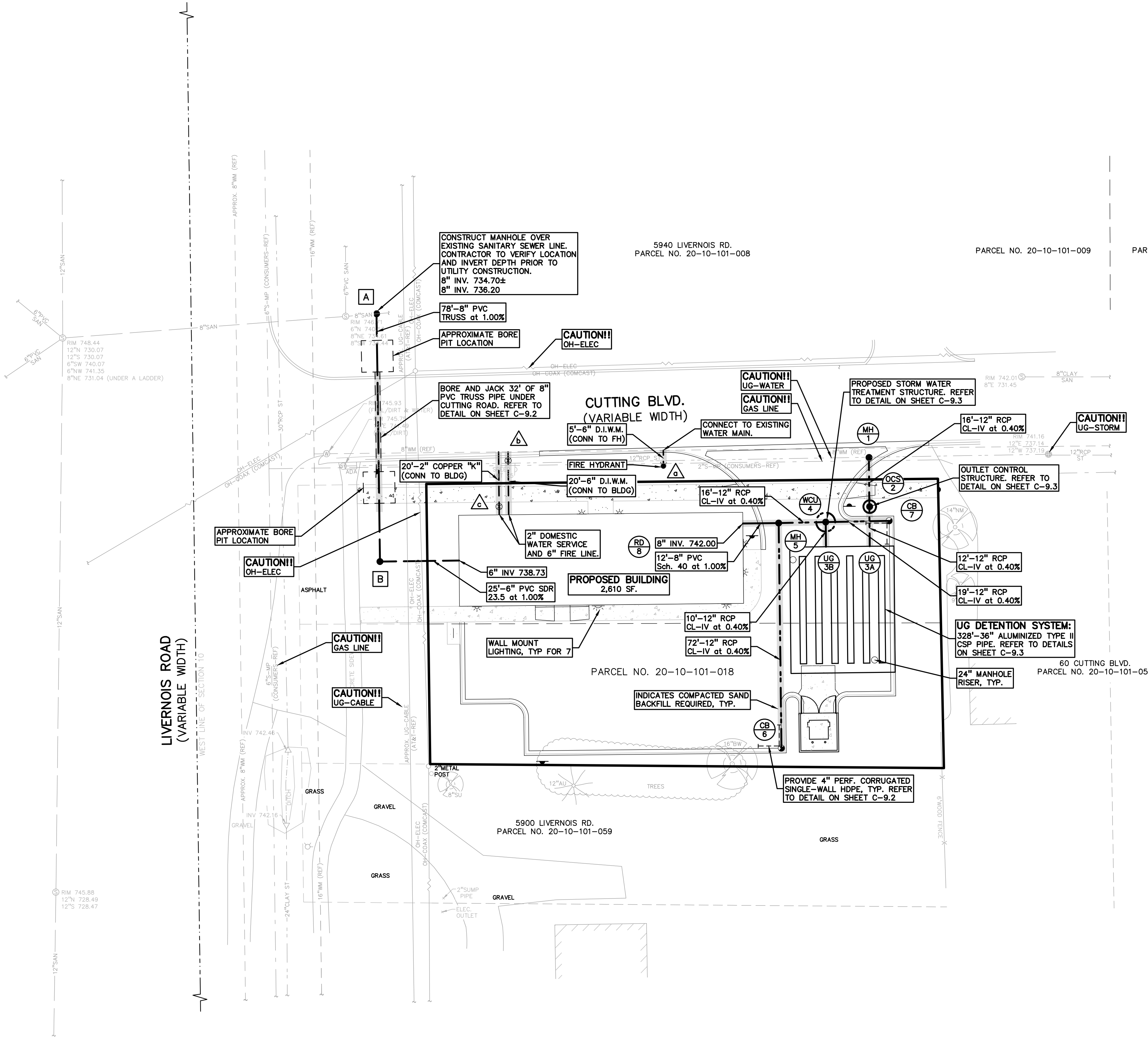
MATCH EX. ±745.40

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NOT FOR CONSTRUCTION

C-4.0



Rainfall Intensity		
Time of Concentration (T _c)		11.00 min
Since T _c <= 15 min, I ₁ = 2.0 in/hr		
I ₁ = 30.2 / [(T + 9.17) ^{0.81}]		2.00 in/hr
I ₁₀ = 60 / [(T + 9.17) ^{0.81}]		5.26 in/hr
I ₁₀₀ = 83.3 / [(T + 9.17) ^{0.81}]		7.31 in/hr
CPVC: Channel Protection Volume Control Volume		
V _{cpvc} = (4719)CA	1,235 cf	
CPVC: Channel Protection Rate Control Volume: Extended Detention		
VED = (6897)CA	1,806 cf	
CPVC Allowable Outlet Rate		
Q _{out} = V _{ED} / (48*60*60)	0.01 cfs	
Water Quality Control		
Forebay Volume = (545)CA	143 cf	
Forebay Release Rate: Q _{VF} = VF / (48*60*60)	0.001 cfs	
100-Year Allowable Outlet Rate		
Since A < 2.0 Ac, Q _{rr} = 1.0		
Q _{rr} =	1.00 cfs/ac	
100-Year Peak Allowable Discharge		
Q ₁₀₀ = Q _{rr} (A)	0.34 cfs	
100-Year Runoff Volume		
V _{100R} = (18,955)CA	4,970 cf	
100-Year Peak Inflow		
Q _{100I} = C _i (100)A	1.91 cfs	
Storage Curve Factor (Vs/V_i)		
R = 0.205 - 0.15 x ln(Q _{100I} /Q _{100I(N)})	0.465	
No infiltration will be provided, so no CPVC deduction is taken.		
I _s V ₁₀₀ >= V _{ED} ?	Yes	
V ₁₀₀ = Vs	2,311 cf	
V ₁₀₀ =	2,311 cf	

Design Requirements	for	WOU 4
Weighted Runoff Coefficient (C)	=	0.77
WOU Tributary Area (A)	=	0.34
WOU Time of Concentration (T _c)	=	11.00 min
(from Storm Sewer Calculations)		

Mechanical Separator Sizing	
I ₁ = 30.2 / [(T + 9.17) ^{0.81}]	2.65 in/hr
I ₁₀ = 60 / [(T + 9.17) ^{0.81}]	5.26 in/hr
Treatment Flow Rate	
Q ₁₀₀ = C _i (100)A	0.69 cfs
Bypass Flow Rate	
10 Year Peak Inflow: Q _{100I} =	1.38 cfs
Select Unit:	CS-4
Selected Unit Treatment Flow Rate:	1.80 cfs
Selected Unit Bypass Flow Rate:	4.50 cfs

Design Requirements	
CPVC Extended Detention: V _{ED} =	1,806 cf
CPVC Allowable Outlet Rate: Q _{out} =	0.01 cfs
100-Year Storage Volume: V _{100R} =	2,311 cf
100-Year Allowable Outlet Rate: Q _{out} =	0.34 cfs
Underground Detention Storage	
Required Storage Volume:	2,311 cf
Pipe Diameter:	36 in
Pipe Volume per Linear Foot:	7.07 c/lf
Total Pipe Length, L:	328 ft
Storage in Stone backfill?	N
Porosity	0 %
Stone Storage Volume:	0 cf
Stone Storage Volume per Linear Foot:	0.00 c/lf
Provided System Volume:	2,318 cft
Lowest Grade over system:	742.5
Required Cover over system:	2.00 ft
Invert of Detention System:	736.00
Invert of OCS:	735.95

Storage in Circular Pipe Detention System	
Effective End Area of Pipe:	7.07 sf
Effective Diameter of Pipe:	3.00 ft
Effective Invert of System:	735.95
CPVC Volume	
Fill Area of CPVC Storage Volume (CPVC _L):	1,806 cf
Φ:	280.00 degrees
Φ:	4.89 radians
Fill Area:	6.61 sf
Effective Fill Depth (per method above):	2.65 ft
V _{ED} Storage Elevation:	738.60
Fill Depth:	2.65 ft
Q _{out} Outlet Rate:	0.01 cfs
Aug. Head over Orifice (H _w):	h=0.5y
Area of Orifice (A):	0.0018 sf
A=Q _u /(0.62*SQRT(2*g*H _w))	
Enter Outlet Hole Diameter:	1 in
Restriction Hole Area:	0.0055 sf
Enter Number of Restriction Holes:	1
Set orifice elevation at:	735.95
Total Restriction Hole Area:	0.005 sf
Actual Discharge (Q):	0.031 cfs
Must be detained for at least 48 hours:	
Drain Time:	16.07 hrs

100-year Volume	
Fill Area of 100-Year Storage Volume:	2,311 cf
Φ:	7.05 sf
Φ:	330.00 degrees
Fill Area:	5.76 radians
Effective Fill Depth (per method above):	7.04 sf
V _{100R} Storage Elevation:	738.90
Fill Depth:	2.95 ft
Q _{100I} Outlet Rate:	0.34 cfs
Flow through Q _{100I} Orifice at this head:	0.047 cfs
Q _{100I} Allowed:	0.29 cfs
Aug. Head over Orifice (H _w):	h=0.5y
Area of Orifice (A):	0.0486 sf
A=Q _u /(0.62*SQRT(2*g*H _w))	
Outlet Hole Diameter:	3 in
Restriction Hole Area:	0.0491 sf
Number of Restriction Holes:	1
Set orifice elevation at:	738.60
Total Restriction Hole Area:	0.0491 sf
Actual Discharge (Q):	0.30 cfs
Is this less than the Q _{rr} of 0.34 cfs ?	
Yes	
Drain Time:	16.48 hrs

UTILITY LEGEND:	
OH-ELEC-W-O	EX. OH. ELEC. POLE & GUY WIRE
UG-CATV-T	EX. U.G. CABLE TV & PEDESTAL
UG-COMM-B-O	EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
UG-ELEC-O-E	EX. U.G. ELEC. MANHOLE, METER & HANDHOLE
-	EX. GAS LINE
⊗	EX. GAS VALVE & GAS LINE MARKER
⊞	EX. TRANSFORMER & IRRIGATION VALVE
-	EX. WATER MAIN
⊕	EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
⊗	EX. WATER VALVE BOX & SHUTOFF
⊕	EX. SANITARY SEWER
⊕	EX. SANITARY CLEANOUT & MANHOLE
⊕	EX. COMBINED SEWER MANHOLE
-	EX. STORM SEWER
⊕	EX. CLEANOUT & MANHOLE
⊕	EX. SQUARE, ROUND, & BEEHIVE CATCH BASIN
⊕	EX. YARD DRAIN & ROOF DRAIN
⊕	EX. UNIDENTIFIED STRUCTURE
-	PROPOSED WATER MAIN
⊕	PROPOSED HYDRANT AND GATE VALVE
⊕	PROPOSED TAPPING SLEEVE, VALVE & WELL
⊕	PROPOSED POST INDICATOR VALVE
⊕	PROPOSED SANITARY SEWER
⊕	PROPOSED SANITARY CLEANOUT & MANHOLE
-	PROPOSED STORM SEWER
⊕	PROPOSED STORM SEWER CLEANOUT & MANHOLE
⊕	PROPOSED CATCH BASIN, INLET & YARD DRAIN

STORM SEWER QUANTITIES:

4" HDPE UNDERDRAIN WITH SOCK	40 LF
8" PVC ASCH 40	12 LF
12" RCP CL-IV PIPE	135 LF
4" DIA. CATCH BASIN	2 EA
4" DIA. MANHOLE	2 EA
6" DIA. OUTLET CONTROL STRUCTURE	1 EA
CONSTRUCT MH OVER EXISTING LINE	1 EA
PUMP STATION	1 EA
(WATER TREATMENT UNIT)	1 EA

SANITARY SEWER QUANTITIES:

6" PVC SDR 23.5 PIPE	25 LF
8" PVC TRUSS PIPE	78 LF
4" DIA. MANHOLE	2 EA
CONSTRUCT MH OVER EXISTING LINE	1 EA

WATER MAIN QUANTITIES:

2" COPPER "K" WATER LEAD	20 LF
6" D.I.W.M. CLASS 54	25 LF
2" VALVE AND BOX	1 EA
8"x6" T.S.V. AND WELL	1 EA
HYDRANT ASSEMBLY	1 EA

NOTE:

CONTRACTOR TO VERIFY ALL QUANTITIES. ANY DEVIATIONS TO THE PLAN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF PEA GROUP FOR VERIFICATION, PRIOR TO BIDDING.

PREMIUM TRENCH BACKFILL NOTE:

ALL UTILITIES UNDER PAVEMENT OR WITHIN 3' OF THE EDGE OF PAVEMENT (OR WITHIN THE 45° LINE OF INFLUENCE OF PAVEMENT) SHALL HAVE M.I.D.T. CLASS II GRANULAR BACKFILL COMPACTED TO 95% MAX. DRY DENSITY (ASTM D-1557).

REFER TO:

UTILITY NOTES ON SHEET C-9.0
UTILITY DETAILS ON SHEET C-9.0

**CITY OF TROY STORM SEWER
FRAME AND COVER NOTES**

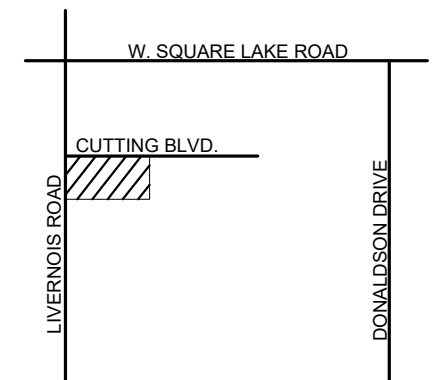
MANHOLE	
FRAME: EJ 1000	
COVER: TYPE "C" PERFORMED WITH "CITY OF TROY STORM" TEXT	
CATCH BASIN - PAVEMENT (RESIDENTIAL)	
FRAME: EJ 5080	
COVER: SINUSOIDAL M2	
CATCH BASIN - PAVEMENT (NON-RESIDENTIAL)	
FRAME: EJ 5105	
COVER: SINUSOIDAL M2	
CATCH BASIN - NON-PAVEMENT	
FRAME: EJ 1000	
COVER: TYPE "M","N" OR "O1" HEAVY DUTY	
CATCH BASIN - LANDSCAPE AREA OR ROADSIDE DITCH	
MAY REQUIRE:	
• EJ 1040 TYPE "N" OVAL GRATE OR TYPE 02 BEEHIVE GRATE	
• EJ 1130 TYPE "N" OVAL GRATE OR TYPE 01 BEEHIVE GRATE	
• EJ 2800 TYPE "N" OVAL GRATE OR TYPE 02 BEEHIVE GRTE	
• EJ 6508 OR EJ6517	



0 10 20 40
SCALE: 1" = 20'



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CITY OF TROY, OAKLAND COUNTY, MICHIGAN

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REVISED PRELIMINARY SPA	12-01-22
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ORIGINAL ISSUE DATE:
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DRAWING TITLE

**PRELIMINARY
UTILITY PLAN**

PEA JOB NO. 2022-1127

P.M. JPB

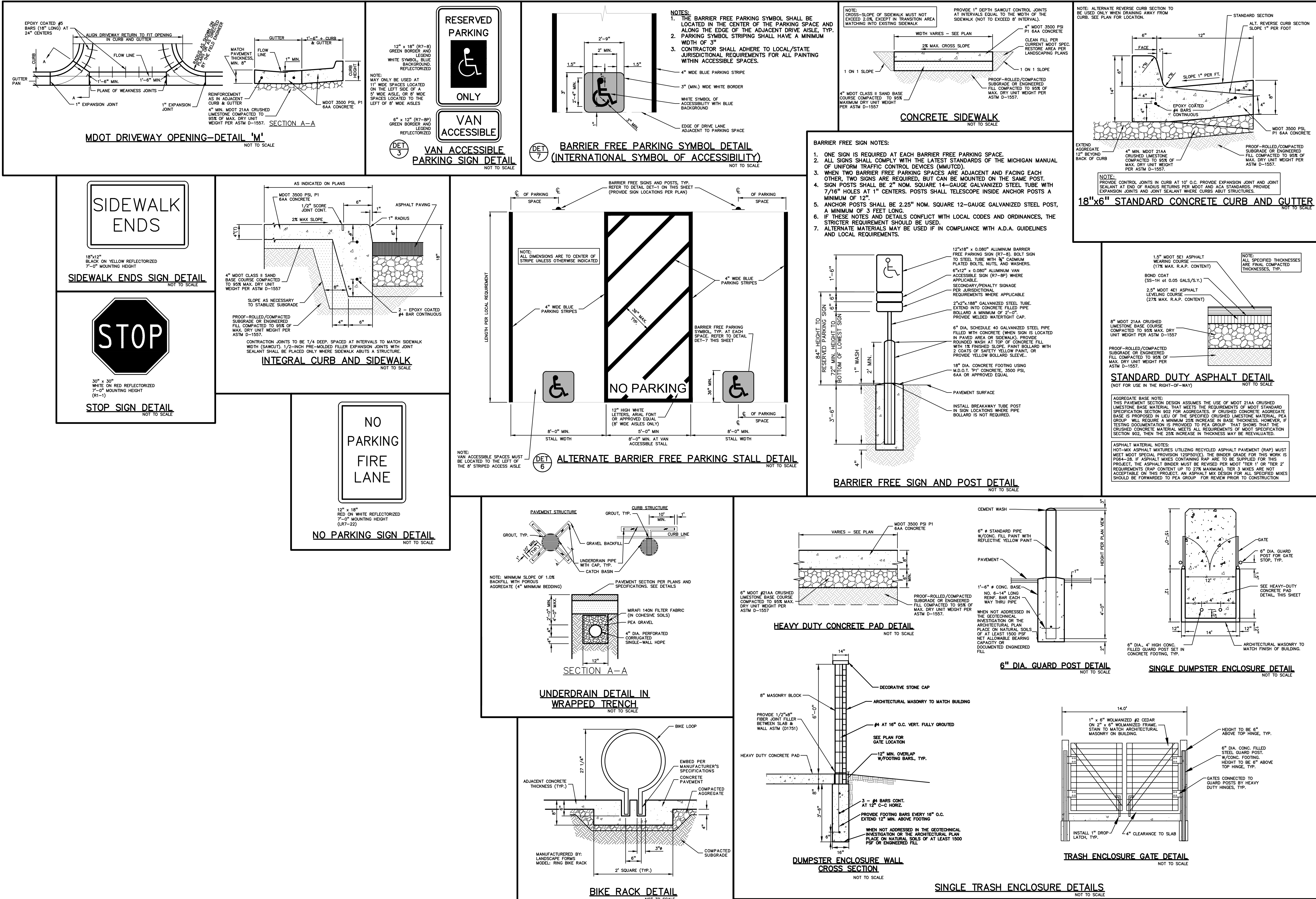
DN. SS

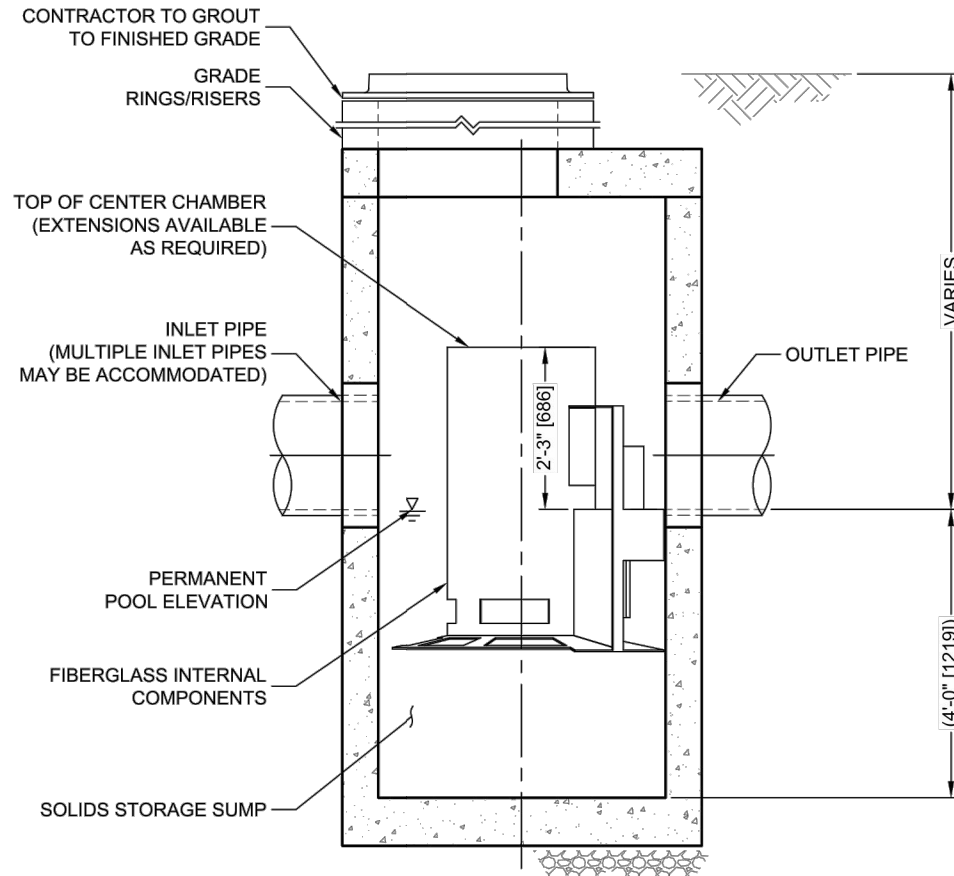
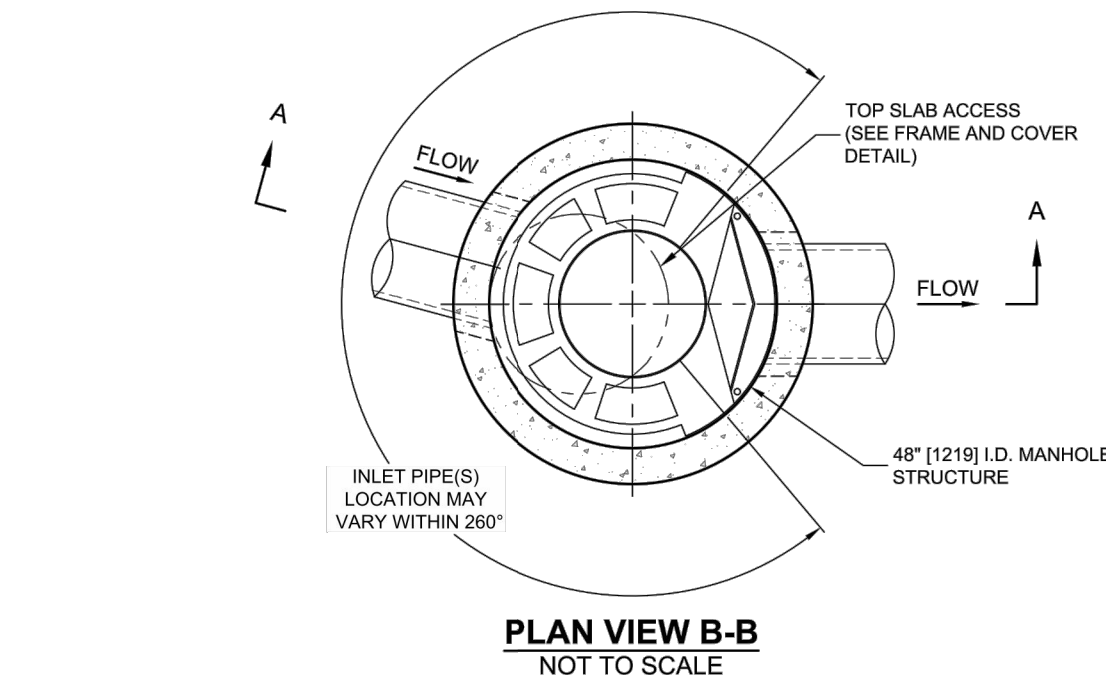
DES. SS

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C-6.0





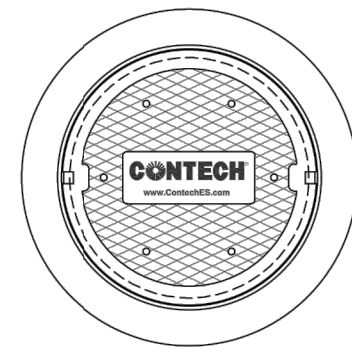
CASCADE separator™

CASCADE SEPARATOR DESIGN NOTES

THE STANDARD CS-4 CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION

- GRATED INLET ONLY (NO INLET PIPE)
- GRATED INLET WITH INLET PIPE OR PIPES
- CURB INLET ONLY (NO INLET PIPE)
- CURB INLET WITH INLET PIPE OR PIPES



FRAME AND COVER (DIAMETER VARIES) NOT TO SCALE

GENERAL NOTES

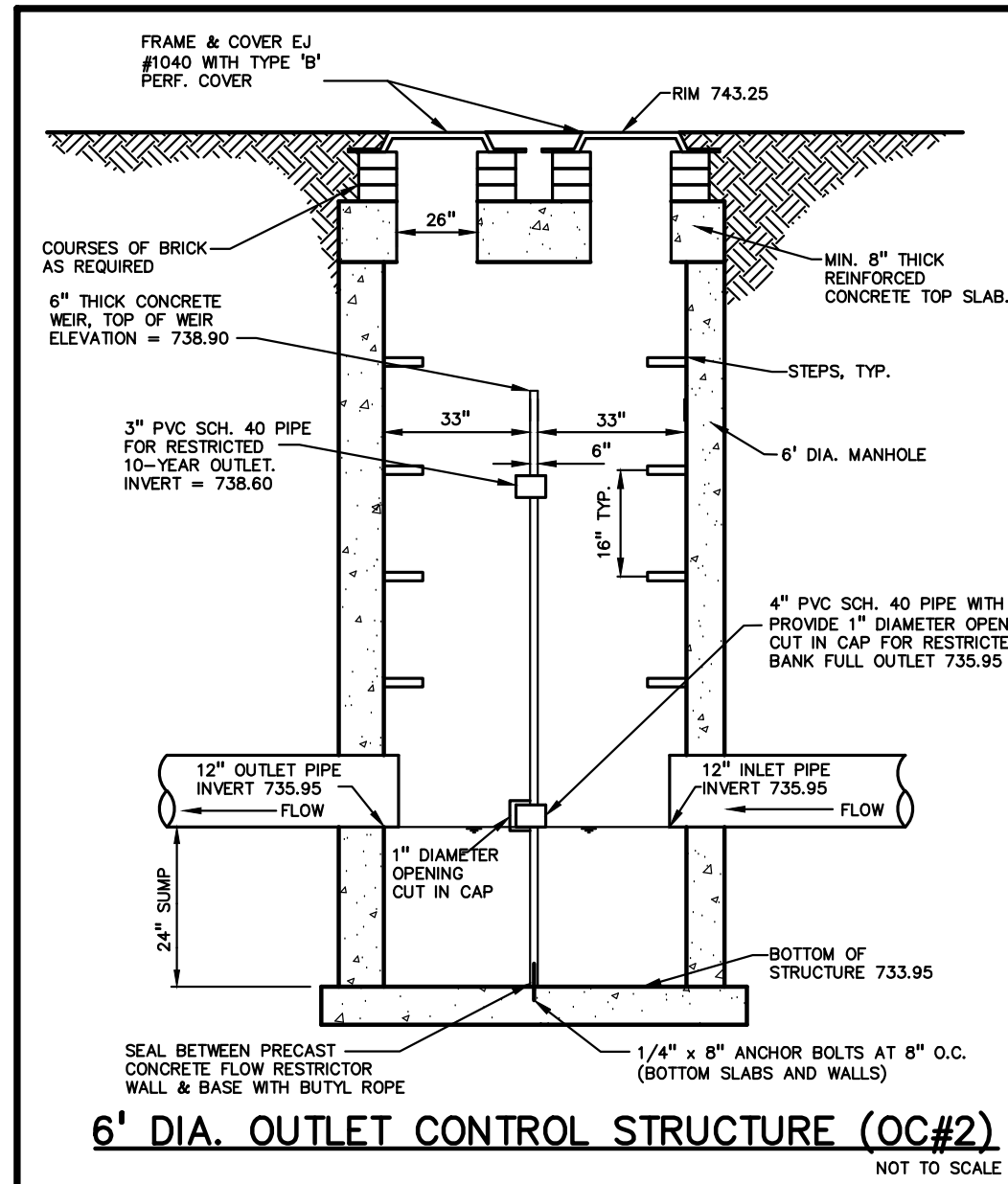
- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.conteches.com
- CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
- CASCADE SEPARATOR STRUCTURE SHALL MEET AASHTO H2020 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' @10', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M308 AND BE CAST WITH THE CONTECH LOGO.
- CASCADE SEPARATOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
- ALTERNATE UNITS ARE SHOWN IN MILLIMETERS (mm).

INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CASCADE SEPARATOR MANHOLE STRUCTURE.
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.



CS-4 CASCADE SEPARATOR STANDARD DETAIL



NOTES:

- CIRCULAR CSP SHALL CONFORM TO AASHTO M36 (ASTM-A760) AND SHALL BE MADE FROM ALUMINUMIZED TYPE II CORRUGATED 14 GAUGE STEEL CONFORMING TO AASHTO M274. THE USE OF CONTINUOUS WELDED SEAM PROCESS IN FABRICATION OF THE PIPES IS NOT PERMITTED. ALL PIPE AND FITTING CONNECTIONS REQUIRE MINIMUM 24" WIDE COUPLING BANDS.
- DUAL WALL HDPE PIPE SHALL CONFORM TO AASHTO M 294 AND SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321.
- ALL JOINTS ARE REQUIRED TO BE SOIL TIGHT.
- PIPE TO BE DESIGNED FOR "H20" PAVEMENT LOADING.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO CONSTRUCTION.
- UNDERGROUND DETENTION PIPES SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

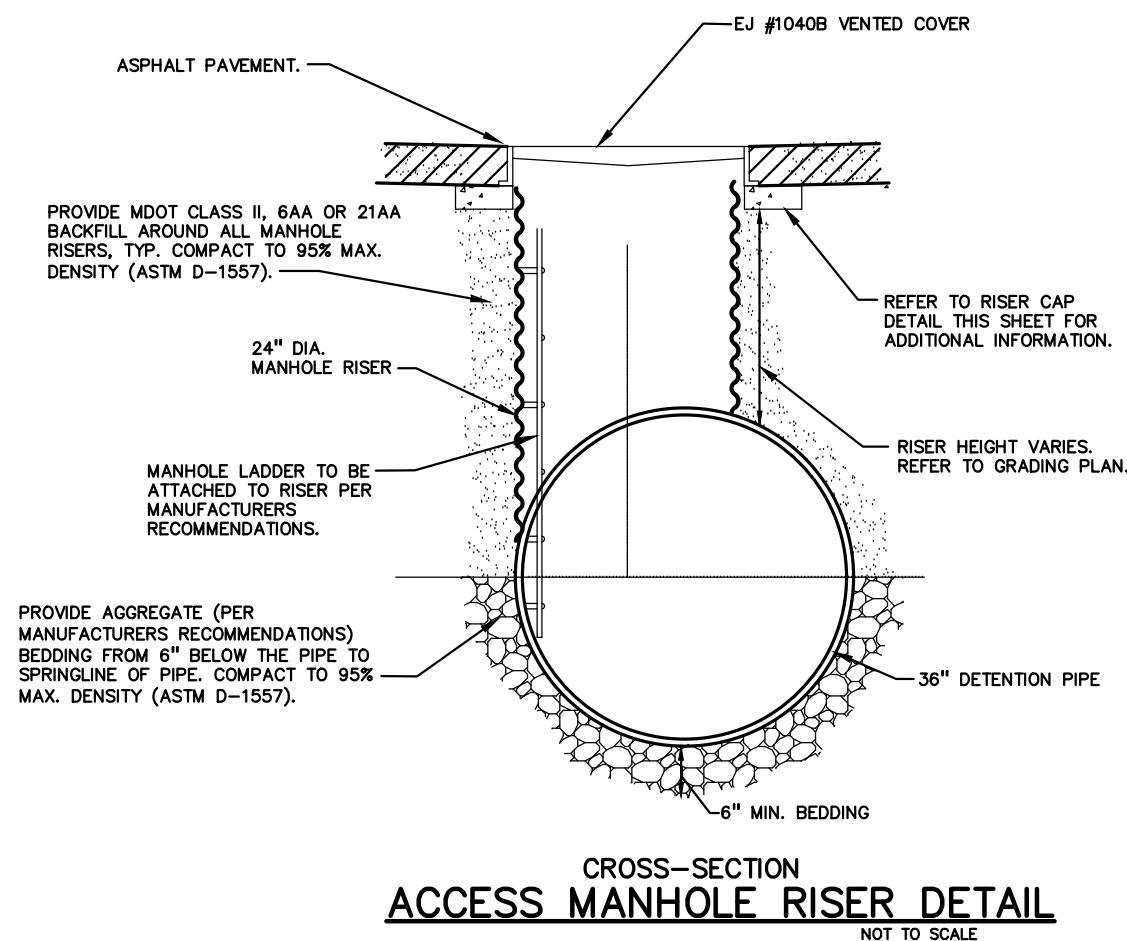
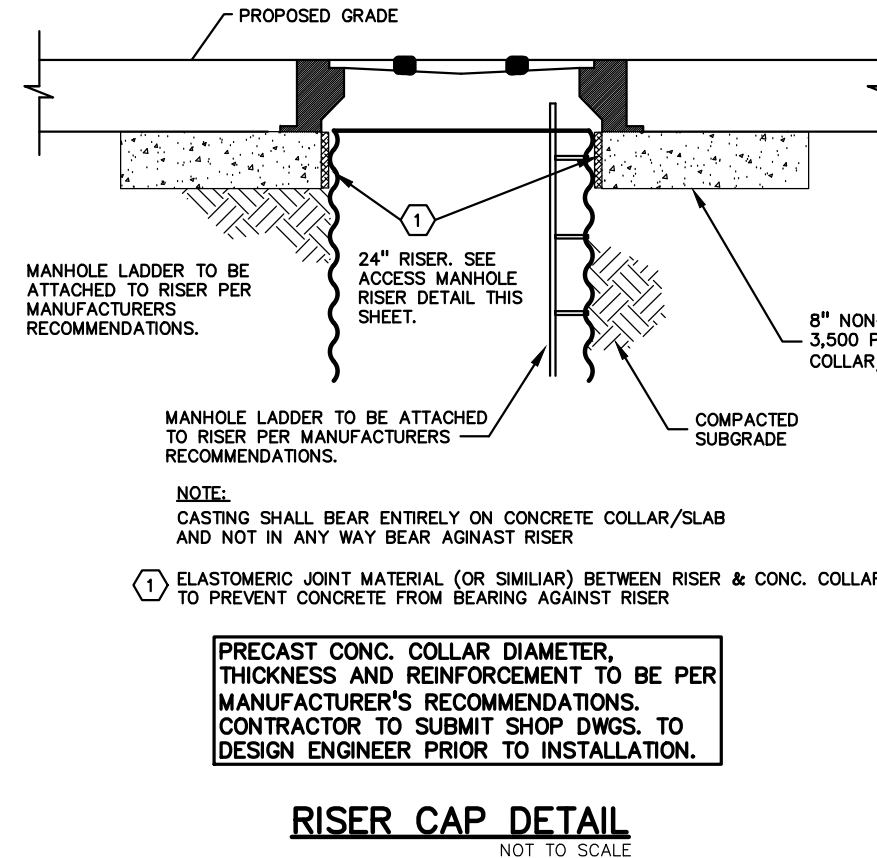
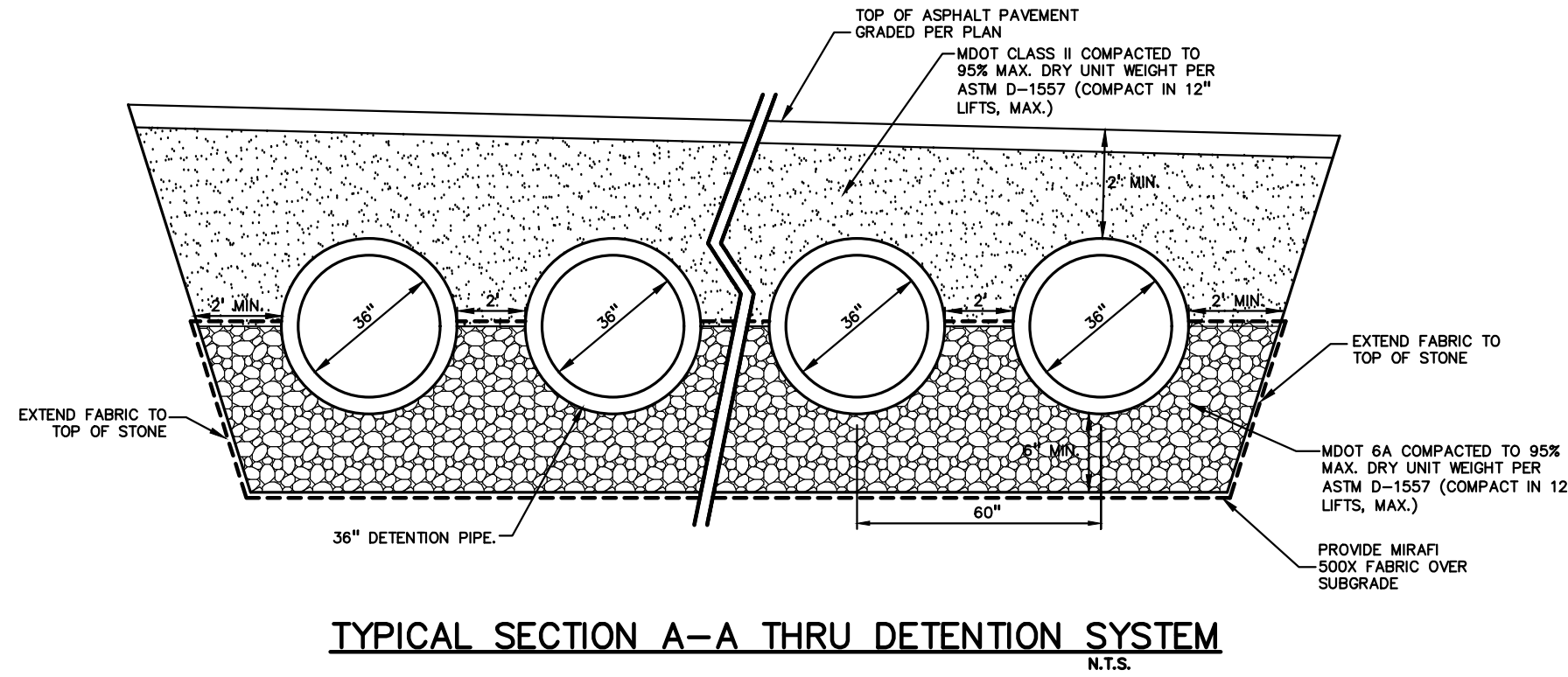
NOTE:

CASTING SHALL BEAR ENTIRELY ON CONCRETE COLLAR/SLAB AND NOT IN ANY WAY BEAR AGAINST RISER

ELASTOMERIC JOINT MATERIAL (OR SIMILAR) BETWEEN RISER & CONC. COLLAR TO PREVENT CONCRETE FROM BEARING AGAINST RISER

PRECAST CONC. COLLAR DIAMETER, THICKNESS AND REINFORCEMENT TO BE PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUBMIT SHOP DWGS. TO DESIGN ENGINEER PRIOR TO INSTALLATION.

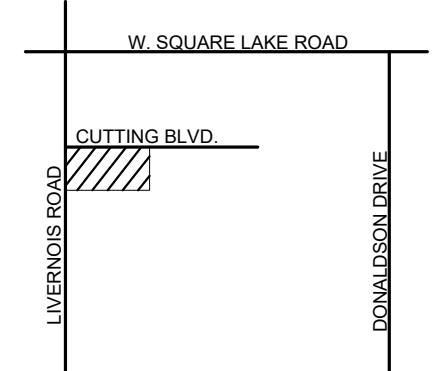
RISER CAP DETAIL NOT TO SCALE



0 10 20 40
SCALE: 1" = 20'



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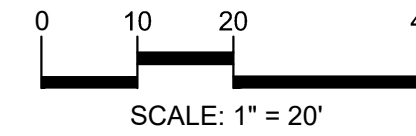
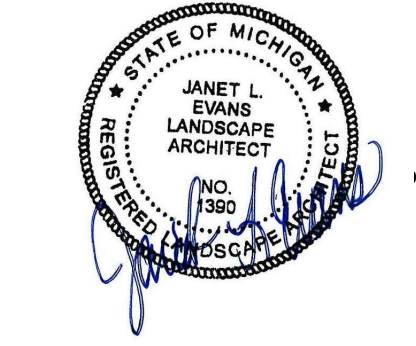
C-9.3

TREE PLANT LIST:					
QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC
1	AR2.5	Red Sunset Maple	<i>Acer rubrum 'Red Sunset'</i>	2.5" Cal.	B&B
3	MJ2.5	Marilee Crab	<i>Malus 'Jarmin' PP14337 (upright, fruitless, 10' x 20' ht.)</i>	2.5" Cal.	B&B
1	SR2.5	Japanese Tree Lilac	<i>Syringa reticulata 'Ivory silk' (15'x 20'ht. utility tree)</i>	2.5" Cal.	B&B
6	SS2.5	Slender Silhouette Sweetgum	<i>Liquidambar styraciflua 'Slender Silhouette' (6' w x 40' ht)</i>	2.5" Cal.	B&B
11	Total Dec.				
SHRUB PLANT LIST:					
QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC
36	JH6	Hetz Columnar Juniper	<i>Juniperus chinensis 'Hetzii Columnaris'</i>	6'	B&B
5	SN30	Neon Flash Spirea	<i>Spiraea japonica 'Neon Flash'</i>	30" Ht.	Cont.
22	TT6	Techny Arborvitae	<i>Thuja occidentalis 'Techny'</i>	6'	B&B
4	VC36	Korean Spice Viburnum	<i>Viburnum carlessii ' Compacta'</i>	36" Ht.	Cont.
67	Total Shrubs				

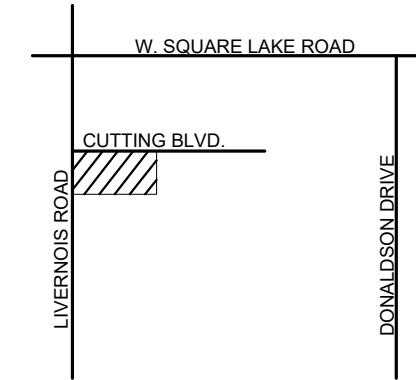
LANDSCAPE CALCULATIONS: PER CITY OF TROY ZONING ORDINANCE: OFFICE BUSINESS DISTRICT, MEDICAL OFFICE, USE GROUP 3
PARKING LOT LANDSCAPING REQUIRED: 1 TREE / 8 PARKING SPACES 14 PARKING SPACES / 8 = 2 TREES PROVIDED: 2 PROPOSED TREES
GREENBELT: REQUIRED: 1 TREE / 30 LF OF FRONTAGE LIVERNOIS RD.: 88.72 LF FRONTAGE/30 = 3 TREES CUTTING BLVD.: 162.06 LF FRONTAGE/30 = 5.4 TREES PROVIDED:LIVERNOIS RD: 3 TREES CUTTING BLVD.: 6 TREES
SCREENING BETWEEN LAND USES: EAST AND SOUTH P/L REQUIRED: ALTERNATE 1 OR 2 1 NARROW EVERGREEN SHRUB FOR EVERY 3' AT P/L OR OR 1 LARGE EVG. TREE PER 10'/LF PROVIDED: 22 NARROW EVERGREEN SHRUB EAST P/L 37 NARROW EVERGREEN SHRUB SOUTH P/L
GENERAL SITE LANDSCAPE REQUIRED: 20% OF SITE AREA SHALL BE LANDSCAPE MATERIAL 14,641 SQ FT + 20% = 2,928 SQ FT PROVIDED: 3,328 SQ FT OF SOFT-SCAPE
AT GRADE EQUIPMENT SCREENING REQUIRED: SCREEN EQUIPMENT WITH EVERGREEN LANDSCAPE MATERIALS, HT. MINIMUM TO EQUAL EQUIPMENT HT. PROVIDED: EVERGREEN/ SHRUBS AT TRANSFORMERS IF PRESENT
TREE REPLACEMENT: REQUIRED: HEALTHY 6" REG. TREE, NOT ON EXEMPT SPECIES LIST, REPLACE AT 50% OF DBH. LANDMARK REPLACE AT 100% OF DBH (2X INCH FOR INCH CREDIT FOR SAVED TREES) REMOVED: 0 PROVIDED: NONE REQUIRED

KEY:	
	= PARKING LOT TREES
	= GREENBELT TREES
	= SCREENING SHRUBS
	= IRRIGATED SOD LAWN
	= NON - IRRIGATED LAWN SEED/ RESTORATION
	= EXISTING PLANTS TO REMAIN WITH TREE PROTECTION FENCE
PLANT BEDS AND SOD LAWN AREAS TO BE IRRIGATED TREES TO BE LOCATED MINIMUM OF 5' OFF UTILITY LINES TYP.	
SEE SHEET L-1.1 FOR LANDSCAPE DETAILS	

GENERAL PLANTING NOTES:
1. LANDSCAPE CONTRACTOR SHALL VISIT SITE, INSPECT EXISTING SITE CONDITIONS AND REVIEW PROPOSED PLANTING AND RELATED WORK. IN CASE OF DISCREPANCY BETWEEN PLAN AND PLANT LIST, PLAN SHALL GOVERN QUANTITIES, CONTACT LANDSCAPE ARCHITECT WITH ANY CONCERNS.
2. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ON SITE UTILITIES PRIOR TO BEGINNING CONSTRUCTION ON HIS/HER PHASE OF WORK. ELECTRIC, GAS, TELEPHONE, CABLE TELEVISION MAY BE LOCATED BY CALLING MISS DIG 1-800-482-7171. ANY DAMAGE OR INTERRUPTION OF SERVICES SHALL BE THE RESPONSIBILITY OF CONTRACTOR. CONTRACTOR SHALL COORDINATE ALL RELATED ACTIVITIES WITH OTHER TRADES ON THE JOB AND SHALL REPORT ANY UNACCEPTABLE JOB CONDITIONS TO OWNER'S REPRESENTATIVE PRIOR TO COMMENCING.
3. ALL PLANT MATERIAL TO BE PREMIUM GRADE NURSERY STOCK AND SHALL SATISFY AMERICAN ASSOCIATION OF NURSERYMEN STANDARD FOR NURSERY STOCK. ALL LANDSCAPE MATERIAL SHALL BE NORTHERN GROWN, NO. 1. GRADE.
4. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON LANDSCAPE PLAN PRIOR TO PRICING THE WORK.
5. THE OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO REJECT ANY PLANT MATERIAL NOT MEETING SPECIFICATIONS.
6. ALL SINGLE STEM SHADE TREES TO HAVE STRAIGHT TRUNKS AND SYMMETRICAL CROWNS.
7. ALL SINGLE TRUNK SHADE TREES TO HAVE A CENTRAL LEADER; TREES WITH FORKED OR IRREGULAR TRUNKS WILL NOT BE ACCEPTED.
8. ALL MULTI STEM TREES SHALL BE HEAVILY BRANCHED AND HAVE SYMMETRICAL CROWNS. ONE SIDED TREES OR THOSE WITH THIN OR OPEN CROWNS SHALL NOT BE ACCEPTED.
9. ALL EVERGREEN TREES SHALL BE HEAVILY BRANCHED AND FULL TO THE GROUND, SYMMETRICAL IN SHAPE AND NOT SHEARED FOR THE LAST FIVE GROWING SEASONS.
10. ALL TREES TO HAVE CLAY OR CLAY LOAM BALLS, TREES WITH SAND BALLS WILL BE REJECTED.
11. NO MACHINERY IS TO BE USED WITHIN THE DRIP LINE OF EXISTING TREES. HAND GRADE ALL LAWN AREAS WITHIN THE DRIP LINE OF EXISTING TREES.
12. ALL TREE LOCATIONS SHALL BE STAKED BY LANDSCAPE CONTRACTOR AND ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION OF THE PLANT MATERIAL.
13. IT IS MANDATORY THAT POSITIVE DRAINAGE IS PROVIDED AWAY FROM ALL BUILDINGS.
14. ALL PLANTING BEDS SHALL RECEIVE 3" SHREDDED HARDWOOD BARK MULCH WITH PRE EMERGENT, SEE SPECIFICATIONS. SHREDDED PALETTE AND DYED MULCH WILL NOT BE ACCEPTED.
15. ALL LANDSCAPED AREAS SHALL RECEIVE 3" COMPACTED TOPSOIL.
16. SEE SPECIFICATIONS FOR ADDITIONAL COMMENTS, REQUIREMENTS, PLANTING PROCEDURES AND WARRANTY STANDARDS.
17. FOR NON-LAWN SEED MIX AREAS, AS NOTED ON PLAN, BRUSH MOW ONCE SEASONALLY FOR INVASIVE SPECIES CONTROL.
18. CONTRACTOR SHALL NOT INSTALL PLANTS UNDER BUILDING OVERHANG AND SHALL NOTIFY LANDSCAPE ARCHITECT IF DRAWINGS CONFLICT WITH BUILDING OVERHANGS.
19. TREES SHALL NOT CONFLICT/ BLOCK PROPOSED REGULATORY/ DIRECTION SIGNAGE, MONUMENT SIGNS, ADDRESS OR LIGHT POLES. SHIFT TREES AS NECESSARY TYP.



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**PRELIMINARY
LANDSCAPE
PLAN**

PEA JOB NO.	2022-1127
P.M.	JPB
DN.	JLE
DES.	JLE

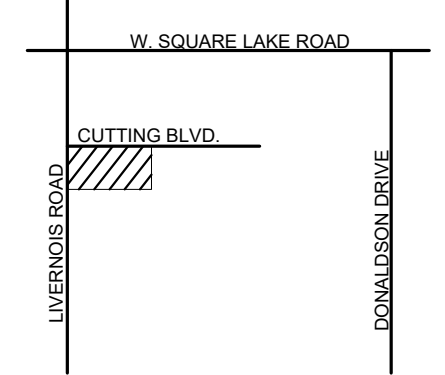
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L-1.0

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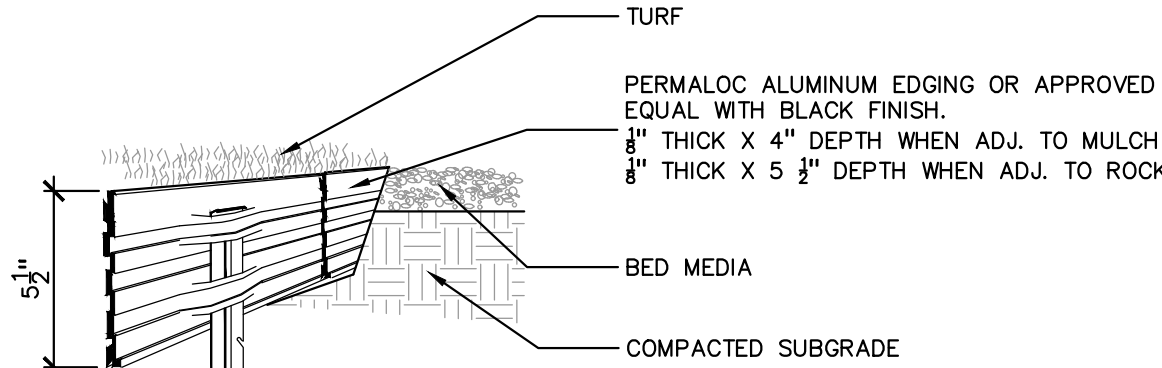
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DRAWING TITLE
**LANDSCAPE
DETAILS**

PEA JOB NO.	2022-1127
P.M.	JPB
DN.	JLE
DES.	JLE

DRAWING NUMBER:

L-1.1



SPECIFICATIONS FOR LANDSCAPE BED EDGING:

LANDSCAPE BED EDGING SHALL BE ALUMINUM AS MANUFACTURED BY PERMALOC 1.800.356.9660.

(8') EIGHT OR (16') SIXTEEN FOOT SECTIONS SHALL BE USED WITH ONE STAKE PER (38") THIRTY EIGHT INCHES OF EDGING.

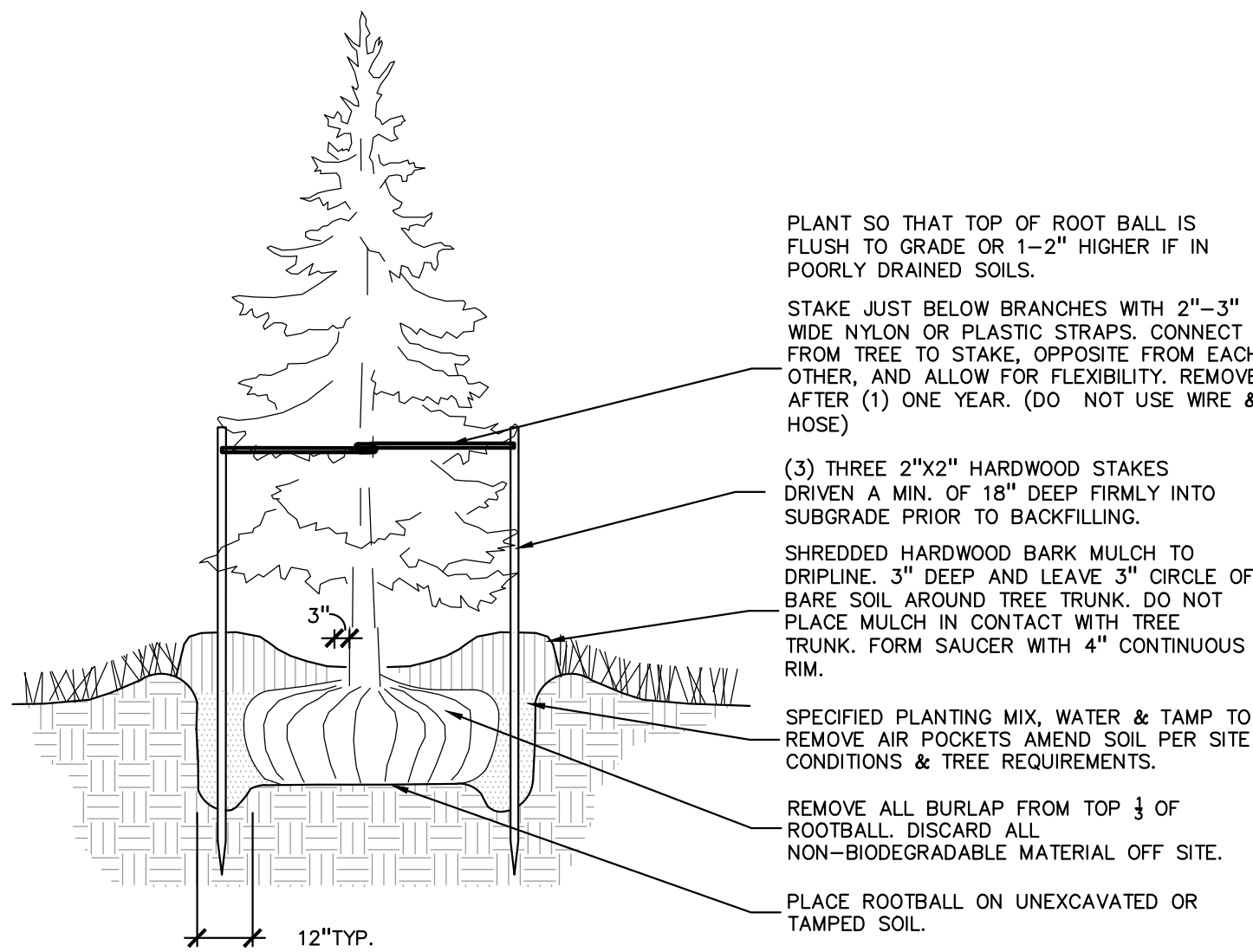
EDGING SHALL BE 1/2" THICK X 4" DEPTH WHEN ADJ. TO MULCH AND 1/2" THICK X 5 1/2" DEPTH WHEN ADJ. TO ROCK, FINISH, BLACK DURAFLEX MEETS AAMA 2603

STAKE SHALL SECURELY ENGAGE EDGING AND SHALL BE ENTIRELY BELOW TOP SURFACE OF EDGING.

EDGING SHALL HAVE A MINIMUM OF (2") TWO INCHES OF INTERLOCKING OVERLAP BETWEEN SECTIONS.

INSTALL AS PER MANUFACTURER'S SPECIFICATIONS WITH TOP OF EDGING 1/2"-1" ABOVE COMPACTED FINISH GRADE. FINISH GRADE TO BE COMPACTED ON EITHER SIDE OF EDGING TO MAINTAIN STABILITY.

3 ALUMINUM EDGE DETAIL
SCALE: 1/2" = 1'-0"



PLANT SO THAT TOP OF ROOT BALL IS FLUSH TO GRADE OR 1-2" HIGHER IF IN POORLY DRAINED SOILS.

STAKE JUST BELOW BRANCHES WITH 2"-3" WIDE NYLON OR PLASTIC STRAPS. CONNECT FROM TREE TO STAKE, OPPOSITE FROM EACH OTHER, AND ALLOW FOR FLEXIBILITY. REMOVE AFTER (1) ONE YEAR. (DO NOT USE WIRE & HOSE)

(3) THREE 2"x2" HARDWOOD STAKES DRIVEN A MIN. OF 18" DEEP FIRMLY INTO SUBGRADE PRIOR TO BACKFILLING.

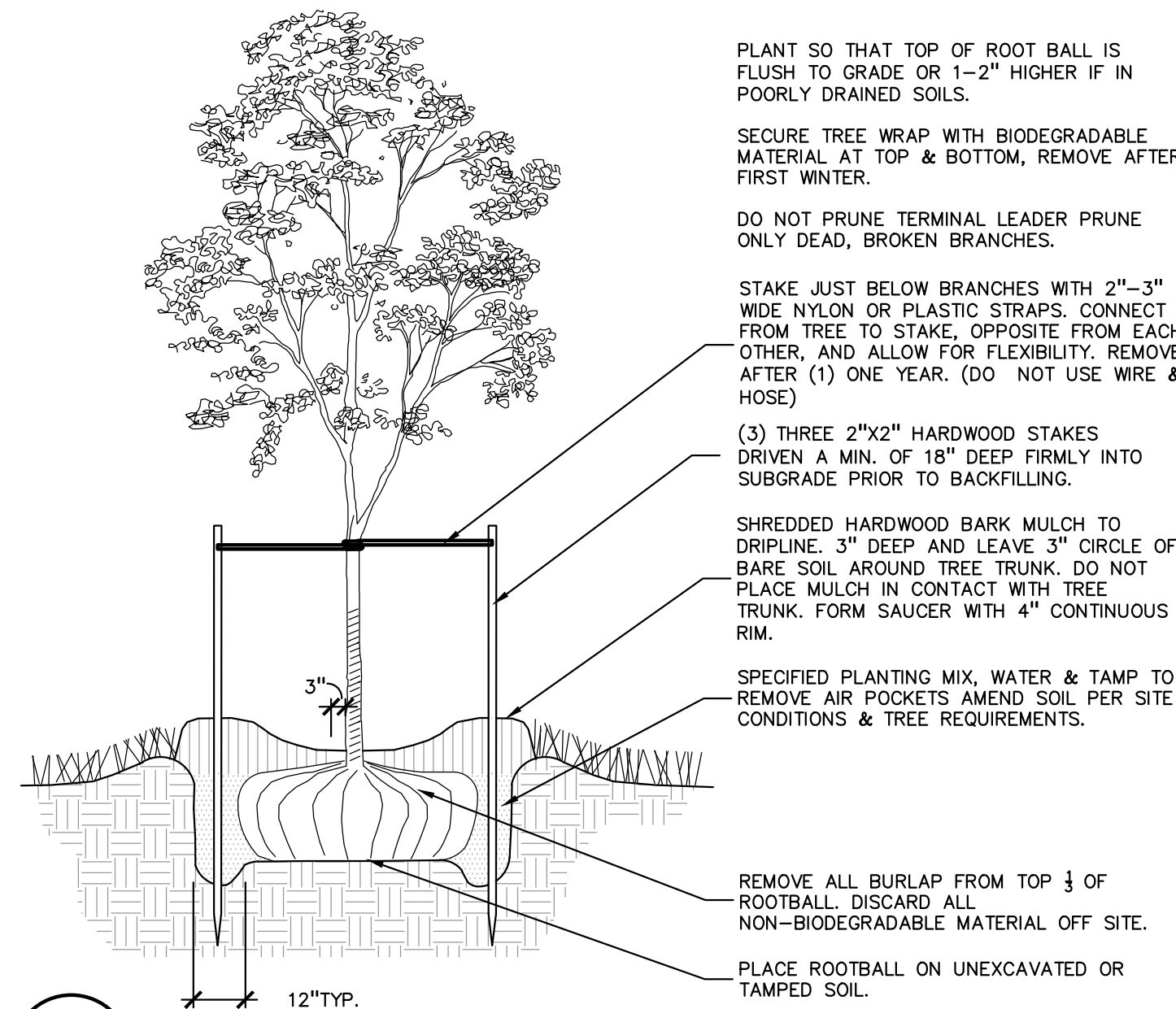
SHREDDED HARDWOOD BARK MULCH TO DRIFLINE, 3" DEEP AND LEAVE 3" CIRCLE OF BARE SOIL AROUND TREE TRUNK. DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK. FORM SAUCER WITH 4" CONTINUOUS RIM.

SPECIFIED PLANTING MIX, WATER & TAMP TO REMOVE AIR POCKETS AMEND SOIL PER SITE CONDITIONS & TREE REQUIREMENTS.

REMOVE ALL BURLAP FROM TOP 1/3 OF ROOTBALL. DISCARD ALL NON-BIODEGRADABLE MATERIAL OFF SITE.

PLACE ROOTBALL ON UNEXCAVATED OR TAMPED SOIL.

2 EVERGREEN TREE PLANTING DETAIL
SCALE: 1" = 3'-0"



PLANT SO THAT TOP OF ROOT BALL IS FLUSH TO GRADE OR 1-2" HIGHER IF IN POORLY DRAINED SOILS.

SECURE TREE WRAP WITH BIODEGRADABLE MATERIAL AT TOP & BOTTOM, REMOVE AFTER FIRST WINTER.

DO NOT PRUNE TERMINAL LEADER PRUNE ONLY DEAD, BROKEN BRANCHES.

STAKE JUST BELOW BRANCHES WITH 2"-3" WIDE NYLON OR PLASTIC STRAPS. CONNECT FROM TREE TO STAKE, OPPOSITE FROM EACH OTHER, AND ALLOW FOR FLEXIBILITY. REMOVE AFTER (1) ONE YEAR. (DO NOT USE WIRE & HOSE)

(3) THREE 2"x2" HARDWOOD STAKES DRIVEN A MIN. OF 18" DEEP FIRMLY INTO SUBGRADE PRIOR TO BACKFILLING.

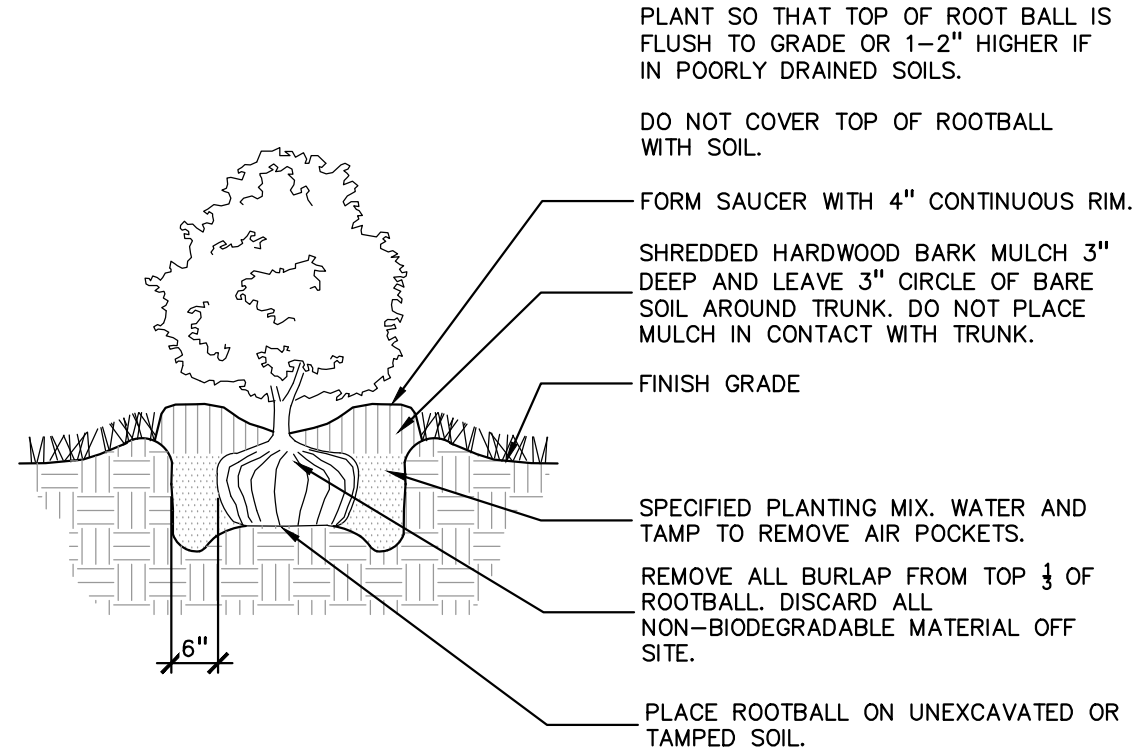
SHREDDED HARDWOOD BARK MULCH TO DRIFLINE, 3" DEEP AND LEAVE 3" CIRCLE OF BARE SOIL AROUND TREE TRUNK. DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK. FORM SAUCER WITH 4" CONTINUOUS RIM.

SPECIFIED PLANTING MIX, WATER & TAMP TO REMOVE AIR POCKETS AMEND SOIL PER SITE CONDITIONS & TREE REQUIREMENTS.

REMOVE ALL BURLAP FROM TOP 1/3 OF ROOTBALL. DISCARD ALL NON-BIODEGRADABLE MATERIAL OFF SITE.

PLACE ROOTBALL ON UNEXCAVATED OR TAMPED SOIL.

1 DECIDUOUS TREE PLANTING DETAIL
SCALE: 1" = 3'-0"



PLANT SO THAT TOP OF ROOT BALL IS FLUSH TO GRADE OR 1-2" HIGHER IF IN POORLY DRAINED SOILS.

DO NOT COVER TOP OF ROOTBALL WITH SOIL.

FORM SAUCER WITH 4" CONTINUOUS RIM.

SHREDDED HARDWOOD BARK MULCH 3" DEEP AND LEAVE 3" CIRCLE OF BARE SOIL AROUND TRUNK. DO NOT PLACE MULCH IN CONTACT WITH TRUNK.

FINISH GRADE

SPECIFIED PLANTING MIX, WATER AND TAMP TO REMOVE AIR POCKETS.

REMOVE ALL BURLAP FROM TOP 1/3 OF ROOTBALL. DISCARD ALL NON-BIODEGRADABLE MATERIAL OFF SITE.

PLACE ROOTBALL ON UNEXCAVATED OR TAMPED SOIL.

4 SHRUB PLANTING DETAIL
SCALE: 1" = 2'-0"

NOT FOR CONSTRUCTION

6" ROUND DIRECT
WET LOCATION
GAMMA SERIES

PROJECT: _____
TYPE: _____



SERIES	LUMENS ¹	CCT	OPTICS	DRIVER / DIMMING ²	LENS	MOUNTING ³	FINISH ⁴
CW0606PC 6" x 6"	10L 700 Lm 15L 1050 Lm 20L 1400 Lm 30L 2100 Lm 40L 2800 Lm	85 CRI 27K 2700K 30K 3000K 35K 3500K 40K 4000K	ND 14° MD 31° WD 75°	EX Electronic Driver, 120V/277V 1% 0-10V, 120V/277V DO10K D52W1 ELV/MLV, 120V	CL Clear Lens SO Micro Prism Solite™ Lens	WM Wall Mount	MW ⁵ Matte White MB ⁵ Matte Black PP ⁵ Platinum Silver CC Custom Color
CW0612PC 6" x 12"							
CW0618PC 6" x 18"							
		90 CRI 27K 2700K 30K 3000K				EMER BAT. OPTIONS EMEM 7W Remote EM EMEN 7W Remote EM with Enclosure	See Page 4 for Full Range of Color Options (83-00165)

EXAMPLE: CW0606PC15L35KNDX/CL/WM/MW

NOTES:
1. Estimated Delivered Lumens at 3000K. 2. Consult Factory for Additional Options. 3. See Mounting Page for Details on Components and Finishes.
4. See Color Page for More Options/Consult Factory for Special Finishes. 5. Standard Finishes.



Dimensions and values shown are nominal. Spectrum Lighting continually works to improve products and reserves the right to make changes which may alter the performance or appearance of products.

SPECTRUM
LIGHTING INC.

WWW.SPECLIGHT.COM • 994 JEFFERSON STREET, FALL RIVER, MA 02721 • 508.678.2303 FAX 508.678.2250

83-00195_BA



Plan View
Scale - 1" = 12ft

General Note

1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0", PROPERTY LINE SHOWN AT: 5' - 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.

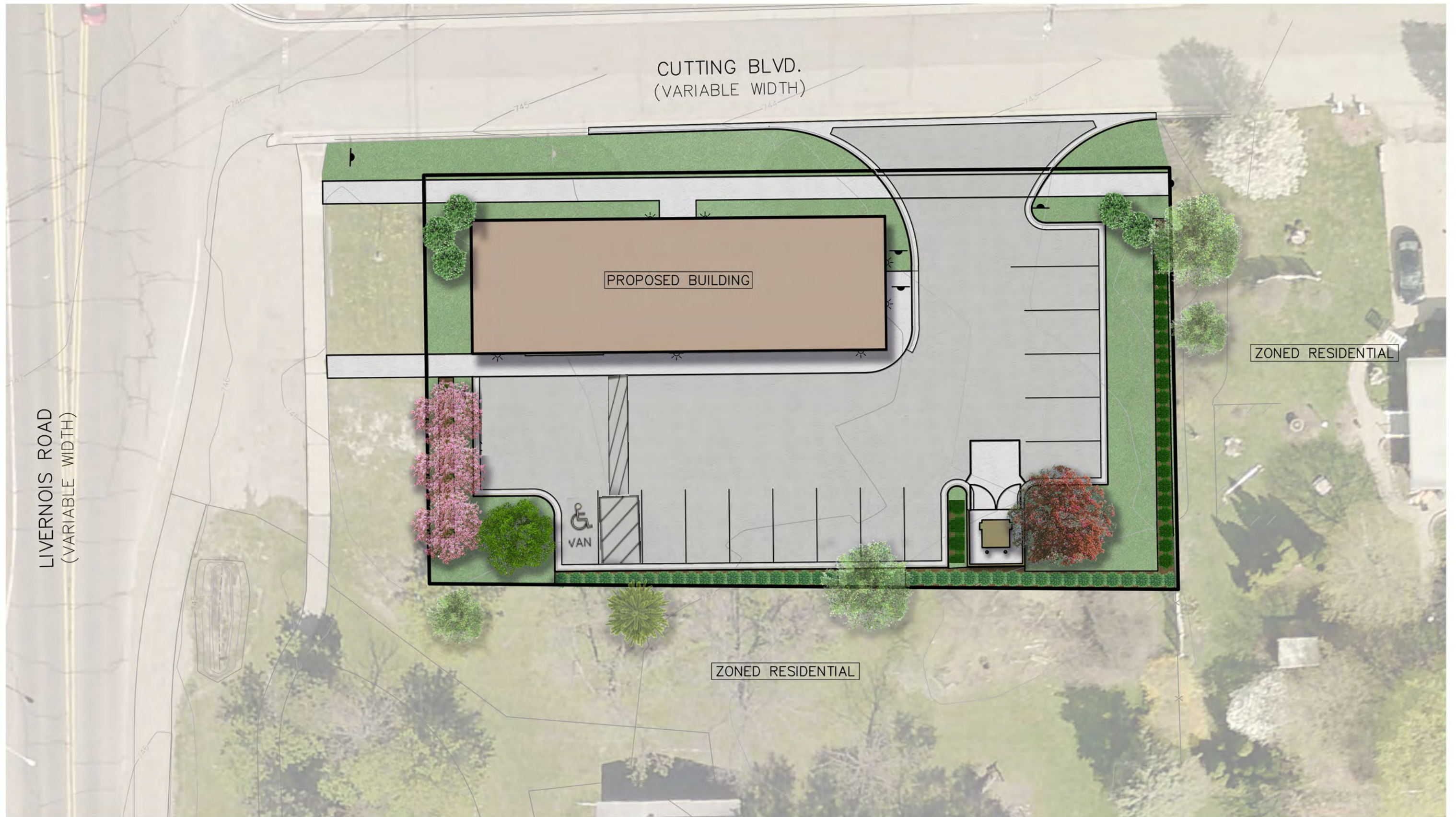
Schedule									
Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Lumens Per Lamp	Light Loss Factor	Wattage
	A	7	Spectrum Lighting	CW06XXPC 20L 35K WD XX CL XX	Nom 6" diam Gamma Cylinder (wet location), clear glass lens	LED	1376	0.9	12.9

Statistics							
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min	Avg/Max
Grade @ 0'		0.1 fc	19.4 fc	0.0 fc	N/A	N/A	0.0:1
Property Line @5' AFG		0.0 fc	0.0 fc	0.0 fc	N/A	N/A	N/A

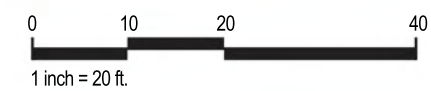


5920 LIVERNOIS OFFICE BUILDING
PHOTOMETRIC PLAN
PREPARED FOR: EUREKA BUILDING COMPANY
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

Designer
DS
Date
10/18/2022
Scale
Not to Scale
Drawing No.
#22-81372 V1
1 of 1



OFFICE - CUTTING & LIVERNOIS



Troy, MI | October, 2022

PEA GROUP
7927 Nemco Way, Ste 115
Brighton, MI 48116
t: 517.546-8583
f: 517.546.8973
www.peagroup.com



PROPOSED OFFICE BUILDING

5920 LIVERNOIS RD.

TROY, MI

PROJECT DATA

PROJECT NAME.....PROPOSED MEDICAL OFFICE
PROJECT LOCATION.....5920 LIVERNOIS RD. TROY, MI

PROJECT DESCRIPTION.....OFFICE

APPLICABLE CODES.....2015 MICHIGAN BUILDING CODE
2015 MICHIGAN MECHANICAL CODE
2015 MICHIGAN PLUMBING CODE
2014 NATIONAL ELECTRICAL CODE W/ STATE AMENDMENTS,
NEC 2014

2015 INTERNATIONAL FUEL GAS CODE, IFGC 2015
2015 INTERNATIONAL FIRE CODE

ACCESSIBILITY: MICHIGAN BARRIER FREE DESIGN LAW, P.A.
1966 AS AMENDED AND THE 2009 ICC/ANSI A117.1 STANDARD
AS REFERENCED FROM CHAPTER 11 OF THE 2015 MICHIGAN
BUILDING CODE.

CONSTRUCTION TYPE.....TYPE VB, UNPROTECTED, UNSPRINKLERED

BUILDING AREA.....4,982 SF
FIRST FLOOR AREA.....2,531 SF
SECOND FLOOR AREA.....2,451 SF
OCCUPANCY.....B - BUSINESS
EXIT ILLUMINATION.....EXIT LIGHTS ON EMERGENCY CIRCUIT WITH
BATTERY PACKS
OCCUPANT LOAD
FIRST FLOOR - OFFICE
2,531 SF/ 10025 PEOPLE
SECOND FLOOR - STORAGE
2,451 SF/ 5005 PEOPLE
TOTAL OCCUPANCY.....28 PEOPLE

MINIMUM REQ. ATTIC VENTILATION

ATTIC VENTILATION SHALL BE PROVIDED IN THE AMOUNT OF 1 SQ. FT. NET VENTILATION PER 300 SQ. FT. OF ATTIC SPACE W/ 50% PROVIDED BY GABLE ROOF AND/OR RIDGE VENTS AND THE BALANCE OF REQUIRED VENTILATION PROVIDED BY EAVE OR CORNICE VENTS.

SQUARE FOOTAGE

FIRST FLOOR AREA2,531 SF

SECOND FLOOR AREA2,451 SF

TOTAL HOME AREA4,982 SF

INDEX OF DRAWINGS

T.1PROJECT DATA

A.1FOUNDATION PLAN, WALL SECTIONS

A.2FLOOR PLANS, BARRIER FREE DETAILS

A.3EXTERIOR ELEVATIONS

CONTACT:

ERION NIKOLLA

CELL: 586.405.4080



NORTH

LOCATION KEY

NTS

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PROJECT

PROPOSED OFFICE BUILDING

5920 LIVERNOIS RD.

TROY, MI

SUBJECT

PROJECT DATA

ARKO DESIGN ASSOCIATES

2298 YASMIN DRIVE - COMMERCE TWP - MI - 48382

PH. (248) 802-8409

ISSUED:

SPA:

08-28-22

DRAWN

AK

CHECKED

AK

APPROVED

AK

BIDS

CONSTR

DO NOT SCALE

PRINTS - USE

FIGURED

DIMENSIONS ONLY

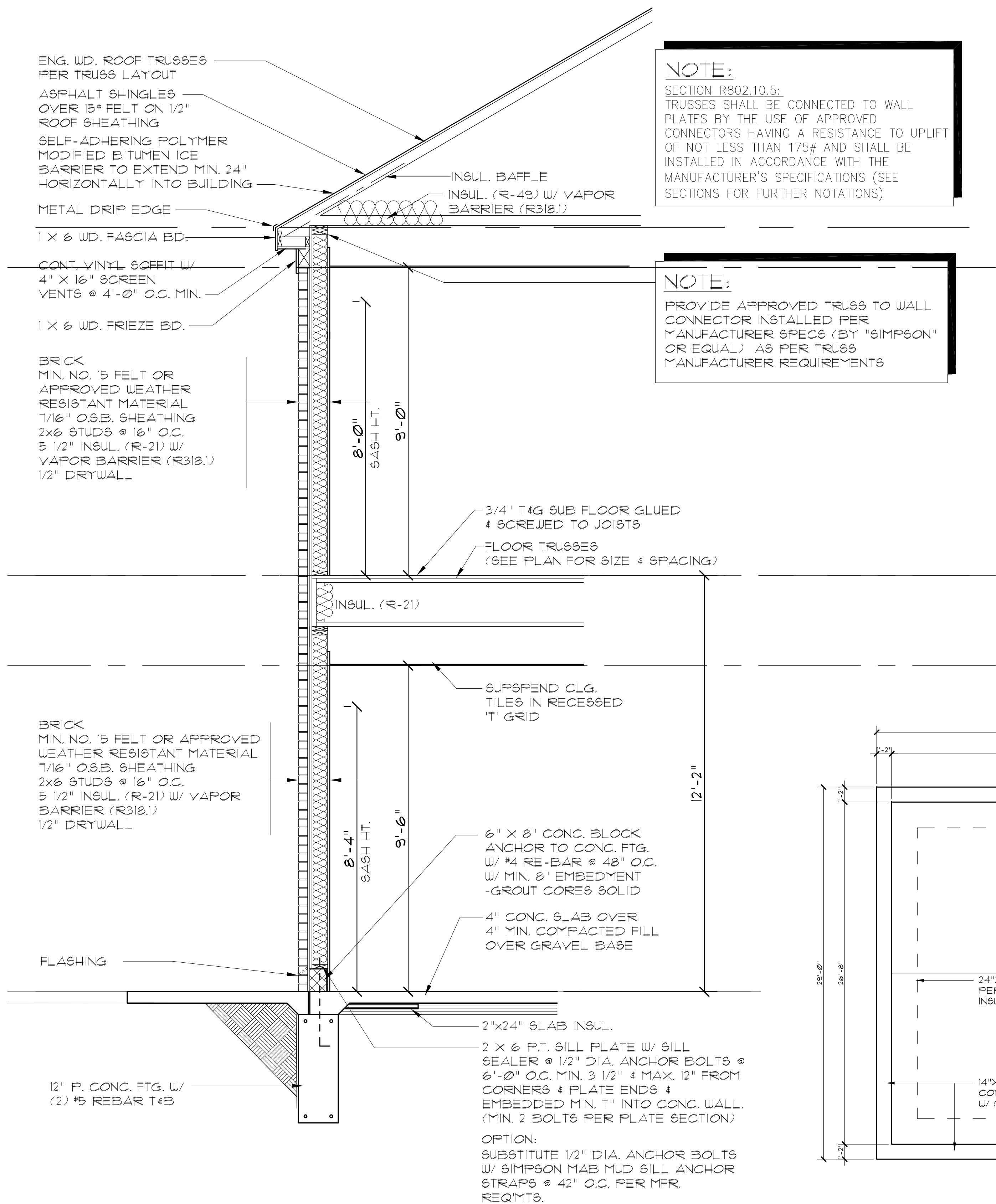
JOB NO.

2022-25

SHEET

T.1

OFFICE BUILDING



TYP. WALL SECTION

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

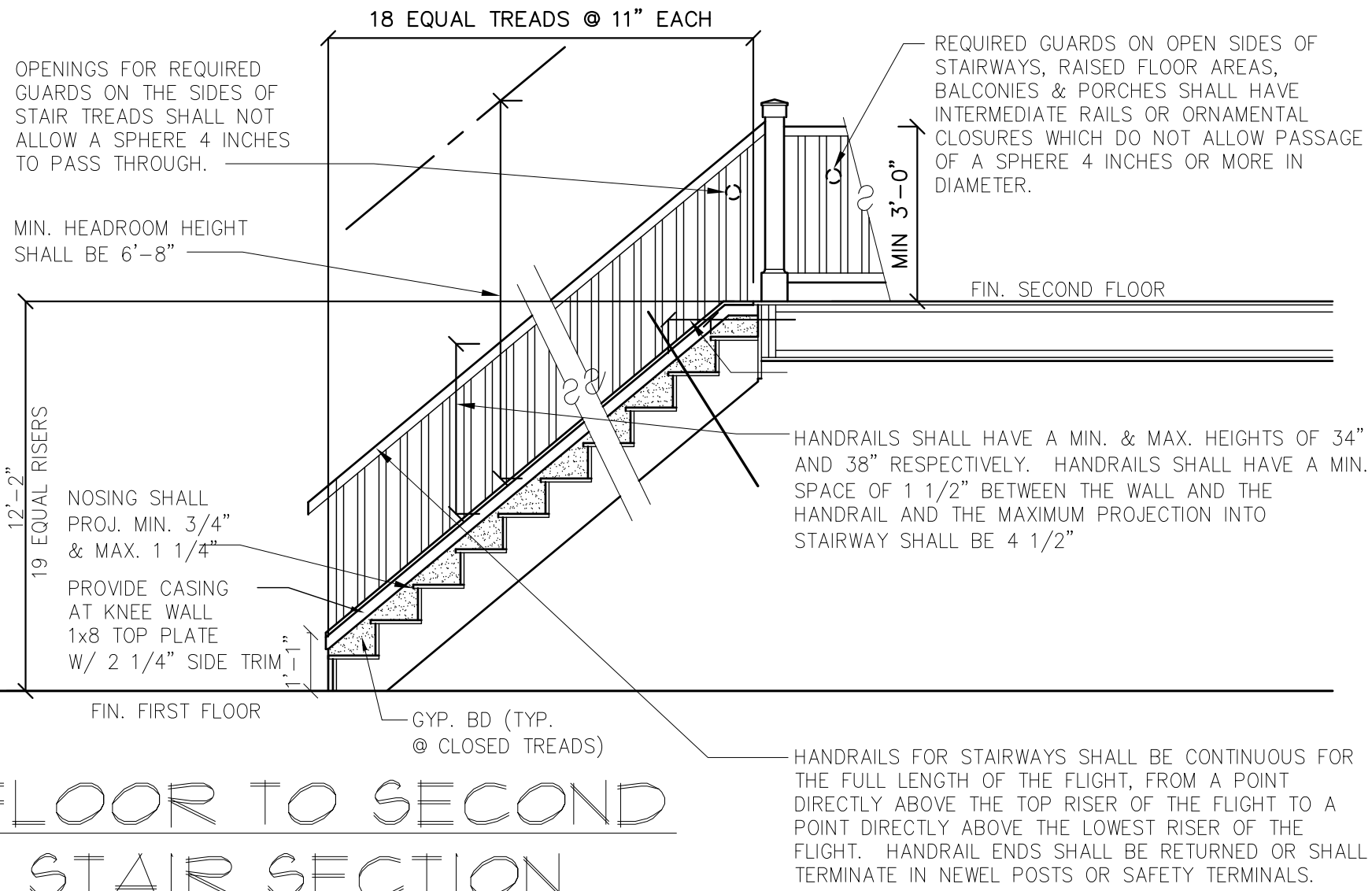
NOTE:

ALL FOOTINGS ARE DESIGNED FOR 3000 P.S.F. IT IS THE RESPONSIBILITY OF THE BUILDER TO FIELD TEST THE SOIL AND TO CONTACT THE ARCHITECT AND/ OR ENGINEER IF THE SOIL CAPACITY IS UNDER 3000 P.S.F.

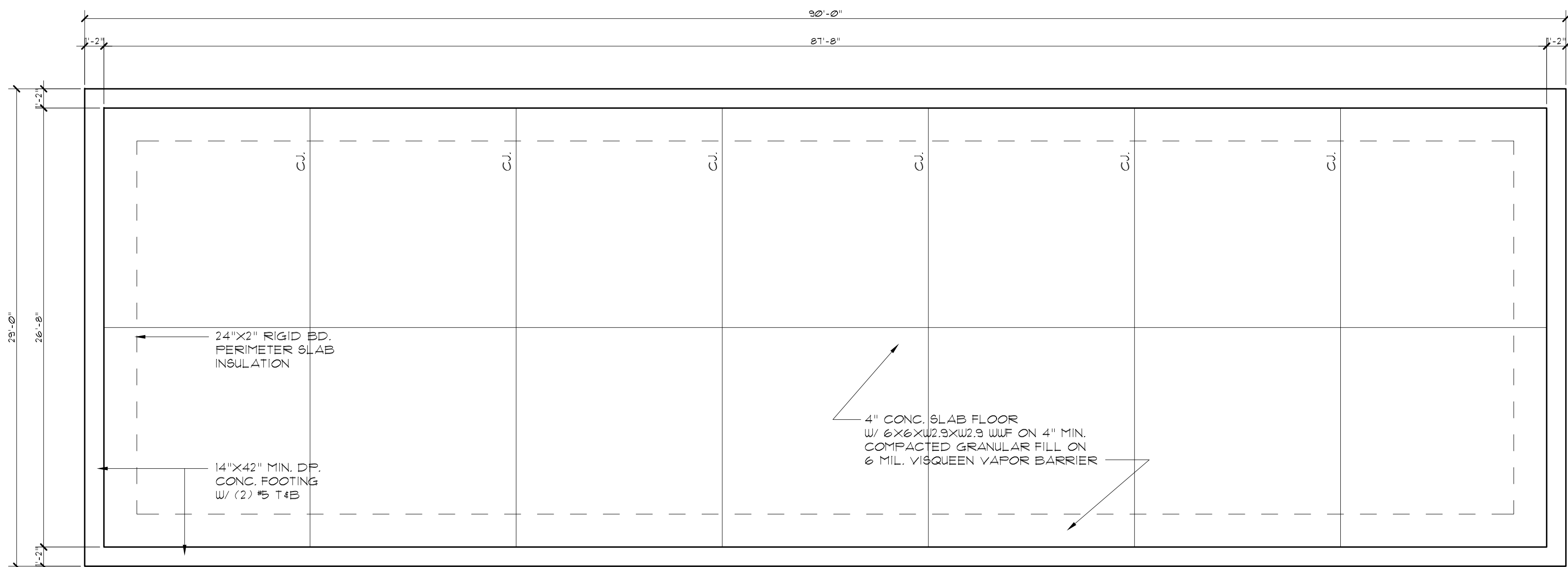
HANDRAILS

TYPE I. HANDRAILS WITH A CIRCULAR CROSS SECTION SHALL HAVE AN OUTSIDE DIAMETER OF AT LEAST 1 1/4 INCHES AND NOT GREATER THAN 2 INCHES. IF THE HANDRAIL IS NOT CIRCULAR IT SHALL HAVE A PERIMETER DIMENSION OF AT LEAST 4 INCHES AND NOT GREATER THAN 6 1/4 INCHES WITH A MAXIMUM CROSS SECTION OF DIMENSION OF 2 1/4 INCHES.

TYPE II. HANDRAILS WITH A PERIMETER GREATER THAN 6 1/4 INCHES SHALL PROVIDE A GRASPABLE FINGER RECESS AREA ON BOTH SIDES OF THE PROFILE. THE FINGER RECESS SHALL BEGIN WITHIN A DISTANCE OF 3/4 INCH MEASURED VERTICALLY FROM THE TALLEST PORTION OF THE PROFILE AND ACHIEVE A DEPTH OF AT LEAST 5/16 INCH WITHIN 7/8 INCH BELOW THE WIDEST PORTION OF THE PROFILE. THIS REQUIRED DEPTH SHALL CONTINUE FOR AT LEAST 3/8 INCH TO A LEVEL THAT IS NOT LESS THAN 1 3/4 INCHES BELOW THE TALLEST PORTION OF THE PROFILE. THE MINIMUM WIDTH OF THE HANDRAIL ABOVE THE RECESS SHALL BE 1 1/4 INCHES TO A MAXIMUM OF 2 3/4 INCHES. EDGES SHALL HAVE A MINIMUM RADIUS OF 0.01 INCHES.



FIRST FLOOR TO SECOND FLOOR STAIR SECTION



FOUNDATION PLAN

SCALE: 3/16" = 1'-0"

- A. LONG SIDE OF ANGLE TO BE PLACED IN A VERTICAL POSITION.
- B. REINFORCED LINTELS SHALL NOT BE LESS THAN 8 IN. TALL & ALL CELLS OF HOLLOW MASONRY LINTELS TO BE GROUTED SOLID. REINFORCEMENT SHALL NOT EXTEND LESS THAN 8 INCHES INTO THE SUPPORTING UNIT.
- C. ABOVE ITEMS ARE EXAMPLES: OTHER STEEL MEMBERS MEETING STRUCTURAL DESIGN REQUIREMENTS MAY BE USED.



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PROJECT

PROPOSED OFFICE BUILDING
5920 LIVERNOIS RD.
TROY, MI

SUBJECT

FLOOR PLANS

ARKO DESIGN ASSOCIATES
2298 YASMIN DRIVE - COMMERCE TWP - MI - 48382
PH. (248) 802-8409

ISSUED:
SPA:
09-26-22

DRAWN	AK
CHECKED	AK
APPROVED	AK
BIDS	
CONSTR	

DO NOT SCALE
PRINTS - USE
FIGURED
DIMENSIONS ONLY

JOB NO.
2022-25

SHEET

A.2

OFFICE
BUILDING



RIGHT (EAST) ELEVATION
SCALE: 3/16" = 1'-0"



FRONT (NORTH) ELEVATION
SCALE: 3/16" = 1'-0"



LEFT (WEST) ELEVATION
SCALE: 3/16" = 1'-0"



REAR (SOUTH) ELEVATION
SCALE: 3/16" = 1'-0"

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PROJECT
PROPOSED OFFICE BUILDING
5920 LIVERNOIS RD.
TROY, MI

SUBJECT
EXTERIOR ELEVATIONS

ARKO DESIGN ASSOCIATES
2288 YASMIN DRIVE - COMMERCE TWP - MI - 48382
PH. (248) 802-8409

ISSUED:
BY: [Signature]
DATE: 08-20-22

DRAWN AK
CHECKED AK
APPROVED AK
BIDS
CONSTR

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PRINTS - USE
FIGURED
DIMENSIONS ONLY

JOB NO.
2022-25

SHEET
A.3
OFFICE
BUILDING





ITEM #7

DATE: December 7, 2022

TO: Planning Commission

FROM: R. Brent Savidant, Community Development Director

SUBJECT: PRELIMINARY SITE PLAN REVIEW (File Number SP JPLN2022-0025) –
Proposed Lange View Townhouses, Southeast corner of Livernois and Leetonia
(4080 Livernois), Section 15, Currently Zoned NN Neighborhood Node (Node “H”)
District

The petitioner 4080 Troy LLC submitted the above referenced Preliminary Site Plan application for the 9-unit Lange View Estates Townhouses project. The units are proposed to be in one building that is 2 stories in height.

The property is currently zoned NN (Neighborhood Node “H”) District. Townhomes are permitted by right in the NN district. The Planning Commission is responsible for granting Preliminary Site Plan approval for this item.

The attached report prepared by Carlisle/Wortman Associates, Inc. (CWA), the City's Planning Consultant, summarizes the project. 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. Report prepared by Carlisle/Wortman Associates, Inc.

G:\SITE PLANS\SP JPLN2022-0025 LANGE VIEW NEW SUBMITTAL\PC Memo 2022 12 13.docx

PROPOSED RESOLUTION

PRELIMINARY SITE PLAN REVIEW (File Number SP JPLN2022-0025) – Proposed Lange View Townhouses, Southeast corner of Livernois and Leetonia (4080 Livernois), Section 15, Currently Zoned NN Neighborhood Node (Node “H”) District

Resolution # PC-2022-12-

Moved by:

Seconded by:

RESOLVED, That Preliminary Site Plan Approval, pursuant to Article 8 of the Zoning Ordinance, as requested for the proposed Lange View Townhouses, 9 units, located on the Southeast corner of Livernois and Leetonia (4080 Livernois), Section 15, Zoned NN (Neighborhood Node “H”) District, be granted, subject to applicant the following:

1. Relocate parking lot light as per report.

_____) or

(denied, for the following reasons: _____) or

(postponed, for the following reasons: _____)

Yes:

No:

MOTION CARRIED/FAILED



Carlisle | Wortman
ASSOCIATES, INC.

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

Date: November 22, 2021
May 17, 2022
November 8, 2022

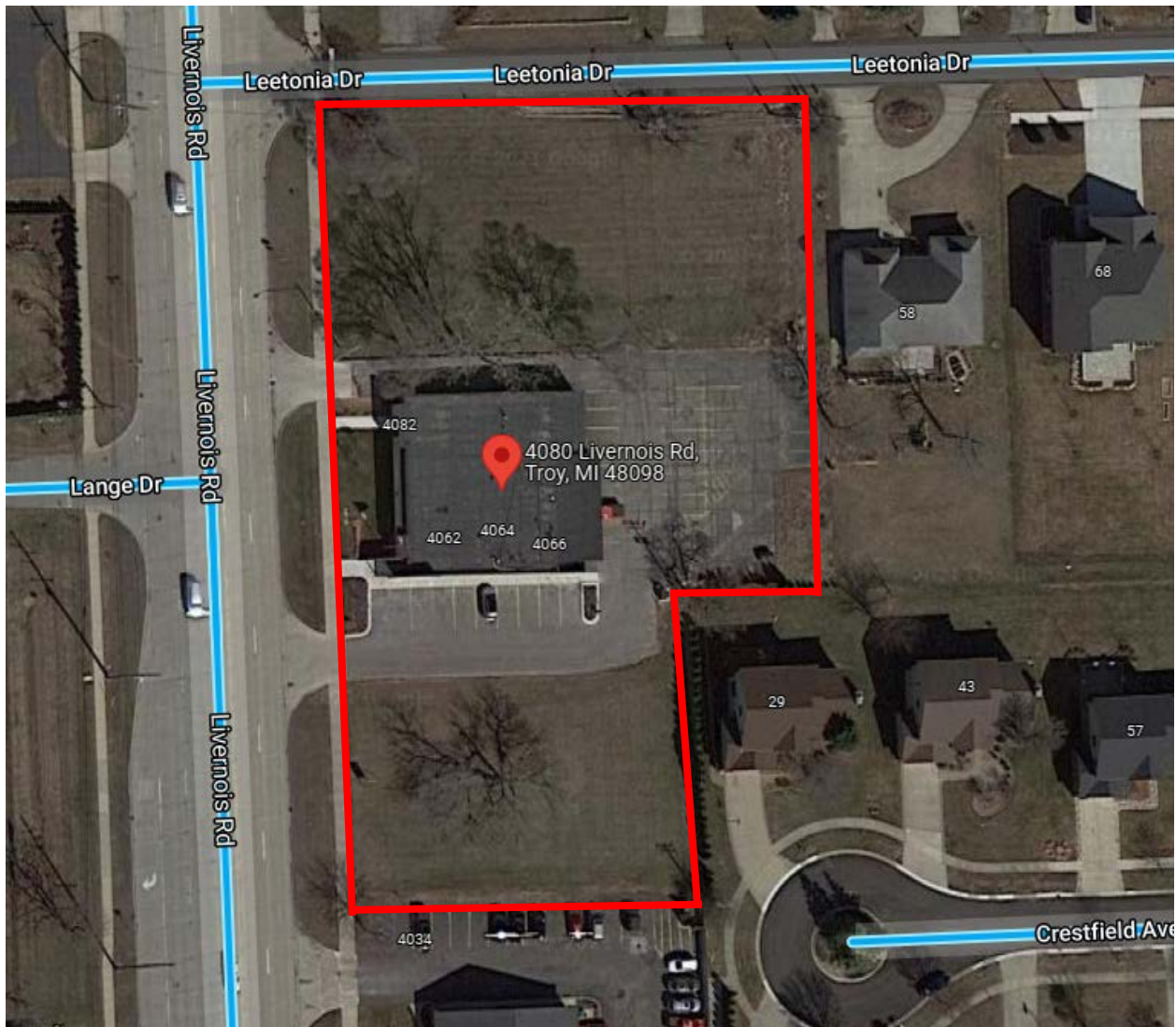
Site Plan Review For City of Troy, Michigan

Applicant:	Vince Pangle
Project Name:	Lange View Townhouses
Plan Date:	Received October 31, 2022
Location:	4080 Livernois Road, Troy, Mi
Zoning:	NN, Neighborhood Node
Action Requested:	Site Plan Approval

PROJECT AND SITE DESCRIPTION

The proposed development is located on the east side of Livernois Road, just north of Wattles Road. The approximate 1.62-acre parcel of land has an existing one (1) story 7,175 square-foot commercial building; recently improved by new façade. The applicant proposes to incorporate nine (9) townhomes that front on Leetonia onto the site with the existing improved office building, with shared parking and cross-access. There is a third parcel to the south that is undeveloped, with no immediate plans for development.

All vehicular access to the site is via Livernois Road. The applicant shows two (2) access driveways onto Livernois Road. The property is zoned Neighborhood Node (NN) and multiple family residential is a permitted use.



Proposed Uses of Subject Parcel:

Eight (8) townhome units and an office building.

Current Use of Subject Property:

The subject property is currently a one (1) story office building.

Current Zoning:

The property is currently zoned NN, Neighborhood Node District.

Surrounding Property Details:

Direction	Zoning	Use
North	R1-B, Single Family	Single Family Residential
South	NN, Neighborhood Node	Dental Office
East	R1-B, Single Family	Single Family Residential

West	NN, Neighborhood Node / R1-B, Single Family	Church / Liquor Store / Single Family Residential
-------------	--	--

NATURAL RESOURCES

Topography: A topographic survey has been provided on page C4, shows site has slightly higher elevation on west and slowly decreases eastward toward property line.

Wetlands: No wetlands on site.

Woodlands: Some of the existing trees on-site will be removed for the new townhome developments and subsequent parking. A landscape Inventory has been provided on page C5.0. No mitigation is required.

Items to be Addressed: None.

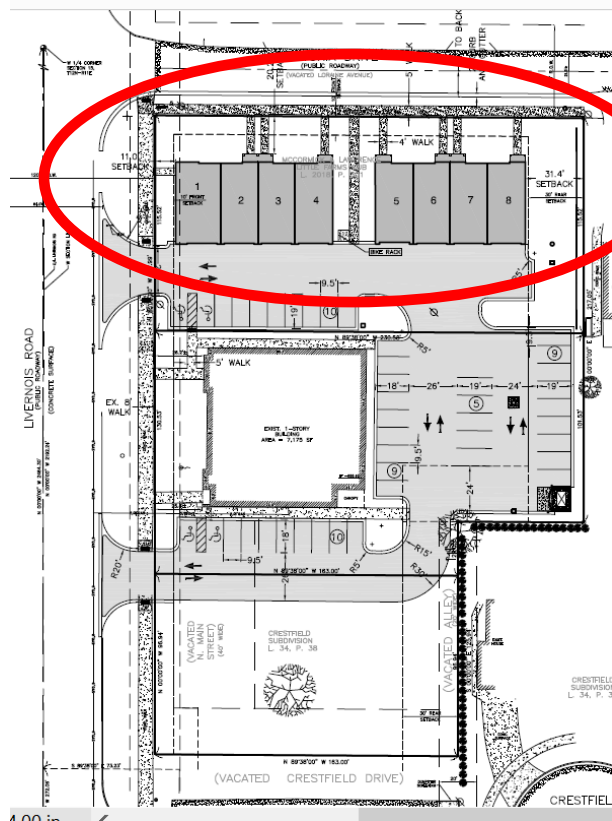
PREVIOUS PLANNING COMMISSION REVIEW

This item was last reviewed by the Planning Commission on May 24, 2022. Please see our May 17, 2022 memo for more details. At the May meeting, there was discussion on:

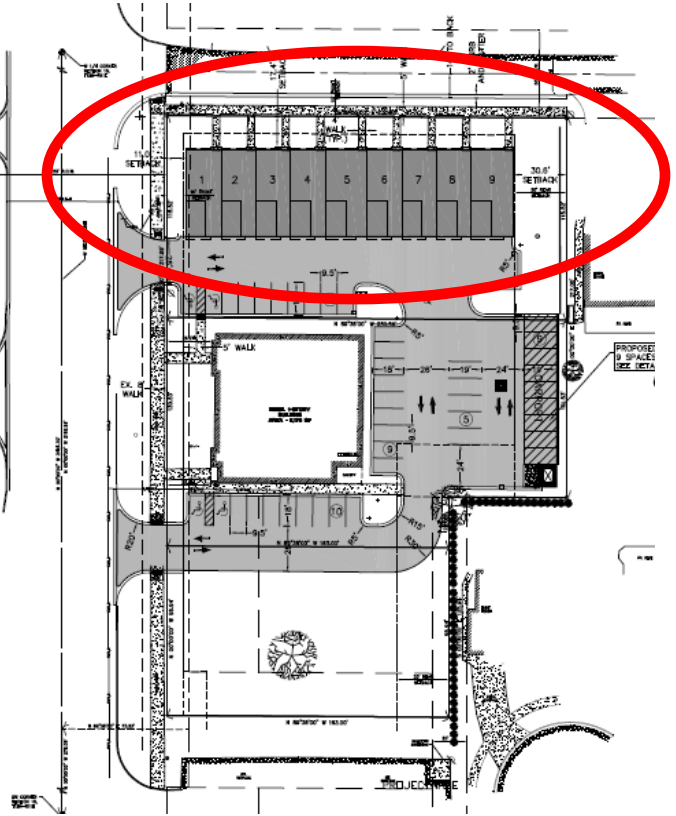
- Lowering building height by one story; provide detached parking.
- Excess of parking spaces per Zoning Ordinance requirements.
- Transitional features in relation to adjacent residential.
- Setback of building to east to avoid overshadowing.
- Potential development of southern-most parcel.
- No public comment received by the Planning Department.

At the May 24, 2022, on a vote of 8-0, the applicant was denied because the Planning Commission found that the development did not meet the ordinance requirements for transition.

CHANGES SINCE LAST PLANNING COMMISSION REVIEW



May 2022 Site Plan



November 2022 Site Plan

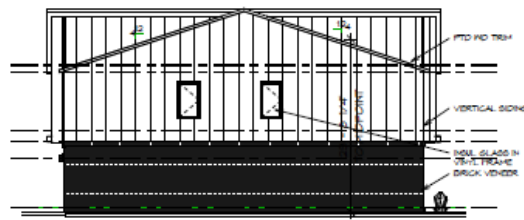


**May 2022
Elevations**

West Elevation
Scale: 1/4" = 1'-0"



North Elevation
Scale: 1/4" = 1'-0"



East Elevation
1/8" = 1'-0"

**November 2022
Elevations**



The applicant has made the following changes to the site plan:

- Added one (1) additional residential unit
- By adding unit, they eliminated the gap on Leetonia between the units, and reduced open space by 3.2%
- Reduced height from 34-feet, 3 stories, to 24-feet, 2 stories.
- Reduced setback along eastern property line from 31.4' to 30.6'
- Reduced setback along Leetonia from 20.2' to 17.4'
- Added car ports along nine (9) spaces along eastern property line.
- Added one (1) parking lot tree.
- Significantly revised architectural style.

BUILDING LOCATION AND SITE ARRANGEMENT

Access to the site will be via dual driveways on Livernois Road. The existing office building onsite will remain, and the nine (9) residential units are being constructed to the north and fronting Leetonia. All residential buildings are two (2) stories.

The site is also adjacent to a dental office zoned Neighborhood Node to the south, a church zoned Neighborhood Node and One-Family residential (R-1B) properties to the west; and more One-Family Residential (R-1B) properties to the north and east.

Items to be Addressed: None.

AREA, WIDTH, HEIGHT, SETBACKS

Table 5.03.B.3, Building Form C, Standards Applicable to All Districts of the Zoning Ordinance establishes the dimensional requirements for the NN, Neighborhood Node District. The requirements of Building form C and the proposed dimensions are shown in the following table.

	Required	Provided	Compliance
Front (Livernois)	10 feet	11 Feet	Complies
Front (Leetonia)	10 feet	17.4 Feet	Complies
Side	N/A, building may be placed up to property line	N/A	Complies
Rear	30-foot minimum setback	30.6 Feet	Complies
Building Height	Maximum 4 stories, 55 feet, Minimum 2 stories	2 stories , 24 feet (as measured by Zoning Ordinance)	Complies
Maximum Lot Coverage	30%	23.6%	Complies
Minimum Open Space	20%	39.7%	Complies
Parking Location	Cannot be located in front yard	Parking lots not in front yard	Complies

The maximum height in the adjacent residential neighborhood is 30 feet. Leetonia Drive comprised of mainly ranch homes. As noted the applicant reduced the building height to two (2) stories.

Items to be Addressed: None.

PARKING, LOADING

Section 13.06.G of the Zoning Ordinance requires:

	Required	Provided
Residential (General): 2 spaces per unit	9 units = 18 spaces	43 spaces and 9 garage spaces = 52 Spaces.
Office (1 space for each 300 square feet of floor area)	7,175 gross square feet = 24 spaces	
TOTAL	40 spaces	
Barrier Free	2	1
Bicycle Parking	2	0
Loading	0	0
Total	40 Spaces	59 Spaces

The site, particularly the office site is overparked. Parking that exceeds 20% of the required minimum requires Planning Commission approval. The required parking (40 spaces) plus a 20% excess is a total of 48 spaces. The applicant is seeking approval for 52 spaces. A shared parking agreement will need to be recorded.

Items to be Addressed: Either obtain parking waiver from Planning Commission, remove additional parking, or landbank parking

SITE ACCESS AND CIRCULATION

Vehicular access to the site is via the two driveways off Livernois Road. Site plan provides a 26' wide fire access drive-aisle. The applicant has provided the required turning fire engine template.

Items to be Addressed: None

LANDSCAPING

A landscaping plan has been provided on page C5.0. The following table discusses the development's compliance with the landscape requirements set forth in Section 13.02.

	Required:	Provided:	Compliance:
Livernois Greenbelt (1 tree per 30 lineal feet)	245 feet = 9 trees	9 trees	Complies

Leetonia Greenbelt (1 tree per 30 lineal feet)	255 feet = 9 trees	9 trees	Complies
Screening Between Uses (Residential to the East) Narrow Evergreen every 3 lineal feet	315 lineal feet = 105 trees	105 trees	Complies
General Site Landscaping (20% of the site area)	41,820 sq. ft x 0.20 = 8,364 square feet is 20%	14,197 square feet is 33.9%	Complies
Parking Lot Landscaping (1 tree per 8 spaces)	43 spaces = 6 trees	6 trees	Complies

Applicant shows trash enclosure and screening with a masonry wall.

Items to be Addressed: none

LIGHTING

A photometric plan has been provided on page E1.0. A total of four (4) pole mounted light fixtures are proposed. There are no building mounted lights indicated. Pole-mounted light fixtures are noted as having a height of 20'. The fixtures and photometrics meet all ordinance requirements; however we note that one of parking lot lights is located in the middle of the parking lot without any protection.

Items to be Addressed: Relocate parking lot light in middle of parking lot.

FLOOR PLAN AND ELEVATIONS

Floor plans and elevations have been provided on pages A1, A2, A3, and A4. The elevations show architectural details, variations in material and pattern. Elevations are significantly different than last reviewed by the Planning Commission. The photo below shows the area of the site of the proposed townhome in relation to adjacent buildings.



Planning Commission to discuss elevations and transitions.

Items to be Addressed: None

DESIGN STANDARDS and SITE PLAN REVIEW STANDARDS

The Neighborhood Node design standards provide the Planning Commission with direction when reviewing the proposed site plan and design features of this development.

Section 5.06.E Design Standards

1. Building Orientation and Entrance
2. Ground Story Activation
3. Transitional Features
4. Site Access, Parking & Loading

*Please see Section 5.06E for standard details

Section 8.06 Site Plan Review Standards

1. Development shall ensure compatibility to existing commercial districts and provide a transition between land uses.
2. Development shall incorporate the recognized best architectural building practices.
3. Enhance the character, environment, and safety for pedestrians and motorists.

*Please see Section 8.06 for standard details

Section 5.06.E.3 Transitional Features outlines transitional standards for the Planning Commission to consider:

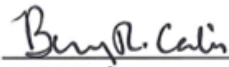
3. Transitional Features

- a) Transitional features are architectural elements, sit features, or alterations to building massing that are used to provide a transition between higher-intensity uses and low- or moderate-density residential areas. These features assist in mitigating potential conflicts between those uses. Transitional features are intended to be used in combination with landscape buffers or large setbacks.
- b) Intensity. A continuum of use intensity, where moderate Intensity uses are sited between high-intensity uses and low-intensity uses, shall be developed for multi-building developments. An example would be an office use between commercial and residential uses.
- c) Height and mass. Building height and mass in the form of building step-backs, recess lines or other techniques shall be graduated so that structures with higher-Intensity uses are comparable in scale with adjacent structures of lower Intensity uses.
- d) Orientation. Primary building façades shall be placed away from residential use.
- e) Architectural features. Similarly sized and patterned architectural features such as windows, doors, arcades, pilasters, cornices, wall offsets, building materials, and other building articulations included on the lower-intensity use shall be incorporated in the transitional features.

SUMMARY

The Planning Commission should discuss the following items:

- Proposed transitional features as it relates to reducing height to 2 stories, but adding an additional unit thus creating one singular massing along Leetonia.
- Proposed changes to architectural style.
- Overall site parking.
- Relocation of parking lot light.



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

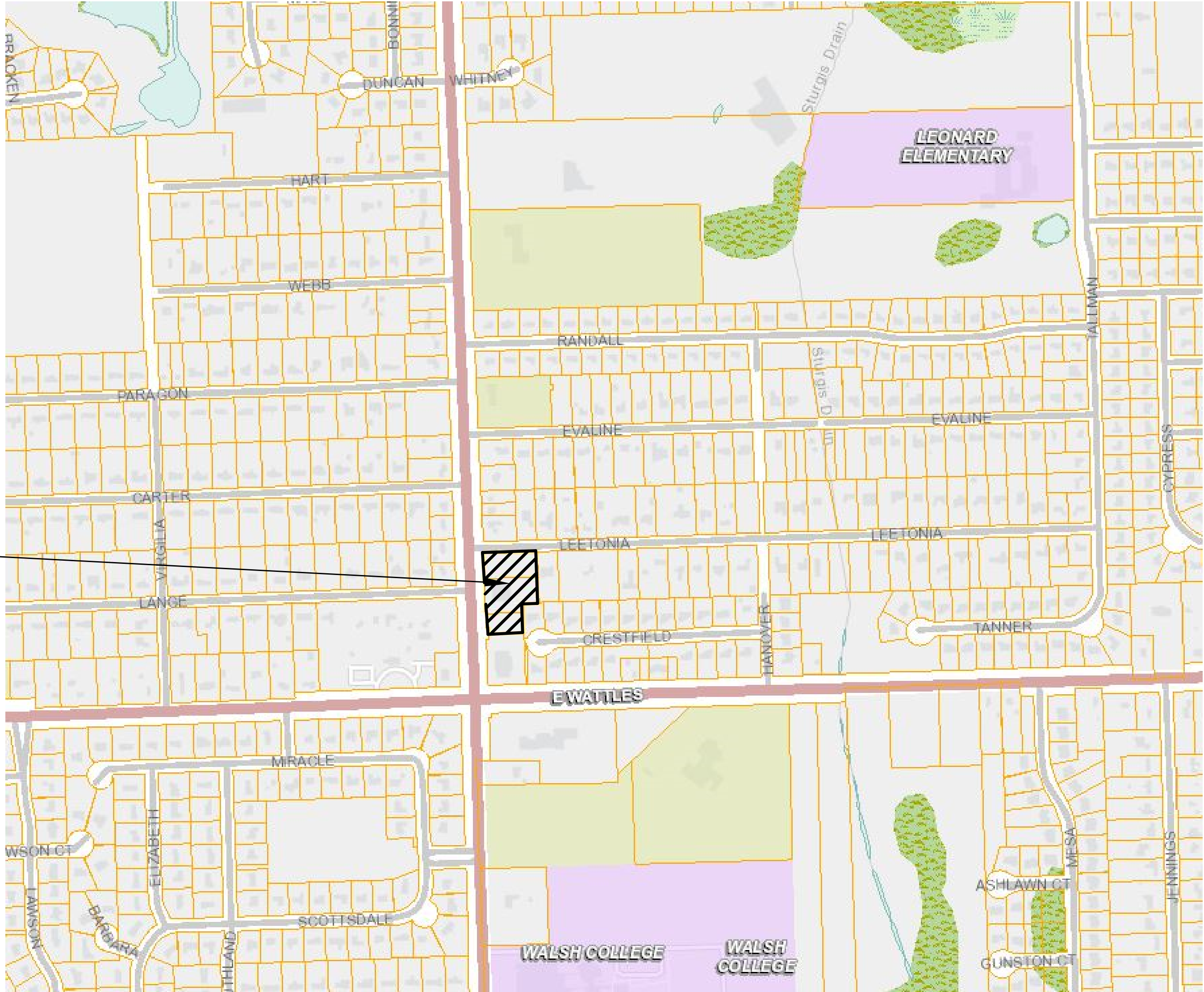
DRAWING INDEX

- C1.0 COVER SHEET
SV1 TOPOGRAPHIC SURVEY
C2.0 REMOVAL PLAN
C2.1 TREE SURVEY
C3.0 OVERALL SITE PLAN
C4.0 GRADING PLAN
C4.1 UTILITY PLAN
C4.2 STORMWATER DETAILS
C4.3 STORMWATER DETAILS 2
C5.0 LANDSCAPING PLAN
C6.0 SITE DETAILS 1
C6.1 SITE DETAILS 2
E1.0 PHOTOMETRIC PLAN
A1 FLOOR PLANS
A2 ELEVATIONS
A3 ELEVATIONS
A4 UNIT PLANS

LANGE VIEW TOWNHOUSES
 OFFICE AND RESIDENTIAL DEVELOPMENT
 SECTION 15, T02N - R11E
 CITY OF TROY, OAKLAND COUNTY, MICHIGAN

OWNER
4080 TROY LLC
4080 LIVERNOIS ROAD
TROY, MI 48098

CIVIL ENGINEER
REDRIDGE ENGINEERING, LLC
RICHARD FOSGITT, PE
2807 Highbrook Dr
Midland, MI 48642
PHONE: (989) 513-4058



LOCATION MAP

SITE

UTILITY NOTE

THE UTILITY LOCATIONS AS HEREON SHOWN ARE BASED ON FIELD OBSERVATIONS AND A CAREFUL REVIEW OF MUNICIPAL AND UTILITY RECORDS. HOWEVER, IT IS NOT POSSIBLE TO DETERMINE THE PRECISE SIZE, LOCATION, DEPTH, PRESSURE, OR ANY OTHER CHARACTERISTICS OF UNDERGROUND UTILITIES, TANKS OR SEPTIC FIELDS WITHOUT EXCAVATION. THEREFORE, WE CANNOT GUARANTEE THE ACCURACY OF COMPLETENESS OF THE BURIED UTILITY INFORMATION HEREON SHOWN. THE CONTRACTOR SHALL CALL MISS DIG (1-800-482-7171) A MINIMUM OF THREE WORKING DAYS PRIOR TO ANY EXCAVATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THESE UTILITY LOCATIONS PRIOR TO CONSTRUCTION AND MAKE EVERY EFFORT TO PROTECT AND/OR RELOCATE THEM AS REQUIRED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/SURVEYOR AS SOON AS POSSIBLE IN THE EVENT A DISCREPANCY IS FOUND.



Know what's below.
Call before you dig.

LEGEND

	MONUMENT / SECTION CORNER
	FOUND PROPERTY IRON
	SET PROPERTY IRON W/CAP NO.26454
	SET MAG NAIL
	EXISTING CATCHBASIN
	EXISTING MANHOLE/CATCHBASIN
	EXISTING MANHOLE
	EXISTING HYDRANT
	EXISTING VALVE
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATERMAIN
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	EXISTING GAS METER
	EXISTING TRANSFORMER
	EXISTING FLAGPOLE
	EXISTING GRASS SURFACE
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	EXISTING CONCRETE SURFACE

BENCHMARKS

B.M. #1 - ARROW ON FLANGE OF HYDRANT, COR OF LEETONIA AVE & LIVERNOIS RD
ELEV. 687.33 NAVD 88

ZONING INFORMATION

ZONED NN (NEIGHBORHOOD NODE)
NODE H - LIVERNOIS & W. WATILES INTERSECTION
STREET TYPE NN:A(LIVERNOIS) AND TYPE NN:B (LEETONIA)
SITE TYPE NN:B

FLOODPLAIN INFORMATION

CITY OF TROY, COMMUNITY NO. 260180
OAKLAND COUNTY, MICHIGAN
MAP NUMBER: 26125C0534F
EFFECTIVE DATE: 9/29/2006
FLOOD ZONE: X
AREA OF MINIMAL FLOOD HAZARD (PER FIRM)

UTILITY CONTACTS

TELEPHONE AT & T 54 N. MILL ST. P.O. BOX 32 PONTIAC, MI 48642	GAS AND ELECTRIC CONSUMERS ENERGY GAS INFORMATION MGMT 1030 FEATHERSTONE RD. PONTIAC, MI 48342
ZONING CITY OF TROY ZONING & PLANNING 500 W. BIG BEAVER RD TROY, MICHIGAN 48084 (248) 524-3364	WATER/SEWER CITY OF TROY TROY DPW 4693 ROCHESTER RD TROY, MICHIGAN 48085 (248) 524-3392

SITE INFORMATION

SITE ADDRESS
4080 LIVERNOIS ROAD
TROY, MI 48098-4721

ZONING CLASSIFICATION
NN - NEIGHBORHOOD NODE

TAX IDENTIFICATION NUMBER
88-20-15-353-053

PROPRIETOR

STRATEGIC PROPERTY SERVICES, LLC
ATTN: VINCE PANGLE
4080 LIVERNOIS ROAD
TROY, MI 48098

SURVEYOR

D&M SITE, INC.
401 BALSAM STREET
CARROLLTON, MI 48624
(989) 752-6500

ENGINEER

REDRIDGE ENGINEERING, LLC
RICHARD FOSGITT, P.E.
2807 Highbrook Drive
Midland, MI 48642
(989) 513-4058

PREPARED UNDER THE SUPERVISION OF:



PROJECT LOG

DESIGN/ANALYSIS/REVISION	04-17-15
REVISED SITE PLAN REVIEW	08-31-21
REVISED LAYOUT	04-04-22

FILE #	OVERALL
PROJ MGR:	RLF
DESIGN BY:	RLF
DRAWN BY:	RLF
CHECKED BY:	
SCALE:	1"=30' NONE
SHEET:	10-10-22 1

REDRIDGE ENGINEERING, LLC
2807 Highbrook Drive, Midland, MI 48642
989-513-4058 rfosgitt@redridge-eng.com

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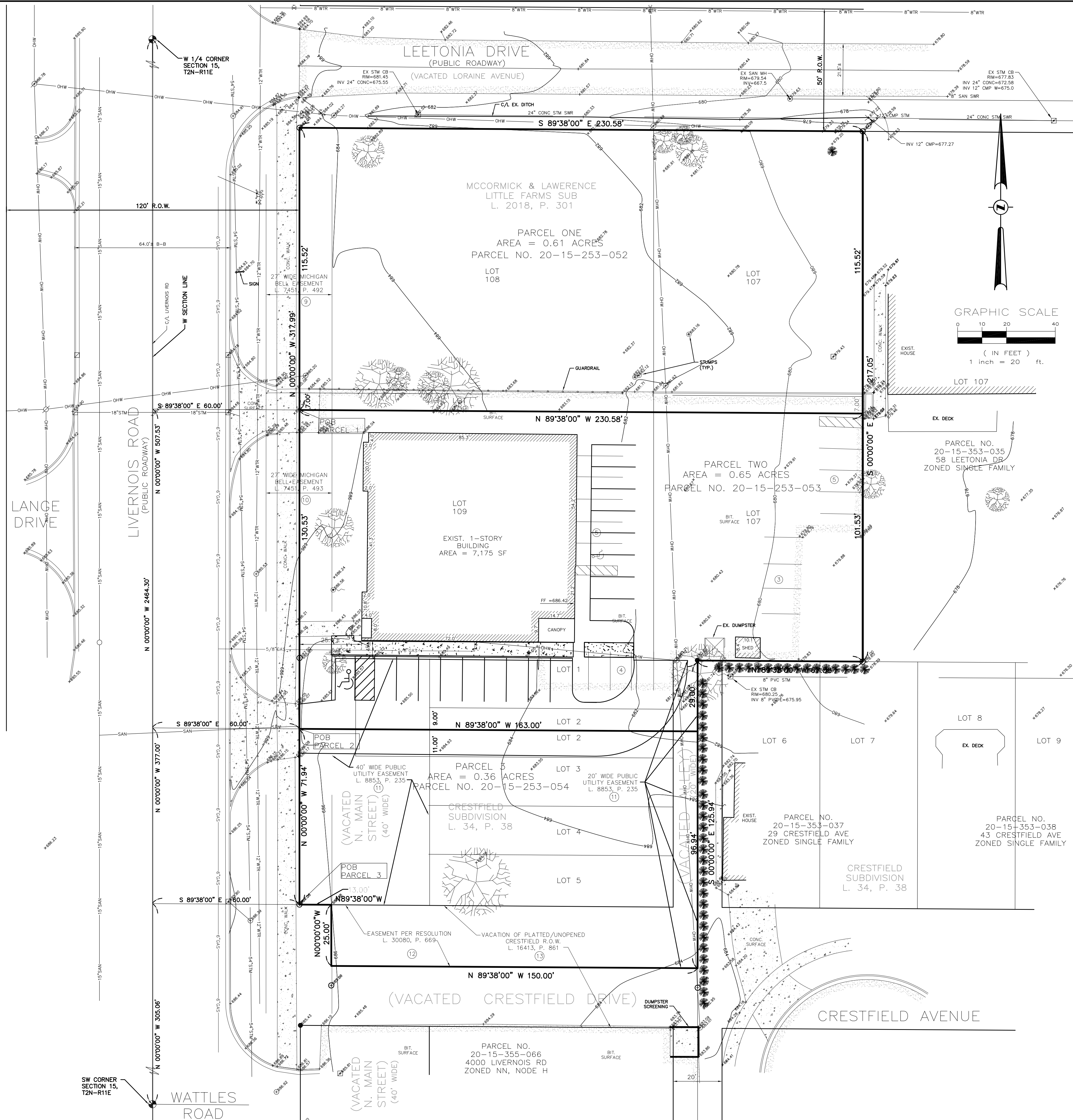
LANGE VIEW TOWNHOUSES
STRATEGIC PROPERTY SERVICES, LLC

4080 LIVERNOIS ROAD
CITY OF TROY
OAKLAND COUNTY, MICHIGAN

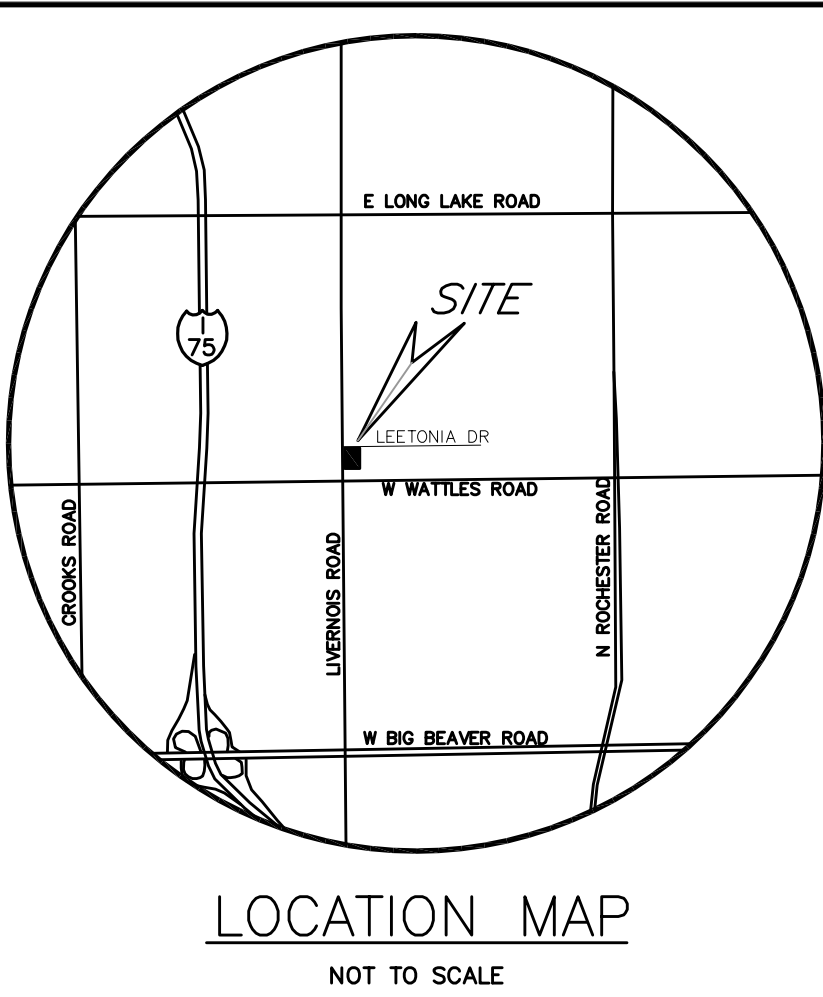
TITLE SHEET

C1.0

180401



UTILITY CONTACTS	
<u>TELEPHONE</u>	<u>GAS AND ELECTRIC</u>
AT & T	CONSUMERS ENERGY
54 N. MILL ST.	GAS INFORMATION MGMT
P.O. BOX 32	1030 FEATHERSTONE RD.
PONTIAC, MI 48642	PONTIAC, MI 48342
 <u>ZONING</u>	 <u>WATER/SEWER</u>
CITY OF TROY	CITY OF TROY
ZONING & PLANNING	TROY DPW
500 W. BIG BEAVER RD	4693 ROCHESTER RD
TROY, MICHIGAN 48064	TROY, MICHIGAN 48065
(248) 524-3364	(248) 524-3392



FURNISHED PROPERTY DESCRIPTIONS

ATA NATIONAL TITLE GROUP, LLC
FILE NO. 15-18594696-COOL
DATE: JUNE 01, 2018, AT 8:00 AM

PARCEL I:

THE NORTH 108.52 FEET OF THE WEST 86 FEET OF LOT 107, ALSO LOT 108, EXCEPT THE WEST 27 FEET, MCCORMICK & LAWRENCE LITTLE FARMS SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN LIBER 20, PAGE 30 OF PLATS, OAKLAND COUNTY RECORDS.

AND

LOT 109, EXCEPT THE WEST 27 FEET AND SOUTH 108.53 FEET OF THE WEST 86 FEET OF LOT 107, MCCORMICK & LAWRENCE LITTLE FARMS SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN LIBER 20, PAGE 30 OF PLATS, OAKLAND COUNTY RECORDS.

AND LOTS 1 AND 2, AND ADJACENT 1/2 OF VACATED ALLEY AND ALL VACATED MAIN STREET, CRESTFIELD SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN LIBER 34, PAGE 38 OF PLATS, OAKLAND COUNTY RECORDS.

AND

THE NORTH 40 FEET OF THE SOUTH 406 FEET OF THE EAST 13 FEET OF THE WEST 73 FEET OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 15, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN.

PARCEL II:

LOTS 3, 4, 5, AND ALL OF VACATED MAIN STREET AND WEST 1/2 OF VACATED ALLEY ADJACENT THERETO, CRESTFIELD SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN LIBER 34, PAGE 38 OF PLATS, OAKLAND COUNTY RECORDS.

AND

THE SOUTH 60.94 FEET OF NORTH 100.94 FEET OF SOUTH 406 FEET OF EAST 13 FEET OF WEST 73 FEET OF SOUTHWEST 1/4 OF SECTION 15, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN, ALSO NORTH 1/2 OF VACATED CRESTFIELD AVE ADJACENT TO SAME.

SCHEDULE "B" EXCEPTIONS

ATA NATIONAL TITLE GROUP, LLC
FILE NO.: 63-18554696-00M
DATE: JUNE 01, 2018, AT 8:00 AM

⑧ RIGHT OF WAY GRANTED TO MICHIGAN BELL TELEPHONE COMPANY COUNTY RECORD 1, 1979 IN LIBER 7451, PAGE 492, OAKLAND COUNTY RECORDS. COVERS LOT 108, MCCORMICK & LAWRENCE TITLE FARMS ONLY. - AS SHOWN; AFFECTS PARCEL I

































⑩ RIGHT OF WAY GRANTED TO MICHIGAN BELL TELEPHONE COMPANY RECORDED MARCH 1, 1979 IN LIBER 7451, PAGE 493, OAKLAND COUNTY RECORDS. COVERS ALL OF LOT 109 AND SOUTH 108.53 FEET OF THE WEST 98 FEET OF LOT 107, MCCORMICK & LAWRENCE TITLE FARMS ONLY. - AS SHOWN; AFFECTS PARCEL I

⑪ EASEMENT FOR PUBLIC UTILITIES OVER THAT PORTION OF SUBJECT PROPERTY INCLUDED IN THE VACATED ALLEY AND VACATED STREET AS EVIDENCED BY INSTRUMENT RECORDED IN LIBER 818, PAGE 225, OAKLAND COUNTY RECORDS. - AS SHOWN; AFFECTS PARCEL I

⑫ TERMS AND CONDITIONS OF RESOLUTION RECORDED JULY 24, 2003 IN LIBER 30080, PAGE 669, OAKLAND COUNTY RECORDS. - AS SHOWN

⑬ TERMS AND CONDITIONS OF RESOLUTION RECORDED JULY 8, 1996 IN LIBER 16413, PAGE 861, OAKLAND COUNTY RECORDS. - AS SHOWN; AFFECTS PARCEL II

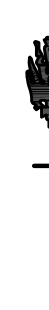
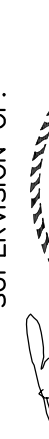
14. TERMS, CONDITIONS AND PROVISIONS WHICH ARE RECTED IN WATER AGREEMENT RECORDED IN LIBER 2125, PAGE 87, OAKLAND COUNTY RECORDS. - DOES NOT AFFECT SUBJECT PROPERTY

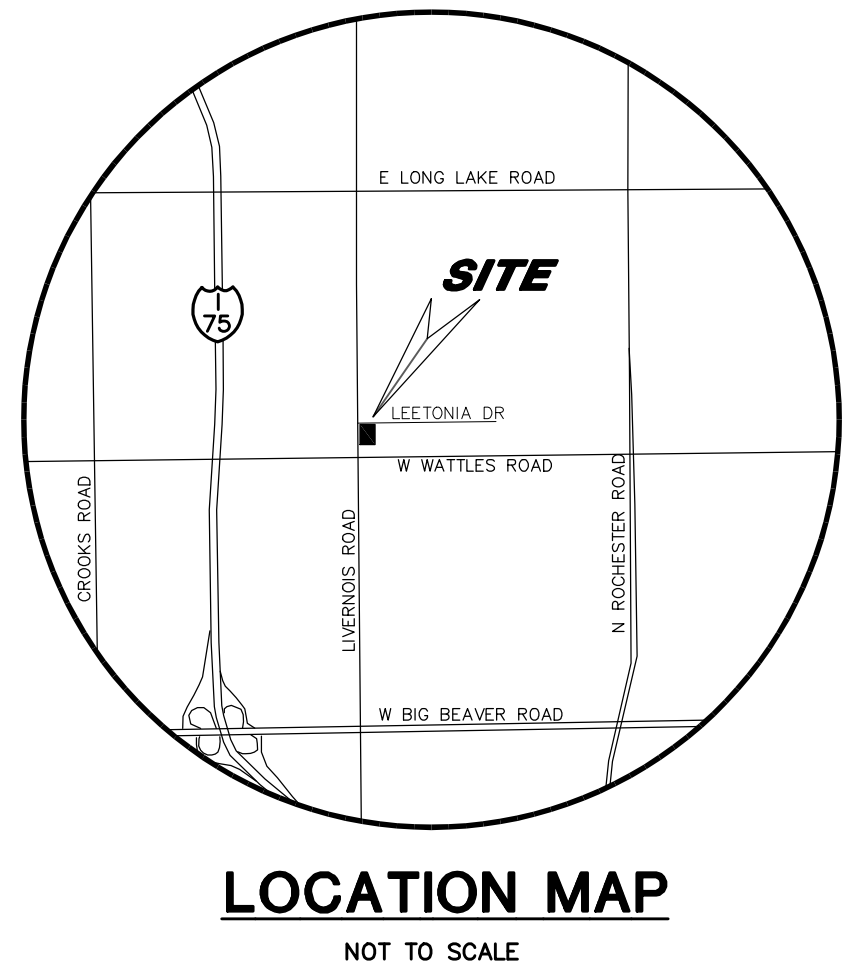
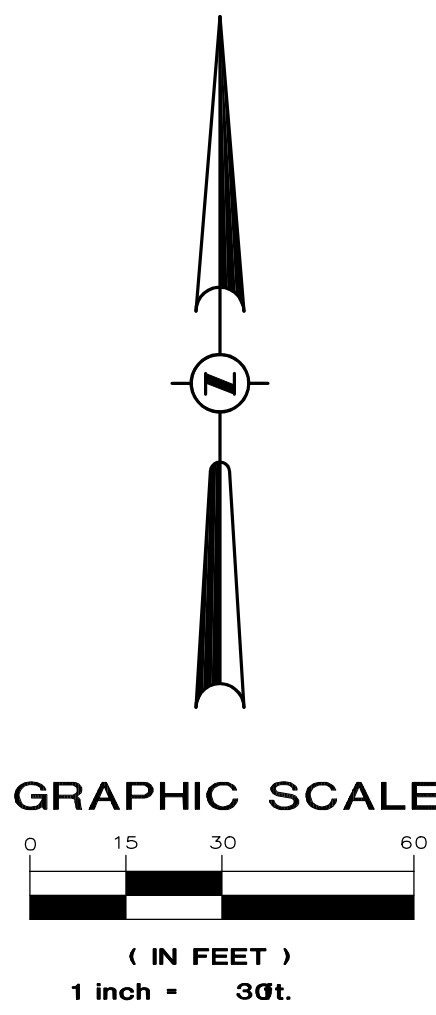
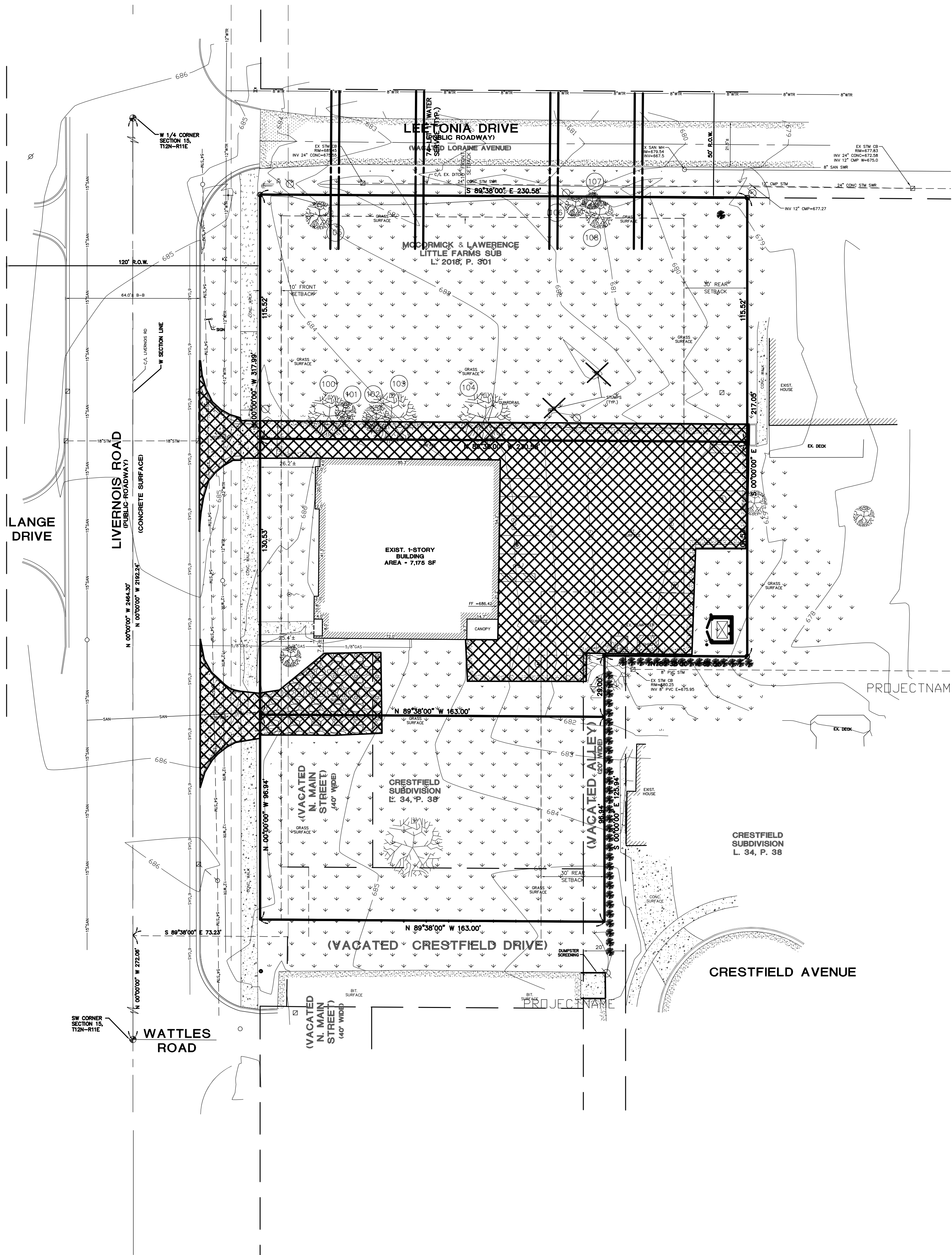
LEGEND	
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	SET PROPERTY IRON W/CAP NO.26454
	SET MAG NAIL
	EXISTING CATCHBASIN
	EXISTING MANHOLE/CATCHBASIN
	EXISTING MANHOLE
	EXISTING HYDRANT
	EXISTING VALVE
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATERMAIN
	EXISTING FENCE LINE
	EXISTING UNDERGROUND ELECTRIC LINE
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	EXISTING OVERHEAD ELECTRICAL WIRES
	EXISTING MAILBOX/NEWSPAPER BOX
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	EXISTING CONIFEROUS TREES
	EXISTING UTILITY POWER POLE
	EXISTING TELEPHONE RISER
	EXISTING BOLLARD
	EXISTING LIGHT POLE
	EXISTING GAS METER
	EXISTING TRANSFORMER
	EXISTING FLAGPOLE
	EXISTING GRASS SURFACE
	EXISTING BITUMINOUS SURFACE
	EXISTING CONCRETE SURFACE

BENCHMARKS	
B.M. #1	ARROW ON FLANGE OF HYDRANT, COR OF LEETONIA AVE & LIVERNOIS RD ELEV. 687.33 NAVD 88

ZONING INFORMATION
ZONED NN (NEIGHBORHOOD NODE) NODE H - LIVERNOIS & W. WATTLES INTERSECTION STREET TYPE NN:A(LIVERNOIS) AND TYPE NN:B (LEETONIA) SITE TYPE NN:B

FLOODPLAIN INFORMATION
CITY OF TROY, COMMUNITY NO. 260180 OAKLAND COUNTY, MICHIGAN MAP NUMBER: 26125C0534F EFFECTIVE DATE: 9/29/2006 FLOOD ZONE: X AREA OF MINIMAL FLOOD HAZARD (PER FIRM)

2018.236	SV1	<div><p>D&M SITE INC. Surveying • Inspection • Testing • Engineering 401 BALSAM STREET PO BOX 159, CARROLLTON, MICHIGAN 48724 PHONE (989) 752-6500 • FAX (989) 752-6600</p></div>	<div><div>4080 LIVERNOIS ROAD</div><div>SECTION 15, T2N-R11E CITY OF TROY OAKLAND COUNTY, MICHIGAN</div><div>PROPERTY SURVEY</div></div>	<div><div>GREAT LAKES FAMILY LLC</div><div>5070 NEW KING ST. SUITE 375 TROY, MICHIGAN 48098 (248) 312-7200</div></div>	<div>FILE: 2018-236</div> <div>PROJECT MGR: JDM</div> <div>DESIGNED BY:</div> <div>DRAWN BY: DJM</div> <div>CHECKED BY:</div> <div>SCALE: 1"=20'</div> <div>SHEET: 1 OF 1</div>	<div>PROJECT LOG</div> <table><tr><td>PROJECT START</td><td>06-20-18</td></tr><tr><td>REVISIONS</td><td>07-25-18</td></tr><tr><td>REVISED BOUNDARY</td><td>04-10-19</td></tr><tr><td>REVISED PARCEL DESCRIPTIONS</td><td>06-14-19</td></tr><tr><td>REVISED PARCEL DESCRIPTIONS</td><td>07-12-19</td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table>	PROJECT START	06-20-18	REVISIONS	07-25-18	REVISED BOUNDARY	04-10-19	REVISED PARCEL DESCRIPTIONS	06-14-19	REVISED PARCEL DESCRIPTIONS	07-12-19									<div>PREPARED UNDER THE SUPERVISION OF:</div> <div></div>
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LEGEND	
	MONUMENT / SECTION CORNER
	FOUND PROPERTY IRON
	SET PROPERTY IRON W/CAP NO.26454
	SET MAG NAIL
	EXISTING CATCHBASIN
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	EXISTING CONCRETE SURFACE

UTILITY CONTACTS	
TELEPHONE AT & T 54 N. MILL ST. P.O. BOX 32 PONTIAC, MI 48642	GAS AND ELECTRIC CONSUMERS ENERGY GAS INFORMATION MGMT 1030 FEATHERSTONE RD. PONTIAC, MI 48342
ZONING CITY OF TROY ZONING & PLANNING 500 W. BIG BEAVER RD TROY, MICHIGAN 48084 (248) 524-3364	WATER/SEWER CITY OF TROY TROY DPW 4693 ROCHESTER RD TROY, MICHIGAN 48085 (248) 524-3392

UTILITY NOTE

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ZONING INFORMATION

ZONED NN (NEIGHBORHOOD NODE)
NODE H - LIVERNOIS & W. WATTLES INTERSECTION
STREET TYPE NN-A (LIVERNOIS) AND TYPE NN-B (LEETONIA)
SITE TYPE NN-B

PROPRIETOR

STRATEGIC PROPERTY SERVICES, LLC
ATTN: VINCE PANGLE
5750 NEW KING STREET, STE 350
TROY, MI 48098

SURVEYOR

D&M SITE, INC.
401 BALSAM STREET
CARROLLTON, MI 48624
(989) 752-6500

ENGINEER

REDRIDGE ENGINEERING, LLC
RICHARD FOSGITT, P.E.
2807 HIGBROOK DRIVE
MIDLAND, MI 48642
(989) 513-4058

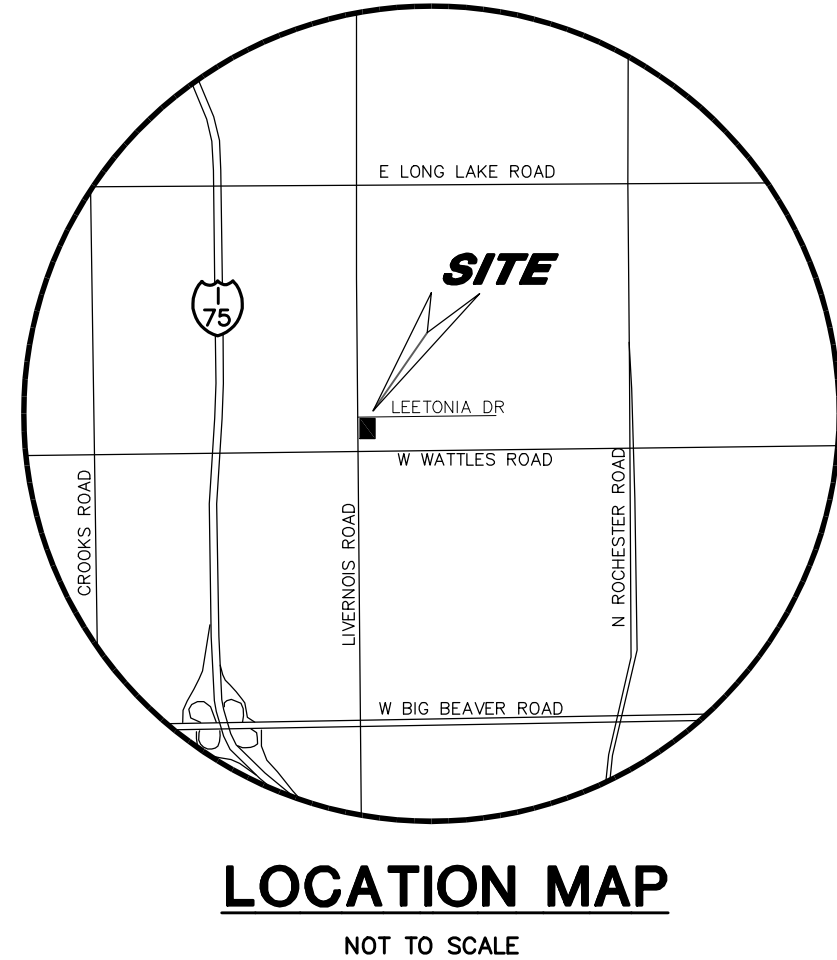
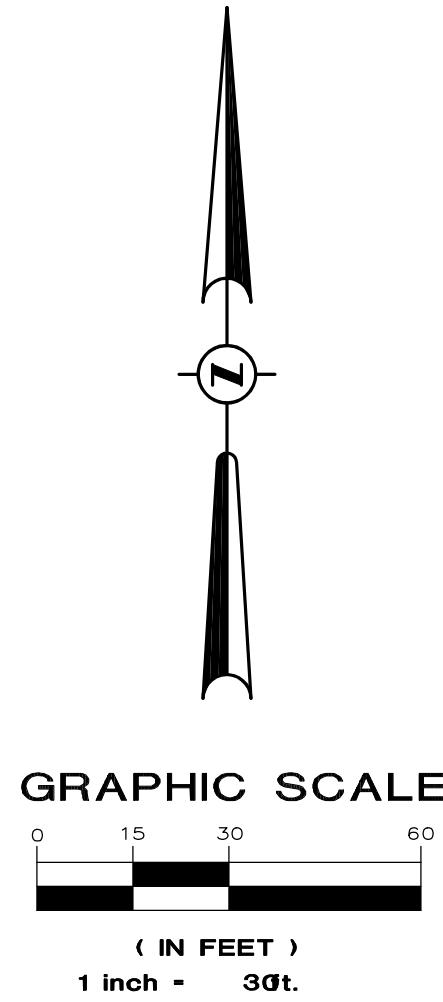
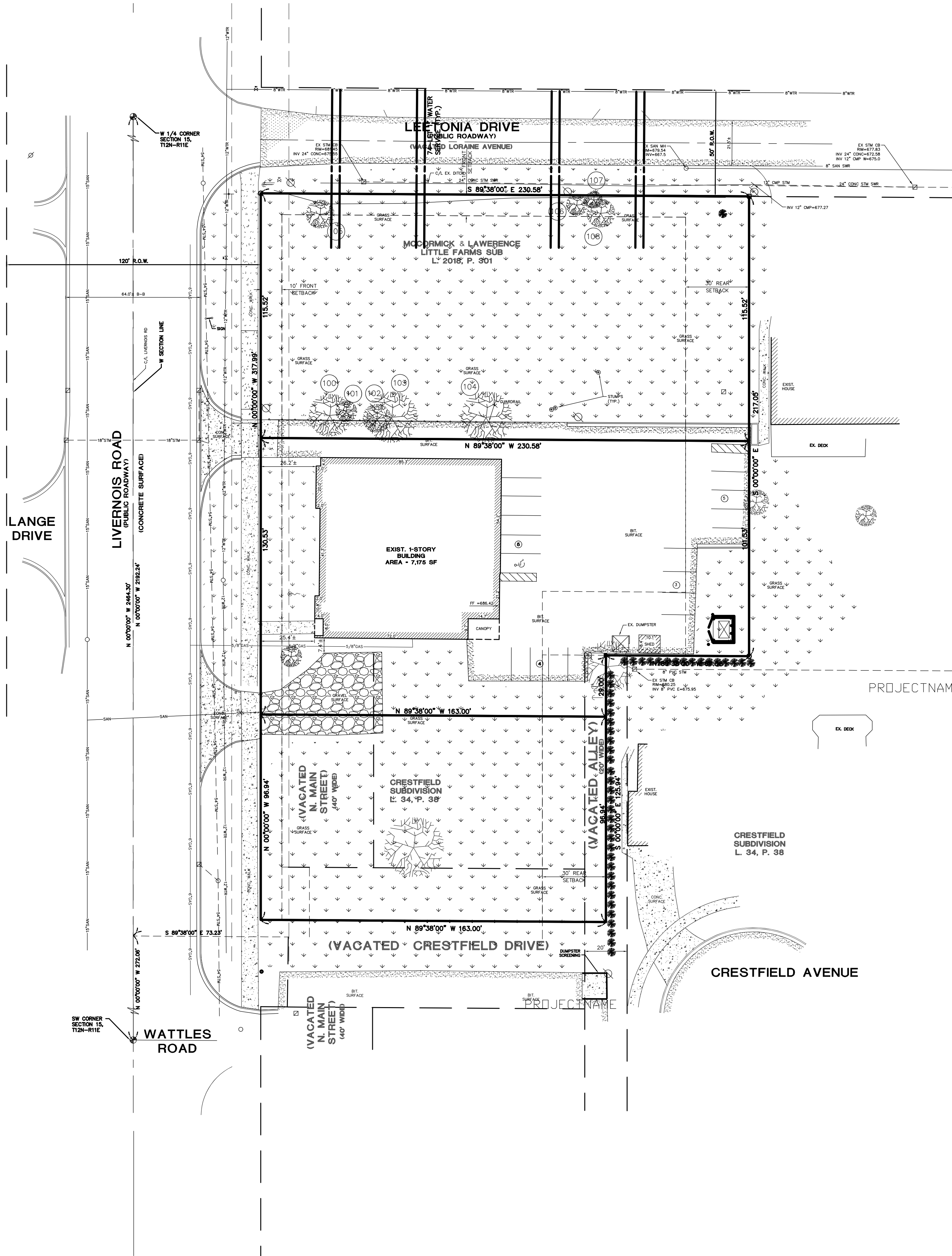
PREPARED UNDER THE SUPERVISION OF:
PROJECT LOG
DESIGN/ANALYSIS/REVISION
04-17-15
08-31-21
04-04-22
FILE # OVERALL
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DESIGN BY: RLF
DRAWN BY: RLF
CHECKED BY:
SCALE: 1"=30'
SHEET: 1 OF 1

REDRIDGE ENGINEERING, LLC
2807 HIGBROOK DRIVE, MIDLAND, MI 48642
989-513-4058 RFOSGITT@REDRIDGE-ENG.COM

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LANGE VIEW TOWNHOUSES
STRATEGIC PROPERTY SERVICES, LLC
4088 LIVERNOIS ROAD
CITY OF TROY
OAKLAND COUNTY, MICHIGAN
DEMOLITION PLAN

C2.0
180401



LEGEND	
	MONUMENT / SECTION CORNER
	FOUND PROPERTY IRON
	SET PROPERTY IRON W/CAP NO.26454
	SET MAG NAIL
	EXISTING CATCHBASIN
	EXISTING MANHOLE/CATCHBASIN
	EXISTING MANHOLE
	EXISTING HYDRANT
	EXISTING VALVE
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATERMAIN
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	EXISTING LIGHT POLE
	EXISTING GAS METER
	EXISTING TRANSFORMER
	EXISTING FLAGPOLE
	EXISTING GRASS SURFACE
	EXISTING BITUMINOUS SURFACE
	EXISTING CONCRETE SURFACE

TAG	DBH	COMMON NAME	LATIN NAME	COND	CLASS	SAVE/REMOVE	ON-SITE
100	30"	CHINESE ELM	ULMUS PARVIFOLIA	POOR	INVASIVE	REMOVE	YES
101	15"	CHINESE ELM	ULMUS PARVIFOLIA	POOR	INVASIVE	REMOVE	YES
102	20"	CHINESE ELM	ULMUS PARVIFOLIA	POOR	INVASIVE	REMOVE	YES
103	36"	COTTONWOOD	POPULUS DELTOIDES	POOR	INVASIVE	REMOVE	YES
104	24"	CHINESE ELM	ULMUS PARVIFOLIA	POOR	INVASIVE	REMOVE	YES
105	24"	CHINESE ELM	ULMUS PARVIFOLIA	POOR	INVASIVE	REMOVE	YES
106	15"	CHINESE ELM	ULMUS PARVIFOLIA	POOR	INVASIVE	REMOVE	YES
107	12"	CHINESE ELM	ULMUS PARVIFOLIA	POOR	INVASIVE	REMOVE	YES
108	20"	BLACK WALNUT	JUGLANS NIGRA	POOR	WOODLAND	REMOVE	YES

TREE REPLACEMENT CALCULATIONS
PER CITY OF TROY ZONING ORDINANCE
NO TREES SAVED – DUE TO POOR CONDITION OR INVASIVE SPECIES.
NO TREE REPLACEMENT REQUIRED.

PROPRIETOR
STRATEGIC PROPERTY SERVICES, LLC
ATTN: VINCE PANGLE
5750 NEW KING STREET, STE 350
TROY, MI 48098

SURVEYOR
D&M SITE, INC.
401 BALSAM STREET
CARROLLTON, MI 48624
(989) 752-6500

ENGINEER
REDRIDGE ENGINEERING, LLC
RICHARD FOSGITT, P.E.
2807 HIGHBROOK DRIVE
MIDLAND, MI 48642
(989) 513-4058

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

DESIGN/ANALYSIS/REVISION	04-17-15
REVISED SITE PLAN REVIEW	08-31-21
REVISED SITE PLAN REVIEW	04-04-22

FILE # OVERALL

PROJ MGR: RLF

DESIGN BY: RLF

DRAWN BY: RLF

CHECKED BY:

SCALE: 1"=30'

SHEET: 1 OF 1

REDRIDGE ENGINEERING, LLC
2807 HIGHTBROOK DRIVE, MIDLAND, MI 48642
989-513-4058 RFOSGITT@REDRIDGE-ENG.COM

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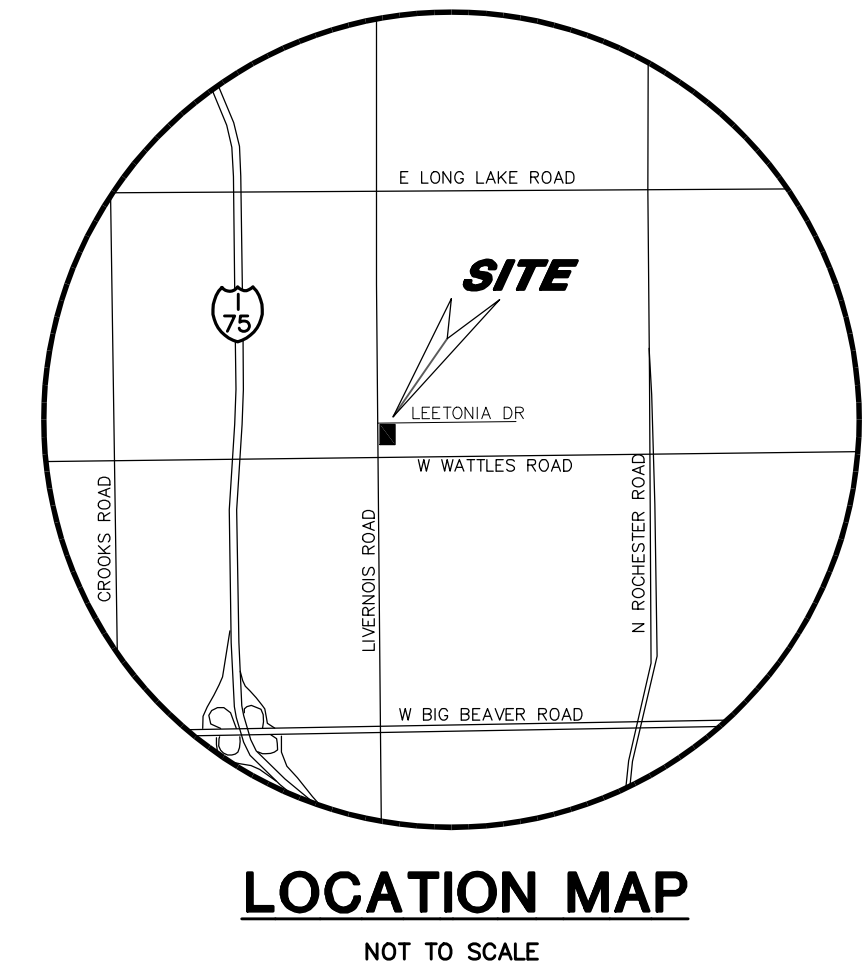
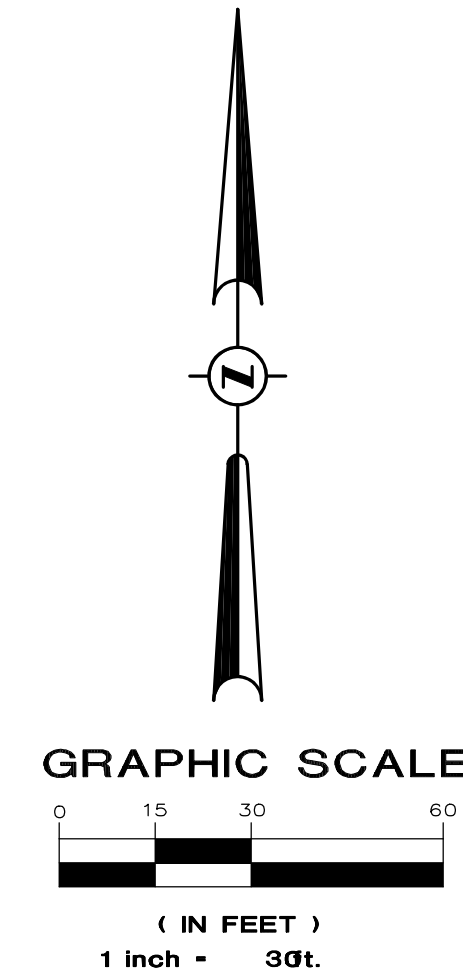
LANGE VIEW TOWNHOUSES
STRATEGIC PROPERTY SERVICES, LLC
4088 LIVERNOIS ROAD
CITY OF TROY
OAKLAND COUNTY, MICHIGAN






























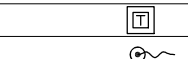
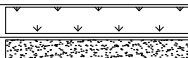
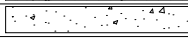
TREE SURVEY

C2.1

180401

LANGE VIEW TOWNHOUSES



LEGEND	
	MONUMENT / SECTION CORNER
	FOUND PROPERTY IRON
	SET PROPERTY IRON W/CAP NO.26454
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FLOODPLAIN INFORMATION
CITY OF TROY, COMMUNITY NO. 260180 OAKLAND COUNTY, MICHIGAN MAP NUMBER: 26125C0534F EFFECTIVE DATE: 9/29/2006 FLOOD ZONE: X AREA OF MINIMAL FLOOD HAZARD (PER FIRM)

ZONING INFORMATION	
ZONED NN (NEIGHBORHOOD NODE)	
NODE H - LIVERNOIS & W. WATTLES INTERSECTION	
STREET TYPE NN:A(LIVERNOIS) AND TYPE NN:B (LEETONIA)	
SITE TYPE NN:B	

	REQUIRED: NEIGHBORHOOD MODE SITE TYPE IN-B BUILDING FORM C	PROVIDED
GROSS SITE AREA USABLE BUILDING AREA		1.82 ACRES
REQUIRED OPEN SPACE	MIN. 15%	1.22 ACRES
LOT COVERED BY BUILDING	MAX. 30%	28,000 SFT 39.7%
BUILDING HEIGHT MAX.	55 FEET	16,675 SFT 23.5%
PROPOSED SETBACKS		
FRONT (N.)	10'	11.0'
FRONT (N.)	10'	17.4'
REAR (E.)	30'	30.6'
SIDE (S)	0'	NA

* SETBACK TO EXISTING BUILDING (TO REMAIN)

* SETBACK TO EXISTING BUILDING (TO REMAIN)

DRAINAGE AREA: 1.31 AC
DEVELOPED % IMPERV: 0.96 AC (73.2%)
ALLOWABLE RELEASE RATE: 0.2 CFS/AC = 0.26 CFS
25-YR DETENTION STORAGE REQD: 9,106 CFT
PROPOSED DETENTION: UG DETENTION ~9,200 CFT

STANDARD DUTY ☐

PARKING			
REQUIRED NUMBER OF PARKING SPACES:			
	REQUIREMENT	BUILDING AREA	REQUIRED PARKING
OFFICE/PROF.	1 SPACE FOR EACH 300 SQ FT OF FLOOR AREA	7,175 GSFT	24 SPACES
SINGLE-FAMILY	2 SPACES PER UNIT	9 UNITS	18 SPACES
	TOTAL SPACES REQUIRED		40 SPACES
	TOTAL SPACES PROVIDED		43 SPACES

STRATEGIC PROPERTY SERVICES, LLC
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2807 Highbrook Drive
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(989) 513-4058

[illegible]

FILE #:	OVERALL
PROJ MGR:	R/LF
DESIGN BY:	R/LF
DRAWN BY:	R/LF
CHECKED BY:	
SCALE:	1"=30' NONE
SHEET:	1 OF 1

REDRIDGE ENGINEERING, LLC
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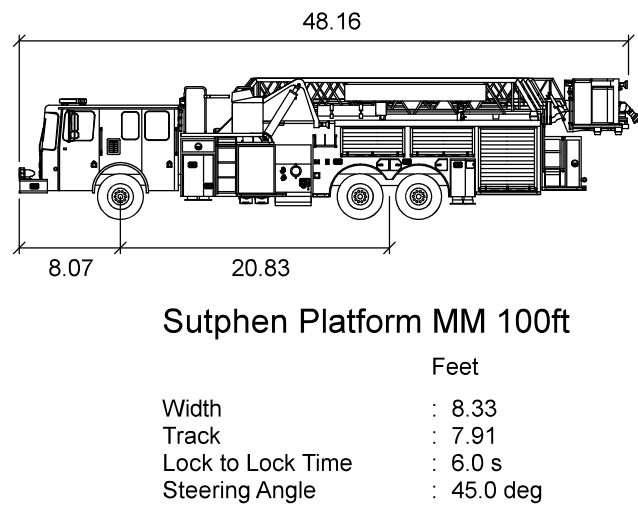
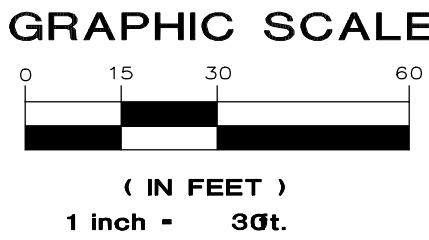
**LANGE VIEW TOWNHOUSES
STRATEGIC PROPERTY SERVICES, LLC**

4080 LIVERNOIS ROAD
CITY OF TROY
OAKLAND COUNTY, MICHIGAN

































OVERALL SITE PLAN

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180401



LEGEND

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REDRIDGE ENGINEERING, LLC
RICHARD FOSGITT, P.E.
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Midland, MI 48642
(989) 513-4058

TURNING PLAN

REDRIDGE ENGINEERING, LLC
2807 Highbrook Drive, Midland, MI 48642
389-513-4058 rfosgitt@redridge-eng.com

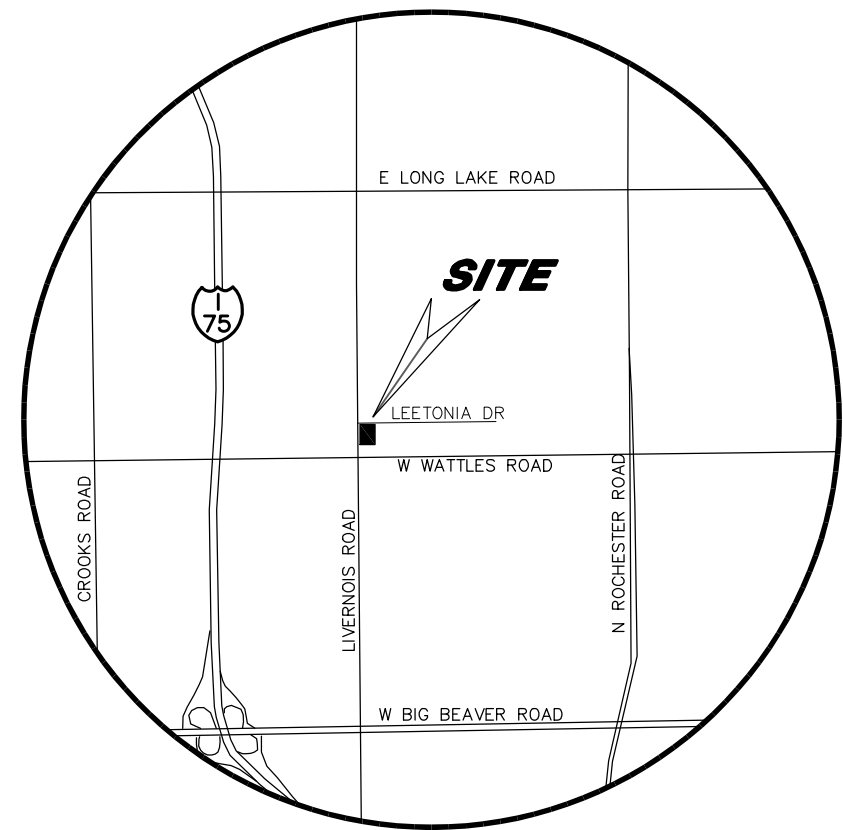
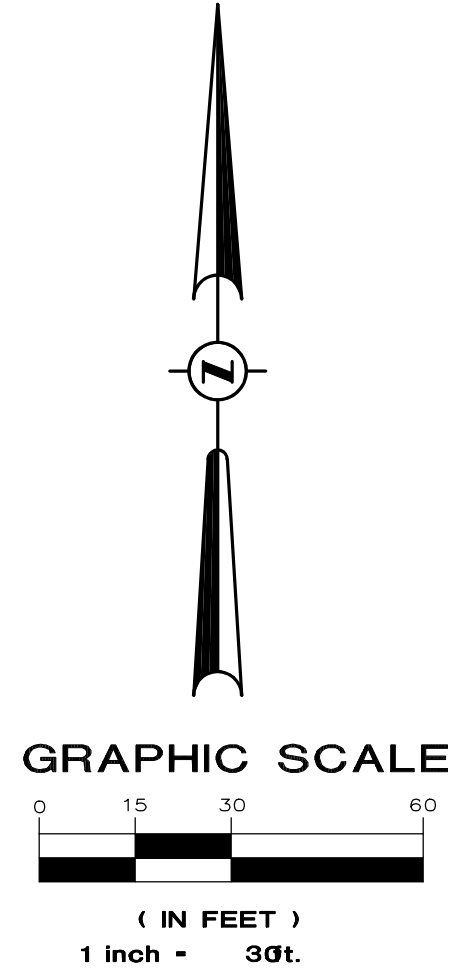
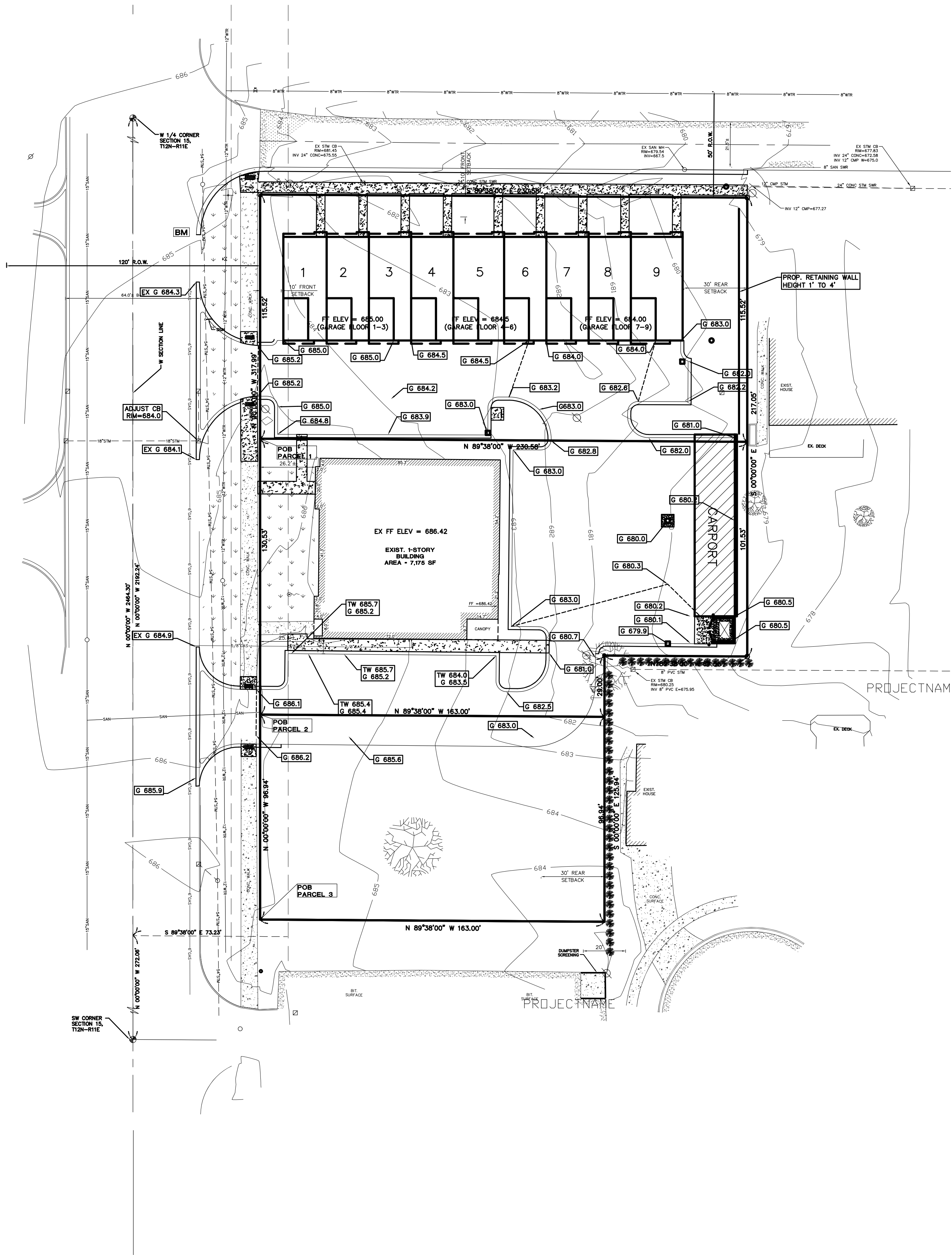
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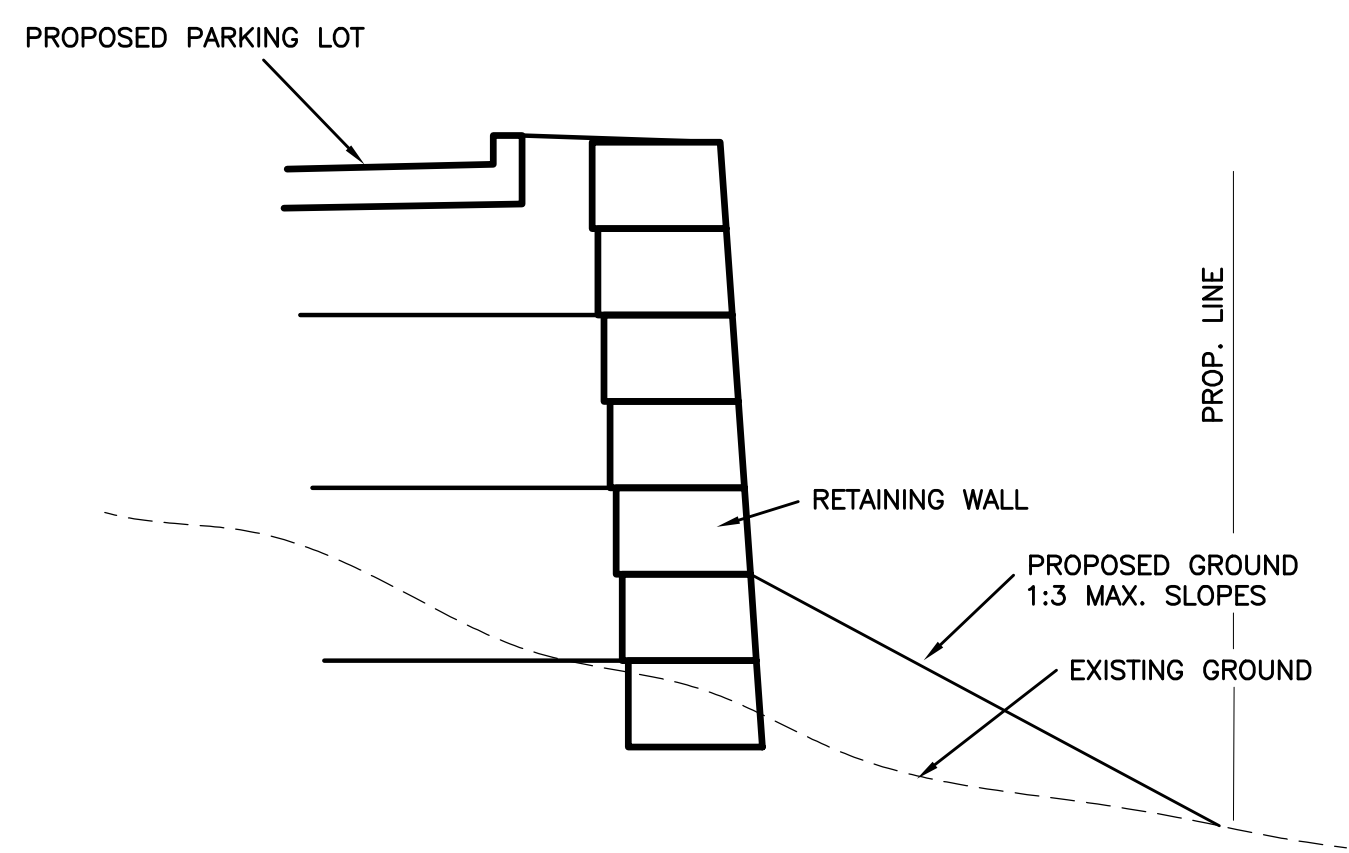
LOCATION MAP
NOT TO SCALE

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G XXX.X DENOTES PAVEMENT GRADE (EDGE OF METAL)
W XXX.X DENOTES SIDEWALK GRADE

SITE GRADING NOTES

- GRADING BASIS OF DESIGN:
PAVEMENT MIN. 1.0% SLOPE
CURB AND GUTTER MIN. 0.50% SLOPE
- CONTRACTOR TO PROVIDE SOIL EROSION CONTROL MEASURES AS NECESSARY TO PREVENT ANY EROSION OR SEDIMENTATION. PROTECT ALL DRAINAGE STRUCTURES WITH SILT FENCE, SURFACE SEDIMENT SUMPS, OR OTHER APPROVED MEASURES.
- PROPOSED RETAINING WALL SHALL BE REDI-ROCK OR APPROVED EQUAL. CONTRACTOR TO PROVIDE SHOP DRAWINGS OF RETAINING WALL FOR APPROVAL BY OWNER AND TOWNSHIP ENGINEER.



EAST RETAINING WALL SECTION

PROPRIETOR
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ENGINEER
REDRIDGE ENGINEERING, LLC
RICHARD FOSGITT, P.E.
2807 HIGBROOK DRIVE
MIDLAND, MI 48642
(989) 513-4058

PREPARED UNDER THE SUPERVISION OF:
RICHARD FOSGITT, P.E.
No. 43189
Professional Engineer

PROJECT LOG	FILE #	OVERALL	PROJ. MGR.	DESIGN BY:	DRAWN BY:	CHECKED BY:	SCALE:	SHEET:
PRELIMINARY LAYOUT DESIGN	04-17-15	RF	RF	RF	RF	RF	1"=30'	1 OF 1
UPDATED SITE PLAN REVIEW	08-31-21	RF	RF	RF	RF	RF	NONE	
REVISED LAYOUT	04-04-22	RF	RF	RF	RF	RF		
	10-10-22	RF	RF	RF	RF	RF		

REDRIDGE ENGINEERING, LLC
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989-513-4058 RFOSGITT@REDRIDGE-ENG.COM

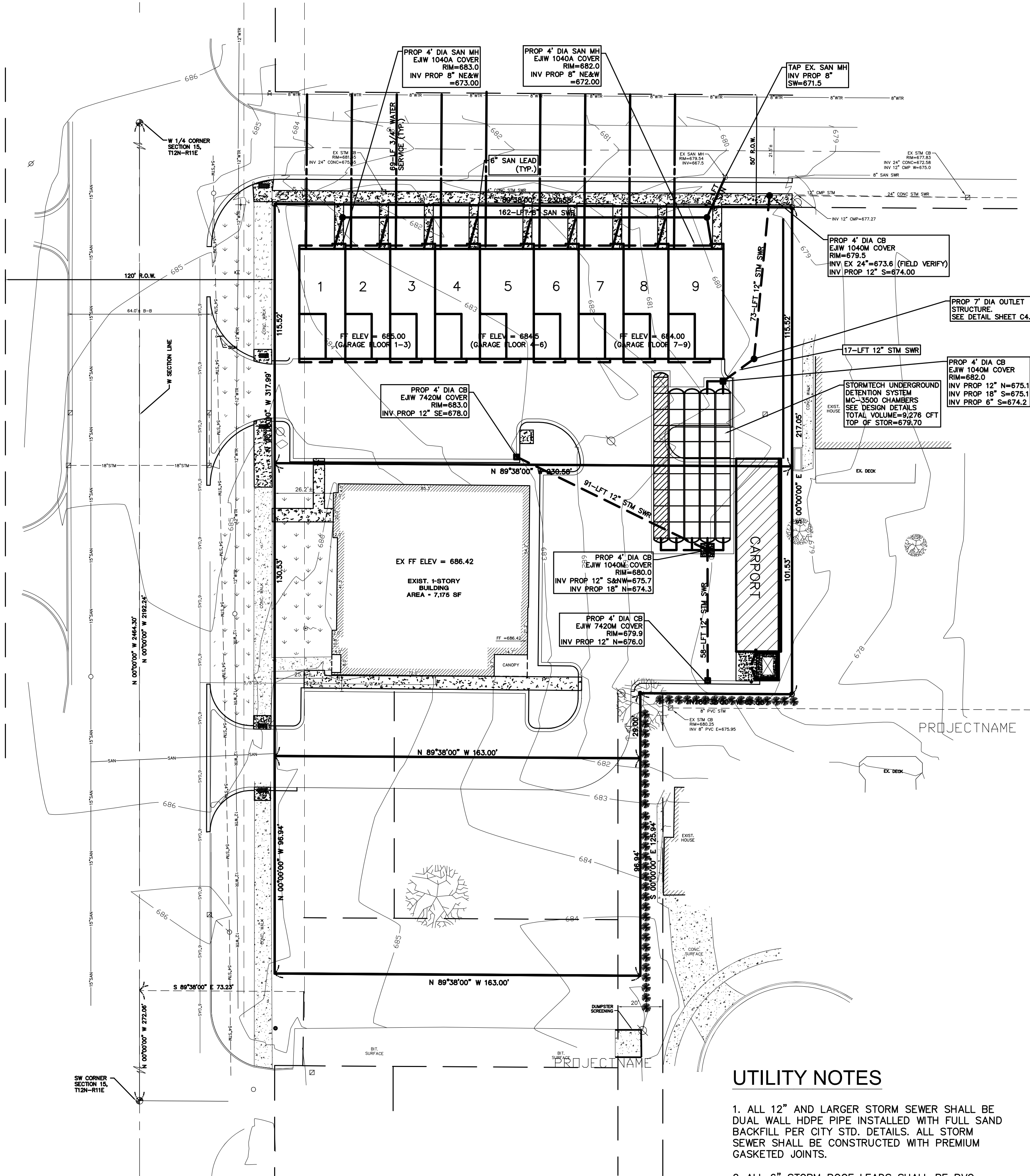
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LANGE VIEW TOWNHOUSES
STRATEGIC PROPERTY SERVICES, LLC
4088 LIVERNOIS ROAD
CITY OF TROY
OAKLAND COUNTY, MICHIGAN

GRADING PLAN

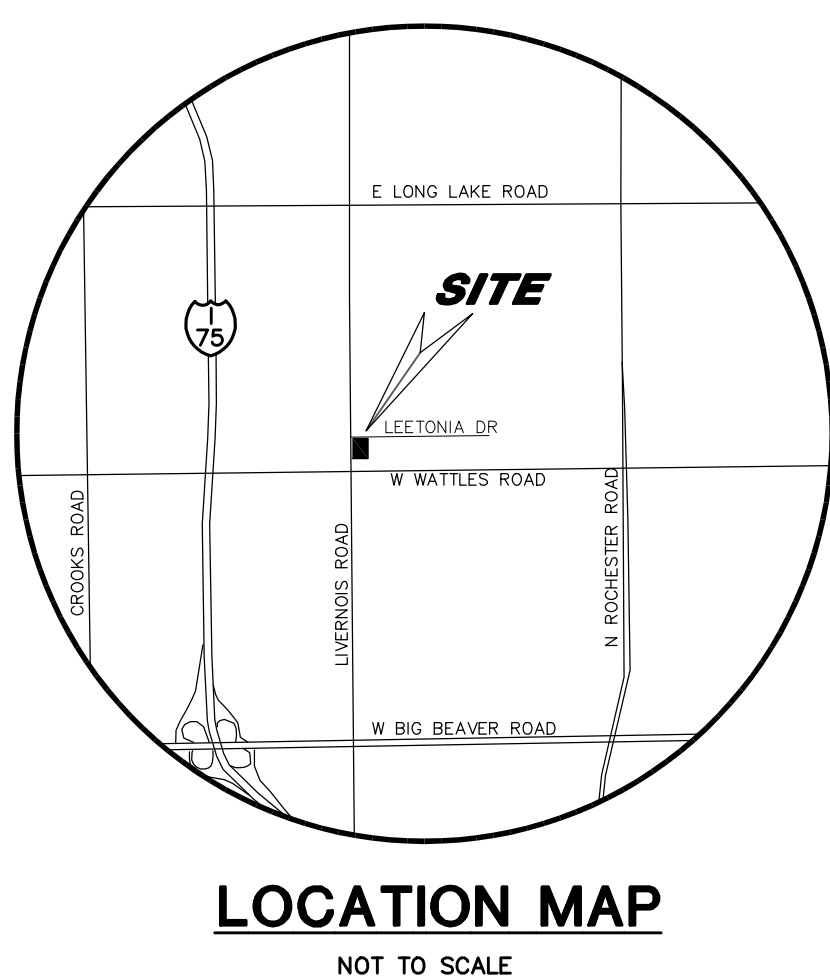
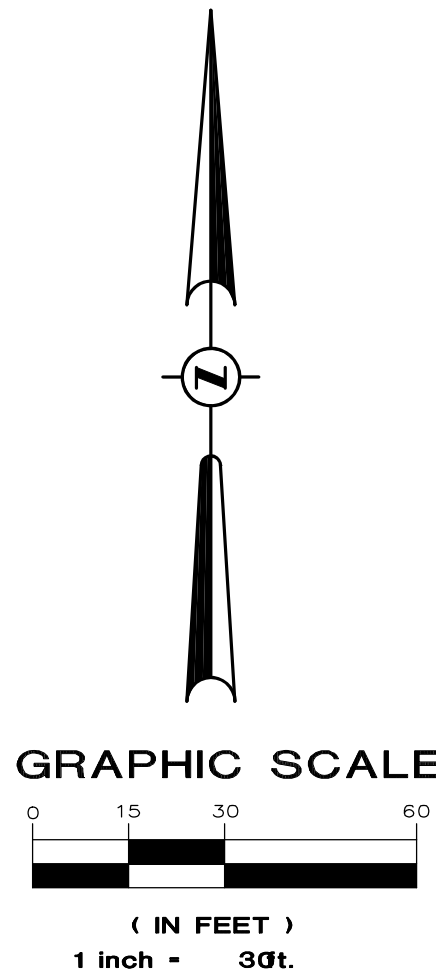
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180401



UTILITY NOTES

- ALL 12" AND LARGER STORM SEWER SHALL BE DUAL WALL HDPE PIPE INSTALLED WITH FULL SAND BACKFILL PER CITY STD. DETAILS. ALL STORM SEWER SHALL BE CONSTRUCTED WITH PREMIUM GASKETED JOINTS.
- ALL 6" STORM ROOF LEADS SHALL BE PVC SDR-26 PIPE,
- WATER SERVICE SHALL BE TYPE K COPPER SERVICE WITH FULL SAND BACKFILL.
- SANITARY SEWER LEADS SHALL BE PVC SDR-26 PIPE INSTALLED WITH FULL SAND BACKFILL AND BEDDING PER CITY STANDARD DETAILS.
- ALL DRAINAGE STRUCTURE CASTINGS LOCATED WITHIN BITUMINOUS PAVEMENT SHALL HAVE CONCRETE COLLARS PER THE SITE DETAILS.
- SANITARY AND WATER BASIS OF DESIGN: 8.0 REU.



Stormwater Detention Calculations			
Input Data			
Return Period	25-yr	Per city of Troy Requirements	
Ai (acres)	0.96		
A (acres)	1.31		
Detention Area Calculations			
I, Intensity of Rainfall	= 1.2256	Per city of Troy Requirements	
Qa, Allowable Runoff	= 0.262		
Qo, Maximum Outflow	= 0.262		
T, Storage Time	= 150.42		
Vs, Volume of Storage per Ai	= 9485		
Vt, Total Storage Required	= 9106		
Detention Volume Required			
	= 9106	cft	
Formulas/Definitions			
A, Acreage of Site			
Ai, Proposed Imp. Acres (After Construction)			
Ci, Impervious Run-off Coef.	= 0.90		
Cp, Perious Run-off Coef.	= 0.15		
I, Intensity of Rainfall	= 215/(25+1)		
Qa, Allowable Runoff	= Ci I Ai + Cp I Ap		
Qo, Maximum Outflow	= Qa/Ai		
T, Storage Time	= [(8062.5/Qo)^0.5]-25		
T, Time in Minutes	= [(12900xT)/(T+25)] - 4000T		
Vs, Volume of Storage per Ai	= Vs x Ai		
Vt, Total Storage Required			

User Inputs		Results	
Chamber Model:	MC-3500	System Volume and Bed Size	
Outlet Control Structure:	Yes	Installed Storage Volume:	9276.06 cubic ft.
Project Name:	Livernois Site 2 copy	Storage Volume Per Chamber:	109.90 cubic ft.
Engineer:	Richard Fosgitt	Number Of Chambers Required:	46
Project Location:	Michigan	Number Of End Caps Required:	10
Measurement Type:	Imperial	Chamber Rows:	5
Required Storage Volume:	9100 cubic ft.	Maximum Length:	81.55 ft.
Stone Porosity:	40%	Maximum Width:	36.08 ft.
Stone Foundation Depth:	9 in.	Approx. Bed Size Required:	2797.01 square ft.
Stone Above Chambers:	12 in.	System Components	
Average Cover Over Chambers:	18 in.	Amount Of Stone Required:	377.01 cubic yards
Design Constraint Dimensions:	(80 ft. x 100 ft.)	Volume Of Excavation (Not including Fill):	569.76 cubic yards

Restrictor Sizing Calculations			
Detention Pond			
Qa, Allowable Runoff	0.262	cfs	
Pass through (existing)	0.000	cfs	
Total Release Rate	0.262	cfs	
Design High Water Elev	679.20		Top of stone
Downstream Water Surface	675.60		Exist 24" outlet full
Computed Head, h	3.60	ft	
C (coefficient)	0.62		
Restrictor Sizing Calculations			
Q = CA (2gh)^0.5 (cfs)			
A, Area of Pipe	0.0278	sft	
r, Radius of Pipe	0.0940	ft	
d, Diameter of Pipe (ft)	0.1880	ft	
d, diameter of Pipe (in)	2.2558	in	
Restrictor Size Required			
Actual Restrictor Size	2.26	in	
Actual Release Rate	0.261	cfs	O.K.

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4080 LIVENOS ROAD
CITY OF TROY
OAKLAND COUNTY, MICHIGAN

UTILITY PLAN

C4.1

180401

LANDSCAPE MAINTENANCE PLAN:

ALL SCREENING ELEMENTS AND PLANT MATERIALS SHALL BE MAINTAINED IN ACCORDANCE WITH THIS SITE PLAN, AND THE FOLLOWING:

A. SCREENING ELEMENTS AND PLANT MATERIALS SHALL BE INSTALLED IN A MANNER CONSISTENT WITH AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS

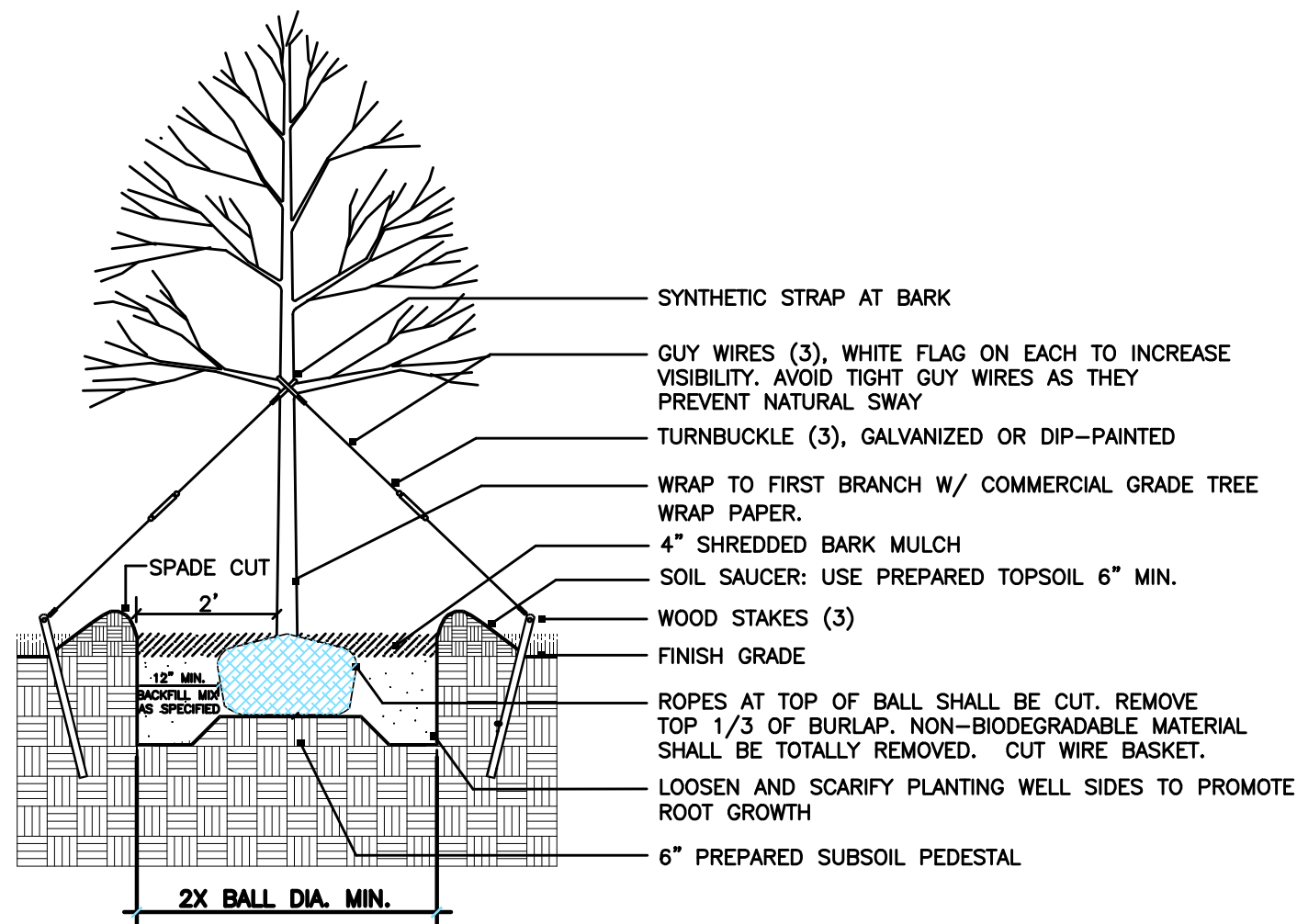
B. IN ADDITION TO THE WATERING-IN REQUIRED AT THE TIME OF PLANTING, WATER, CULTIVATE, AND REMOVE GRASS AND WEEDS AROUND EACH PLANT AT LEAST 5 TIMES DURING THE FIRST FULL YEAR GROWING SEASON TO ENSURE HEALTHY PLANTING GROWTH. DURING EACH WATERING AND CULTIVATION, REMOVE GRASS AND WEEDS WITHIN THE MULCH RING. CUT GRASS TO 3 INCHES HIGH. INSPECT LANDSCAPING AND REMOVE INSECT INFESTATIONS OR DISEASE DAMAGE TO THE PLANTS AND PRUNE DEAD WOOD.

C. DURING THE FIRST AND SECOND WATERING OF THE SECOND GROWING SEASON, USE A NITROGEN-ENRICHED SOLUTION AS PART OF WATERING. APPLY FERTILIZER BEFORE JULY 7. AT THE FIRST WATERING OF THE SECOND GROWING SEASON, REMOVE AND DISPOSE OF THE GUYING MATERIAL, WRAPPING MATERIAL, IDENTIFICATION TAGS, AND INSPECTION TAGS. AT THE FINAL WATERING, REPLENISH THE MULCH AROUND THE PLANTS TO A DEPTH OF 4-6 INCHES.

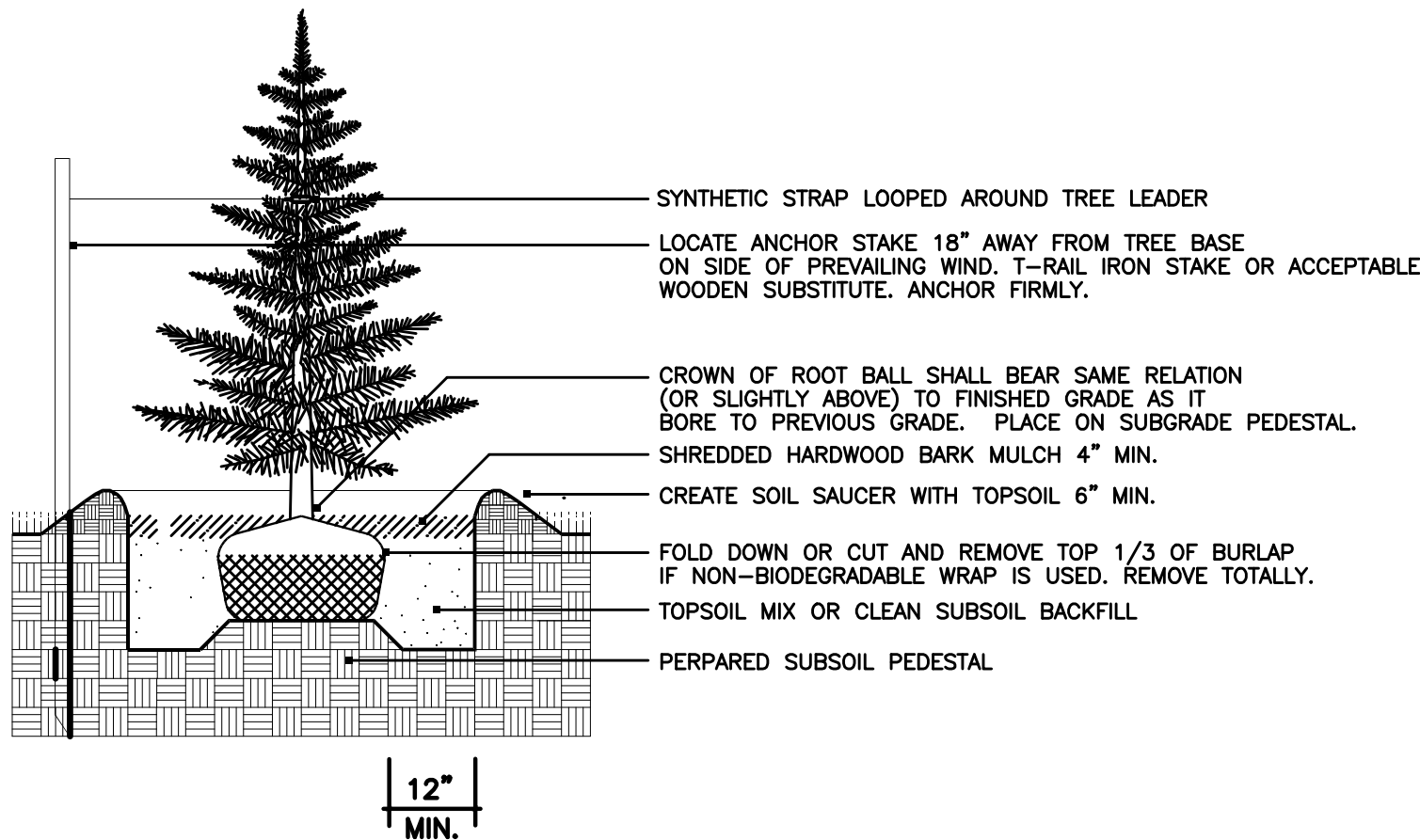
D. PRUNING OF PLANT MATERIALS SHALL BE LIMITED TO THE MINIMUM NECESSARY TO ENSURE PROPER MATURATION OF PLANTS TO ACHIEVE THEIR INTENDED PURPOSE. ENSURE AN ARBORIST, CERTIFIED BY THE INTERNATIONAL SOCIETY OF ARBORICULTURE, PRUNES BRANCHES BEFORE PLANTING. DO NOT USE PRUNING PAINT. PRUNE DECIDUOUS TREES TO REMOVE DEAD WOOD AND BROKEN BRANCHES. PRUNE EVERGREENS TO REMOVE BROKEN OR DAMAGED BRANCHES. PRUNE SHRUBS TO FORM AN OUTLINE CONFORMING TO THE GENERAL SHAPE OF THE SHRUB TYPE.

E. PLANT MATERIALS SHALL BE KEPT IN A NEAT, ORDERLY AND HEALTHY GROWING CONDITION, FREE FROM WEEDS, DEBRIS AND REFUSE. ALL REQUIRED PLANTINGS SHALL BE PLANTED AND MAINTAINED AS SHOWN. OWNER SHALL BE RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF DEAD OR DISEASED PLANT MATERIALS.

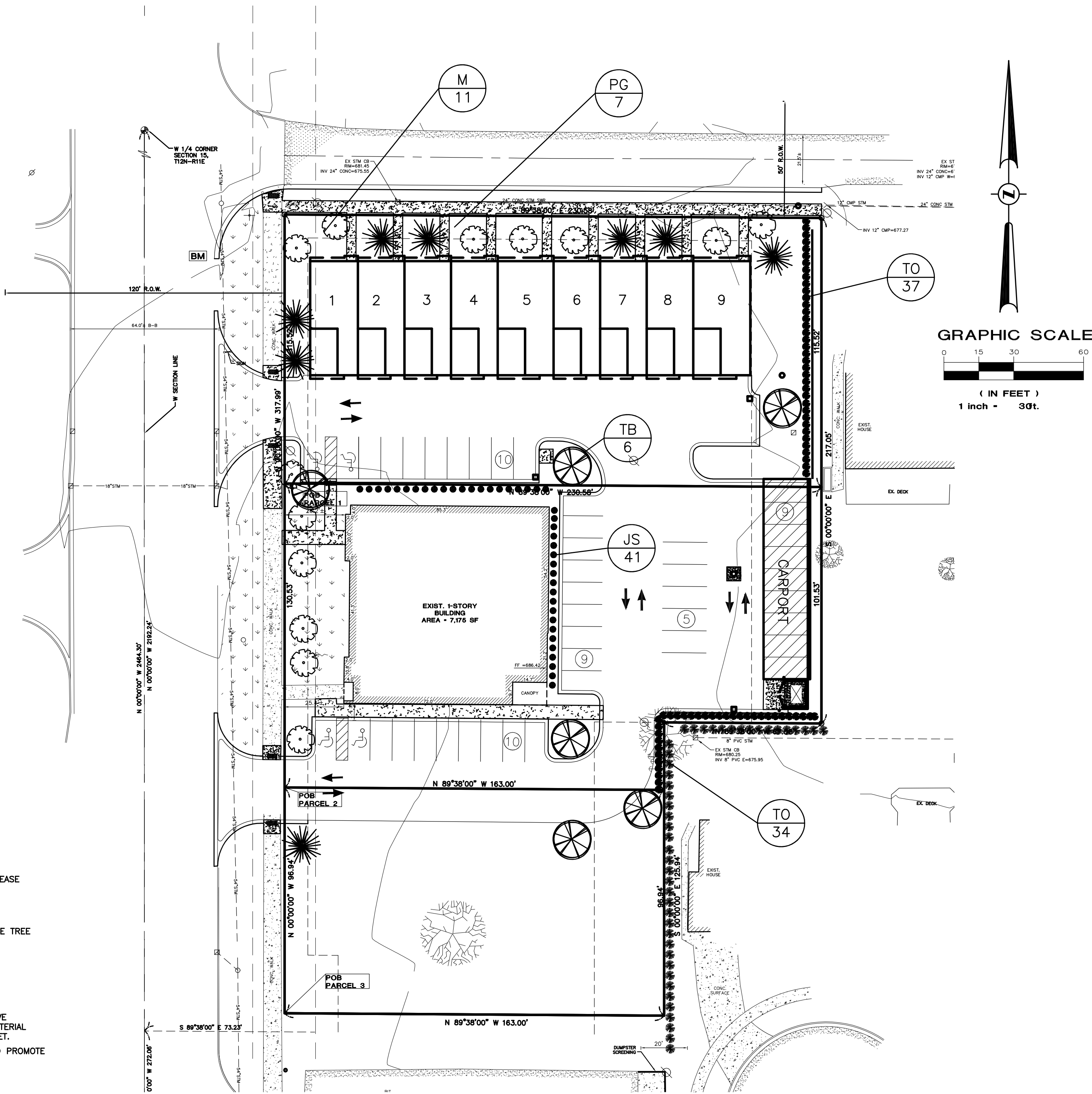
F. THE REPLACEMENT OR REMOVAL OF ANY PLANT MATERIALS IN A MANNER NOT CONSISTENT WITH THIS SITE PLAN IS NOT PERMITTED WITHOUT CITY APPROVAL.



TYPICAL TREE PLANTING DETAIL
NOT TO SCALE



TYPICAL EVERGREEN PLANTING DETAIL
NOT TO SCALE



LEGEND	
	MONUMENT / SECTION CORNER
	FOUND PROPERTY IRON
	SET PROPERTY IRON W/CAP NO.26454
	SET MAG NAIL
	EXISTING CATCHBASIN
	EXISTING MANHOLE
	EXISTING HYDRANT
	EXISTING VALVE
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATERMAIN
	EXISTING FENCE LINE
	EXISTING UNDERGROUND ELECTRIC LINE
	EXISTING UNDERGROUND GAS LINE
	EXISTING UNDERGROUND TELEPHONE LINE
	EXISTING CENTERLINE
	EXISTING OVERHEAD ELECTRICAL WIRES
	EXISTING MAILBOX/NEWSPAPER BOX
	EXISTING SIGN
	EXISTING DECIDUOUS TREES
	EXISTING CONIFEROUS TREES
	EXISTING UTILITY POWER POLE
	EXISTING TELEPHONE RISER
	EXISTING LIGHT POLE
	EXISTING GAS METER
	EXISTING TRANSFORMER
	EXISTING FLAGPOLE
	EXISTING GRASS SURFACE
	EXISTING BITUMINOUS SURFACE
	EXISTING CONCRETE SURFACE

- NOTES:
- BARK MULCH AREAS NOTED ON PLANS SHALL CONSIST OF 4" DEPTH OF SHREDDED HARDWOOD BARK MULCH.
 - A SIX FOOT DIAMETER SHREDDED HARDWOOD BARK MULCH RING SHALL BE PLACED AROUND ALL PROPOSED PLANTINGS NOT DESIGNATED FOR PLANTERS.
 - ALL PLANT MATERIAL AND PLANTINGS SHALL CONFORM TO ANSI 260.1 OR CURRENT EDITION.
 - AREAS NOT SPECIFIED WITH PLANT MATERIAL SHALL BE FINE GRADED AND SEEDED FOR TURF ESTABLISHMENT.
 - CONTRACTOR /LANDSCAPE CONTRACTOR SHALL COORDINATE FINAL PLACEMENT OF ALL PLANT MATERIAL LOCATIONS FOR APPROVAL BY ENGINEER IN RELATION TO FINAL UTILITY PLACEMENT.
 - WHERE A DISCREPANCY IS FOUND BETWEEN EXISTING FIELD CONDITIONS AND/OR REQUIRED LANDSCAPING WORK, NOTIFY OWNER OR ENGINEER FOR CLARIFICATION IMMEDIATELY.
 - ALL EXCESS EXCAVATED MATERIALS AND DEBRIS, WHICH ARE NOT ACCEPTED FOR DISPOSAL ON SITE BY THE OWNER SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AND DISPOSED OF LEGALLY OFFSITE.
 - PLANT DECIDUOUS PLANTS FROM MARCH 1 TO MAY 15 AND FROM OCTOBER 1 UNTIL THE PREPARED SOIL FREEZES. IF UNUSUAL PLANTING CONDITIONS EXIST OR IF USING CONTAINER-GROWN MATERIAL, THE ENGINEER MAY ALTER THESE PLANTING SEASONS. PLANT EVERGREEN PLANTS FROM MARCH 1 TO JUNE 1.
 - SEEDING SHALL OCCUR FROM APRIL 15 THROUGH OCTOBER 10. DORMANT SEEDING IS PERMITTED AFTER NOVEMBER 15, BUT NOT ON FROZEN GROUND.
 - ALL TURF ESTABLISHMENT SHALL BE DONE BY HYDROSEEDING WITH A COMMERCIAL MIXTURE INCLUDING SEED, FERTILIZER, AND MULCH. SEED MIX SHALL BE APPROVED FOR HEAVY SOIL IN FULL SUN CONDITIONS AND APPLIED AT A MINIMUM RATE OF 400 LBS PER ACRE.
 - THE OWNER SHALL BE RESPONSIBLE TO MAINTAIN ALL LANDSCAPING PER THE MAINTENANCE PLAN CONTAINED HEREIN AND IN ACCORDANCE WITH ALL CITY REQUIREMENTS.
 - CONTRACTOR TO BE FAMILIAR WITH AND ADHERE TO ALL LANDSCAPING REQUIREMENTS OUTLINED IN ARTICLE 13, SECTION 13.02 LANDSCAPING, OF THE CITY OF TROY ZONING ORDINANCE.

LANDSCAPING REQUIREMENTS

REQUIRED SITE LANDSCAPING:	REQUIREMENT	PROVIDED
13.02.B SCREENING BETWEEN USES: REQUIRED: ABUTS RESID. ADJ. TO OFFICE TO THE EAST, ALT. 1 OR ALT. 2 PROVIDED: ALT. 1, 1 NARROW EXG. PER 3 FT. & SCREEN WALL	315 LFT 71 TREES AND SCREEN WALL	WALL AND 71 TREES
13.02.E GENERAL SITE LANDSCAPE: REQUIRED: 20% OF SITE AREA SHALL BE LANDSCAPE MATERIAL 41,820 SFT X 20% = 8,364 SFT REQUIRED	8,364 SFT 20.0%	14,197 SFT 33.9%
13.02.C LANDSCAPING WITHIN PARKING LOTS: REQUIRED: 1 TREE FOR EVERY 8 SPACES, 200 SFT MIN CURBED ISLANDS	43 SPACES 6 TREES	6 TREES
13.02D GREENBELT STANDARDS: REQUIRED: 1 TREE FOR EVERY 30 LFT	500 LFT 17 TREES	17 TREES

THIS LANDSCAPE PLAN HAS BEEN REVIEWED BY
WESLEY K. LANDON, A LANDSCAPE ARCHITECT
LICENSED IN THE STATE OF MICHIGAN (LICENSE NO.
3901001603), AND DETERMINED TO BE COMPLETE
BASED ON THE CITY OF TROY ZONING ORDINANCE
SECTION 13.02 - LANDSCAPING.



LANDSCAPE PLANTING SCHEDULE

SYM	KEY	QUANTITY	SIZE	BOTANICAL NAME	COMMON NAME	NOTES
	TO	71	6' TALL	THUJA OCCIDENTALIS 'TECHNY'	TECHNY ARBORVITAE	BALLED IN BURLAP
	PG	7	6' TALL	PICEA GLAUCA	MONTROSE CHARM	BALLED IN BURLAP
	M	11	2 1/2" CALIPER	MALUS 'PRAIRIEFIRE'	PRAIRIEFIRE CRABAPPLE	BALLED IN BURLAP
	TB	6	2 1/2" CALIPER	TILIA AMERICANA 'BOULEVARD'	BOULEVARD LINDEN	BALLED IN BURLAP
	JS	41	2.5 QT 24" HT.	JUNIPERUS SABINA 'BROADMORE'	BROADMORE JUNIPER	4' ON CENTER

PROPRIETOR

STRATEGIC PROPERTY SERVICES, LLC
ATTN: VINCE PANGLE
5750 NEW KING STREET, STE 350
TROY, MI 48068

SURVEYOR

D&M SITE, INC.
401 BALSAM STREET
CARROLLTON, MI 48624
(989) 752-6500

ENGINEER

REDRIDGE ENGINEERING, LLC
RICHARD FOSGITT, P.E.
2807 HIGHBROOK DRIVE
MIDLAND, MI 48642
(989) 513-4058

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

DESIGN	04-17-15
PERMANENT LANDSCAPE DESIGN	08-31-21
REVISED PER LONDON	04-23-22
REVISED LAYOUT	10-10-22

FILE # OVERALL
PROJ MGR: RLF
DESIGN BY: RLF
DRAWN BY: RLF
CHECKED BY:
SCALE: 1"=30'
SHEET: 1 OF 1

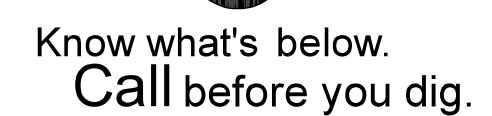
REDRIDGE ENGINEERING, LLC
2807 HIGHBROOK DRIVE, MIDLAND, MI 48642
989-513-4058 RFOSGITT@REDRIDGE-ENG.COM

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LANGE VIEW TOWNHOUSES
STRATEGIC PROPERTY SERVICES, LLC
4080 LIVERNOIS ROAD
TROY, MI 48068
OAKLAND COUNTY, MICHIGAN

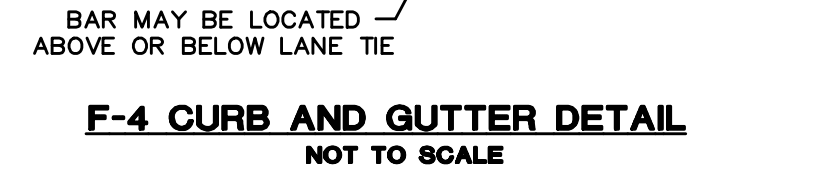
OVERALL LANDSCAPING PLAN

C5.0
180401



PROJECT LOG					
FILE #:	# OVERALL				
PROJ MGR:	R/LF	PRELIMINARY LAYOUT FOR REVIEW		04-17-19	
DESIGN BY:	R/LF	UPDATED SITE PLAN REVIEW		04-04-19	
DRAWN BY:	R/LF	REVISED LAYOUT		10-09-22	
CHECKED BY:					
SCALE:	NONE NONE NONE				
SHEET:	1 OF 1				

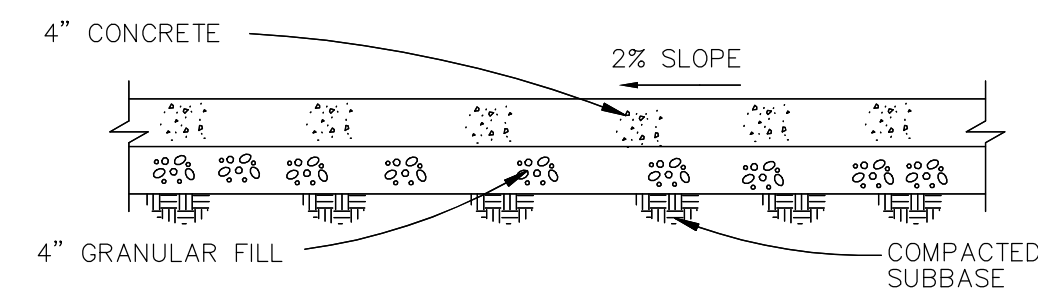




REPLACEMENT BITUMINOUS PAVEMENT



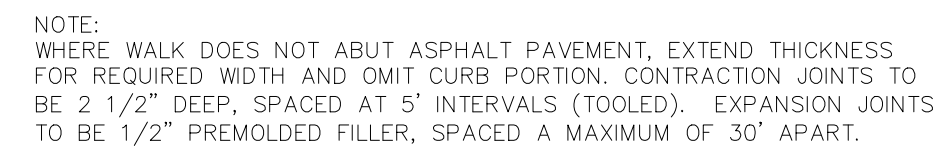
RESURFACING BITUMINOUS PAVEMENT



NOTE:
CONTRACTION JOINTS SHALL BE 1/4" x 2 3/4" DEEP, SPACED AT 5'-0"
INTERVALS. EXPANSION JOINTS SHALL BE 1/2" PREMOLDED FILLER, SPACED AT A
MAXIMUM 30' APART. EXPANSION JOINTS TO BE PLACED BETWEEN NEW AND
EXISTING CONCRETE.

CONCRETE WALK

NO SCALE



CONCRETE CURB WALK

NO SCALE



CONCRETE PAVEMENT

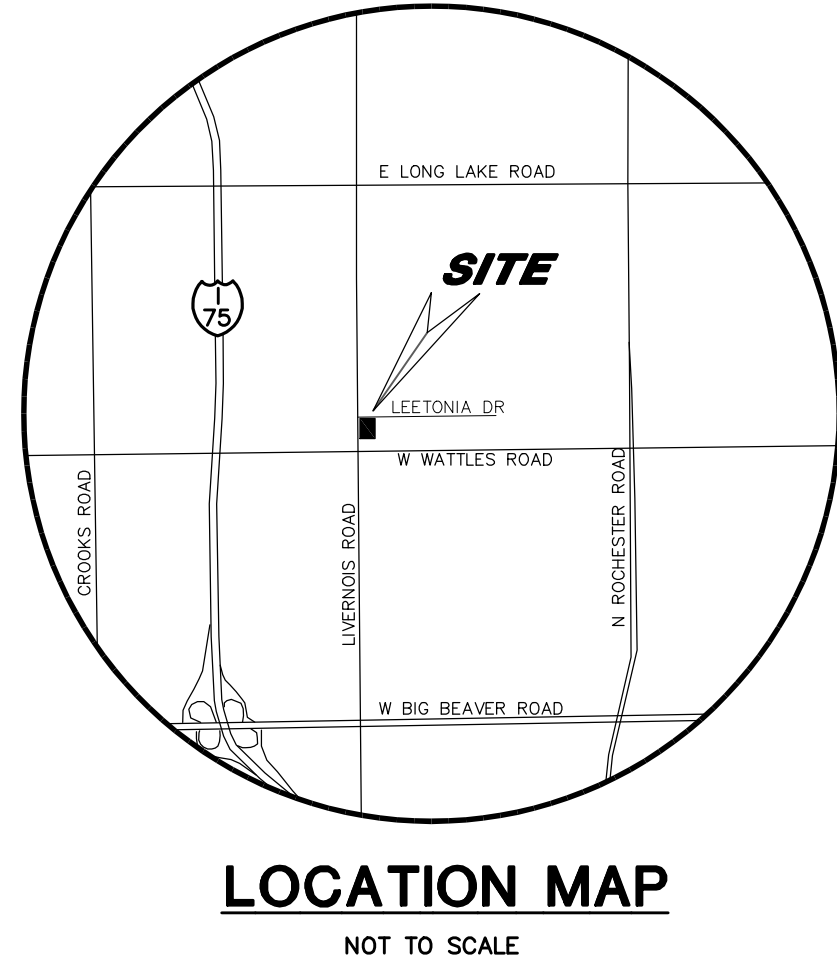
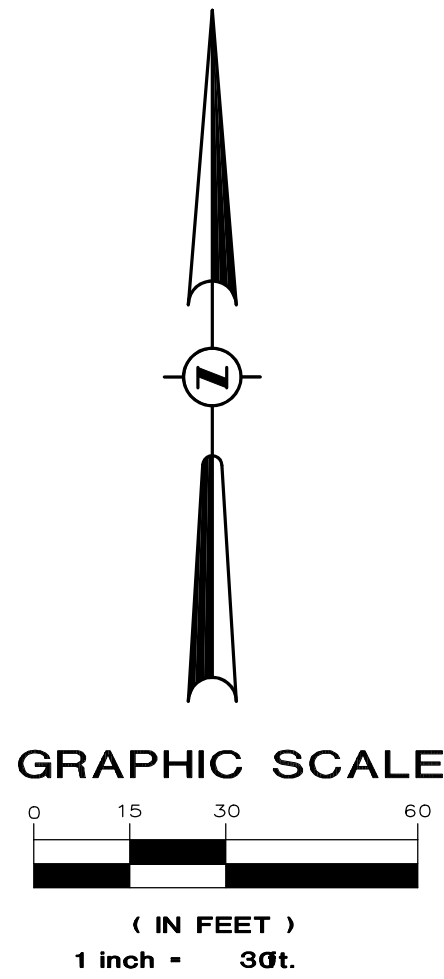
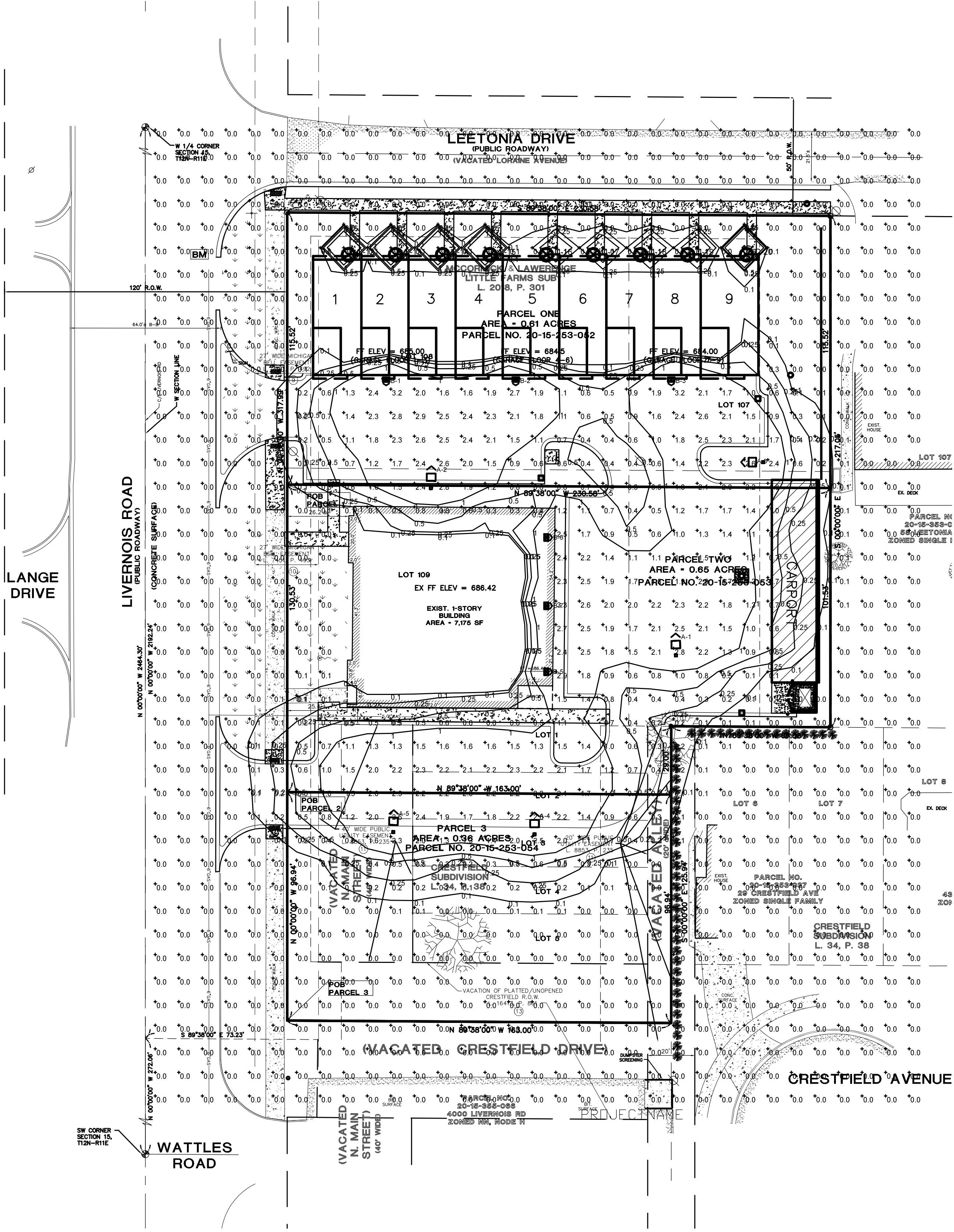
NO SCALE



LOT LIGHT POLE CONCRETE BASE DETAIL

NO SCALE





D-Series Size 1 LED Area Luminaire

Specifications

EPAC	1.01 ft
Length	33"
Width	13"
Height H1	7.1/2"
Height H2	3.1/2"
Weight (max)	27 lbs

Introduction

The modern styling of the D-Series is striking yet understated - making a bold, progressive statement even as it blends seamlessly with its environment. The D-Series distills the benefits of the latest in LED technology into a high performance, high efficiency, long life luminaire.

The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 750W metal halide in pedestrian and area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information		EXAMPLE: DSK1 LED P7 40K T3M MVOLT SPA NLTAR2 PIRHN DBXKD	
Series	Model	Color Temperature	Wavelength
DSK1 LED	Forward optics	3000	175
	P1 P1	4000	175
	P2 P1	5000	175
	P3 P1	5000	175
DSK1 LED	Reverse optics	3000	175
	P1 P2	4000	175
	P2 P2	5000	175
	P3 P2	5000	175

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WEDGE2 LED Architectural Wall Sconce Visual Comfort Optic

Specifications

Depth (D1)	7"
Depth (D2)	1.5"
Height	9"
Width	11.5"
Weight	13.5 lbs

Introduction

The WEDGE2 LED is designed to meet specific every wall-mounted lighting need in a widely accepted design that blends with any architecture. The clean, rectangular design comes in four sizes with lumen packages ranging from 1,200 to 25,000 lumens, providing a true site-wide solution. Embedded with nLight® ABL wireless controls, the WEDGE2 family provides additional energy savings and code compliance.

WEDGE2 delivers up to 6,000 lumens with a soft, non-polluted light source, creating a visually comfortable environment. When combined with multiple integrated emergency battery backup options, including an 18W cold temperature option, the WEDGE2 becomes the ideal wall-mounted lighting solution for pedestrian scale applications in any environment.

WEDGE2 LED Family Overview	
Series	Model
WEDGE2 LED	WEDGE2 LED
WEDGE2 LED	WEDGE2 LED
WEDGE2 LED	WEDGE2 LED
WEDGE2 LED	WEDGE2 LED

Ordering Information		EXAMPLE: WEDGE2 LED P3 40K 80CRI VF MVOLT SRM DBXKD	
Series	Model	Color Temperature	Wavelength
WEDGE2 LED	Forward optics	3000	175
	P1 P1	4000	175
	P2 P1	5000	175
	P3 P1	5000	175
WEDGE2 LED	Reverse optics	3000	175
	P1 P2	4000	175
	P2 P2	5000	175
	P3 P2	5000	175

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LITHONIA LIGHTING

FEATURES & SPECIFICATIONS

Provides years of performance free illumination for outdoor use in residential & commercial applications. Ideal applications such as lighting walkways and stairways for safety and security.

CONSTRUCTION

Cast aluminum housing with corrosion resistant paint in either dark bronze or white finish.

OPTICS

4000K CCT LED.

ELECTRICAL

WEDGE2 down optics are low voltage from 120-277V. Operating temperature: 40° F to 140° F.

INSTALLATION

Surface-mount to vertical junction box (provided by others).

LISTINGS

UL Listed in U.S. and Canadian safety standards for wet locations.

WARRANTY

5-year limited warranty. The 5-year warranty is provided and no other statements or specifications shall constitute any warranty of this kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.lithonia.com/warranty.

Ordering Information		EXAMPLE: OLLWD LED P1 40K MVOLT DBX	
Series	Model	Color Temperature	Wavelength
OLLWD LED	Forward optics	3000	175
	P1 P1	4000	175
	P2 P1	5000	175
	P3 P1	5000	175
OLLWD LED	Reverse optics	3000	175
	P1 P2	4000	175
	P2 P2	5000	175
	P3 P2	5000	175

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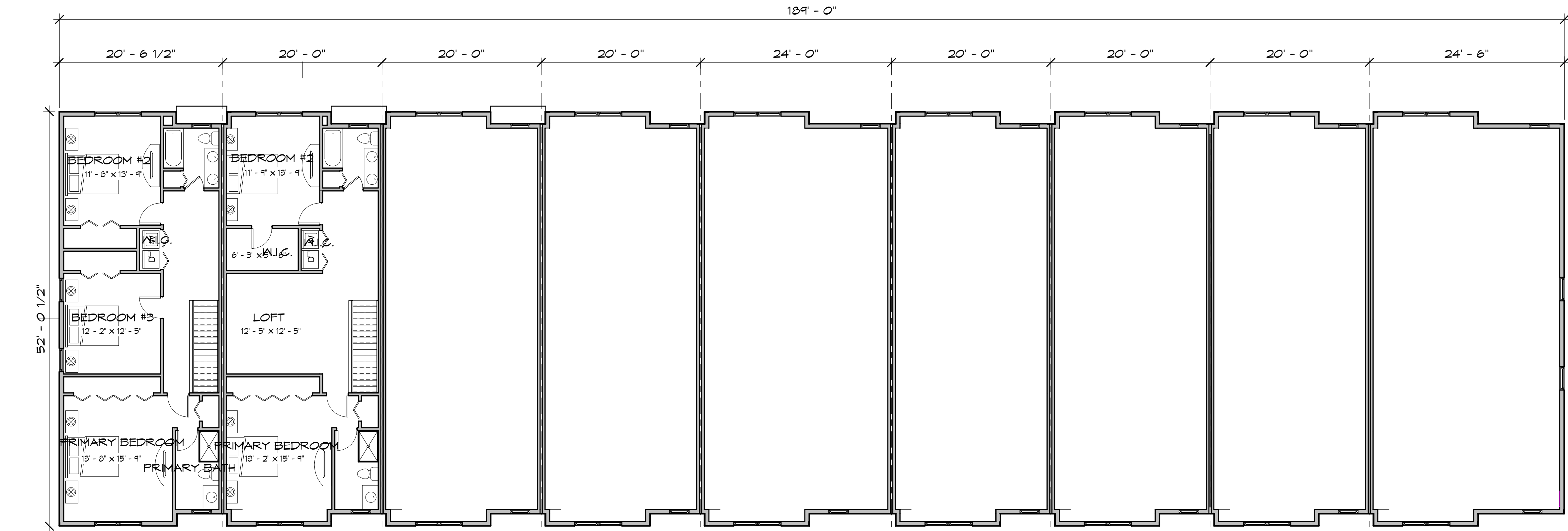


PROJECT LOG	
FILE #	OVERALL
PROJ. MGR.	RF
DESIGN BY:	RF
DRAWN BY:	RF
CHECKED BY:	RF
SCALE:	1"=30'
SHEET:	1 OF 1

REDRIDGE ENGINEERING, LLC
2807 HIGHBROOK DRIVE, MIDLAND, MI 48642
989-513-4058 RFOSGITT@REDRIDGE-ENG.COM

STRATEGIC PROPERTY SERVICES, LLC
4080 LIVERNOIS ROAD
OAKLAND COUNTY, MICHIGAN
PHOTOMETRIC PLAN

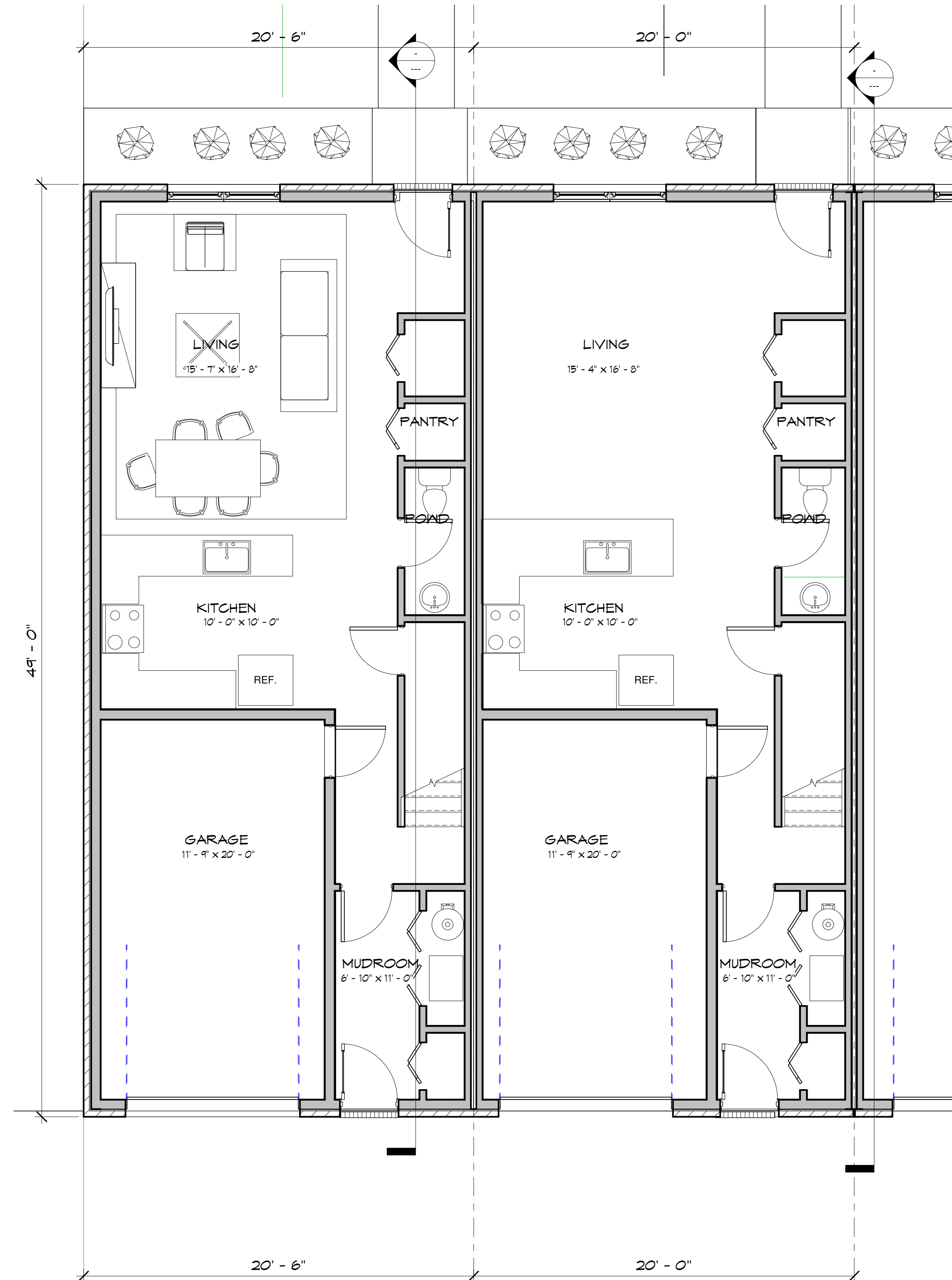
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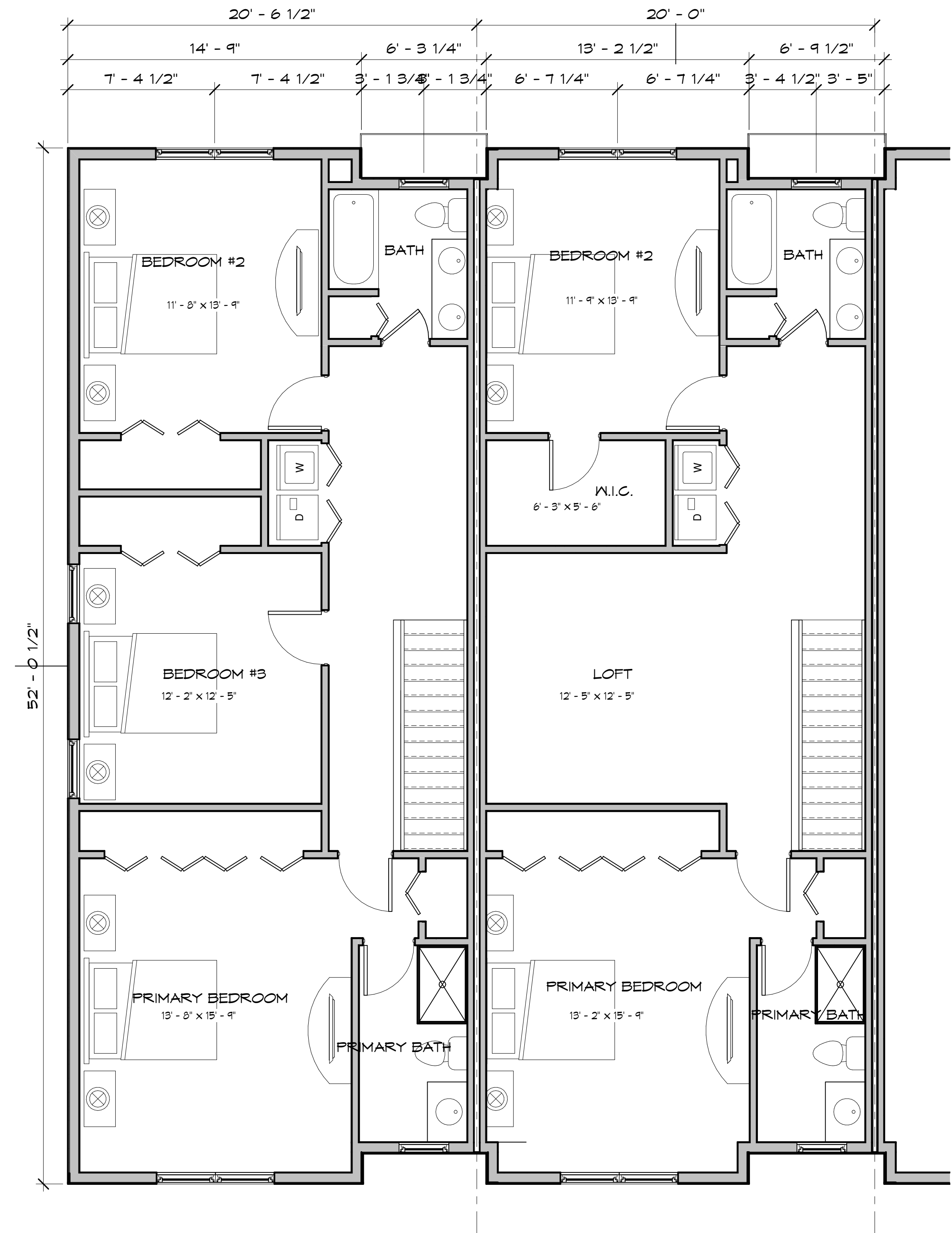
2 SECOND FLOOR OVERALL
A3 1/8" = 1'-0"



1 FIRST FLOOR OVERALL
A3 1/8" = 1'-0"



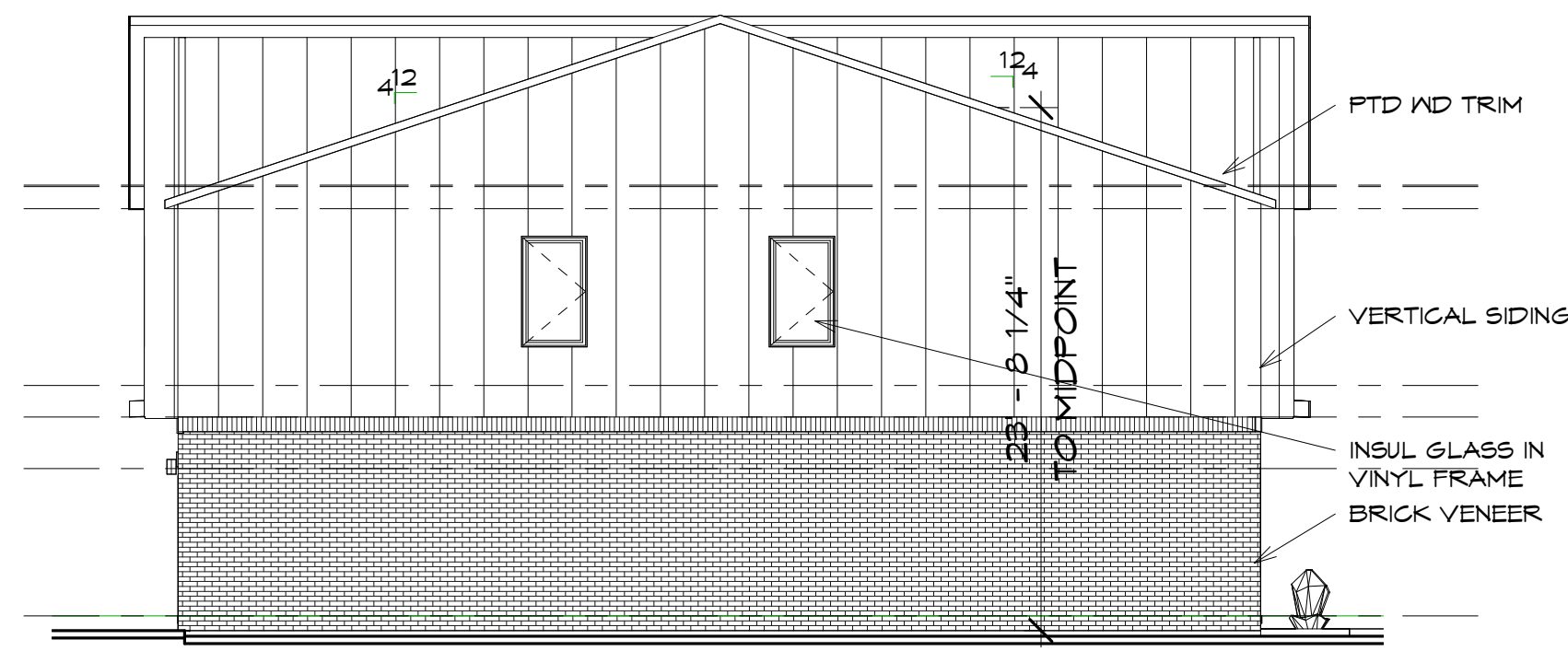
734 SQ FT



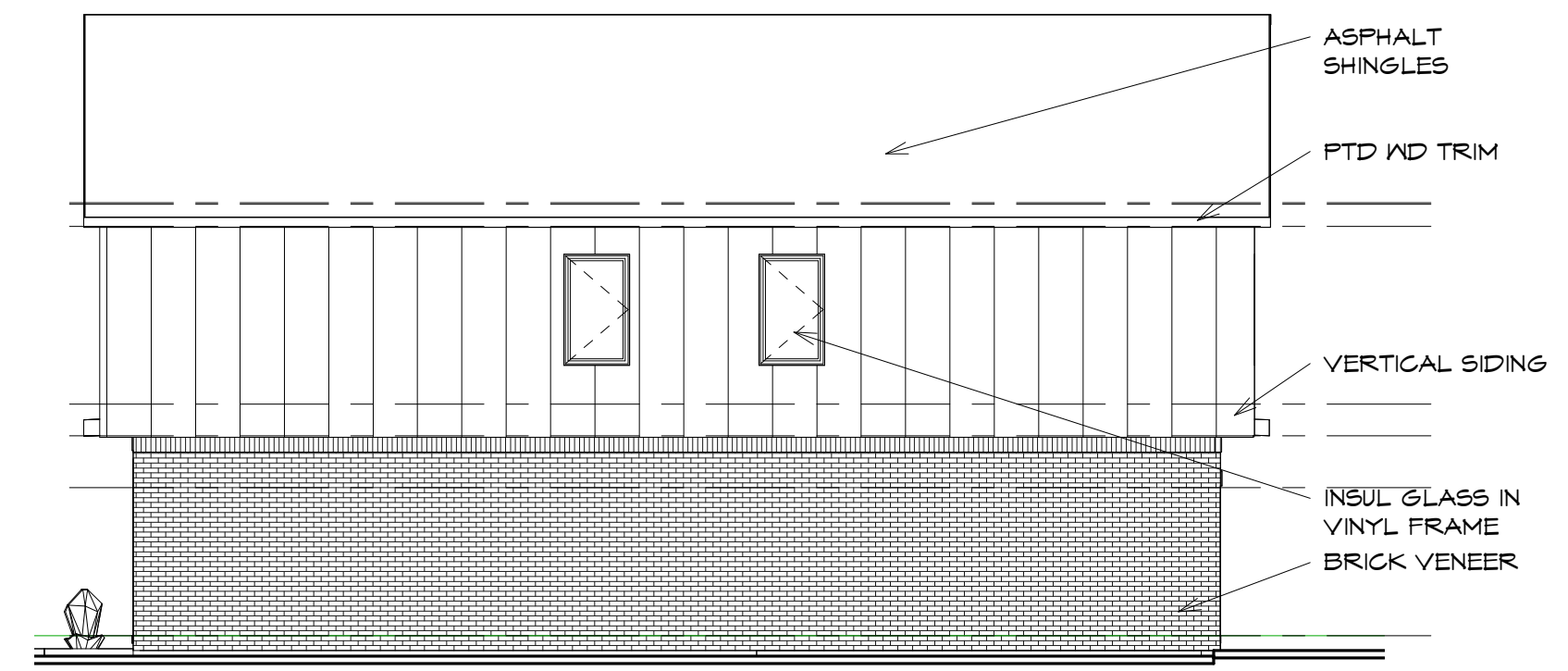
964 SQ FT



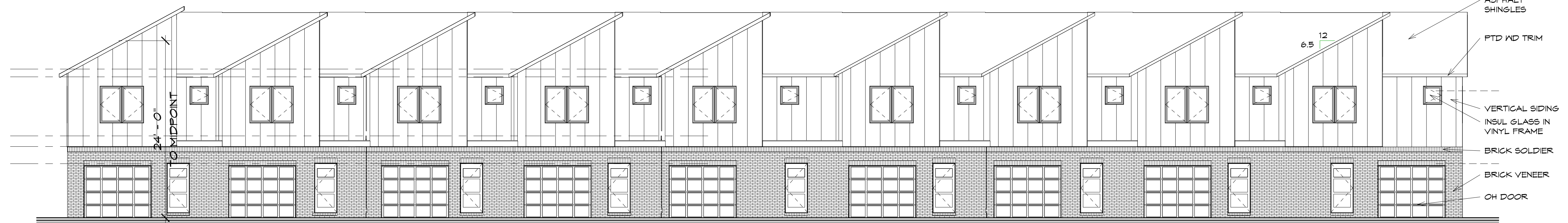
1 NORTH ELEVATION
1/8" = 1'-0"



3 EAST ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"



2 SOUTH ELEVATION
1/8" = 1'-0"



Moiseev/Gordon Associates, Inc.
4351 Delemere Court
Royal Oak, MI 48073

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248.549.7300 faxes.

www.mga-architects.net

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Client:
GFA
Development

Project Title:
Lange View
Townhouses

Troy, MI

Sheet Title:
RENDER

Project Number: 22304
Drawn By:
Checked By:
Approved By:
Date: 06-03-2022

Issued:	
City Review	08-31-22
SPA	09-19-22

Sheet Number:

A4

PRELIMINARY NOT
FOR CONSTRUCTION

ITEM #8

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

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.

Resolution # PC-2022-12-

Moved by:
Seconded by

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 railway 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.

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.

Yes:
No:
Absent:

MOTION CARRIED/FAILED



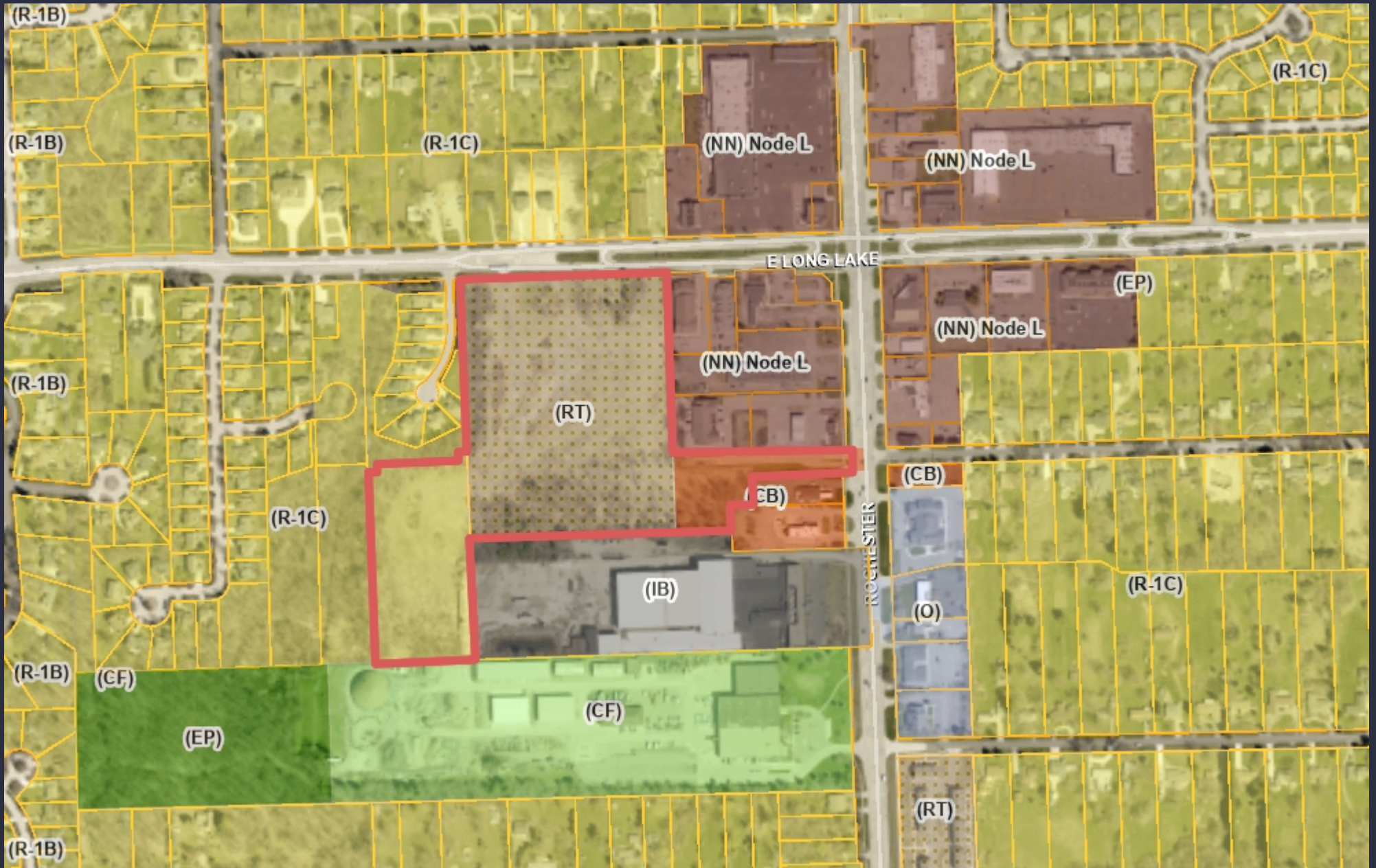
1,189 0 595 1,189 Feet



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 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.

PUBLIC HEARING OPENED

- 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:

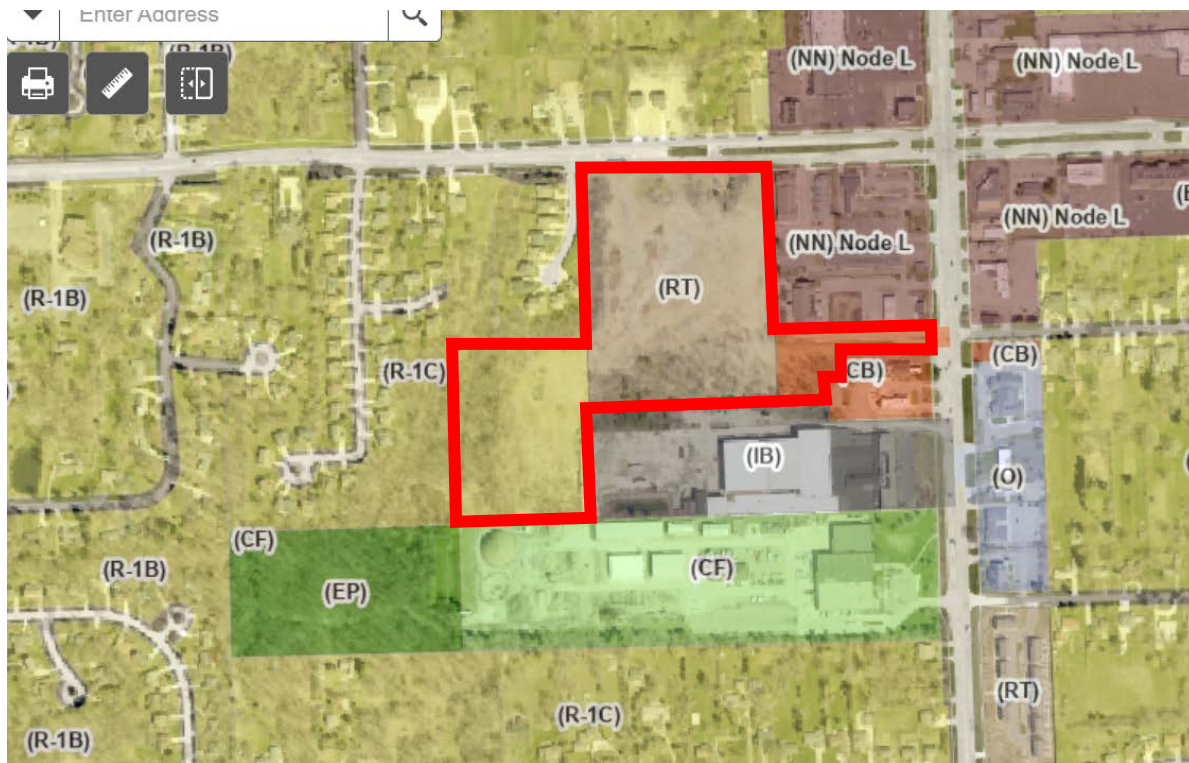
Vacant

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.

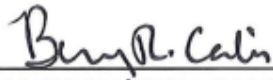


SUMMARY

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

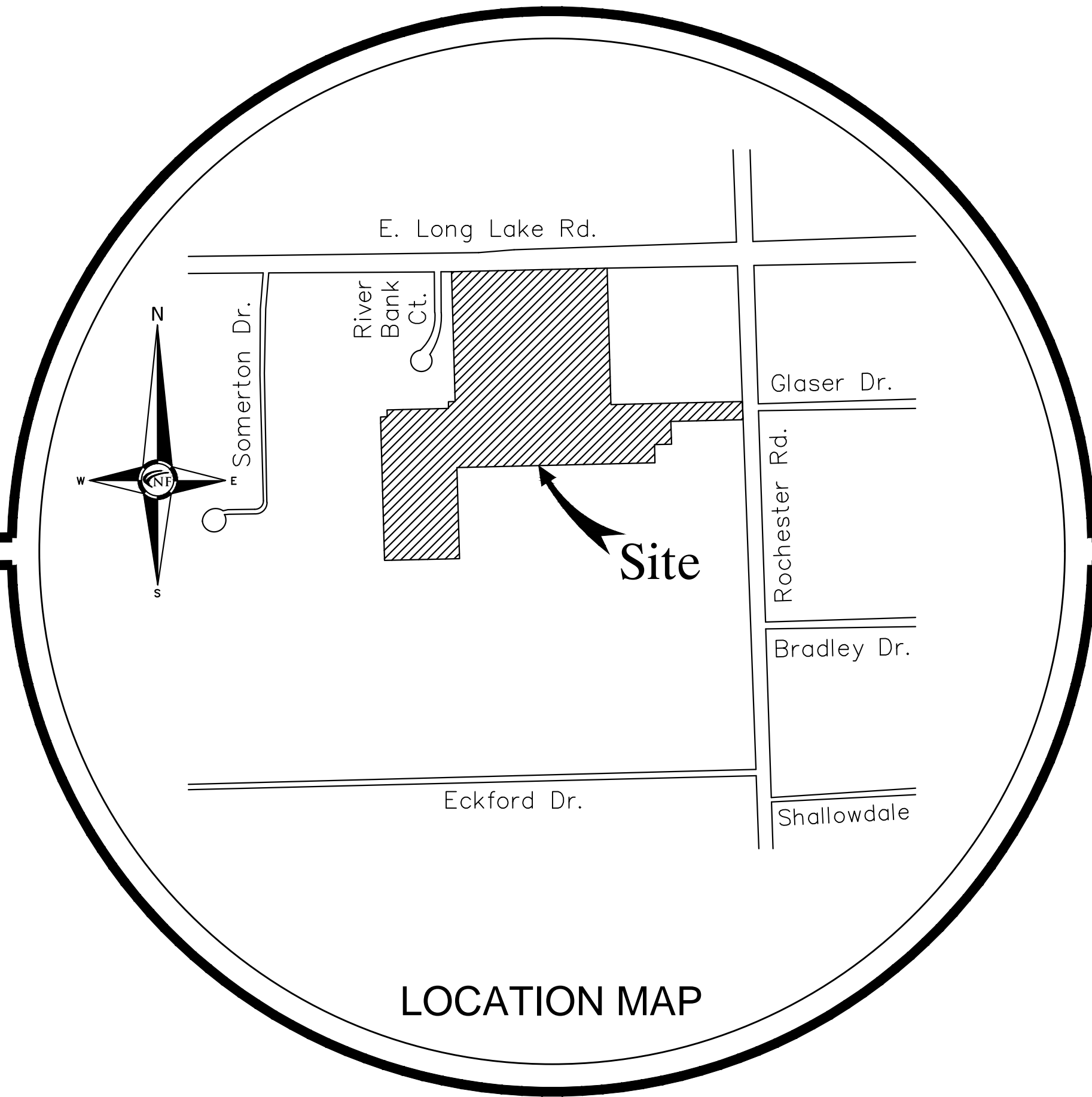
NOWAK & FRAUS ENGINEERS
46777 Woodward Ave.
Pontiac, MI 48342-5032
CONTACT: Brad W. Brickel, P.E.
Tel. (248) 332-7931
Fax. (248) 332-8257

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

Project Name

The Village of Troy



SHEET INDEX

SP00	Cover Sheet
SP01	Overall Boundary Survey
SP02	ALTA/NSPS Land Title/ Topographic/ Tree/ Wetland Survey
SP03	ALTA/NSPS Land Title/ Topographic/ Tree/ Wetland Survey
SP04	ALTA/NSPS Land Title/ Topographic/ Tree/ Wetland Survey
SP05	Tree List
SP06	Tree List
SP07	Overall Site Plan
SP08	Preliminary Site Plan (1 of 4)
SP09	Preliminary Site Plan (2 of 4)
SP10	Preliminary Site Plan (3 of 4)
SP11	Preliminary Site Plan (4 of 4)
SP12	Preliminary Paving & Grading Plan (1 of 8)
SP13	Preliminary Paving & Grading Plan (2 of 8)
SP14	Preliminary Paving & Grading Plan (3 of 8)
SP15	Preliminary Paving & Grading Plan (4 of 8)
SP16	Preliminary Paving & Grading Plan (5 of 8)
SP17	Preliminary Paving & Grading Plan (6 of 8)
SP18	Preliminary Paving & Grading Plan (7 of 8)
SP19	Preliminary Paving & Grading Plan (8 of 8)
SP20	Preliminary Utility Plan (1 of 4)
SP21	Preliminary Utility Plan (2 of 4)
SP22	Preliminary Utility Plan (3 of 4)
SP23	Preliminary Utility Plan (4 of 4)
SP24	Fire Truck Turning Plan

L-1	Concept Landscape Plan - Overall
L-2	Landscape Area Calculations
L-3	Enlargement Plans - Single Family Lots
L-4	Enlargement Plans - Townhomes North
L-5	Enlargement Plans - Townhomes South
L-6	Enlargement Plans - Park & East Entry
L-7	Long Lake Frontage & Focal Park
L-8	Tree Preservation/ Removal Plan North
L-9	Tree Preservation/ Removal Plan South
L-10	Tree Survey 1 of 3
L-11	Tree Survey 2 of 3
L-12	Tree Survey 3 of 3 & Details

1 of 1 Site Photometric Plan

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.

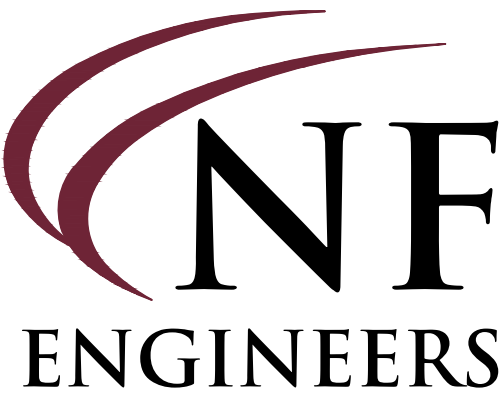
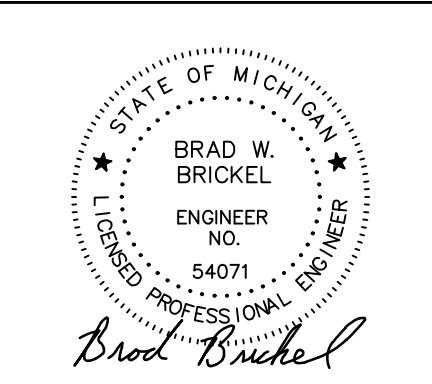
TAX ID NUMBER: 20-15-201-046 AND 20-15-201-033

ADDRESS: VACANT

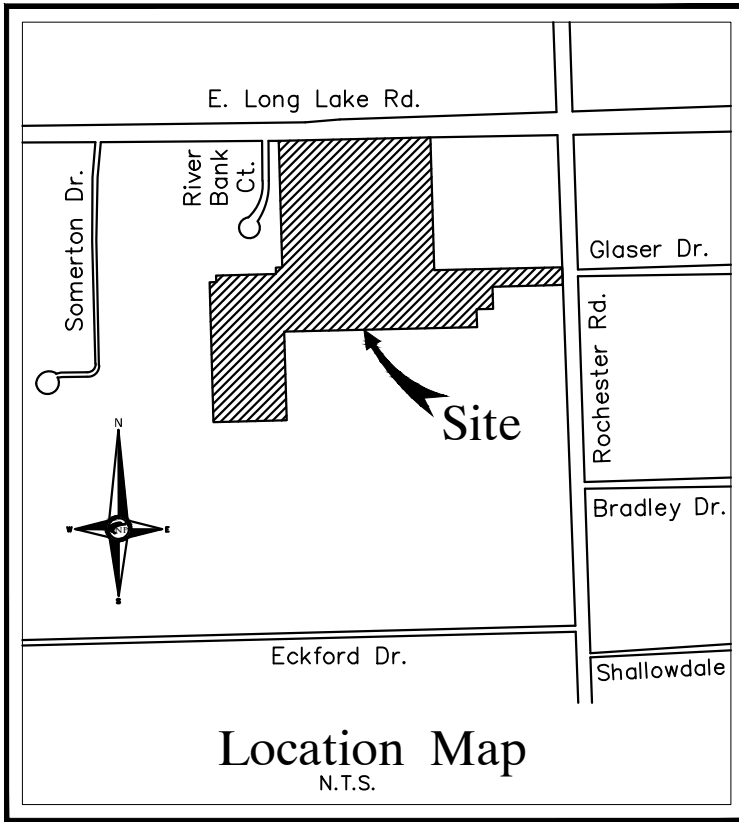
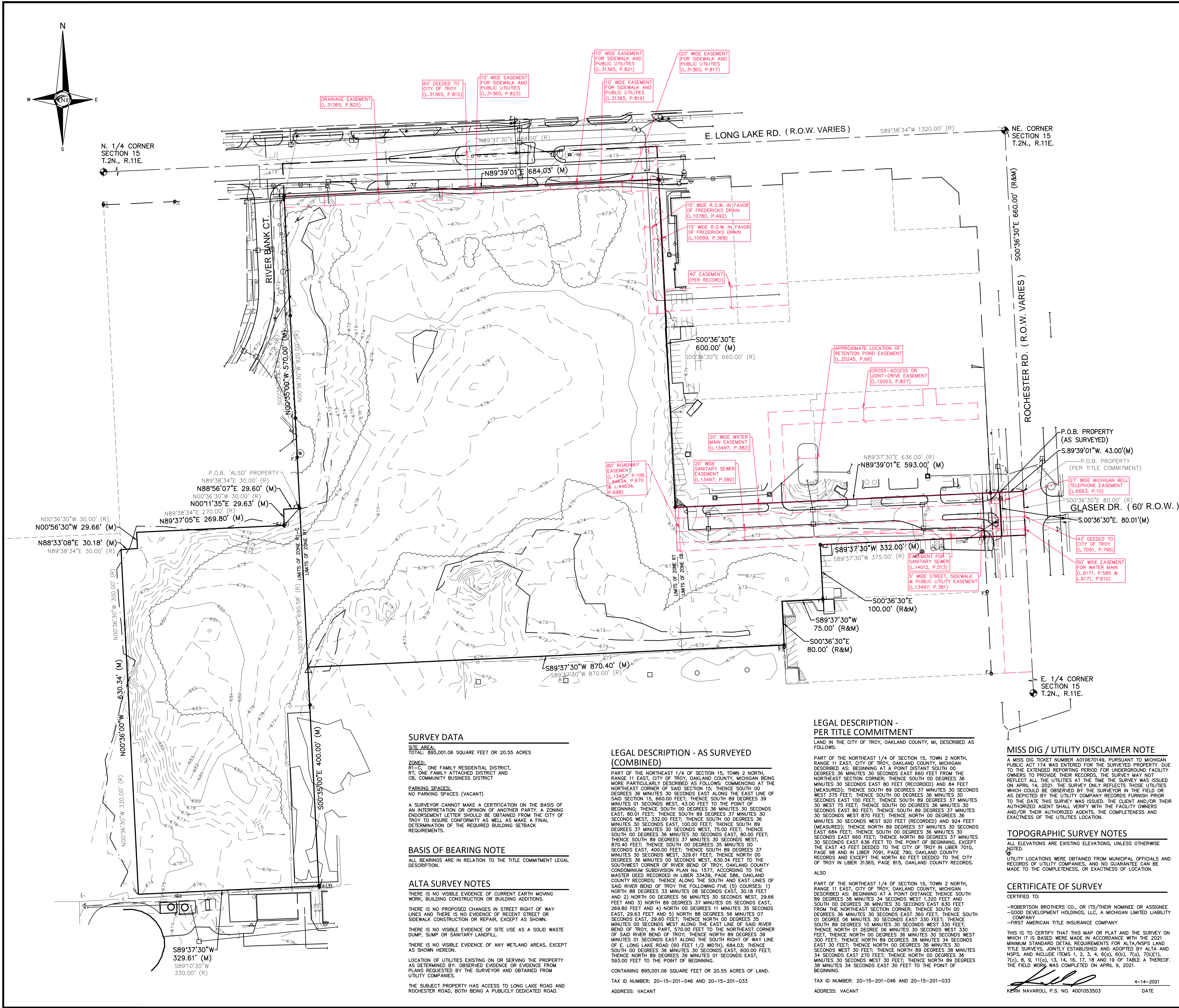
REVISIONS:
03-29-22 ISSUED FOR PRELIMINARY SITE PLAN REVIEW
10-21-22 REVISED PER SITE PLAN REVIEW
11-07-22 REVISED PER SITE PLAN REVIEW



N & F JOB #J943-01



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



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 10099, PAGE 368 [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 13497, PAGE 381 [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 13497, PAGE 381 [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 381 [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 382 [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 14012, PAGE 513 [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 825 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS 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.



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46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
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PROJECT
Village of Troy

CLIENT

Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
toughrin@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



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'

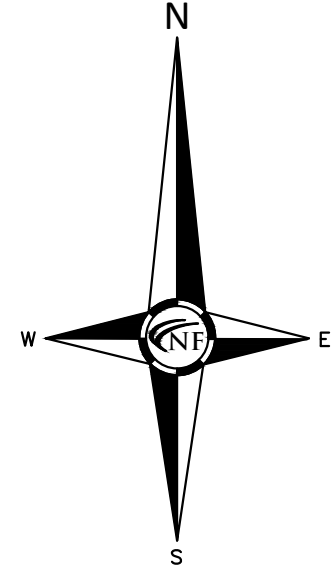
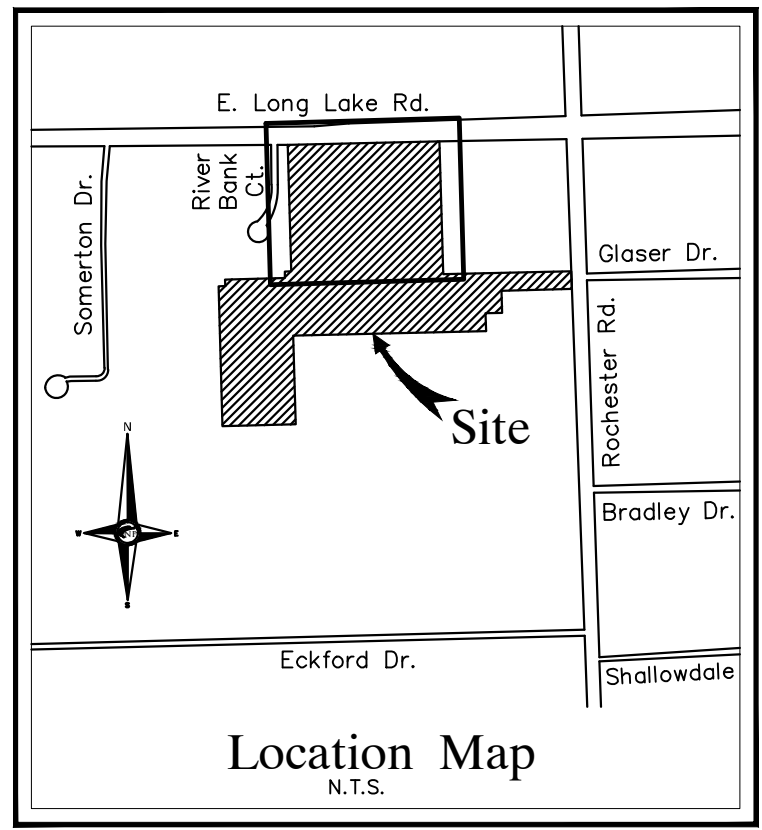
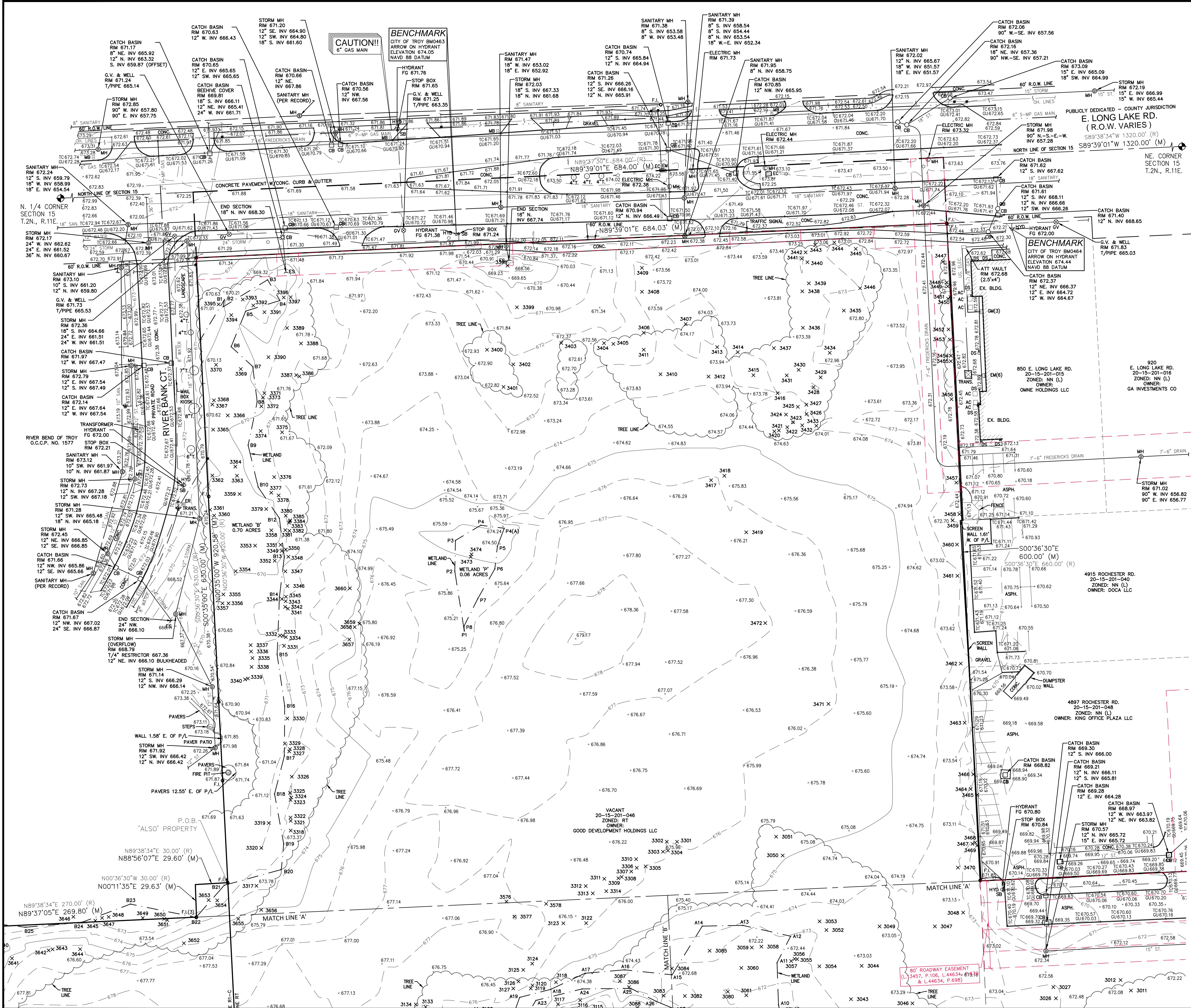
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NFE JOB NO.

J943-01

SHEET NO.

SP01



LEGEND	
MANHOLE(MH)	EXISTING SANITARY SEWER
HYDRANT(HYD)	EXISTING SAN. CLEAN OUT
MANHOLE(MH)	EXISTING WATER MAIN
MANHOLE(MH)	EXISTING STORM SEWER
UTILITY POLE	EX. BEEHIVE CATCH BASIN
GUY WIRE	EX. UNDERGROUND (UG.) CABLE
LP	OVERHEAD (OH.) LINES
LP	LIGHT POLE
LP	SIGN
LP	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
EC	ELECTRIC RISER
AC	AIR CONDITIONING UNIT
DS	DRAINPOUT
MB	MAIL BOX

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

SEAL

PROJECT
Village of Troy

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

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

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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:

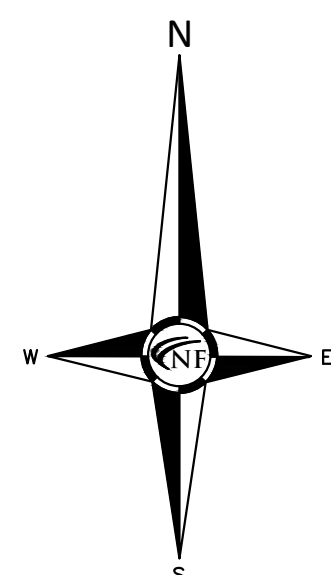
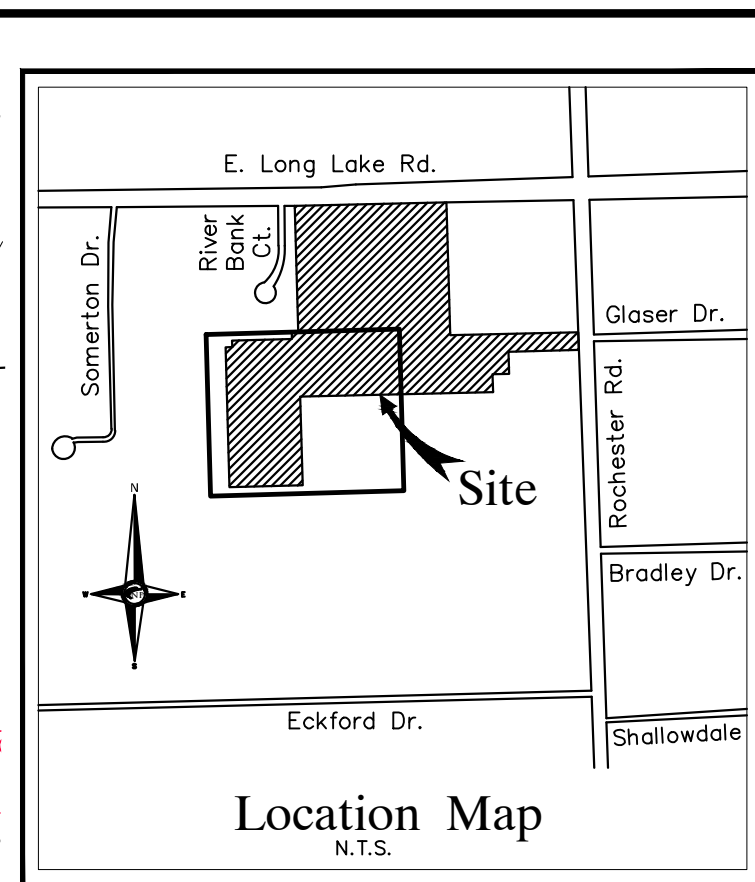
APPROVED BY:
K. Navaroli

DATE:
April 14, 2021

SCALE: 1" = 40'

NFE JOB NO. SHEET NO.

J943-01 SP02



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



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PROJECT
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SHEET
ALTA/NSPS Land Title /
Topographic / Tree Survey



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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

Tag	Scientific Name	Common Name	Diameter at Breast Height (DBH)				Landmark (2)
			Trunk 1	Trunk 2	Trunk 3	Condition (1)	
2975	Acer negundo	Box elder	7.2	7.1	6.6	Fair	X
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	
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	X
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	
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	Very Poor
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			Fair	
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	X
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	
3086	Populus deltoides	Cottonwood	12.2			Fair	

Tag	Scientific Name	Common Name	Diameter at Breast Height (DBH)				Landmark (2)
			Trunk 1	Trunk 2	Trunk 3	Condition (1)	
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	
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	
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	
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	



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Bloomfield Hills, MI 48301

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

SHEET
Tree List



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:

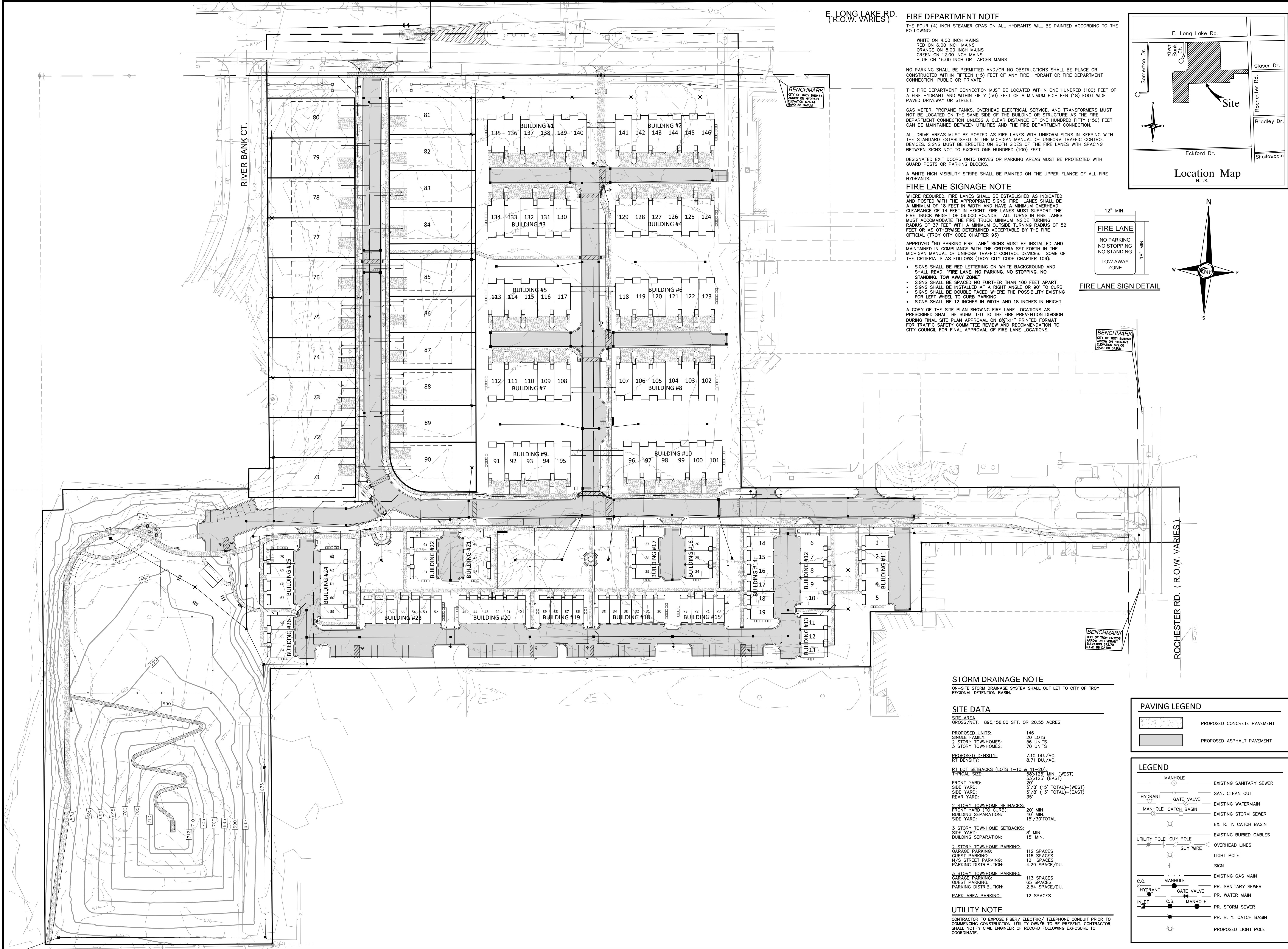
APPROVED BY:
K. Navaroli

DATE:
April 14, 2021

SCALE: 1" = 40'
40 20 0 20 40 60
NFE JOB NO. SHEET NO.
J943-01 SP06

Tag	Scientific Name	Common Name	Diameter at Breast Height (DBH)				Landmark (2)
			Trunk 1	Trunk 2	Trunk 3	Condition (1)	
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			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	

Tag	Scientific Name	Common Name	Diameter at Breast Height (DBH)				Landmark (2)
			Trunk 1	Trunk 2	Trunk 3	Condition (1)	
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	



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

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 8 1/2" X 11" PRINTED FORMAT FOR TRAFFIC SAFETY COMMITTEE REVIEW AND RECOMMENDATION TO CITY COUNCIL FOR FINAL APPROVAL OF FIRE LANE LOCATIONS.



FIRE LANE SIGN DETAIL

BENCHMARK
CITY OF TROY BRICKELL
ARROW ON HYDRANT
ELEVATION 672.00
NAVD 83 DATUM

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

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:
SINGLE FAMILY: 20 LOTS
2 STORY TOWNHOMES: 56 UNITS
3 STORY TOWNHOMES: 70 UNITS

PROPOSED DENSITY:
RT DENSITY: 7.10 DU./AC.
BT DENSITY: 8.71 DU./AC.

BT LOT SETBACKS (LOTS 1-10 & 11-20):
TYPICAL SIZE: 58' X 125' MIN. (WEST)
53' X 125' (EAST)

FRONT YARD: 5' / 8' (15' TOTAL) (WEST)
SIDE YARD: 5' / 8' (15' 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

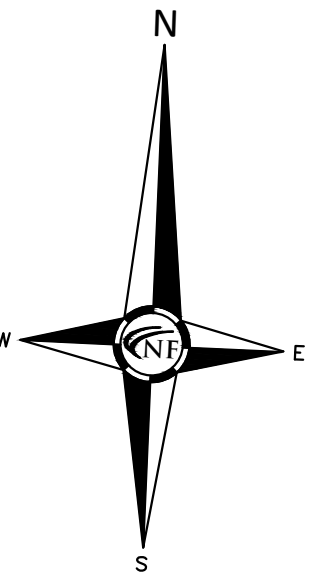
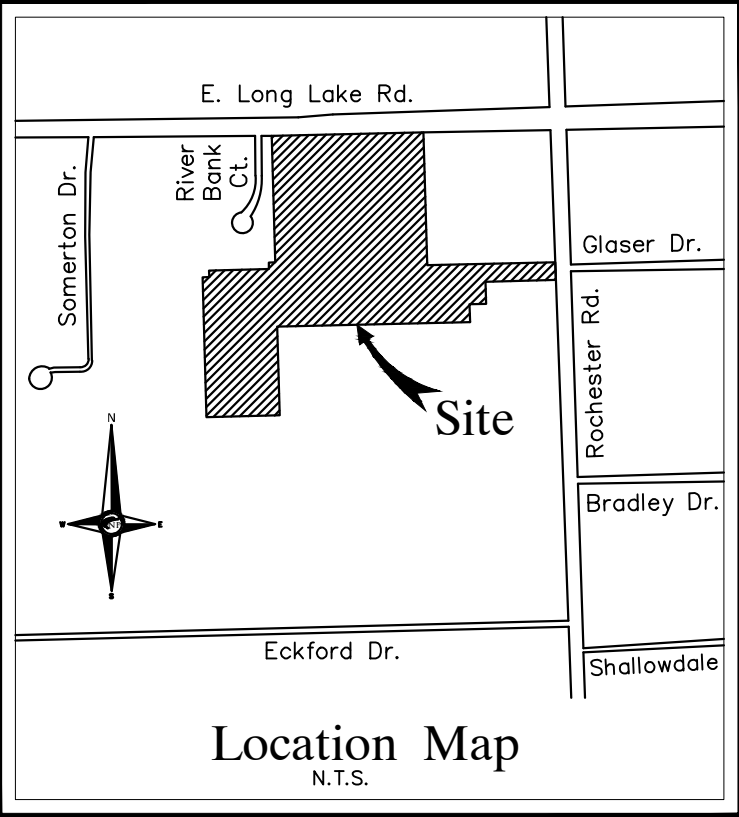
CONTRACTOR TO EXPOSE FIBER/ ELECTRIC/ TELEPHONE CONDUIT PRIOR TO COMMENCING CONSTRUCTION. UTILITY OWNERS TO BE PRESENT. CONTRACTOR SHALL NOTIFY CIVIL ENGINEER OF RECORD FOLLOWING EXPOSURE TO COORDINATE.

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

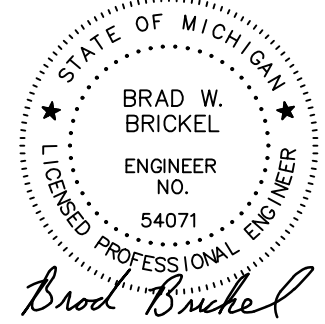
LEGEND

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



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

SEAL



PROJECT

The Village of Troy

CLIENT

Robertson Brothers Homes
6905 Telegraph Road
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
toughrin@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



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. Brickell

APPROVED BY:

B. Brickell

DATE:

April 14, 2021

SCALE: 1" = 60'

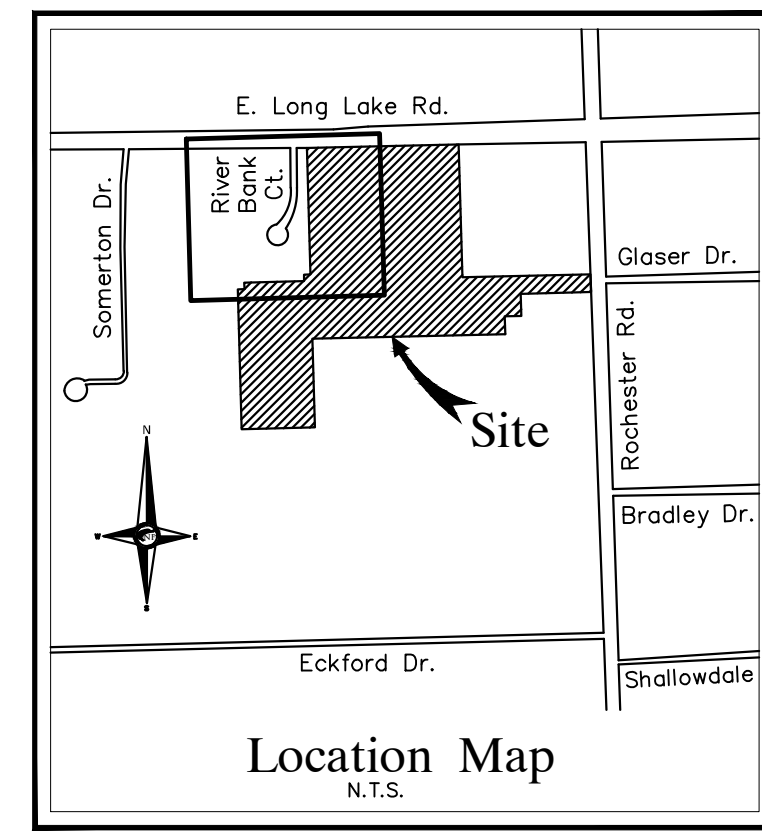
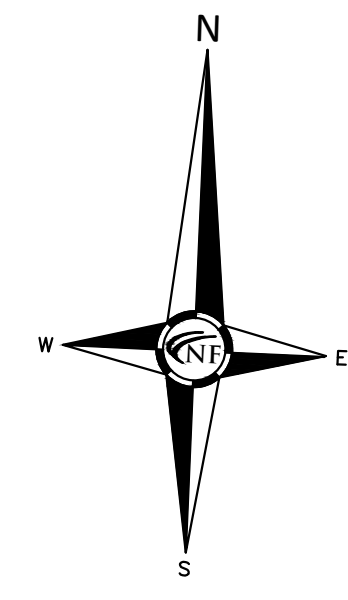
60 30 0 30 60 90

NFE JOB NO.

J943-01

SHEET NO.

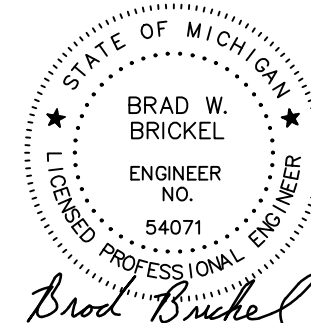
SP07



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LAND PLANNERS

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

SEAR



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)



Know what's **below**
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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

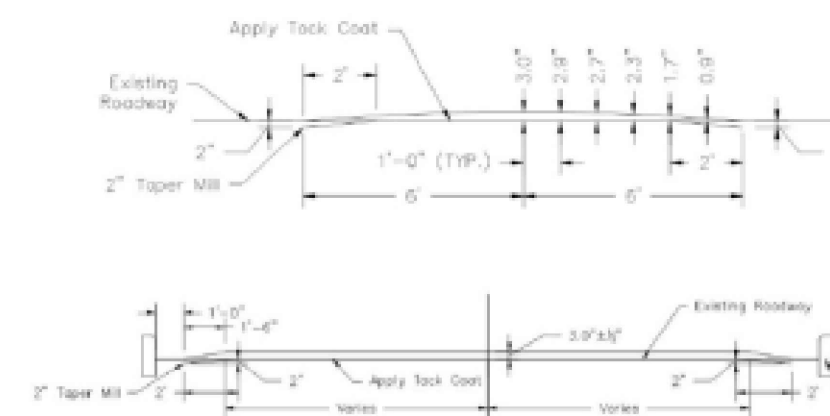
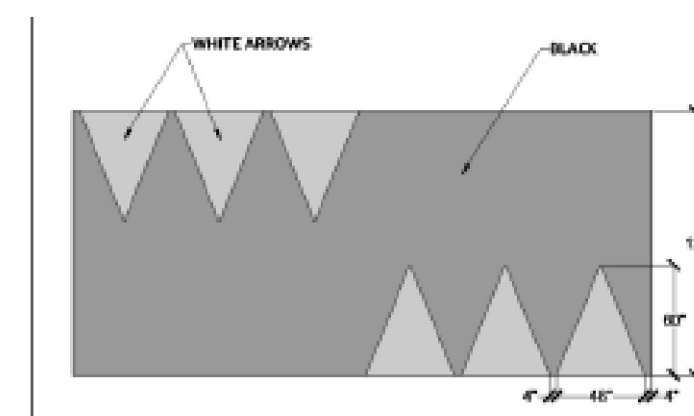
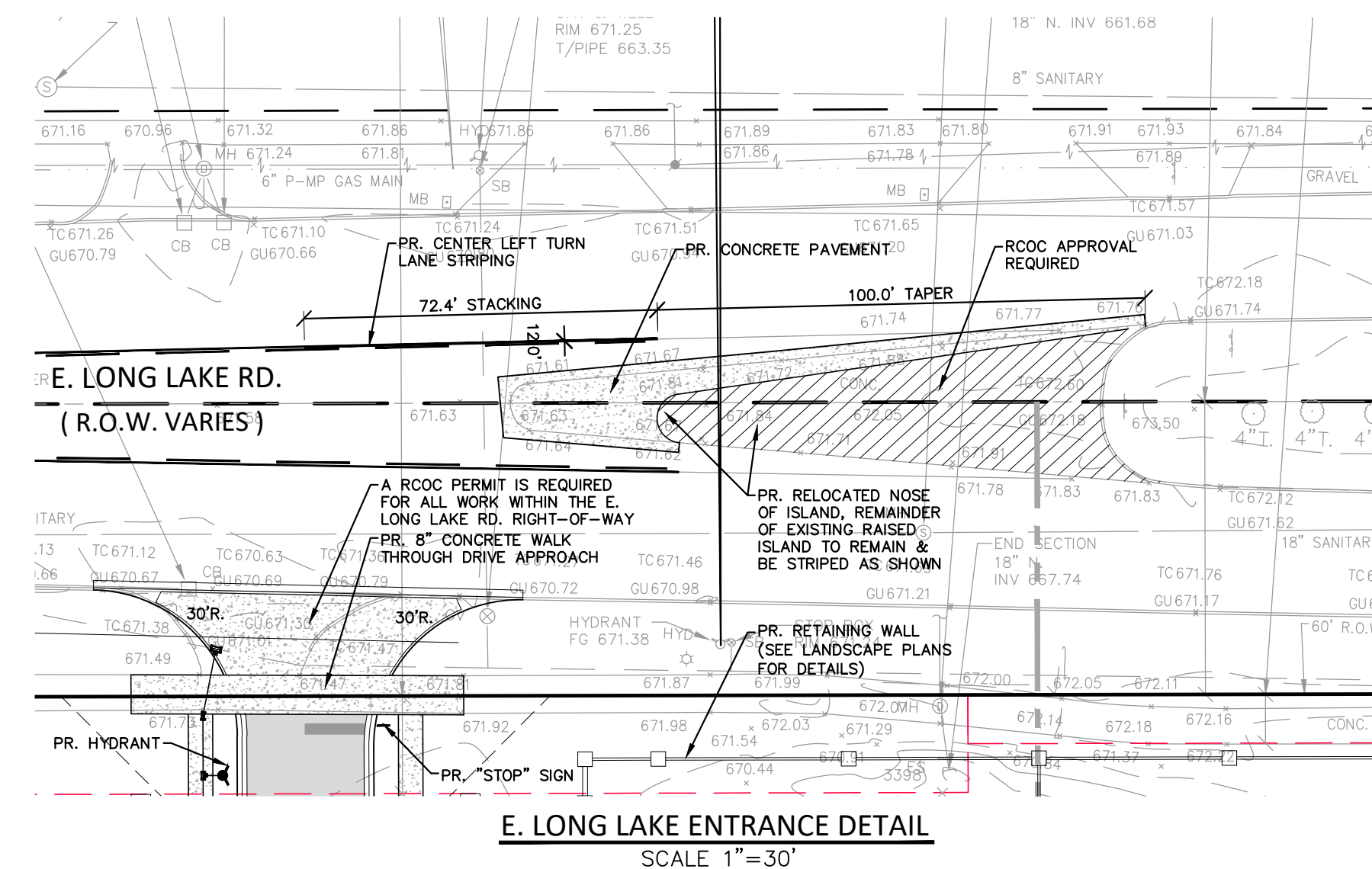
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SCALE: 1" = 30'

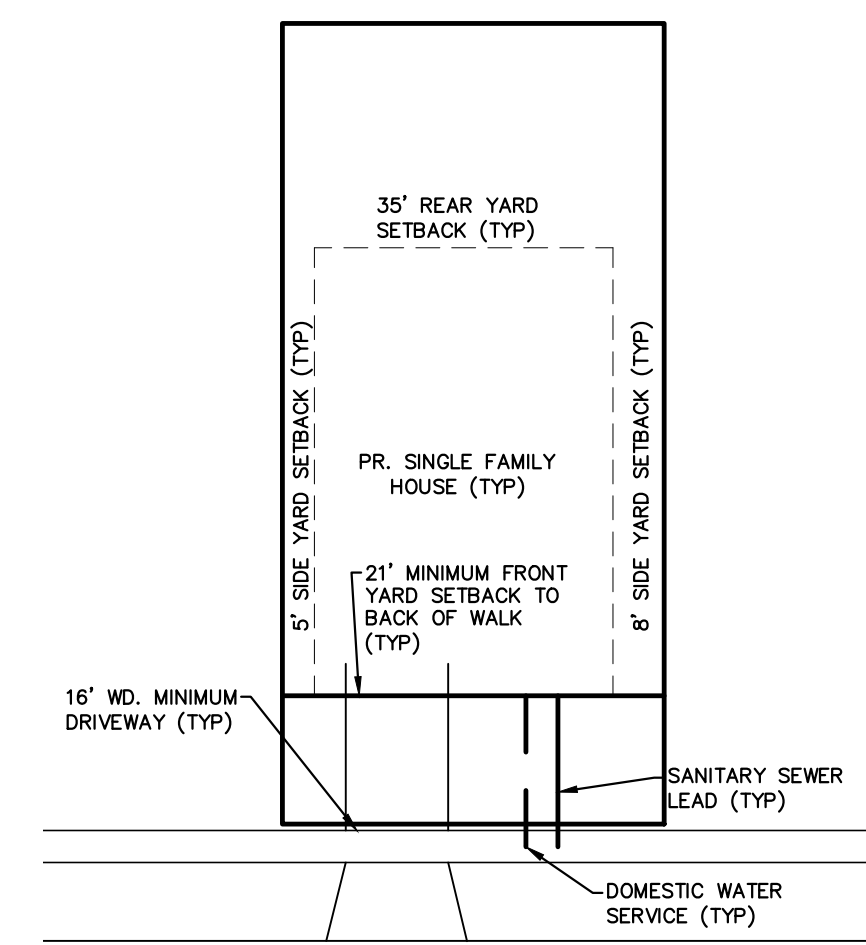
NFE JOB NO.

J943-01

SP08





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.




















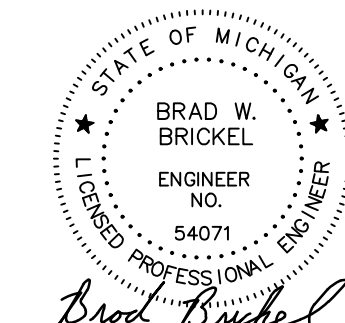
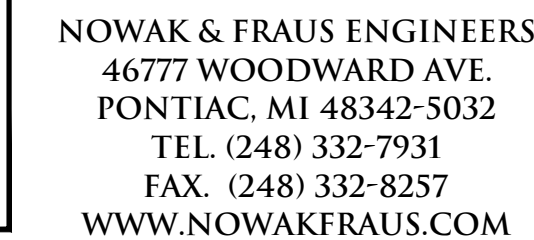
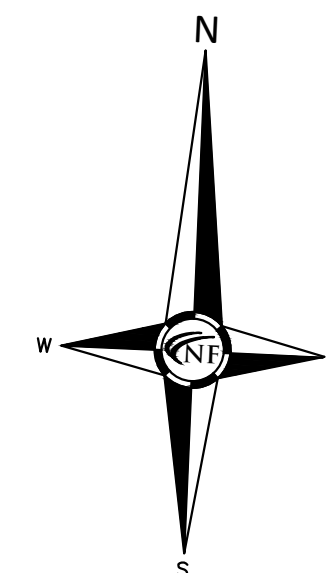
TYPICAL UNIT
SCALE 1"=30'

PAVING LEGEND

	PROPOSED CONCRETE PAVEMENT
	PROPOSED ASPHALT PAVEMENT

LEGEND

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



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DESIGNED BY:
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APPROVED BY
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DATE:
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







SCALE: 1" = 30'

NFE JOB NO
J943-01

SHEET NO
SP10

PAVING LEGEND

	PROPOSED CONCRETE PAVEMENT
	PROPOSED ASPHALT PAVEMENT

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

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 1A (AIR-ENTAINED) 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.

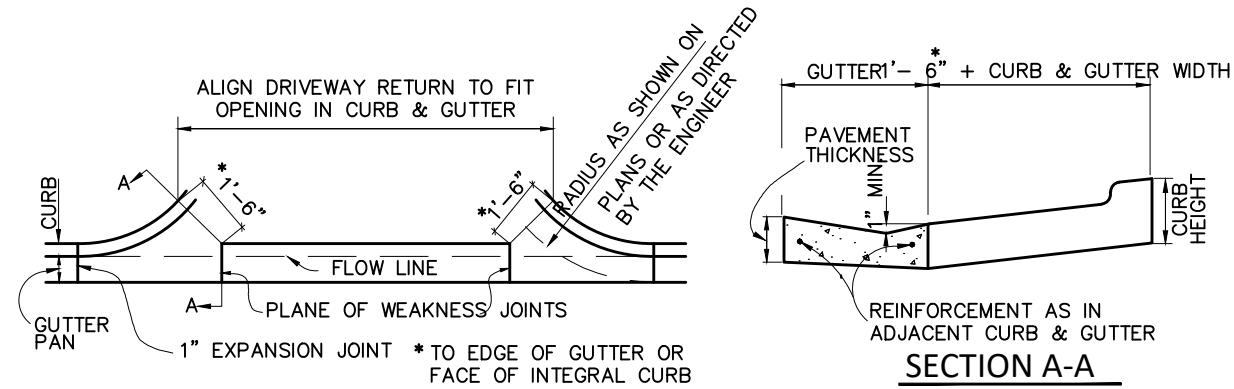
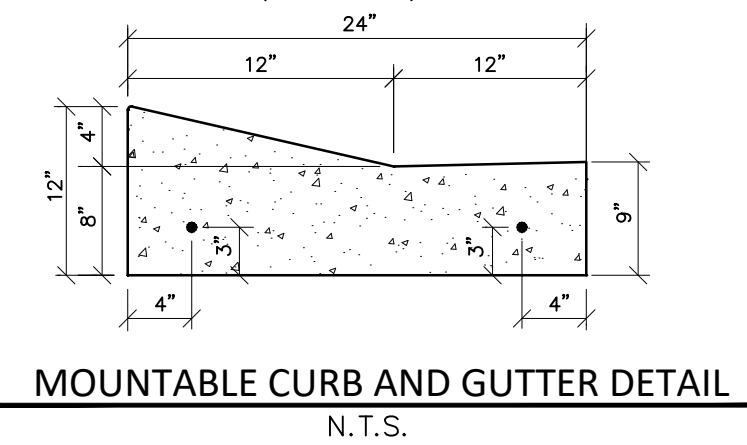
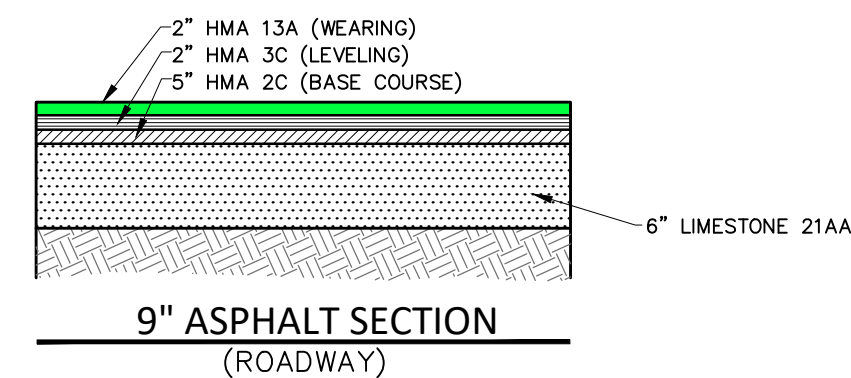
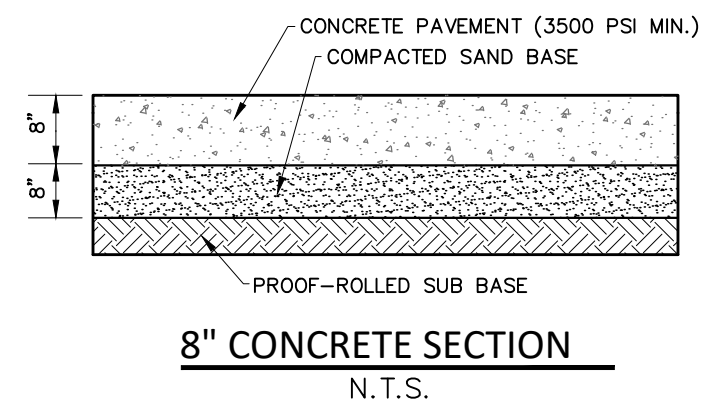
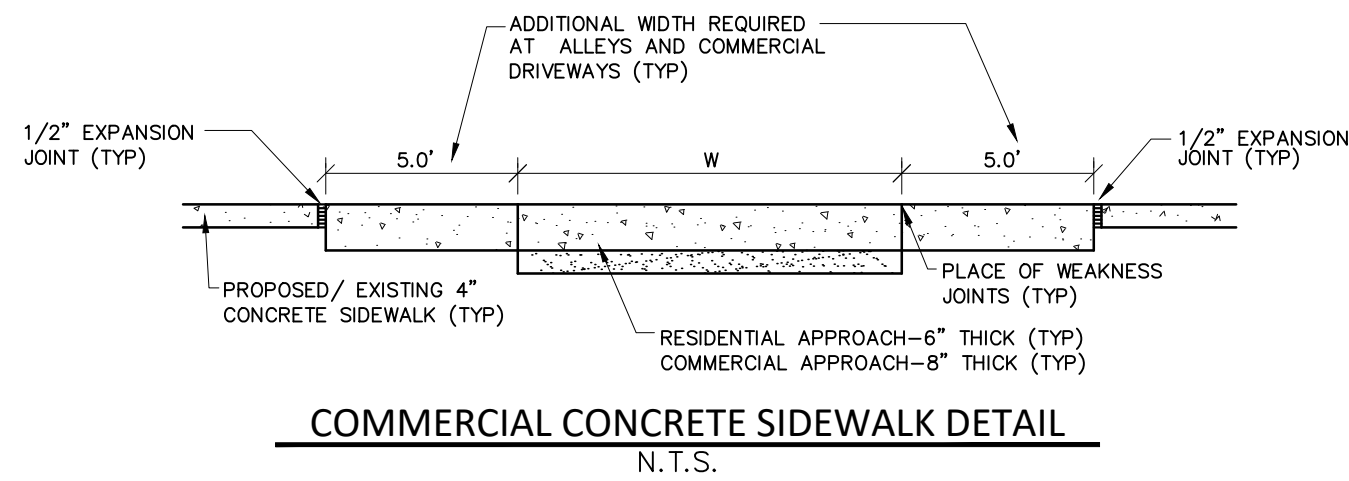
EXISTING TOPSOIL, VEGETATION AND ORGANIC MATERIALS SHALL BE STRIPPED AND REMOVED FROM PROPOSED PAVEMENT AREA PRIOR TO PLACEMENT OF BASE MATERIALS.

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

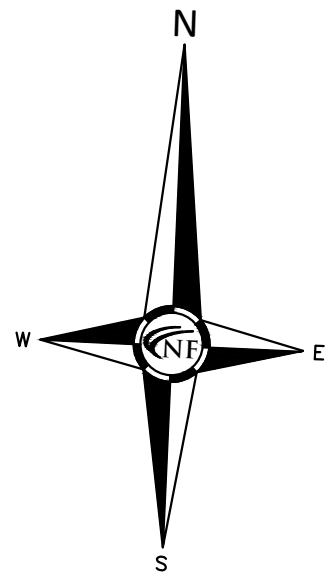
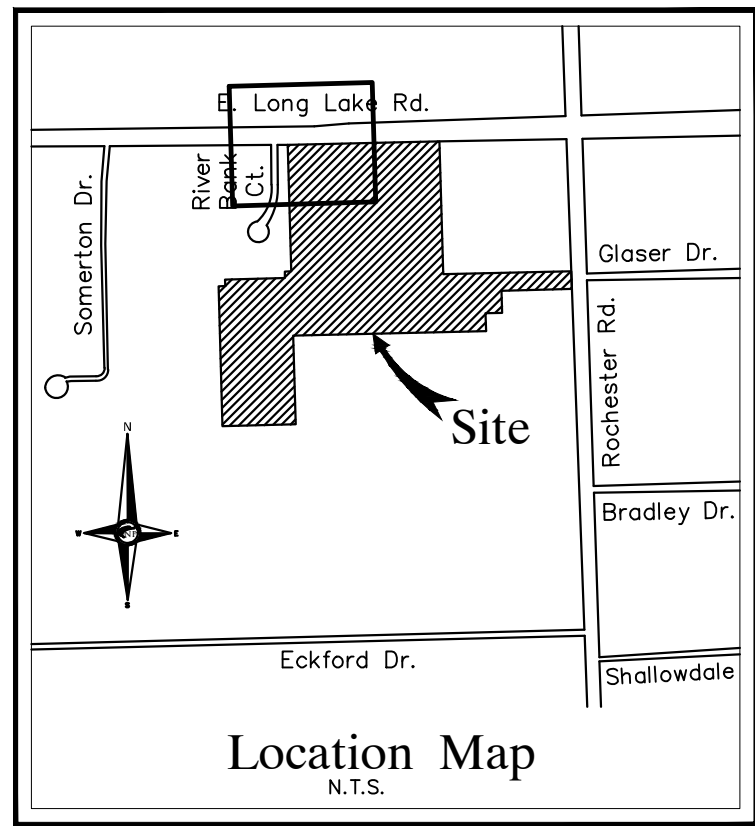
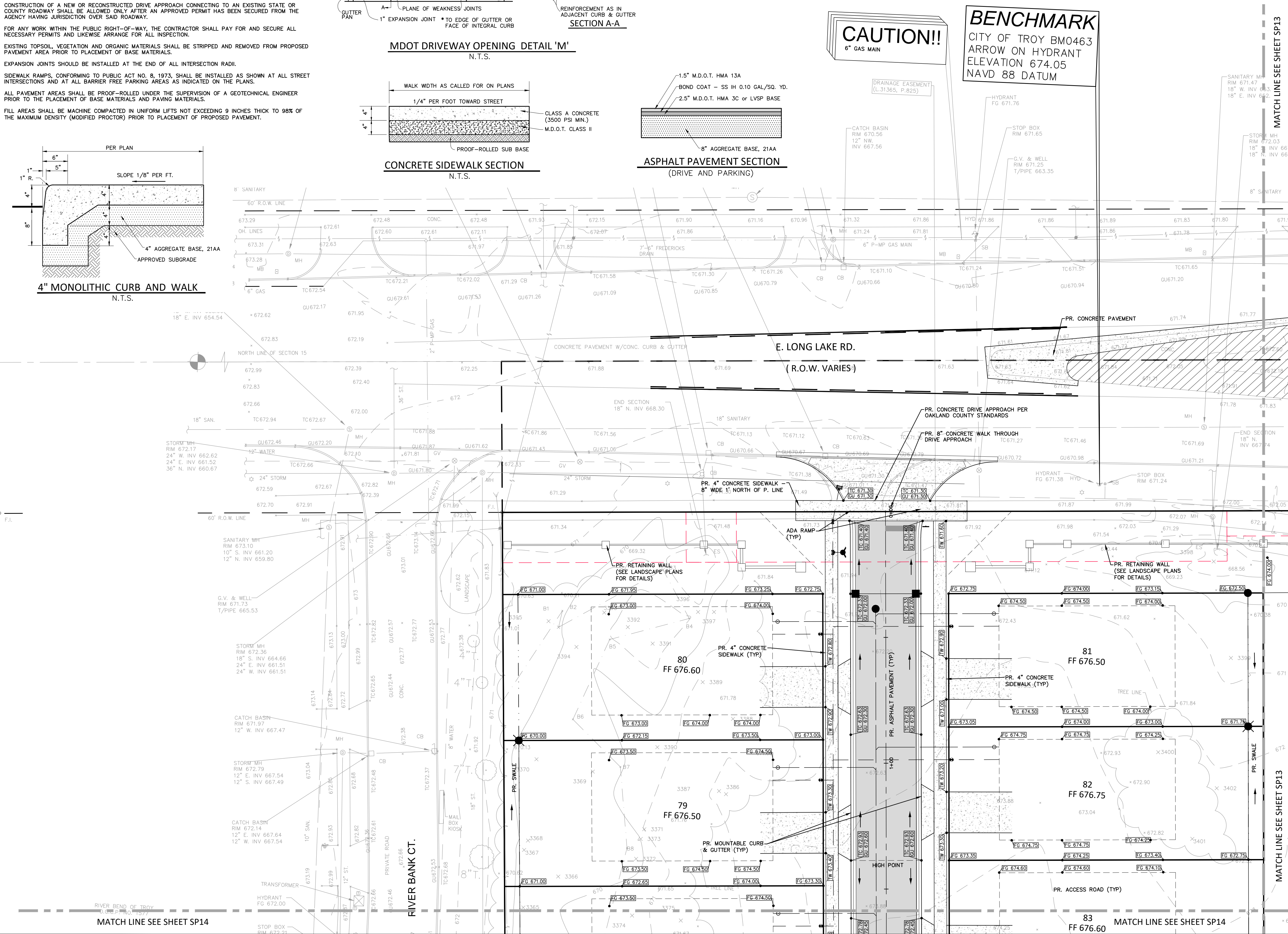
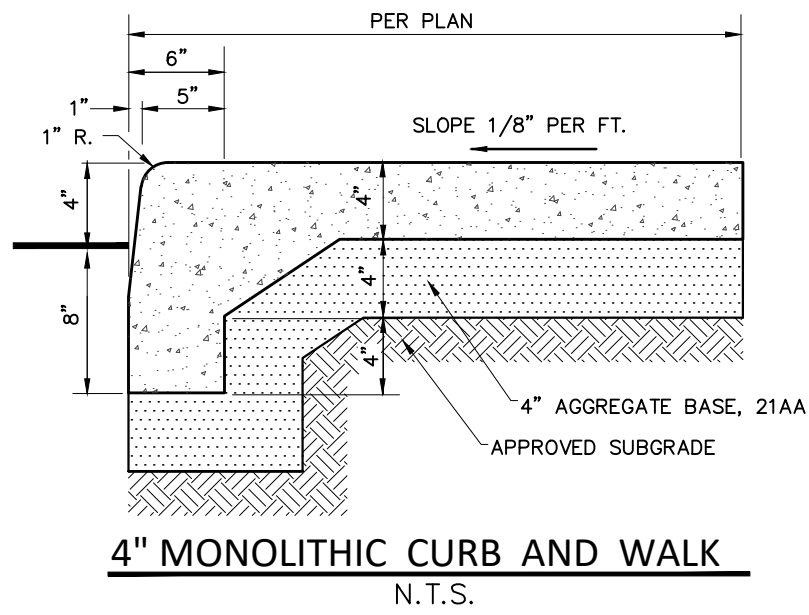
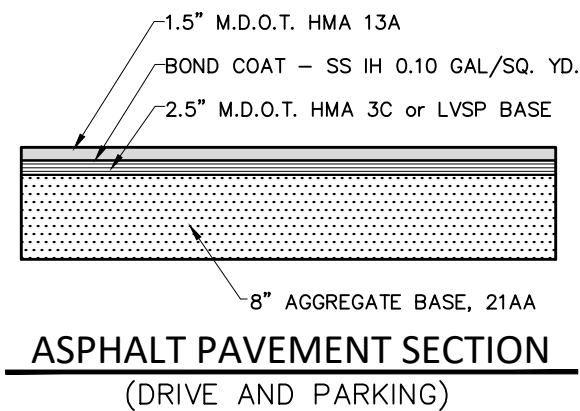
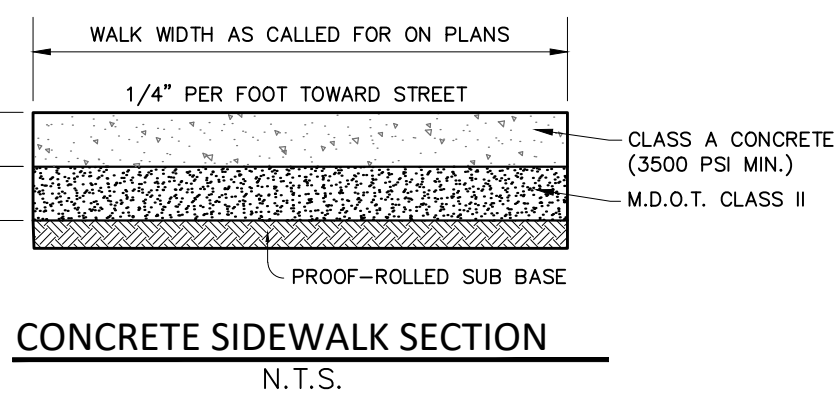
SIDEWALK RAMPS, CONFORMING TO PUBLIC ACT NO. 8, 1973, SHALL BE INSTALLED AS SHOWN AT ALL STREET INTERSECTIONS AND AT ALL BARRIER FREE PARKING AREAS AS INDICATED ON THE PLANS.

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.



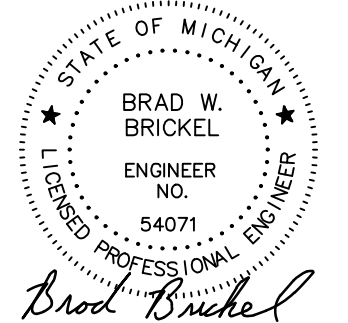
MDOT DRIVEWAY OPENING DETAIL 'M'
N.T.S.



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SEAL



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PROJECT LOCATION

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SHEET

Preliminary Paving &
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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

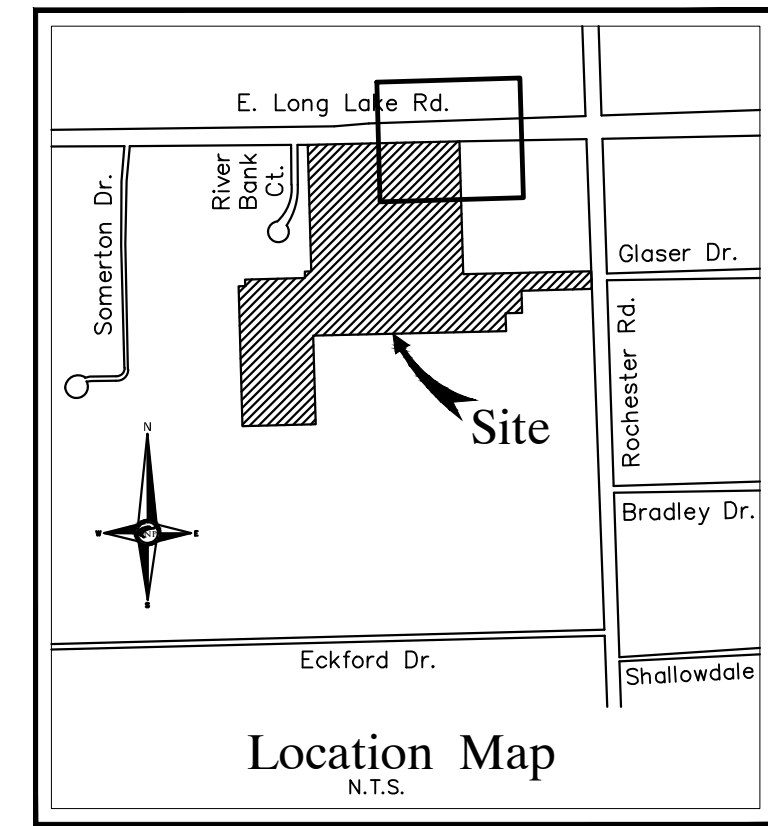
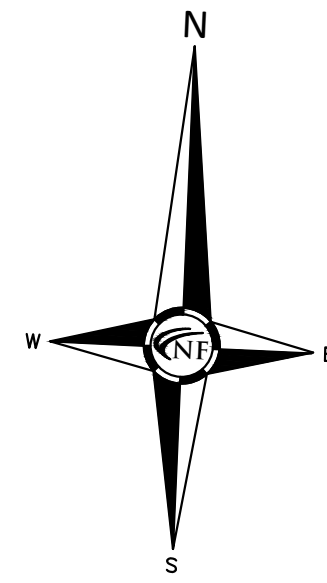
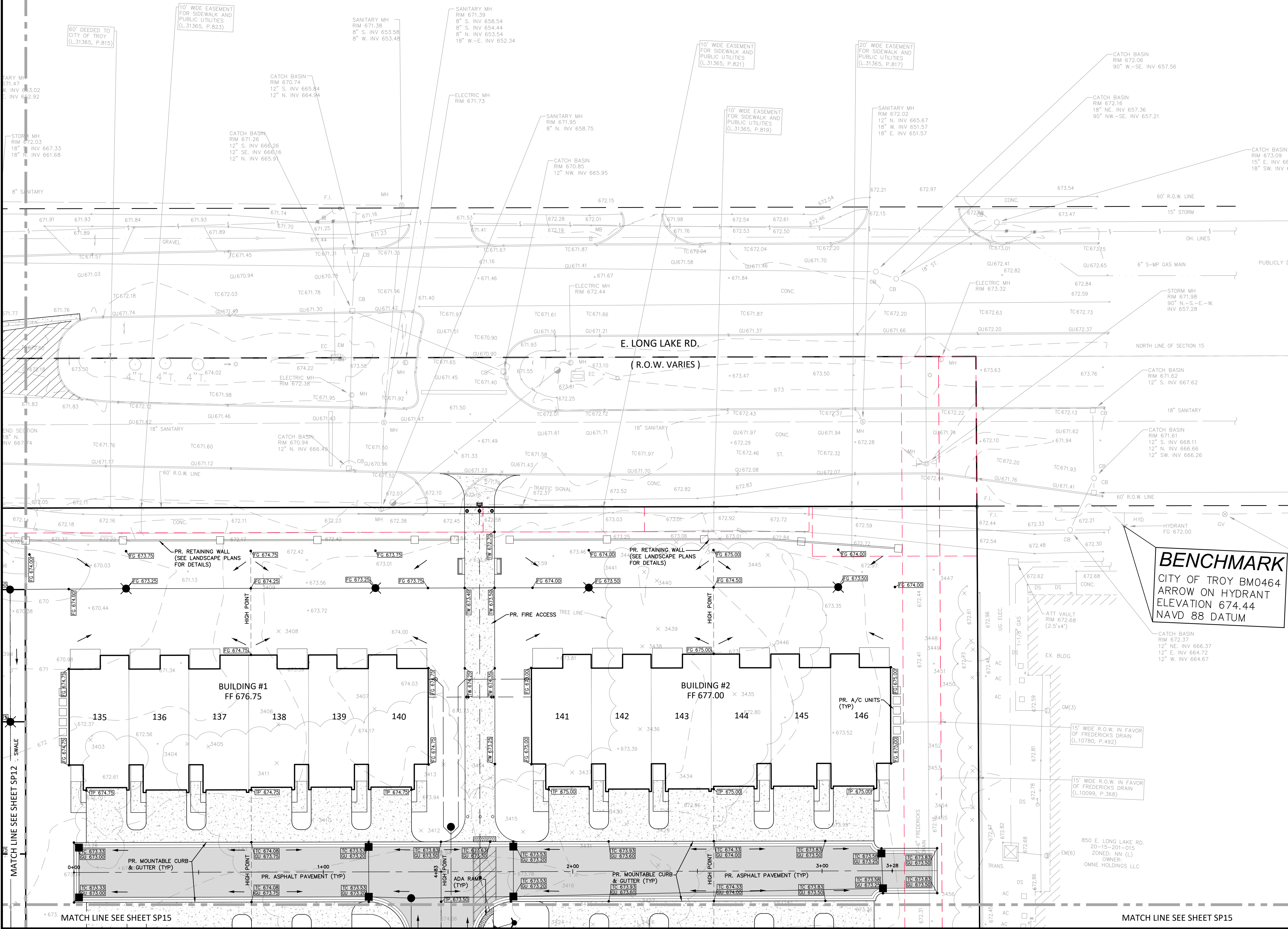
NFE JOB NO.

J943-01

SHEET NO.

SP12

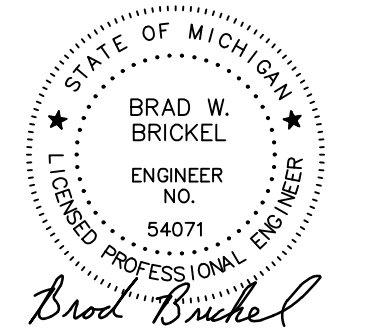
MATCH LINE SEE SHEET SP12



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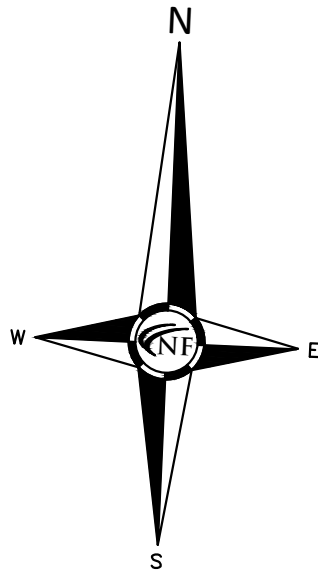
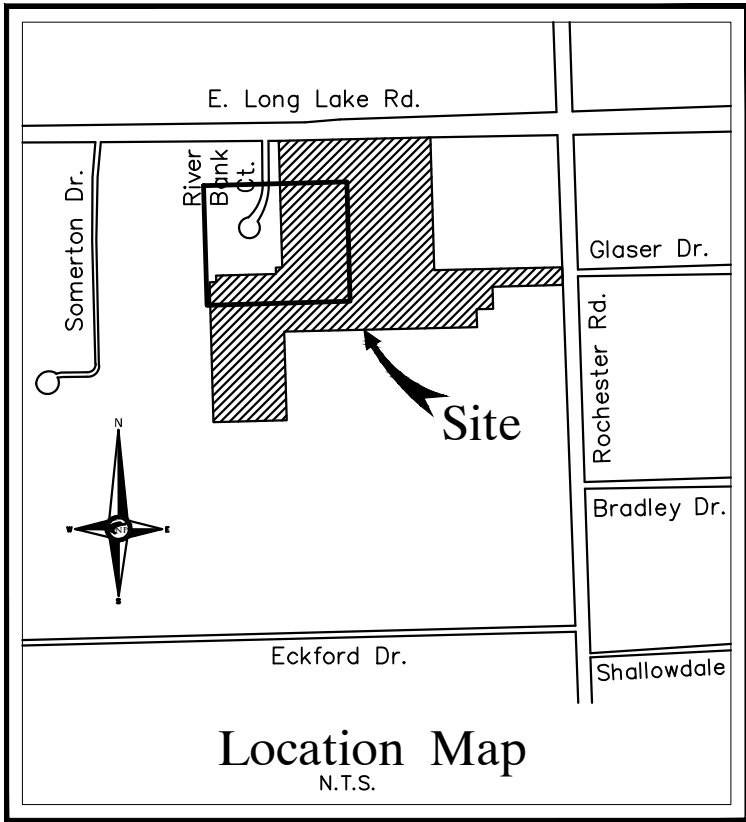
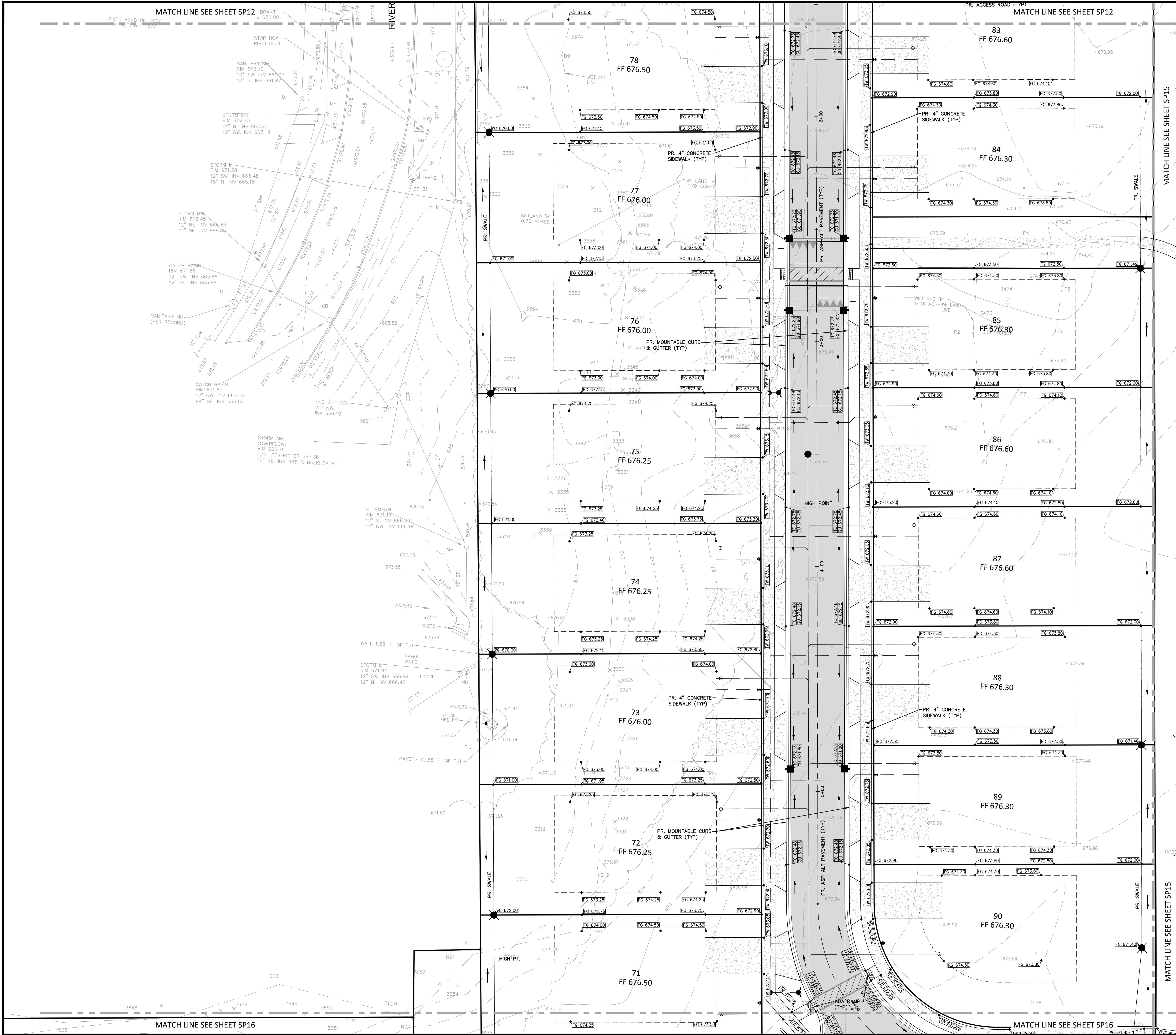
SP13

PAVING LEGEND

	PROPOSED CONCRETE PAVEMENT
	PROPOSED ASPHALT PAVEMENT

LEGEND

	MANHOLE		EXISTING SANITARY SEWER
	HYDRANT		SAN. CLEAN OUT
	MANHOLE		EXISTING WATERMAIN
	MANHOLE		EXISTING STORM SEWER
	UTILITY POLE		EX. R. Y. CATCH BASIN
	GUY POLE		EXISTING BURIED CABLES
	GUY WIRE		OVERHEAD LINES
	LIGHT POLE		SIGN
	C.O.		EXISTING GAS MAIN
	HYDRANT		PR. SANITARY SEWER
	INLET		PR. WATER MAIN
	MANHOLE		PR. STORM SEWER
	MANHOLE		PR. R. Y. CATCH BASIN
	PROPOSED LIGHT POLE		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 PMV ELEVATION
	FG 600.00		FINISH GRADE ELEVATION



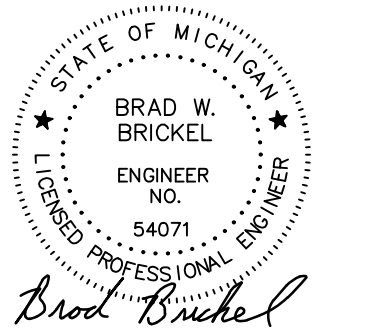
PAVING LEGEND	
	PROPOSED CONCRETE PAVEMENT
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LEGEND	
	MANHOLE
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	MANHOLE CATCH BASIN
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	EXISTING SANITARY SEWER
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	EXISTING STORM SEWER
	EX. R. Y. CATCH BASIN
	EXISTING BURIED CABLES
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	LIGHT POLE
	SIGN
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	PR. SANITARY SEWER
	PR. WATER MAIN
	PR. STORM SEWER
	PR. R. Y. CATCH BASIN
	PROPOSED LIGHT POLE
	PR. TOP OF CURB ELEVATION
	PR. GUTTER ELEVATION
	PR. TOP OF WALK ELEVATION
	PR. TOP OF PVM. ELEVATION
	FINISH GRADE ELEVATION

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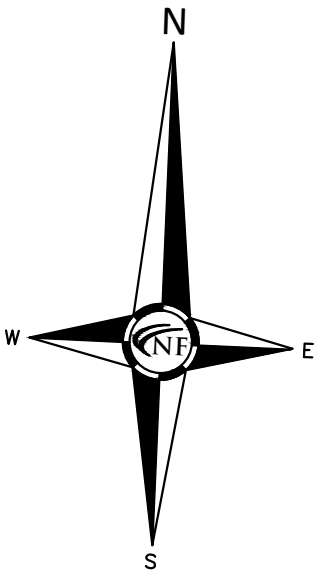
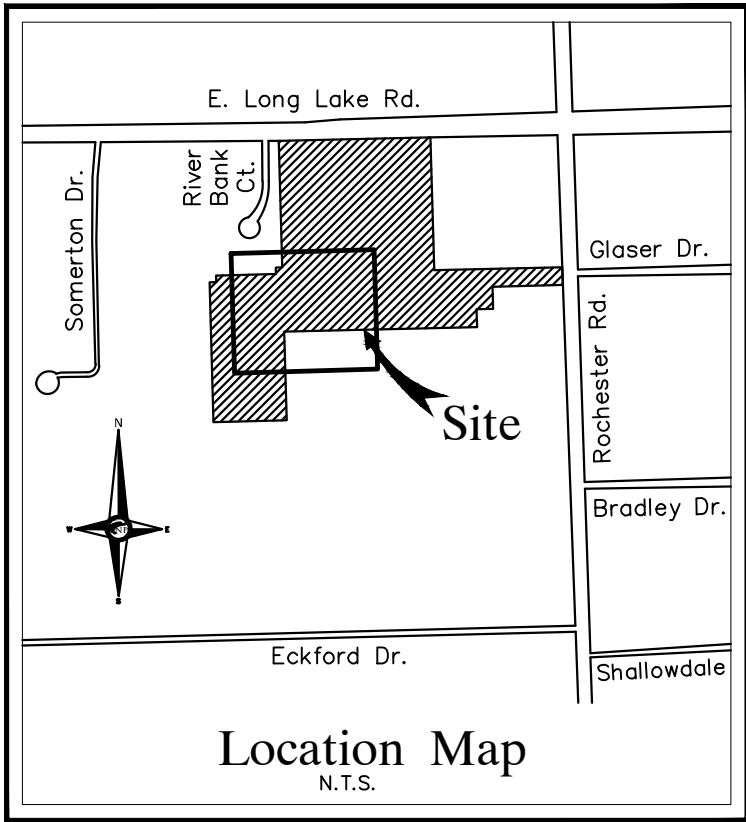
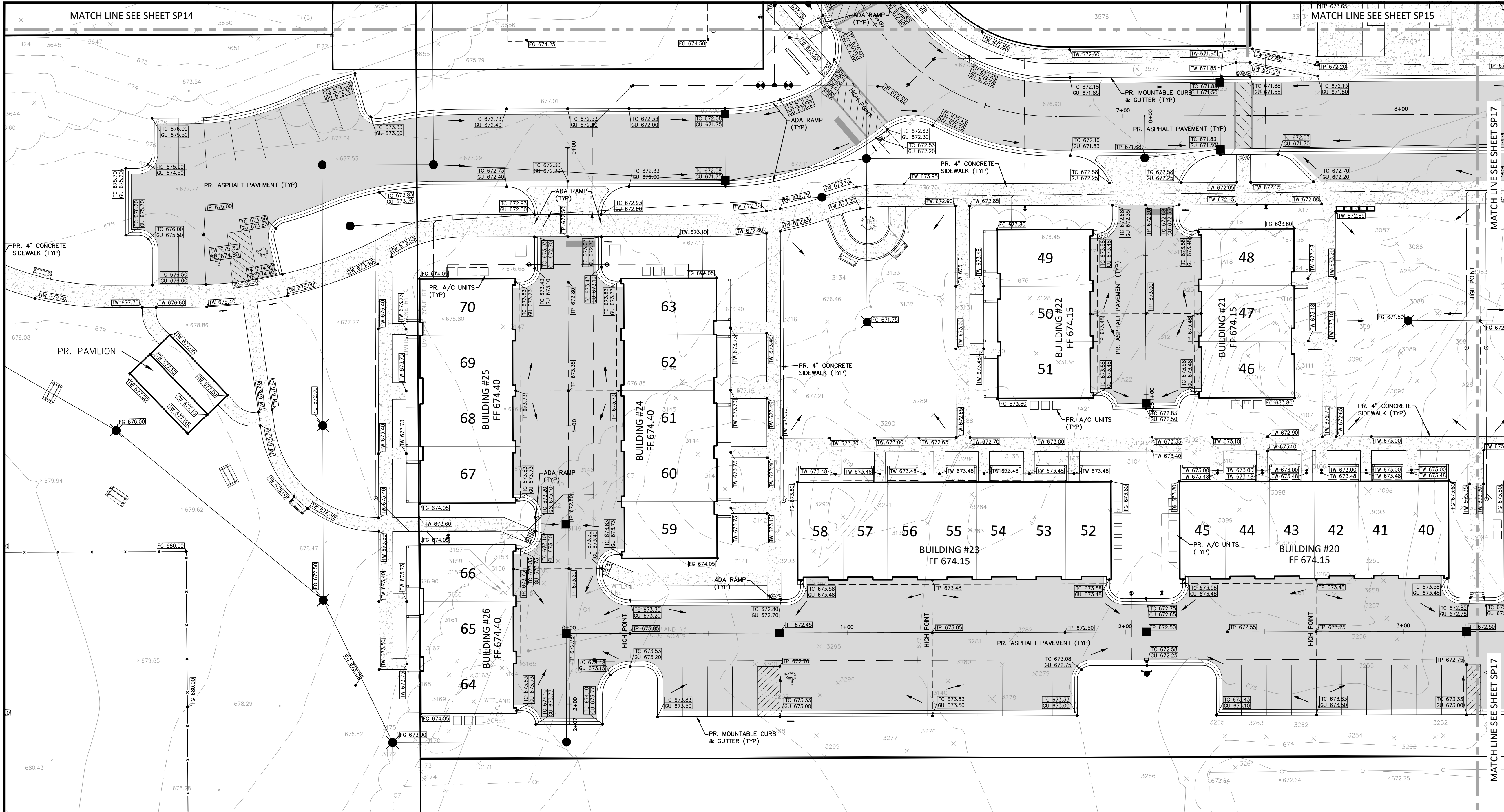
SHEET
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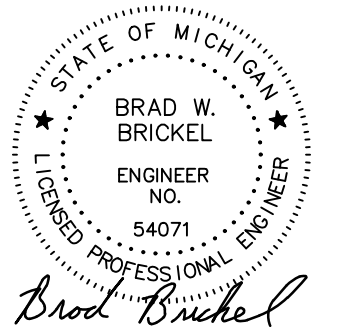
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DESIGNED BY:
B. Brickel
APPROVED BY:
B. Brickel
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April 14, 2021
SCALE: 1" = 20'
20 10 0 10 20 30
NFE JOB NO. SHEET NO.
J943-01 SP14



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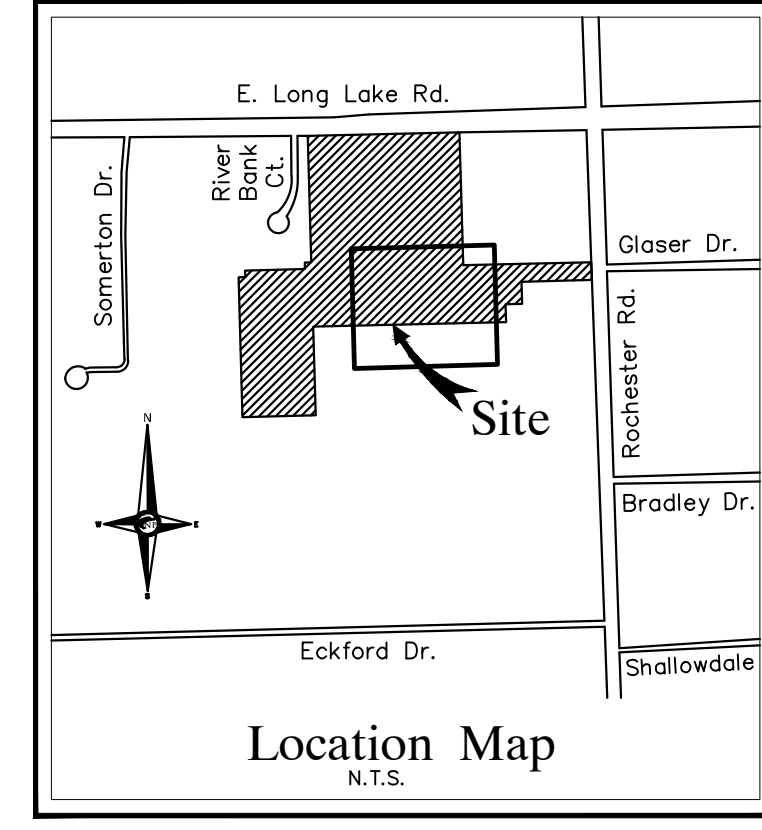
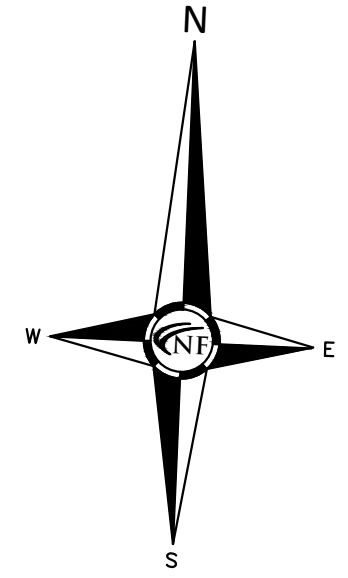
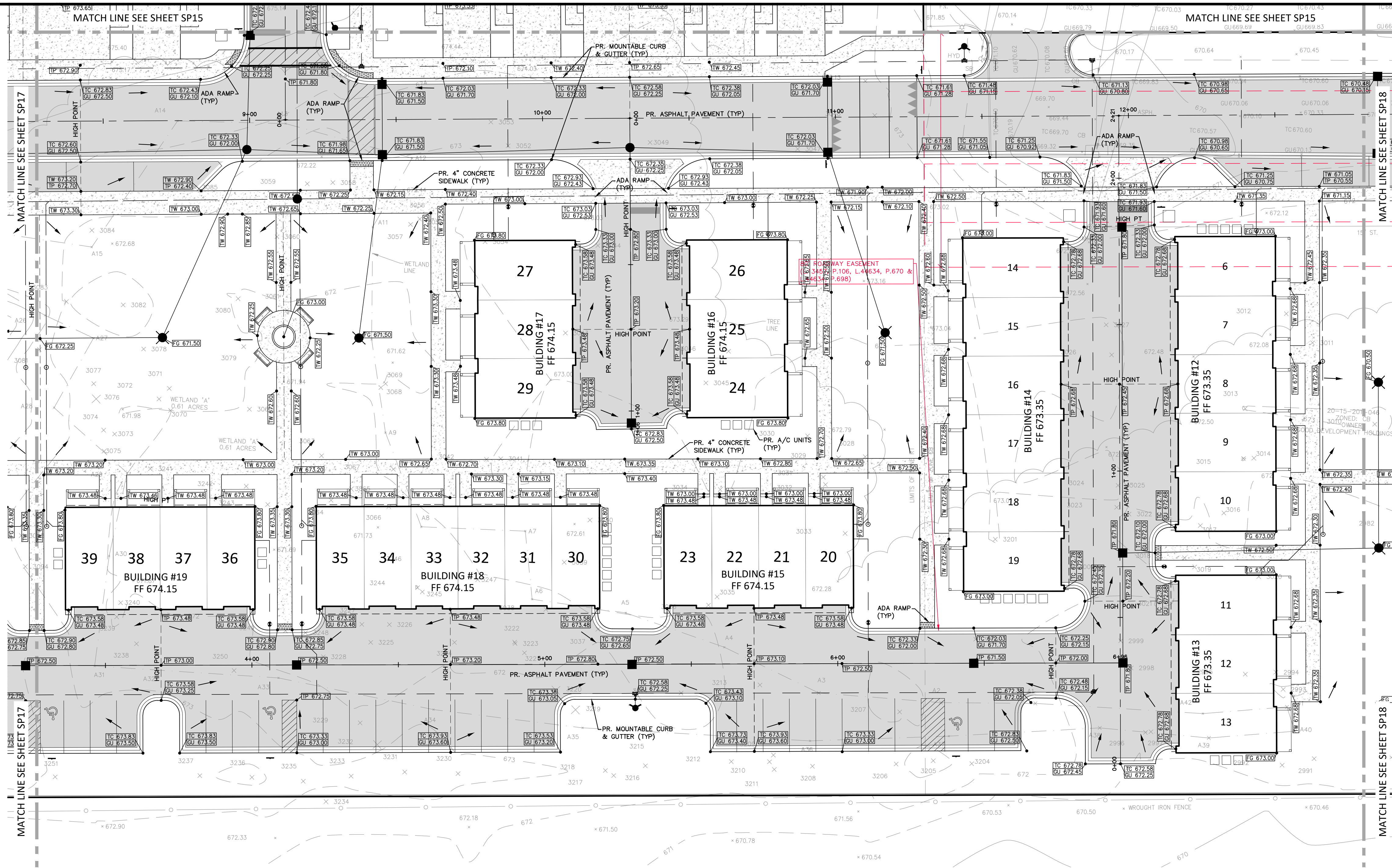


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NFE JOB NO. SHEET NO.
J943-01 SP16

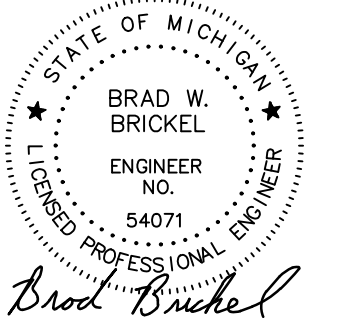
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	PROPOSED ASPHALT PAVEMENT

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	GATE VALVE
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	PR. TOP OF PVM. ELEVATION
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	EXISTING GAS MAIN
	PR. SANITARY SEWER
	PR. WATER MAIN
	PR. STORM SEWER
	PR. R. Y. CATCH BASIN



NOWAK & FRAUS ENGINEERS
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PONTIAC, MI 48342-5032
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SEAL



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)

PAVING LEGEND	
	PROPOSED CONCRETE PAVEMENT
	PROPOSED ASPHALT PAVEMENT

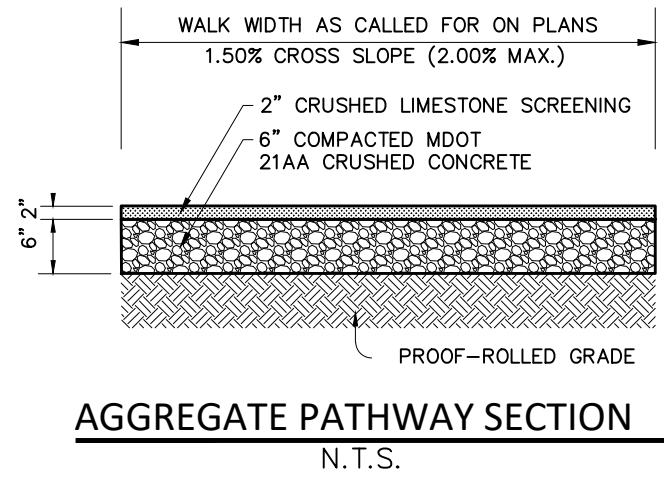
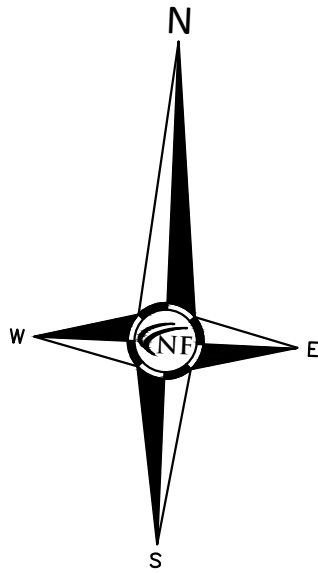
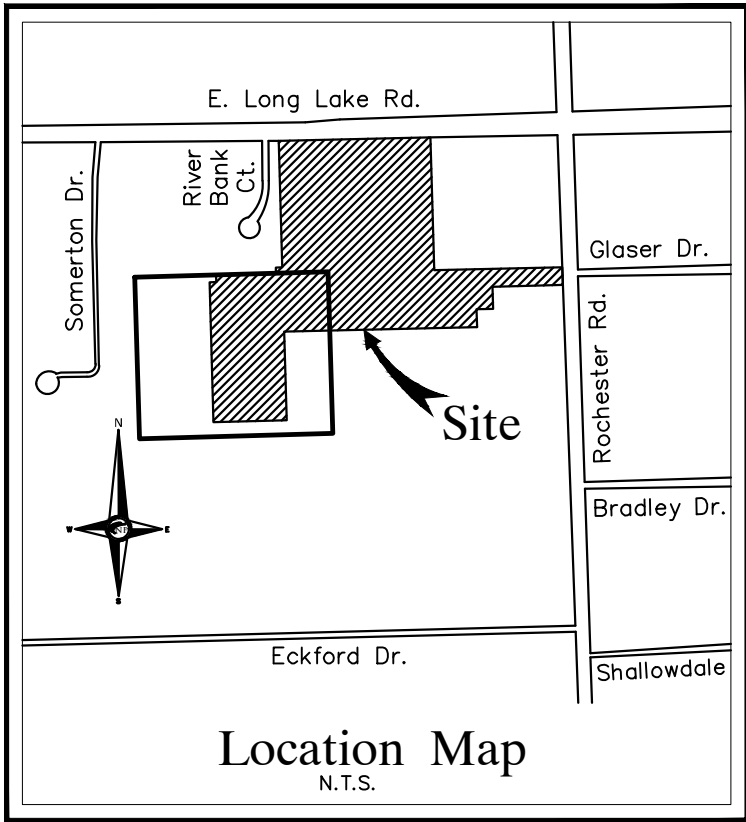
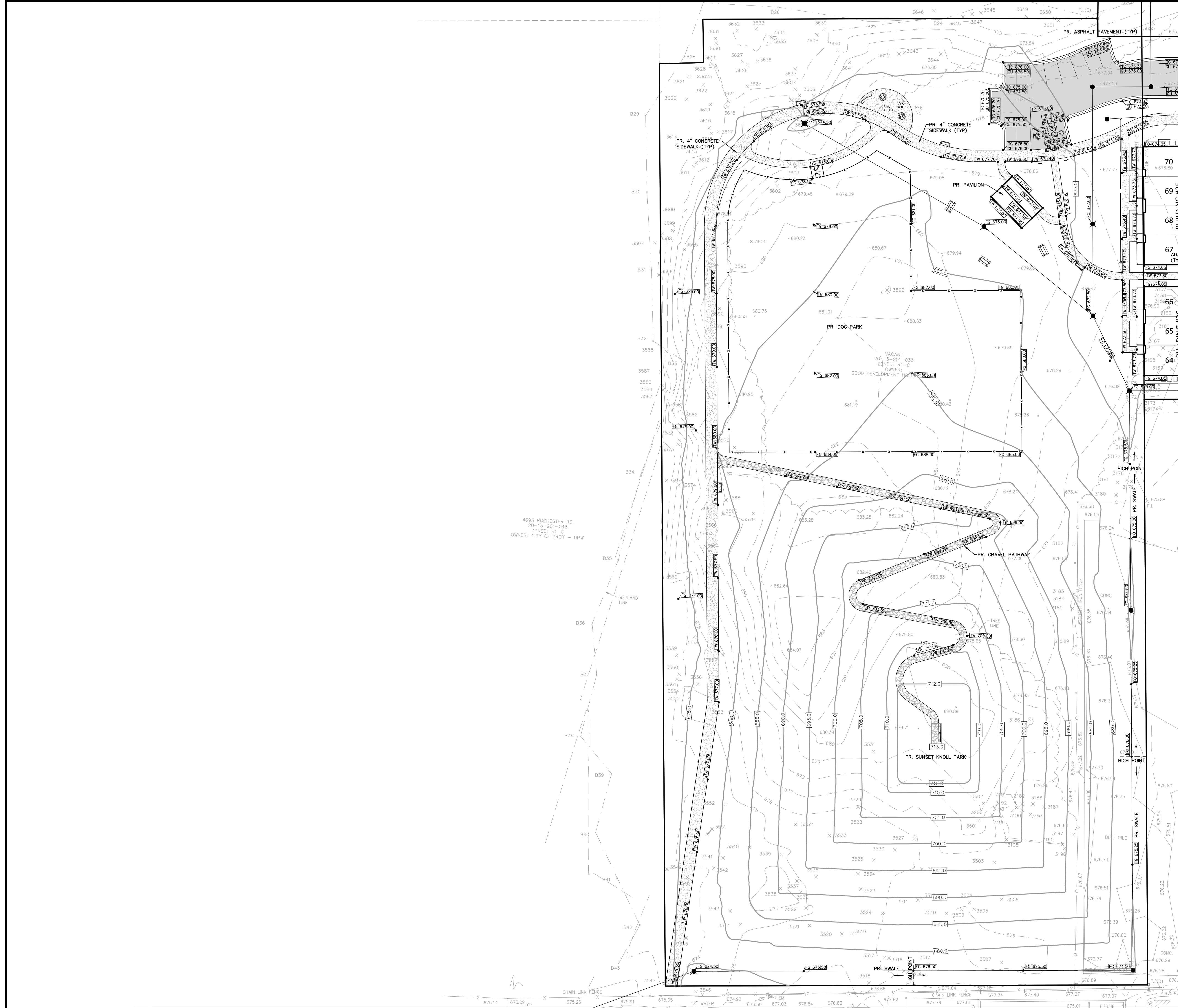
LEGEND	
	MANHOLE
	HYDRANT
	MANHOLE CATCH BASIN
	UTILITY POLE
	GUY POLE
	GUY WIRE
	C.O.
	HYDRANT
	INLET
	PROPOSED LIGHT POLE
	PR. TOP OF CURB ELEVATION
	PR. GUTTER ELEVATION
	PR. TOP OF WALK ELEVATION
	PR. TOP OF PVMT. ELEVATION
	FINISH GRADE ELEVATION
	EXISTING SANITARY SEWER
	SAN. CLEAN OUT
	EXISTING 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



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



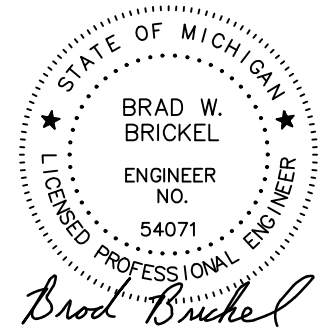
PAVING LEGEND	
	PROPOSED CONCRETE PAVEMENT
	PROPOSED ASPHALT PAVEMENT

LEGEND	
	MANHOLE
	HYDRANT
	MANHOLE CATCH BASIN
	UTILITY POLE
	GUY POLE
	C.O.
	HYDRANT
	INLET
	PROPOSED LIGHT POLE
	TC 600.00
	GU 600.00
	TW 600.00
	TP 600.00
	FG 600.00
	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
	PR. TOP OF CURB ELEVATION
	PR. GUTTER ELEVATION
	PR. TOP OF WALK ELEVATION
	PR. TOP OF PMT. ELEVATION
	FINISH GRADE ELEVATION

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SEAL



PROJECT
The Village of Troy

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

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

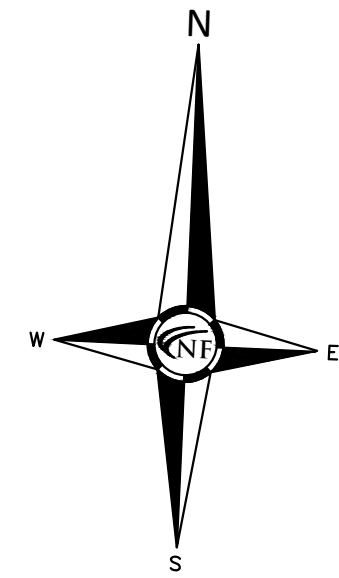
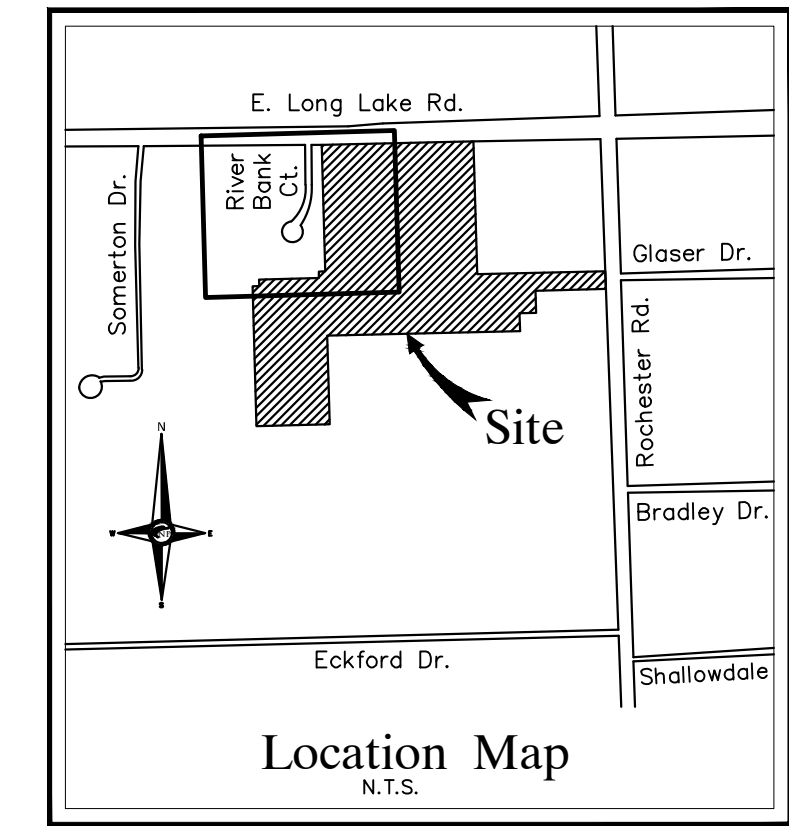
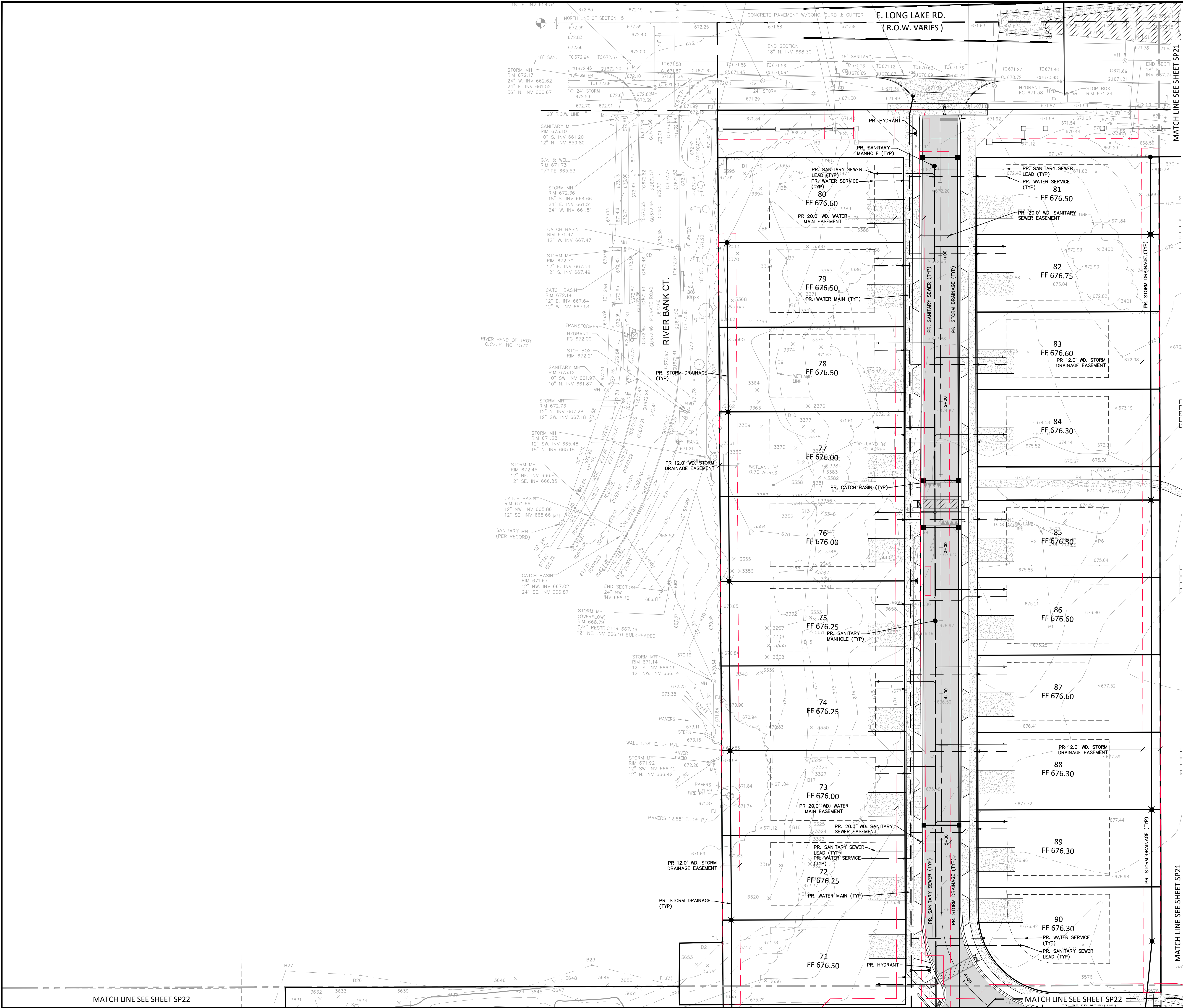
PROJECT LOCATION
Part of the NE 1/4
of Section 15
T.2N., R.11E.,
City of Troy,
Oakland County, Michigan

SHEET
Preliminary Paving &
Grading Plan (8 of 8)



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

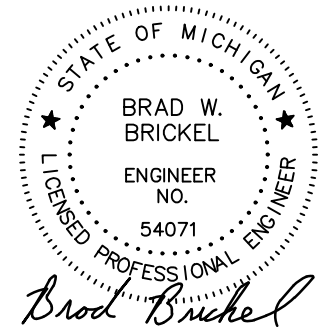
DRAWN BY:
J. Lawrey
DESIGNED BY:
B. Brickel
APPROVED BY:
B. Brickel
DATE:
April 14, 2021
SCALE: 1" = 30'
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NFE JOB NO. SHEET NO.
J943-01 SP19



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SEAL



PROJECT
The Village of Troy

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

Contact: Tim Loughrin
Phone: 248.282.1428
Email:
toughrin@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

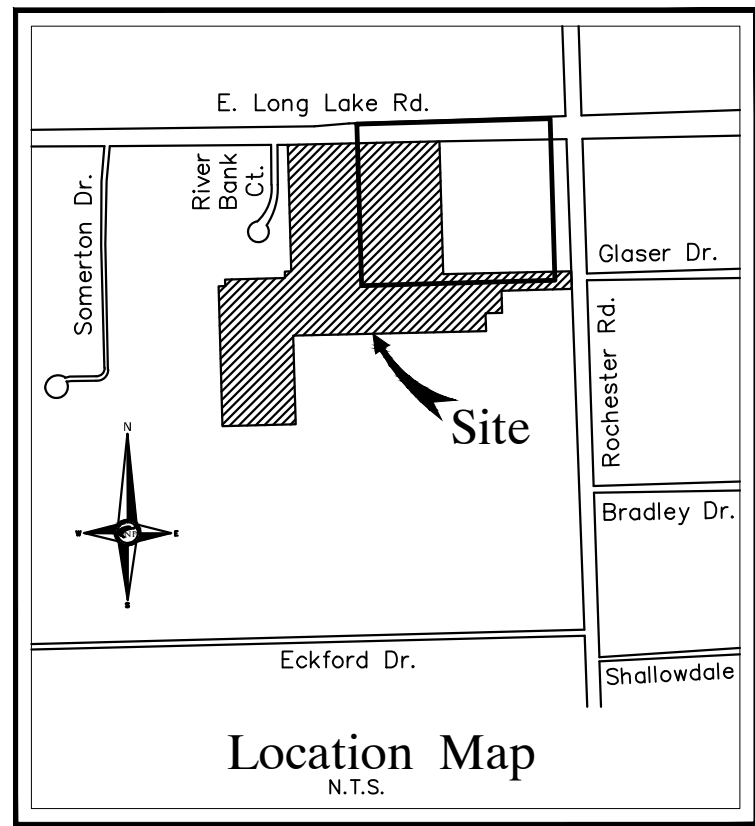
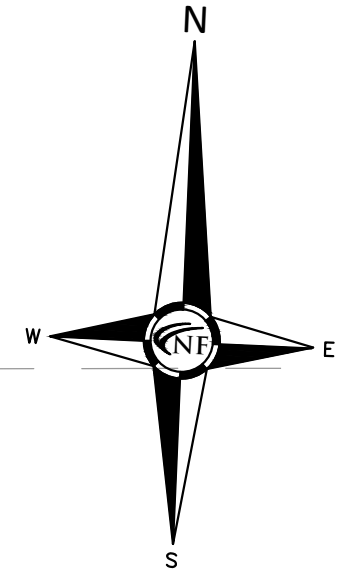
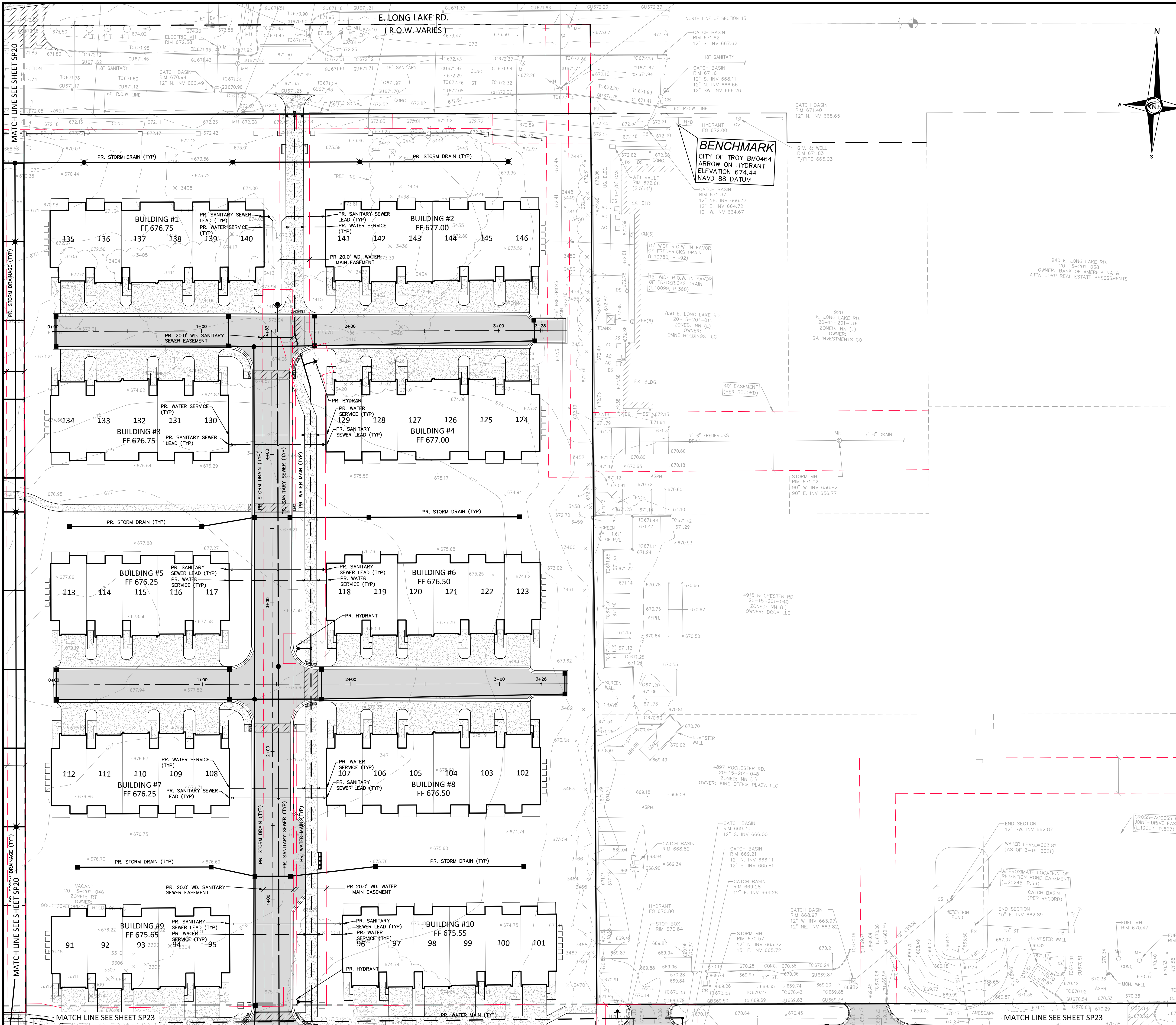
SCALE: 1" = 30'

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NFE JOB NO.
J943-01

SHEET NO.
SP20

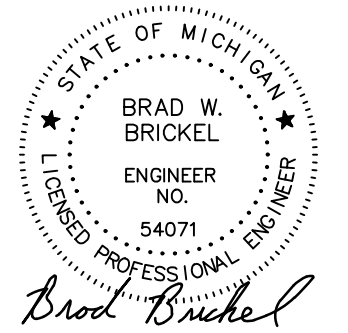
LEGEND	
	EXISTING SANITARY SEWER
	SAN. CLEAN OUT
	EXISTING WATER MAIN
	EXISTING STORM SEWER
	EX. R. Y. CATCH BASIN
	EXISTING BURIED CABLES
	OVERHEAD LINES
	LIGHT POLE
	SIGN
	EXISTING GAS MAIN
	PR. SANITARY SEWER
	PR. WATER MAIN
	PR. STORM SEWER
	PR. R. Y. CATCH BASIN
	SAND BACKFILL (95 % DENSITY)
	PROPOSED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



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SEAL



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)



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.
SP21

LEGEND	
	MANHOLE
	HYDRANT
	MANHOLE
	CATCH BASIN
	UTILITY POLE
	GUY POLE
	GUY WIRE
	C.O.
	HYDRANT
	INLET
	MANHOLE
	GATE VALVE
	C.B.
	MANHOLE
	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

MATCH LINE SEE SHEET SP20



SEAL



CLIENT

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

PROJECT LOCATION

SHEET

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

DRAWN BY:
J. Lawrey

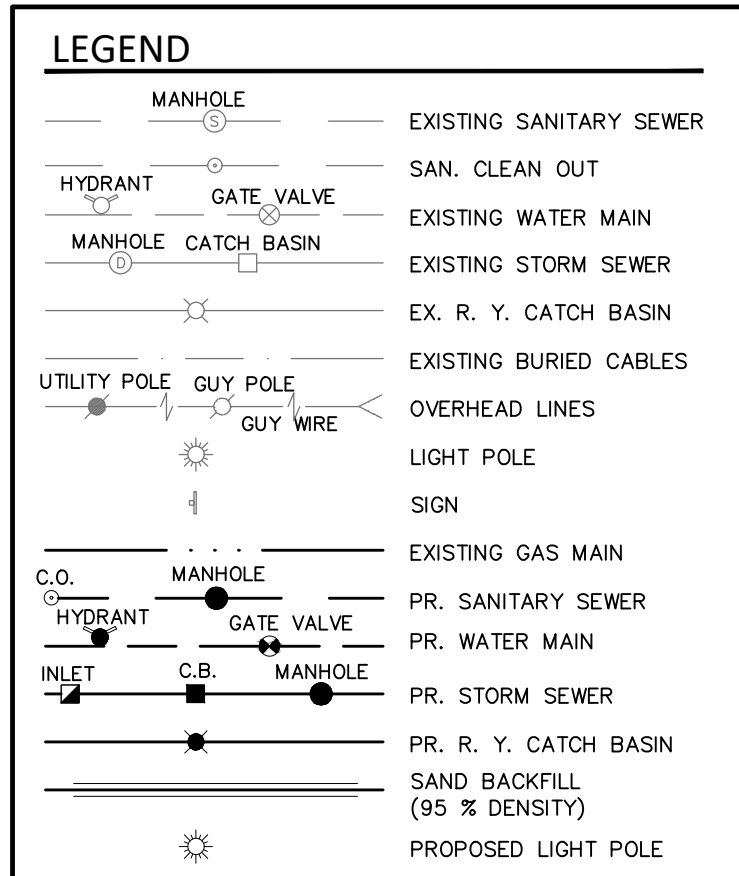
DESIGNED BY:
B. Brickel

APPROVED BY:
B. Brickel

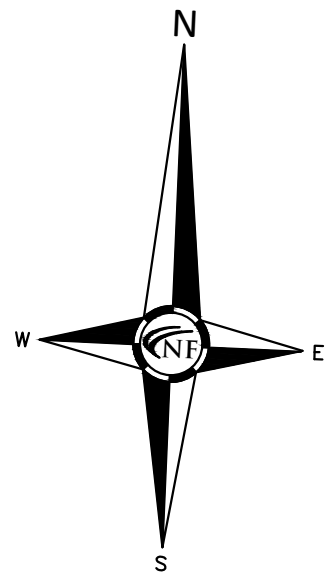
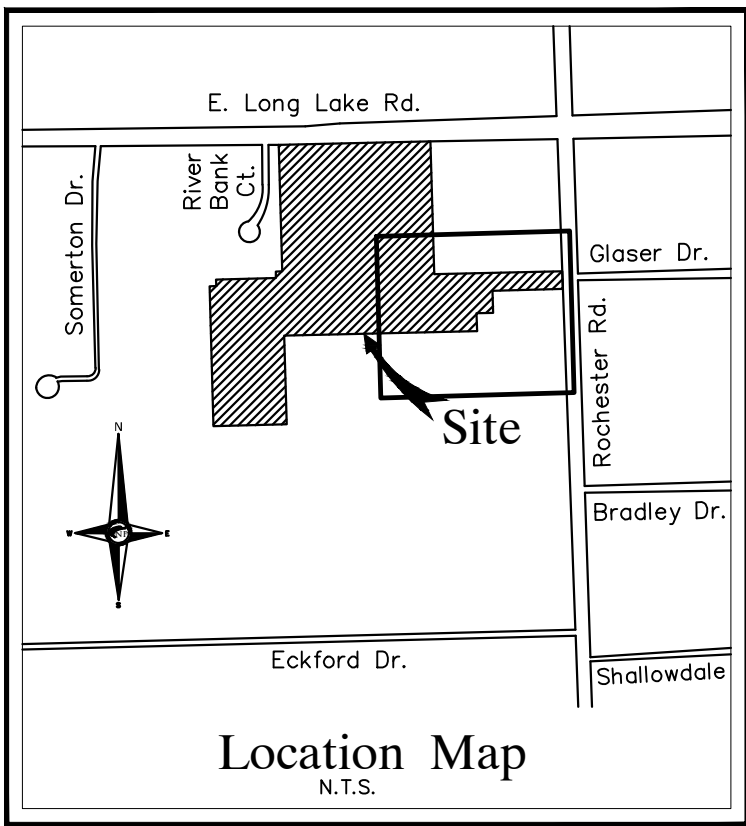
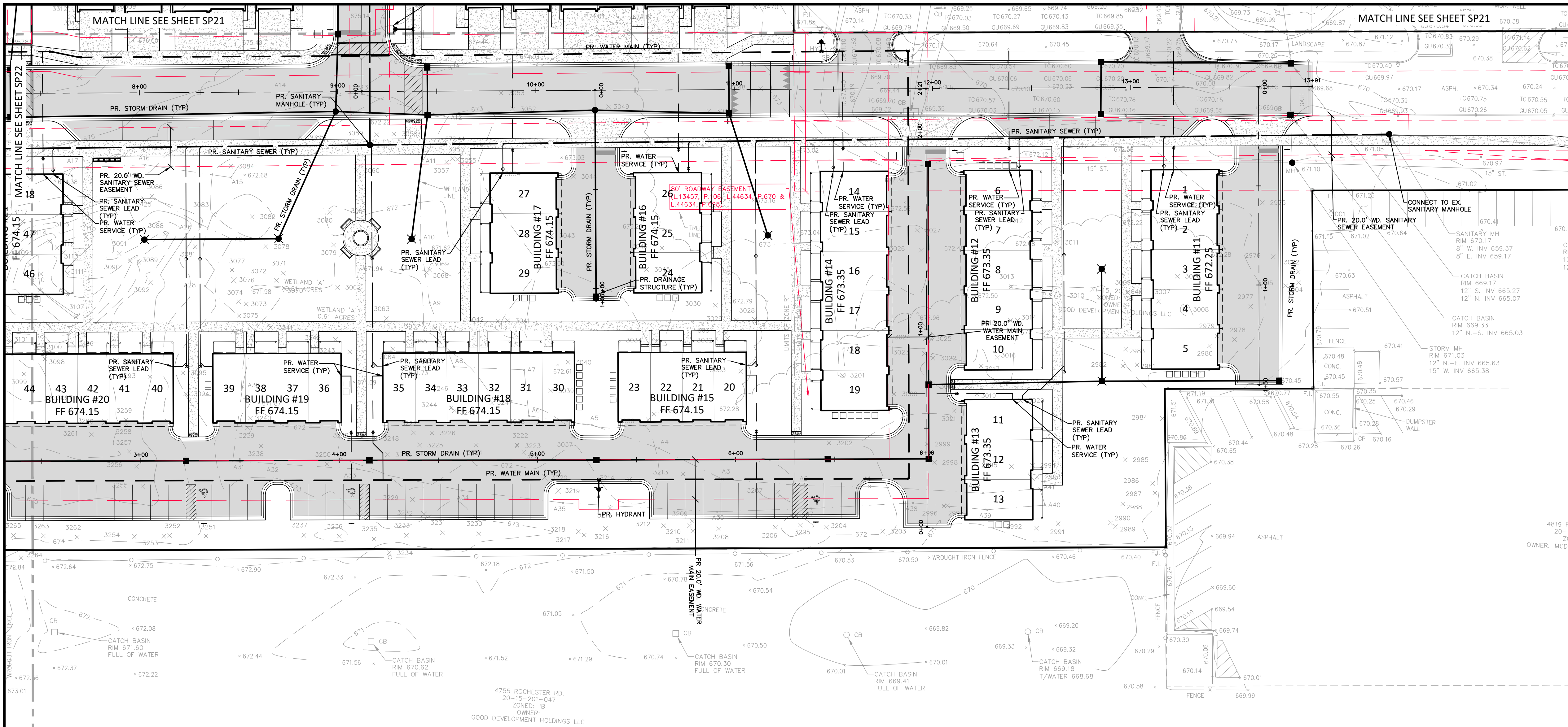
DATE:
April 14, 2021

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NFE JOB NO. SHEET NO.
J943-01 SP22



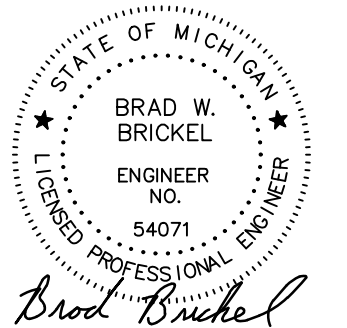
MATCH LINE SEE SHEET SP23



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SEAL



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)



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

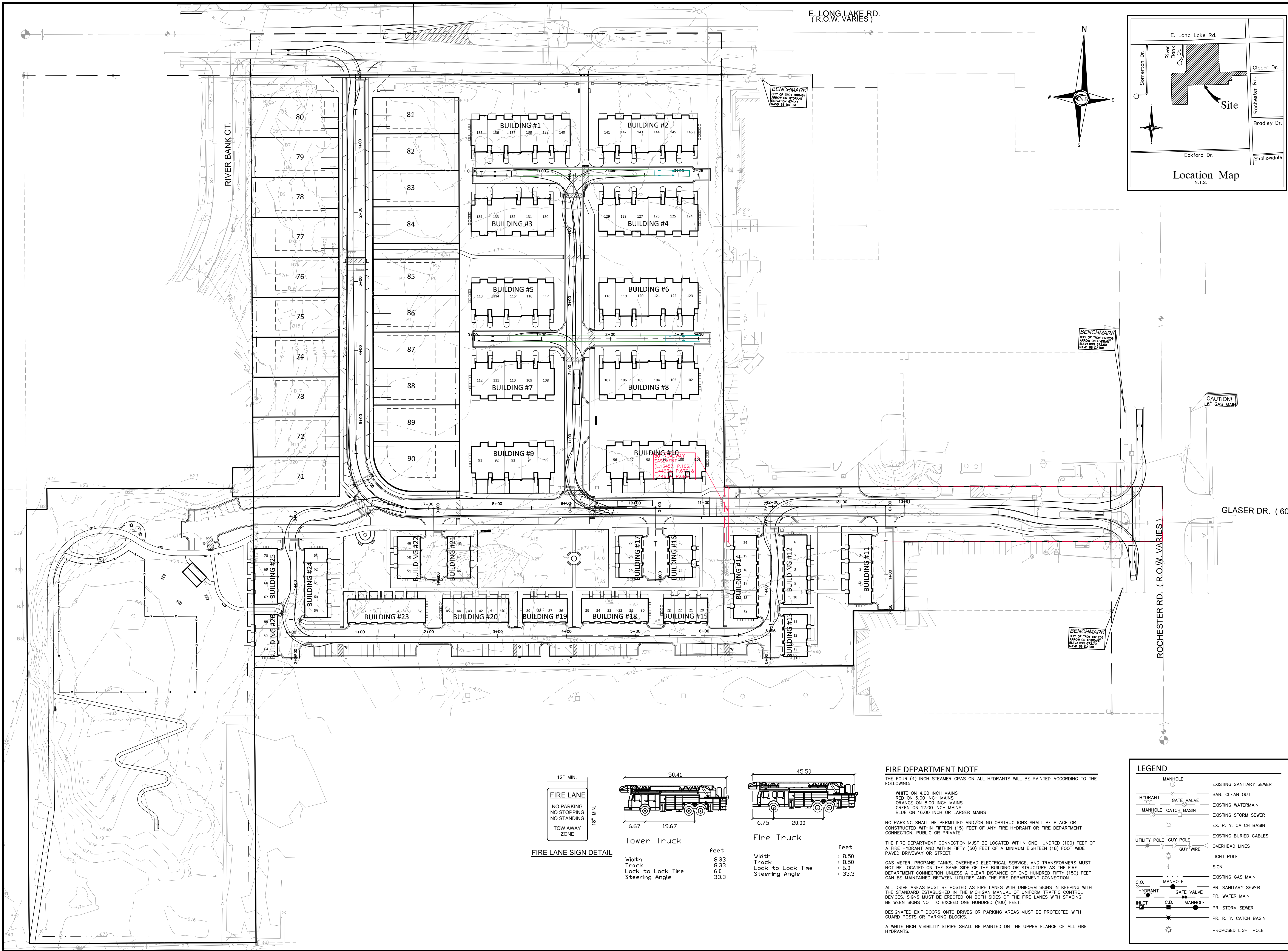
DRAWN BY:
J. Lawrey
DESIGNED BY:
B. Brickel
APPROVED BY:
B. Brickel

DATE:
April 14, 2021

SCALE: 1" = 30'
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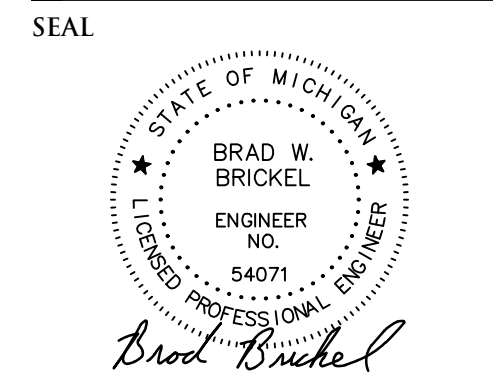
NFE JOB NO. SHEET NO.
J943-01 SP23

LEGEND	
	MANHOLE
	HYDRANT
	MANHOLE
	UTILITY POLE
	GUY POLE
	GUY WIRE
	C.O.
	HYDRANT
	INLET
	MANHOLE
	GATE VALVE
	C.B.
	MANHOLE
	PROPOSED LIGHT POLE
	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



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PROJECT
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Bloomfield Hills, MI 48301

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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



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'

NFE JOB NO.
J943-01

SHEET NO.
SP24

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.

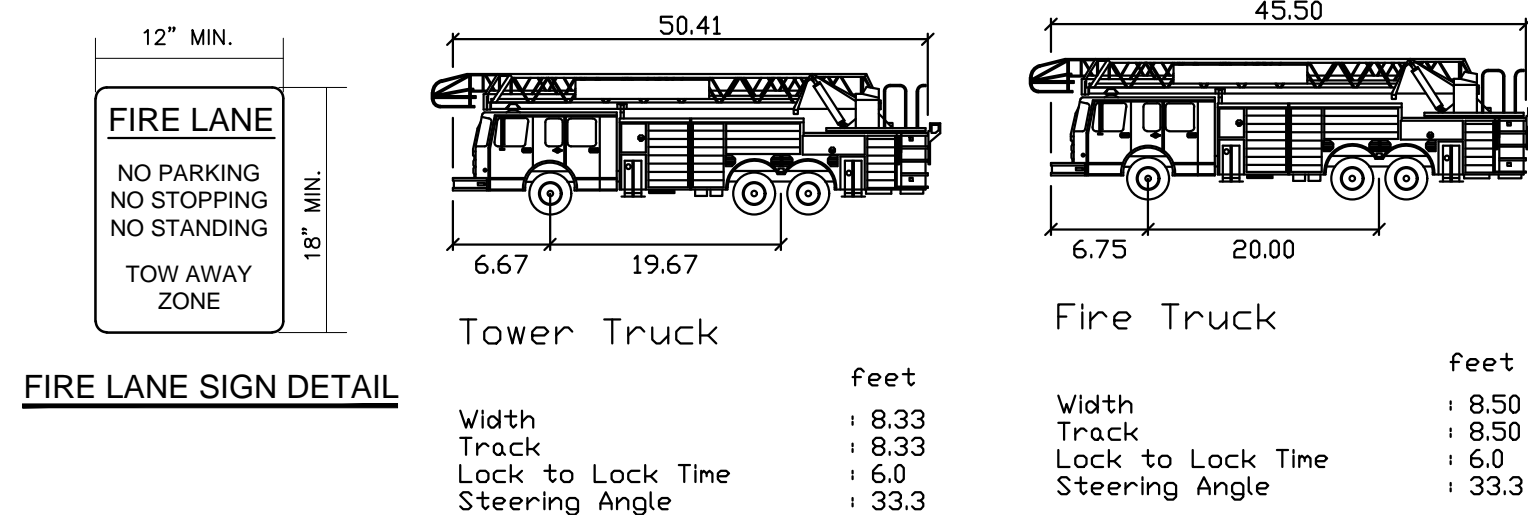
GAS METER, PROPANE TANKS, OVERHEAD ELECTRICAL SERVICE, AND TRANSFORMERS MUST NOT BE LOCATED ON THE SAME SIDE OF THE BUILDING OR STRUCTURE AS THE FIRE DEPARTMENT CONNECTION UNLESS A CLEAR DISTANCE OF ONE HUNDRED FIFTY (150) FEET CAN BE MAINTAINED BETWEEN UTILITIES AND THE FIRE DEPARTMENT CONNECTION.

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



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

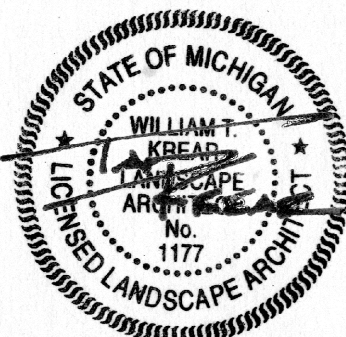
Total Onsite Trees: 632
- Total Landmark Trees: 10

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:

19017

■ date:

03.29.2022

■ drawn by:

EMJ

■ checked by:

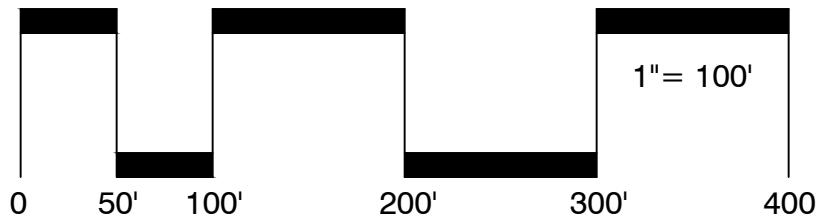
WTK

■ revisions:

10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

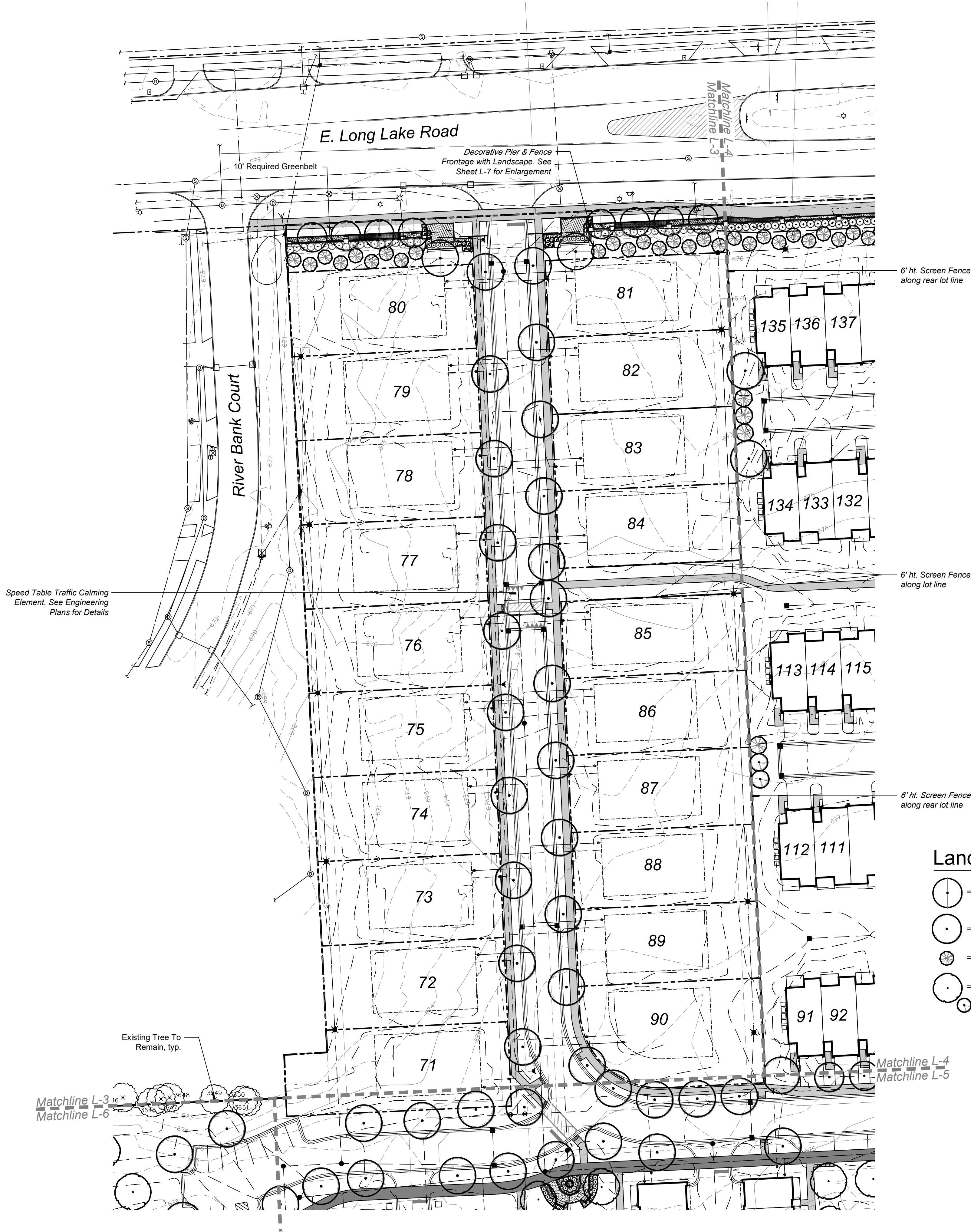


Know what's below.
Call before you dig.



sheet no.

L-1



Landscape Legend

- = Public Road Greenbelt Tree
- = Internal Street Tree
- = R.O.W. Screening Tree
- = Woodland Replacement Trees



■ 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:

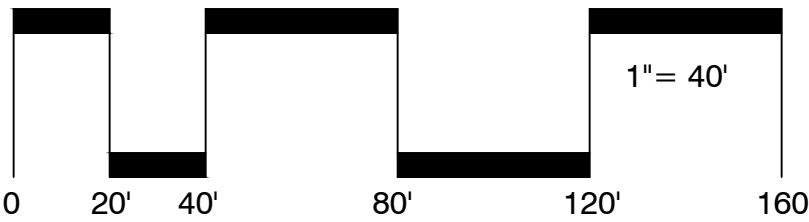
EMJ WTK

■ revisions:

10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

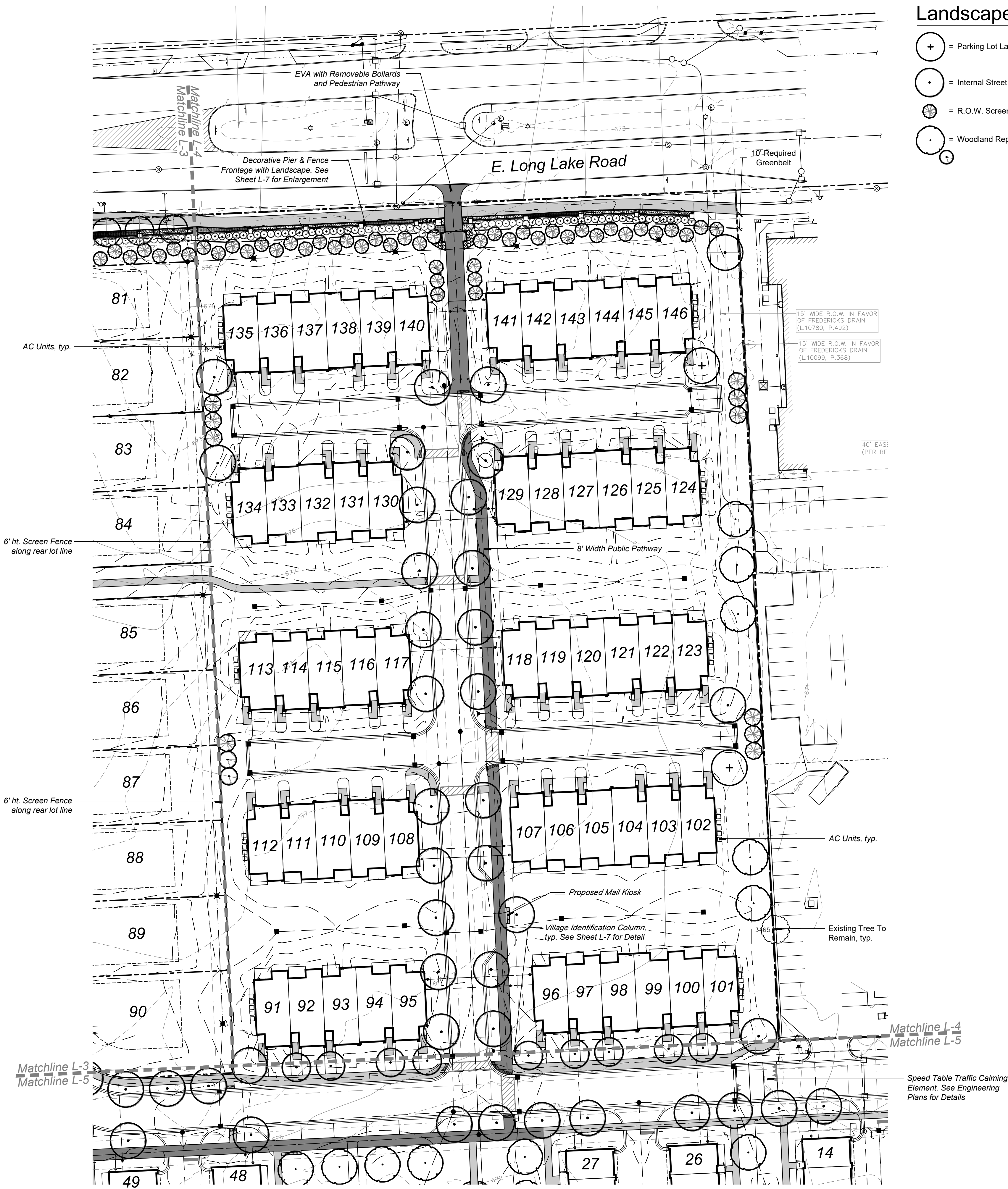


Know what's below.
Call before you dig.



sheet no.

L-3



Landscape Legend

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



■ 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: 19017 ■ date: 03.29.2022

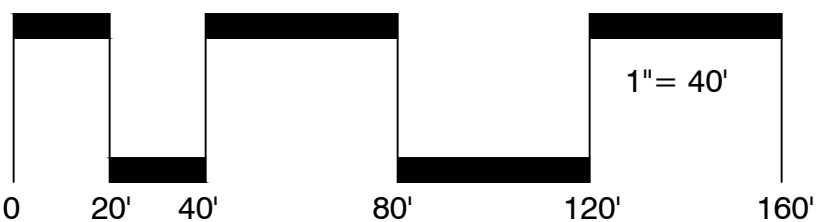
■ drawn by: EMJ ■ checked by: WTK

■ revisions:

10.21.2022	Per Plan Revisions
11.07.2022	Per Plan Revisions

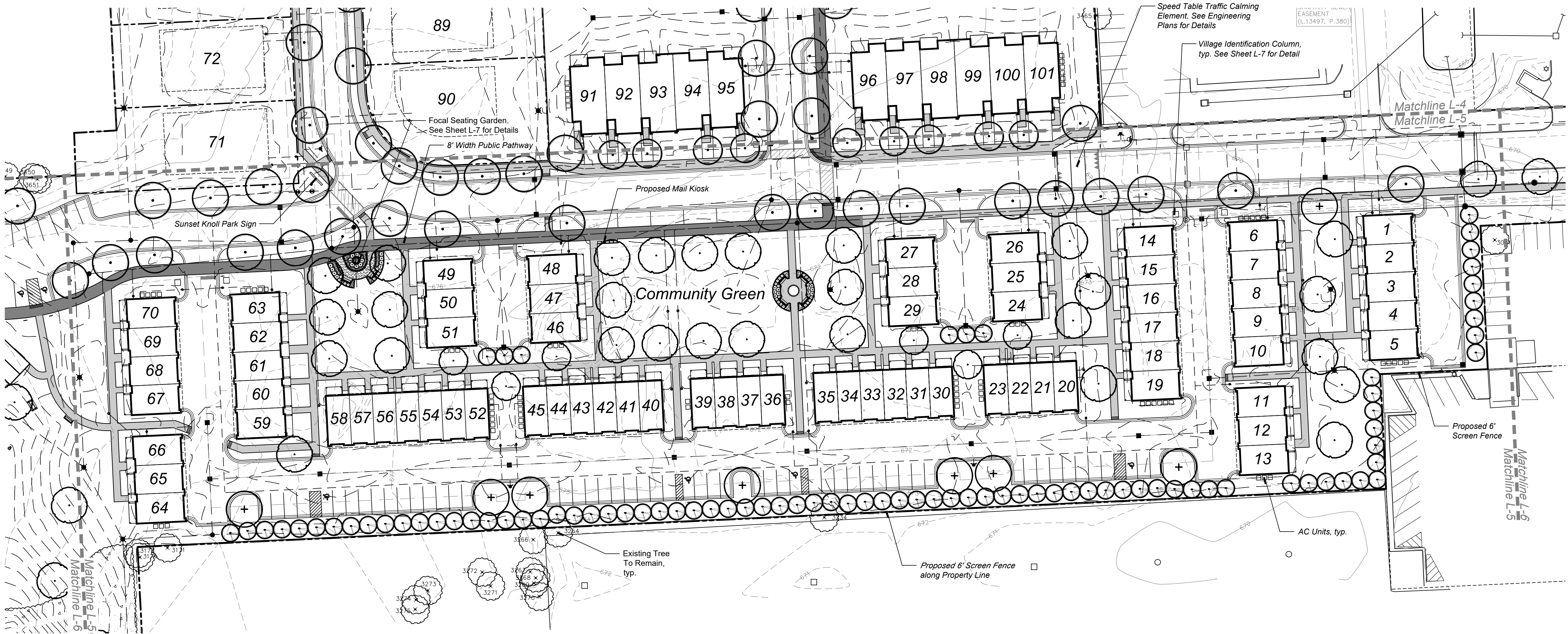


Know what's below.
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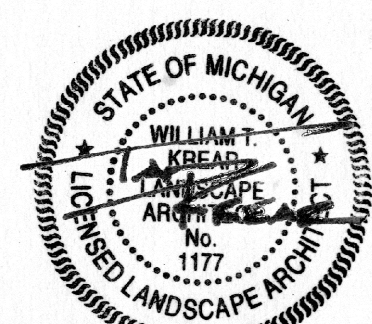
sheet no.

L-4



Landscape Legend

- = Parking Lot Landscape Tree
- = Internal Street Tree
- = Woodland Replacement Trees



■ 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

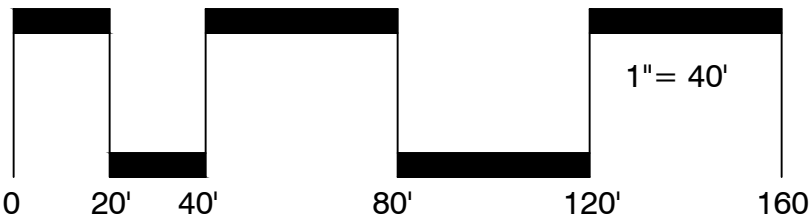
■ job number: 19017 ■ date: 03.29.2022

■ drawn by: EMJ ■ checked by: WTK

■ revisions:	
10.21.2022	Per Plan Revisions
11.07.2022	Per Plan Revisions



Know what's below.
Call before you dig.



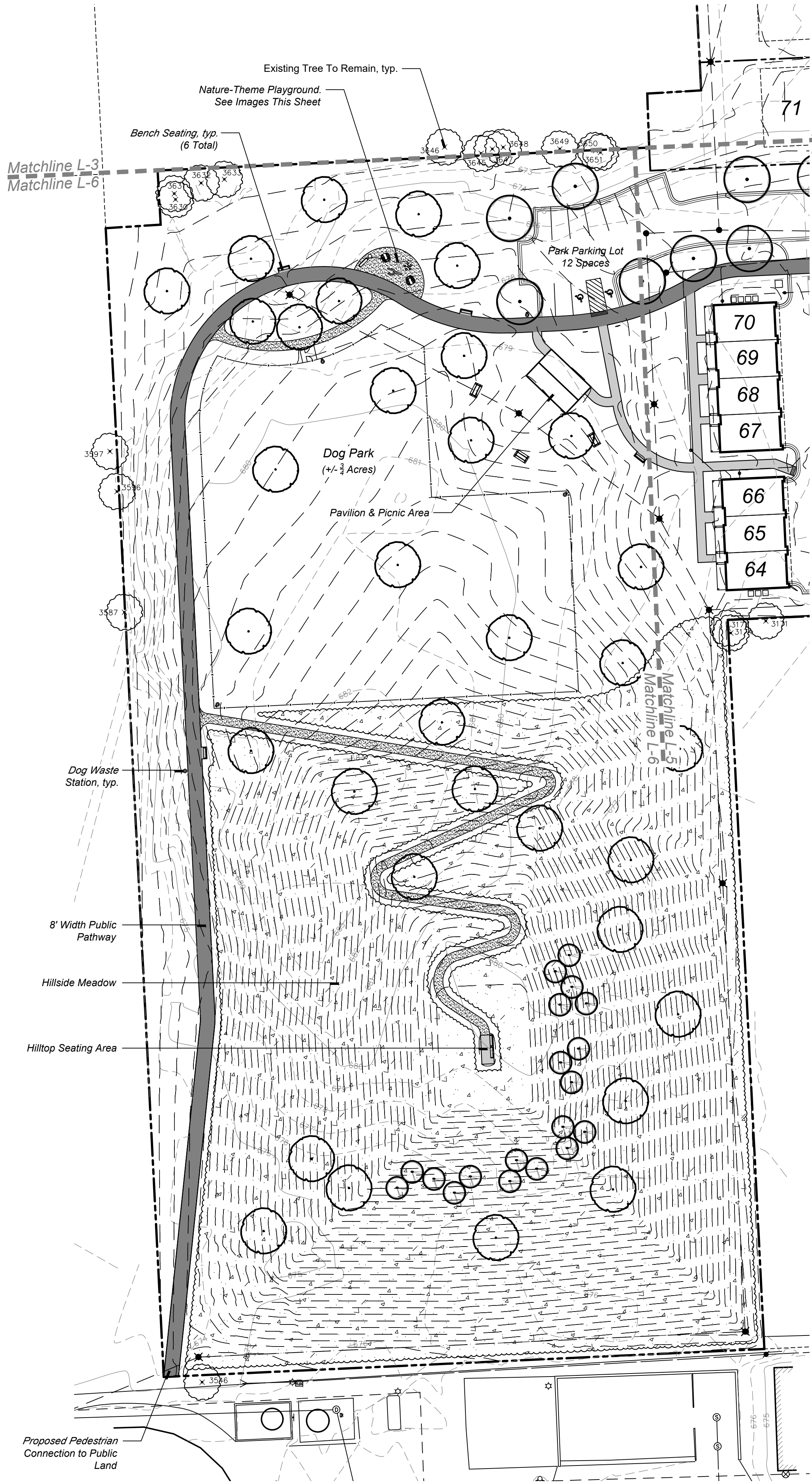
sheet no.

L-5

Nature Playground Imagery



Dog Waste Station

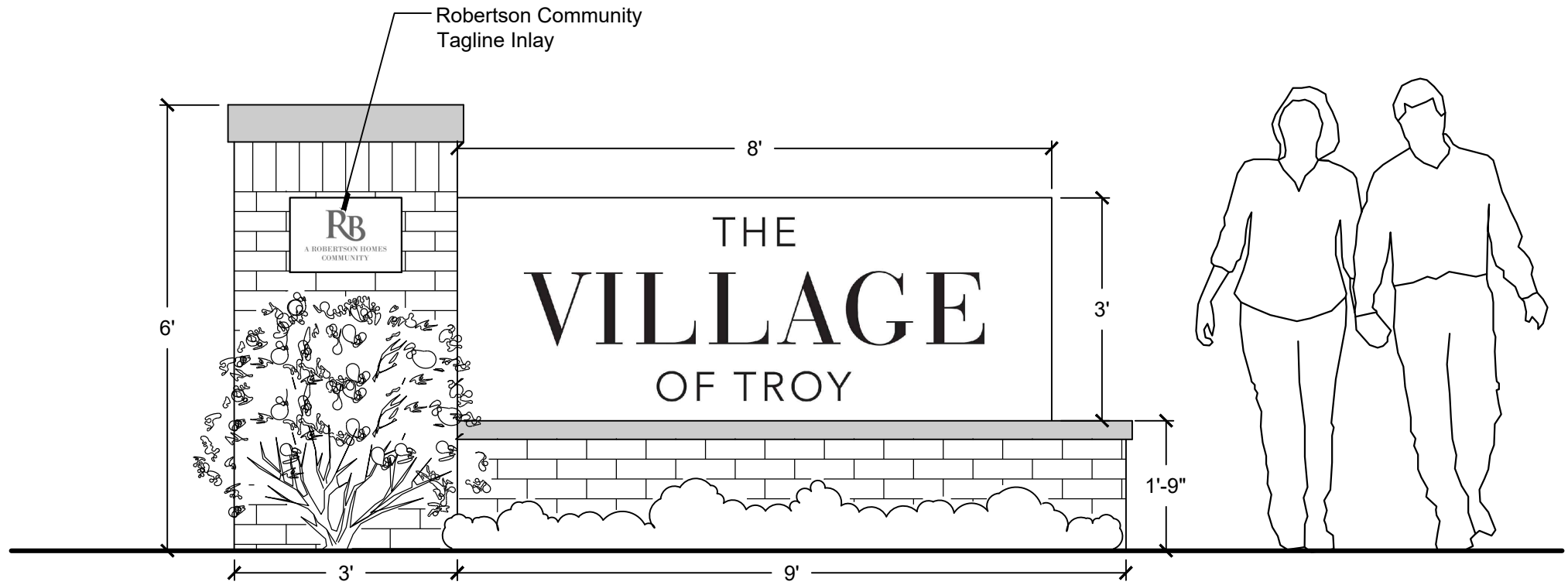


Sunset Knoll Park Enlargement Plan

Scale: 1" = 40'

Landscape Legend

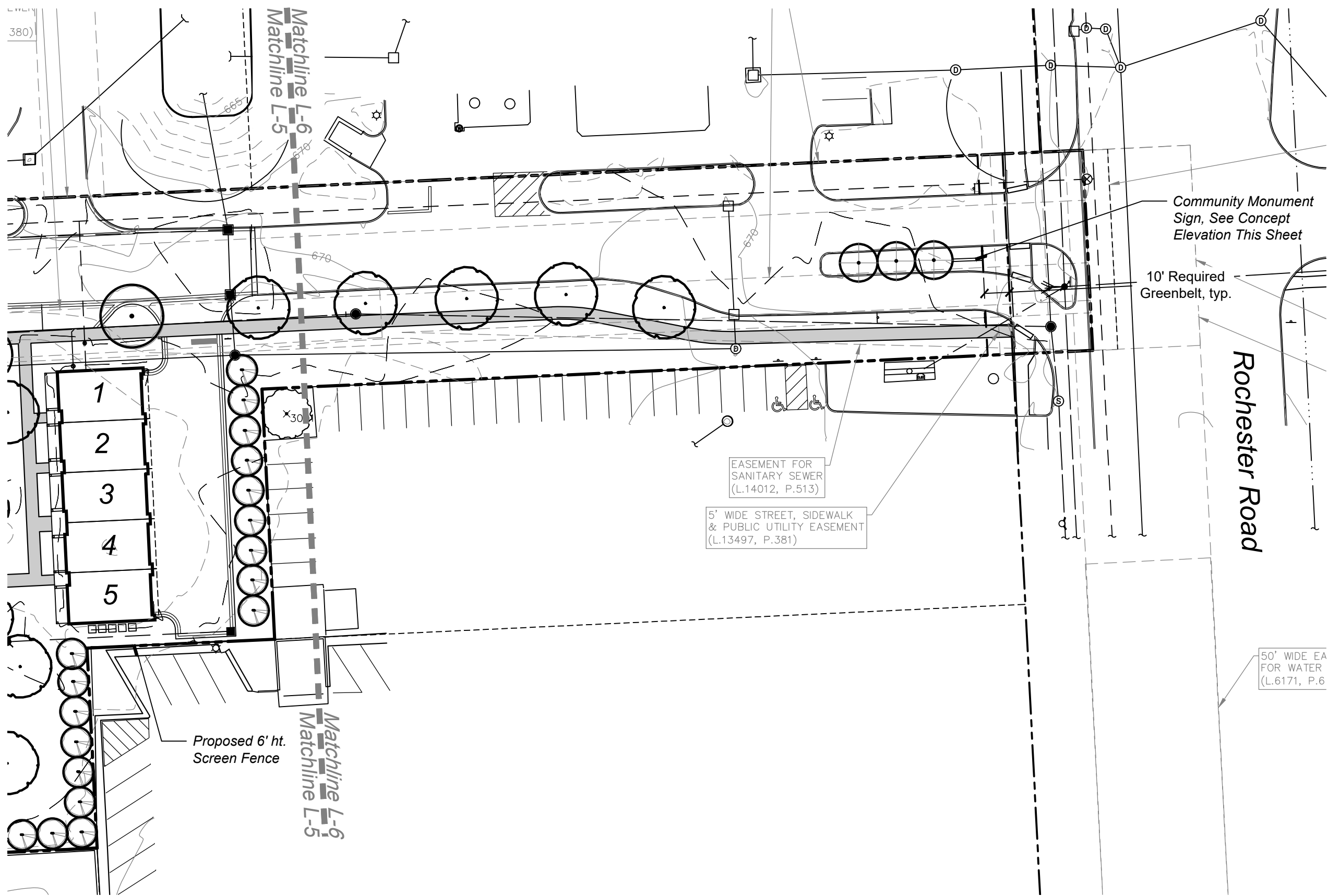
- + = Parking Lot Landscape Tree
- = Public Road Greenbelt Tree
- = Internal Street Tree
- = Woodland Replacement Trees
- = Concrete/Asphalt Sidewalk
- = Stone Aggregate Pathway



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'

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



■ 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

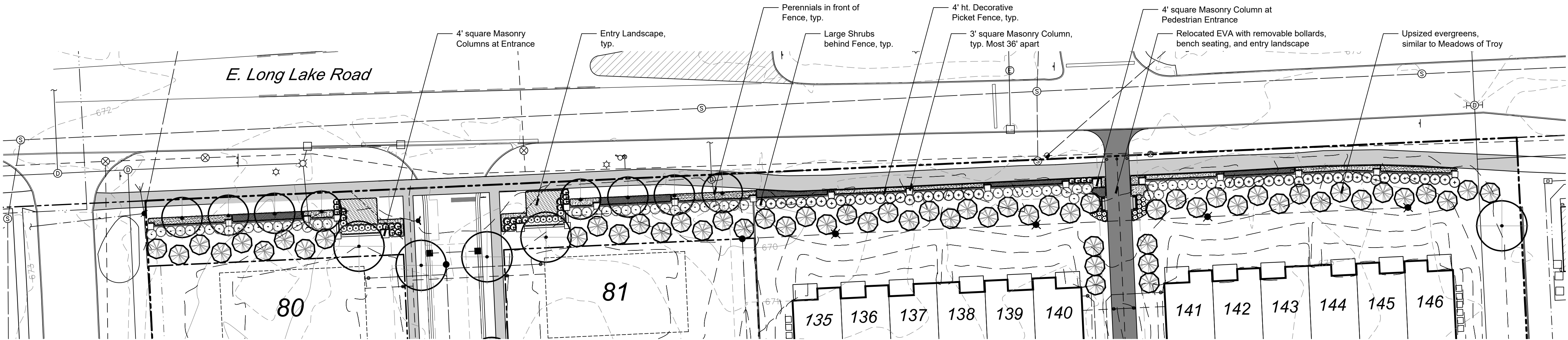
■ job number: 19017
■ date: 03.29.2022

■ drawn by: EMJ
■ checked by: WTK

■ revisions:
10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

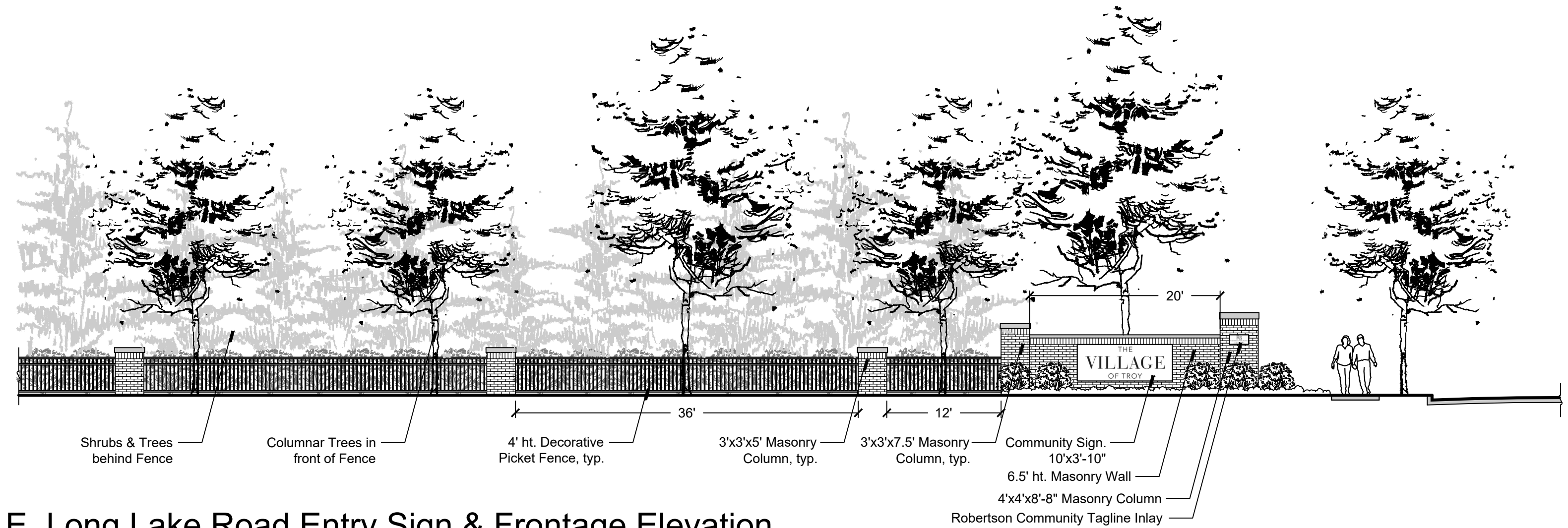


sheet no.
L-6



East Long Lake Road Frontage Enlargement Plan

Scale: 1" = 30'



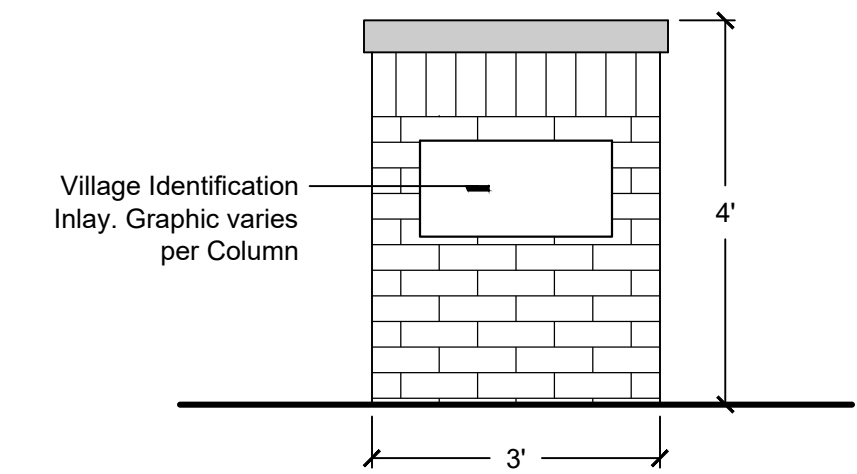
E. Long Lake Road Entry Sign & Frontage Elevation

Scale: 1" = 10'

Sign Ordinance

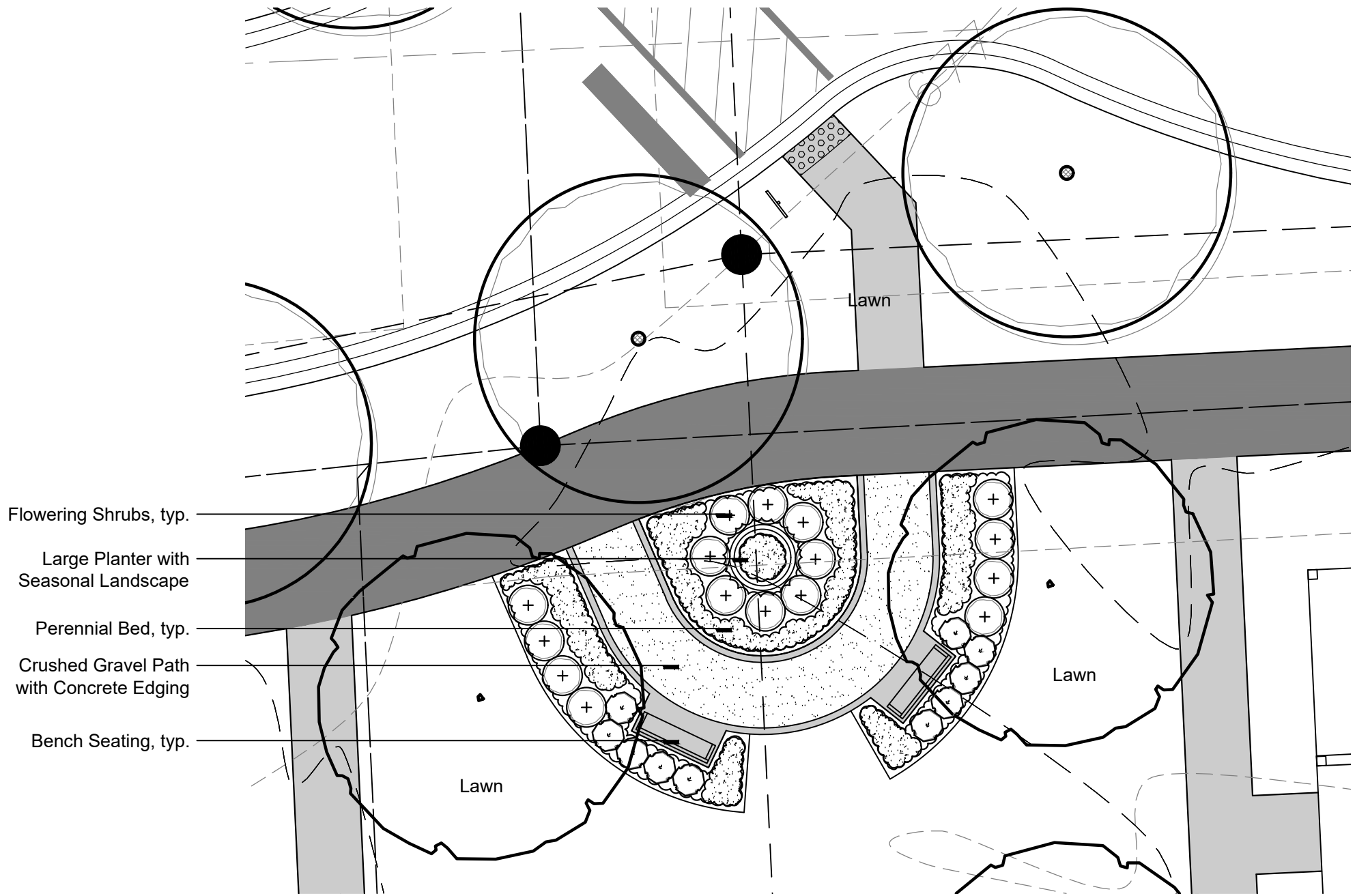
	Allowed	Proposed
- Sign Area:	100 sf*	24 sf & 38.33 sf
- Sign Height:	12' ht. max	5'-4" ht.
- Sign Setback:	10' min.	21'-6"

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



Village Identification Column Detail

Scale: 3/4" = 1'



Focal Garden Enlargement Concept

Scale: 1" = 10'



■ 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:

19017

■ date:

10.20.2022

■ drawn by:

EMJ

■ checked by:

WTK

■ revisions:

11.07.2022 Per Plan Revisions



Know what's below.
Call before you dig.



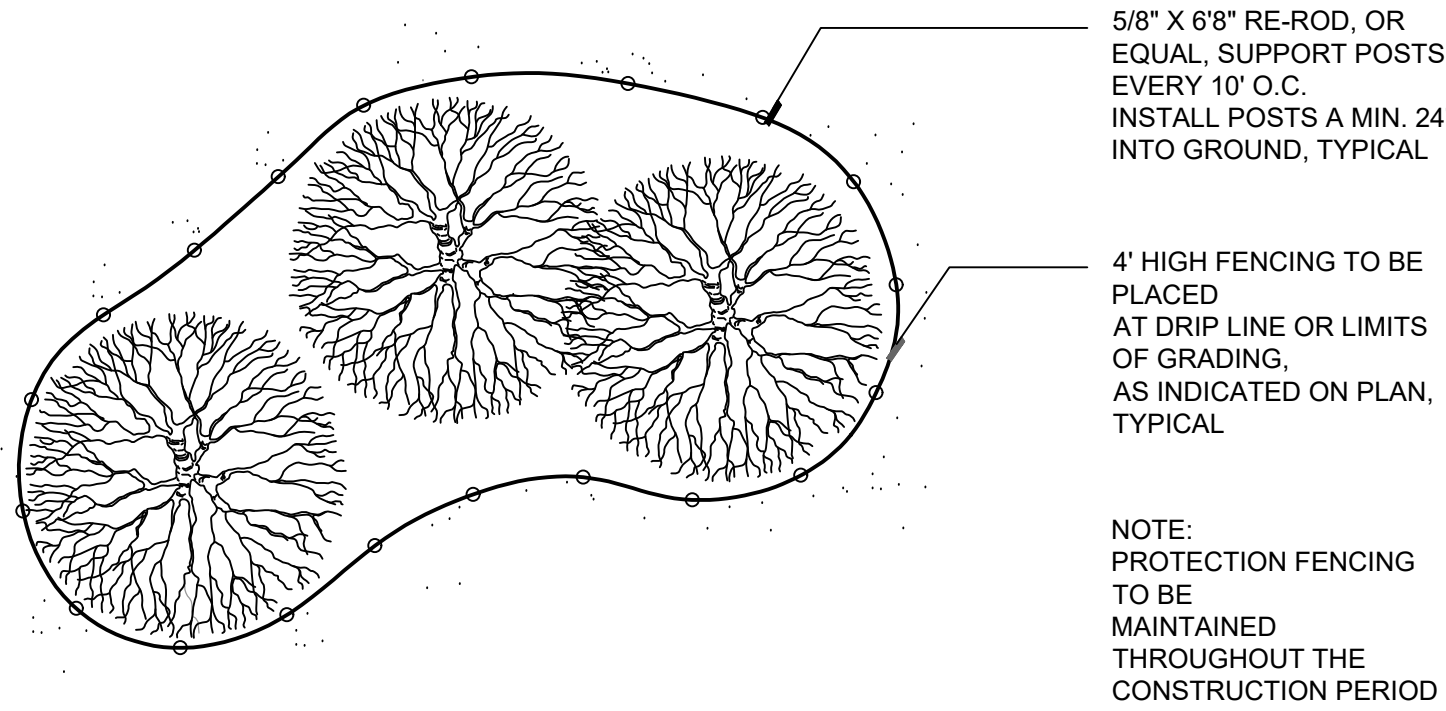
sheet no.

L-7



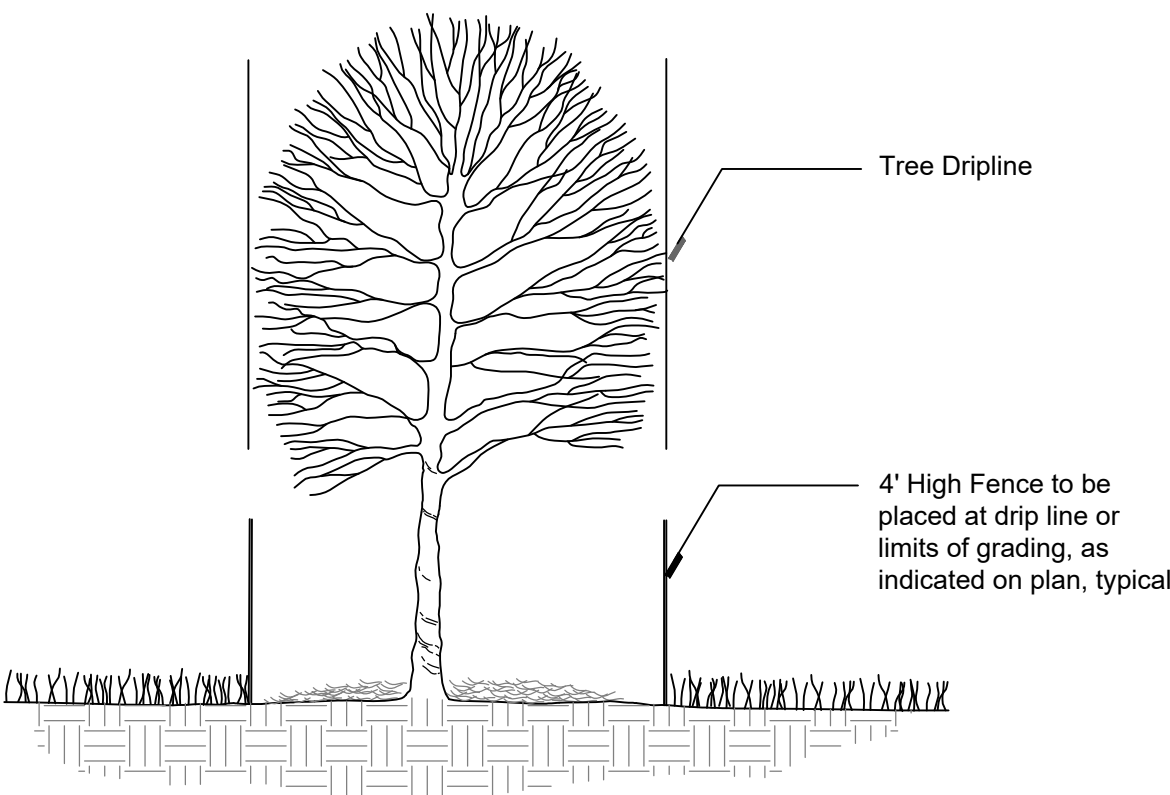
LEGEND

- = Approx. Location of Tree Protection Fence
- = Existing Tree To Remain
- = Existing Tree To Be Removed



Tree Protection Detail - Plan

Scale: NTS



Tree Protection Detail - Section

Scale: NTS

Tree Protection Notes

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



■ 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:

19017

■ date:

03.29.2022

■ drawn by:

EMJ

■ checked by:

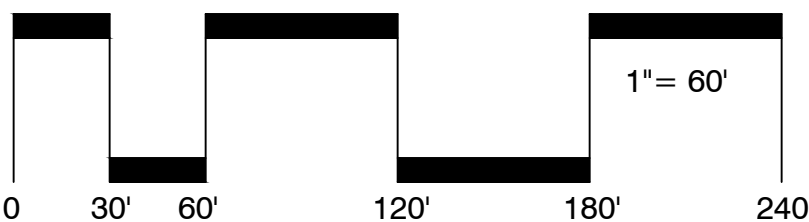
WTK

■ revisions:

10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions



Know what's below.
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sheet no.

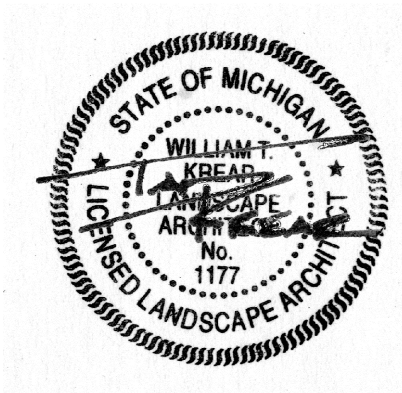
L-8



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



■ 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:

19017

■ date:

03.29.2022

■ drawn by:

EMJ

■ checked by:

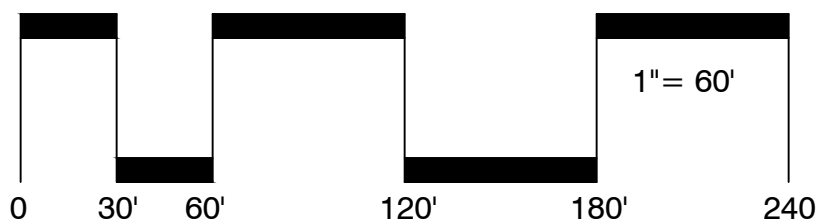
WTK

■ revisions:

10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions



Know what's below.
Call before you dig.



sheet no.

L-9

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)



■ 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:

19017

■ date:

03.29.2022

■ drawn by:

EMJ

■ checked by:

WTK



Know what's below.
Call before you dig.

■ revisions:

10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

Tag	Scientific Name	Common Name	Diameter at Breast Height (DBH)				Landmark (2)	Exempt	Save/Remove
			Trunk 1	Trunk 2	Trunk 3	Condition (1)			
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

Tag	Scientific Name	Common Name	Diameter at Breast Height (DBH)				Landmark (2)	Exempt	Save/Remove
			Trunk 1	Trunk 2	Trunk 3	Condition (1)			
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

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)



■ 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:

19017

■ date:

03.29.2022

■ drawn by:

EMJ

■ checked by:

WTK



Know what's below.
Call before you dig.

■ revisions:

10.21.2022 Per Plan Revisions
11.07.2022 Per Plan Revisions

sheet no.

Tag	Scientific Name	Common Name	Diameter at Breast Height (DBH)				Landmark (2)	Exempt	Save/Remove
			Trunk 1	Trunk 2	Trunk 3	Condition (1)			
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

Tag	Scientific Name	Common Name	Diameter at Breast Height (DBH)				Landmark (2)	Exempt	Save/Remove
			Trunk 1	Trunk 2	Trunk 3	Condition (1)			
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



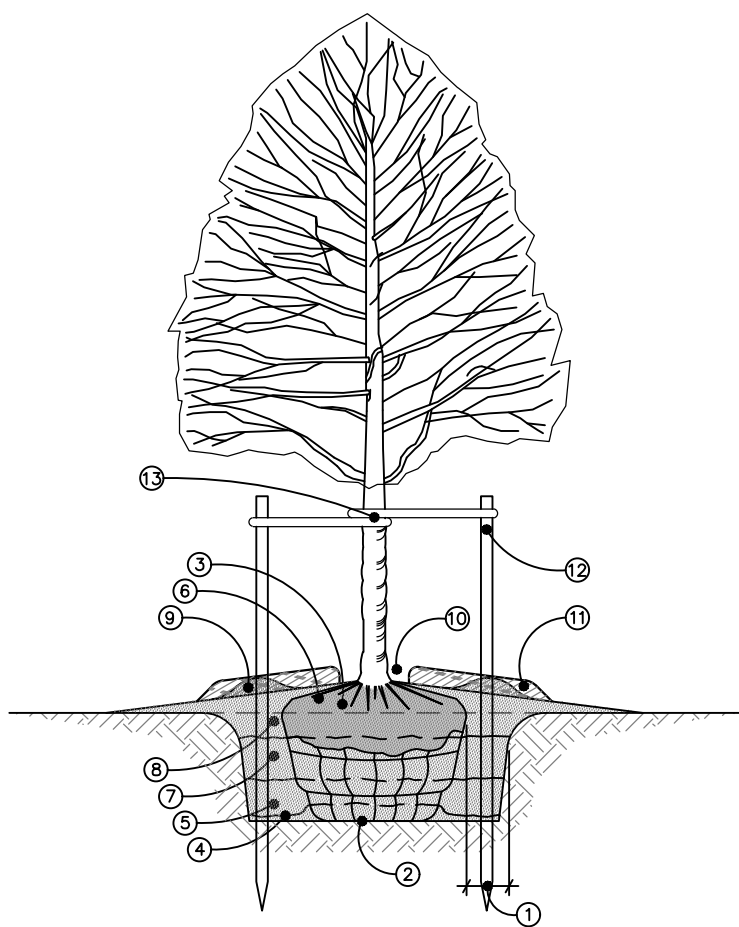
Tag	Scientific Name	Common Name	Diameter at Breast Height (DBH)				Landmark (2)	Exempt	Save/Remove
			Trunk 1	Trunk 2	Trunk 3	Condition (1)			
3615	Populus deltoides	Cottonwood	10.4			Fair		X	Remove
3616	Populus deltoides	Cottonwood	9.4			Fair		X	Remove
3617	Populus deltoides	Cottonwood	6.4			Fair		X	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.

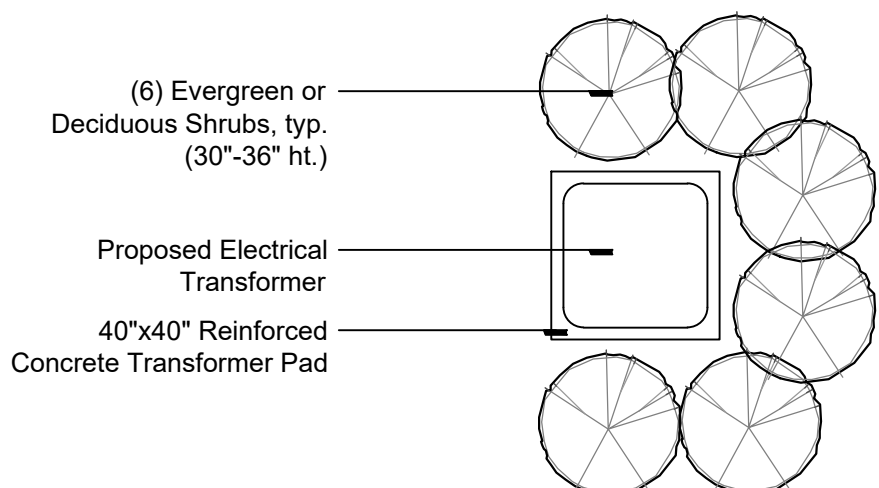
(2) Landmark as per City of Troy Zoning Ordinance, Section 13.07 Woodland Protection (C)(1)



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

Deciduous Tree Planting Detail - 4" Cal. and Under

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- *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

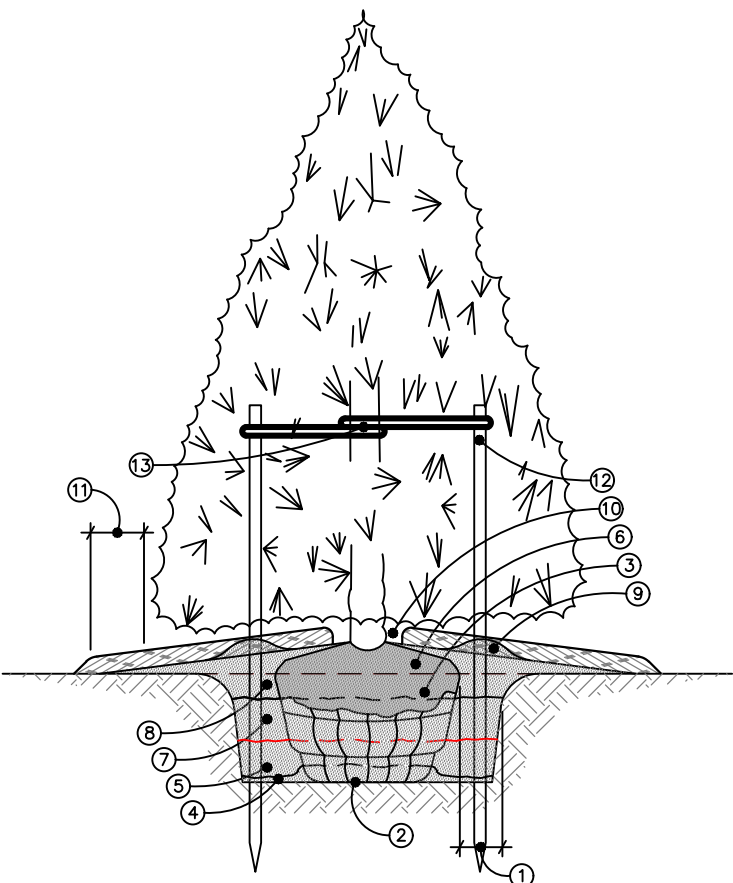
Optional Transformer Screening Detail

Scale: 1/4" = 1'

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Landscape Notes

- All plant material shall be true to name and free from physical damage and wind burn.
- Plants shall be full, well-branched, and in a healthy, vigorous growing condition.
- Plants shall be watered before and after planting is complete.
- 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.
- All material shall conform to the guidelines established in the most recent edition of the American Standard for Nursery Stock. Provide clean backfill soil, using material stockpiled on site. Soil shall be screened and free of any debris, foreign material, or stone.
- "Agrifirm" tabs or similar slow-release fertilizer shall be added to the planting pits before being backfilled.
- Amended planting mix shall consist of 1/3 screened topsoil, 1/3 sand, and 1/3 peat.
- 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.
- The Landscape Contractor shall be responsible for all work shown on the landscape drawings and specifications.
- No substitutions or changes of location, or plant types shall be made without the approval of the Landscape Architect or Owner's representative.
- The Landscape Architect shall be notified of any discrepancies between the plans and field conditions prior to installation.
- The Landscape Contractor shall be responsible for maintaining all plant material in a vertical condition throughout the guaranteed period.
- 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.
- 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.
- The Landscape Contractor shall seed and mulch or sod (as indicated on plans) all areas disturbed during construction, throughout the contract limits.
- A pre-emergent weed control agent, "Preen" or equal, shall be applied uniformly to all planting beds prior to mulching.
- All lawn areas to be irrigated.
- 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.
- All Lawn areas shall be Seeded or Sodded
- All Landscape Areas shall be irrigated by an automatic irrigation system with separate zones for Lawn and Plants.

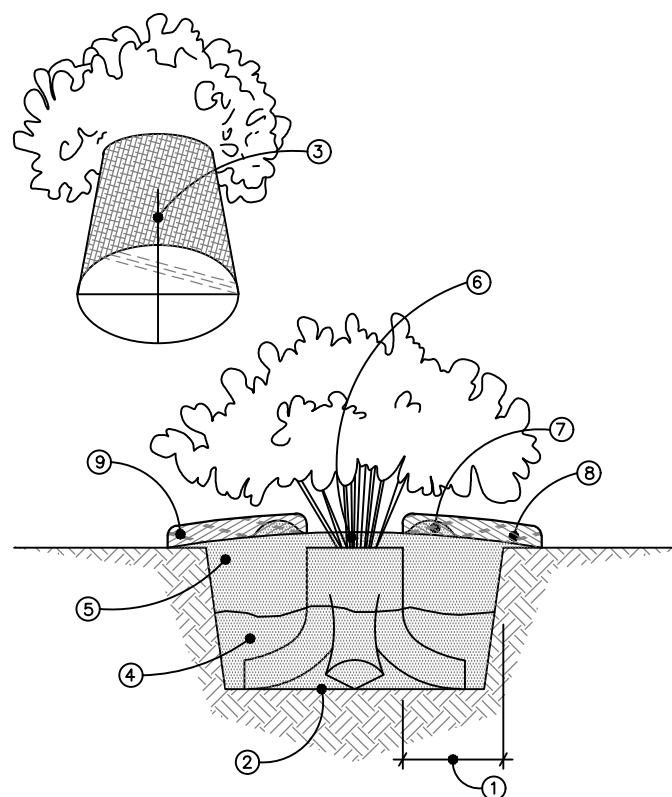


Evergreen Tree Planting Detail - 10' Ht. and Under

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Scale: NTS

- INSTALLATION NOTES:
- DIG PLANT POCKET 6" WIDER THAN EDGE OF ROOTBALL.
 - THOROUGHLY COMPACT BOTTOM OF PLANT POCKET.
 - 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, DISRUPTING ROOTMASS AND INTEGRATE PLANT ROOTS & POTTING MEDIA WITH PLANTING MIX. PLACE PLANT IN POCKET SLIGHTLY ABOVE GRADE.
 - BACKFILL PLANT POCKET 1/2 WITH PLANTING MIX CONSISTING OF 50% TOPSOIL & 50% NATIVE SOIL, ASSURING SHRUB IS STRAIGHT.
 - BACK FILL REMAINING 1/2 OF PLANT POCKET WITH PLANTING MIX & COMPACT THOROUGHLY. ASSURING SHRUB IS STILL STRAIGHT.
 - SPREAD 1" OF PLANTING MIX OVER TOP OF CONTAINER ROOTBALL. SLOPE GRADE AWAY FROM SHRUB.
 - IF PLANTED IN NON-IRRIGATED AREAS, FORM A SAUCER WITH SOIL AT OUTSIDE EDGE OF ROOTBALL.
 - SHREDDED BARK MULCH, 3" DEPTH. MULCH TO BE NATURAL IN COLOR. LEAVE 12" RING EXPOSED AT BASE OF PLANT.
 - IF NOT PLANTED WITHIN A LANDSCAPE BED, MULCH RINGS TO BE CONSISTENT IN SIZE WITH PLANT TYPE/SIZE THROUGHOUT PROJECT.



Shrub Planting Detail - Container

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



Decorative Mailbox - 16 Gang CBU

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

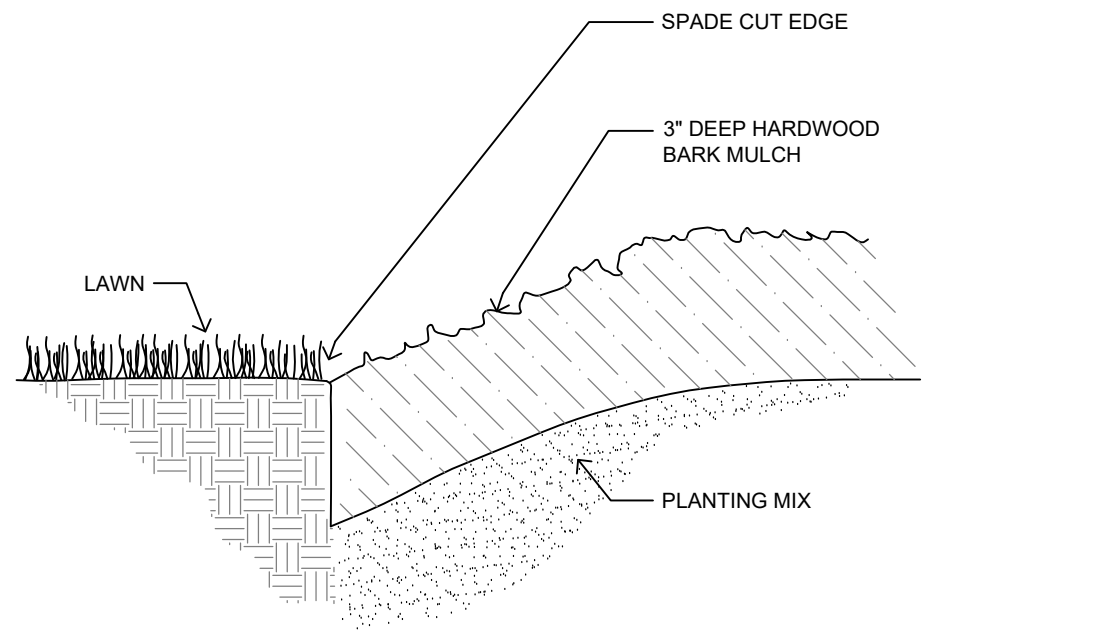
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Decorative Mailbox - 12 Gang CBU

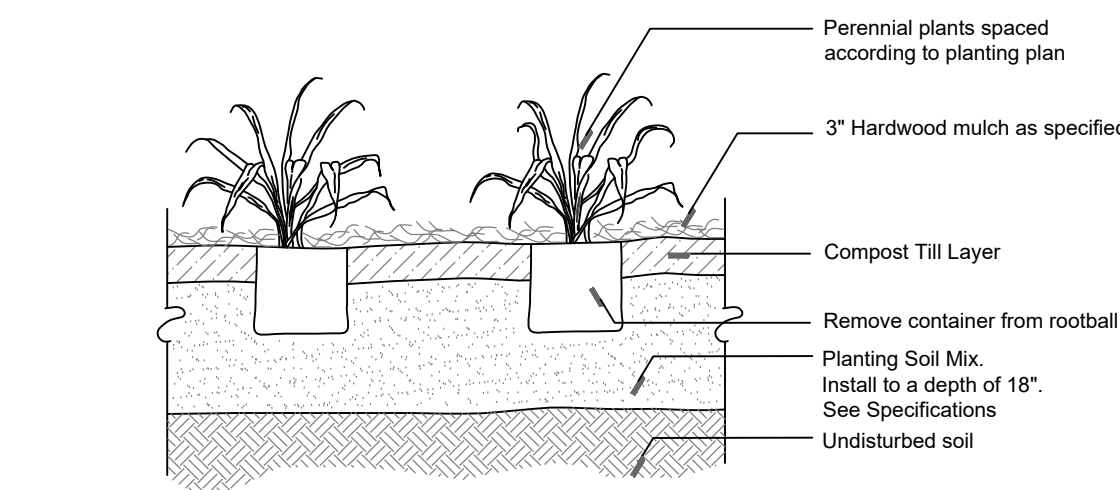
Manufacturer: Salisbury Industries
1010 E. 62nd St.
Los Angeles, CA 90001
www.mailboxes.com
Regency Decorative CBU
#3312R
Black
Quantity: 1

Scale: NTS



Spade Cut Edging Detail

NTS



Perennial Planting Detail

NTS

design studio

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LEGEND

■ 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:

19017

■ date:

03.29.2022

■ drawn by:

EMJ

■ checked by:


WTK

■ 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 REQUIRMENTS 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: LUSH DESIGN STUDIO
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

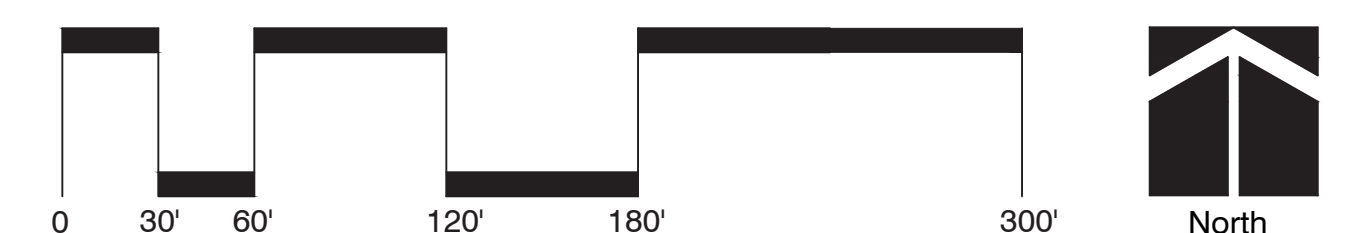
Designer
DS
Date
03/31/2022
Scale
Not to Scale
Drawing No.
#22-74064 V1
1 of 1



Village of Troy

Rendered Site Plan
City of Troy, Michigan

October 2022

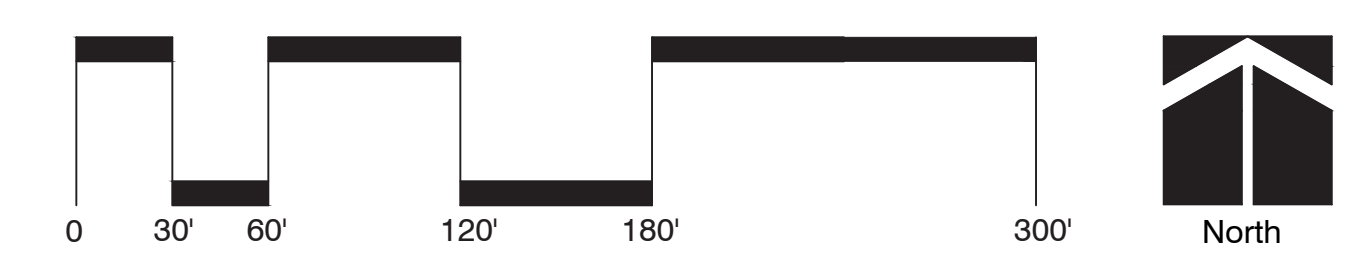




Village of Troy

Rendered Site Plan
City of Troy, Michigan

October 2022











"D"

"E"

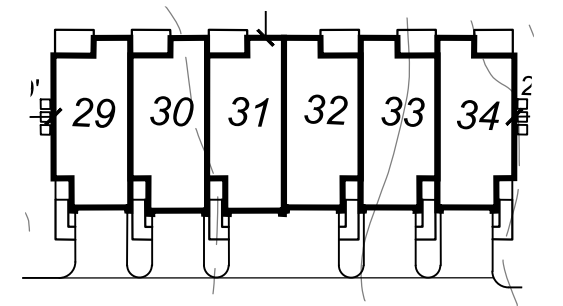
"B"

"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 & 30 P.S.F. FOOTING LOAD. FOR VARYING CONDITIONS REFER TO TABLE R403.1(1) R403.1(2) & R403.1(3) OF THE 2015 IRC.

1. ALL COLUMNS 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 LAGGING 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

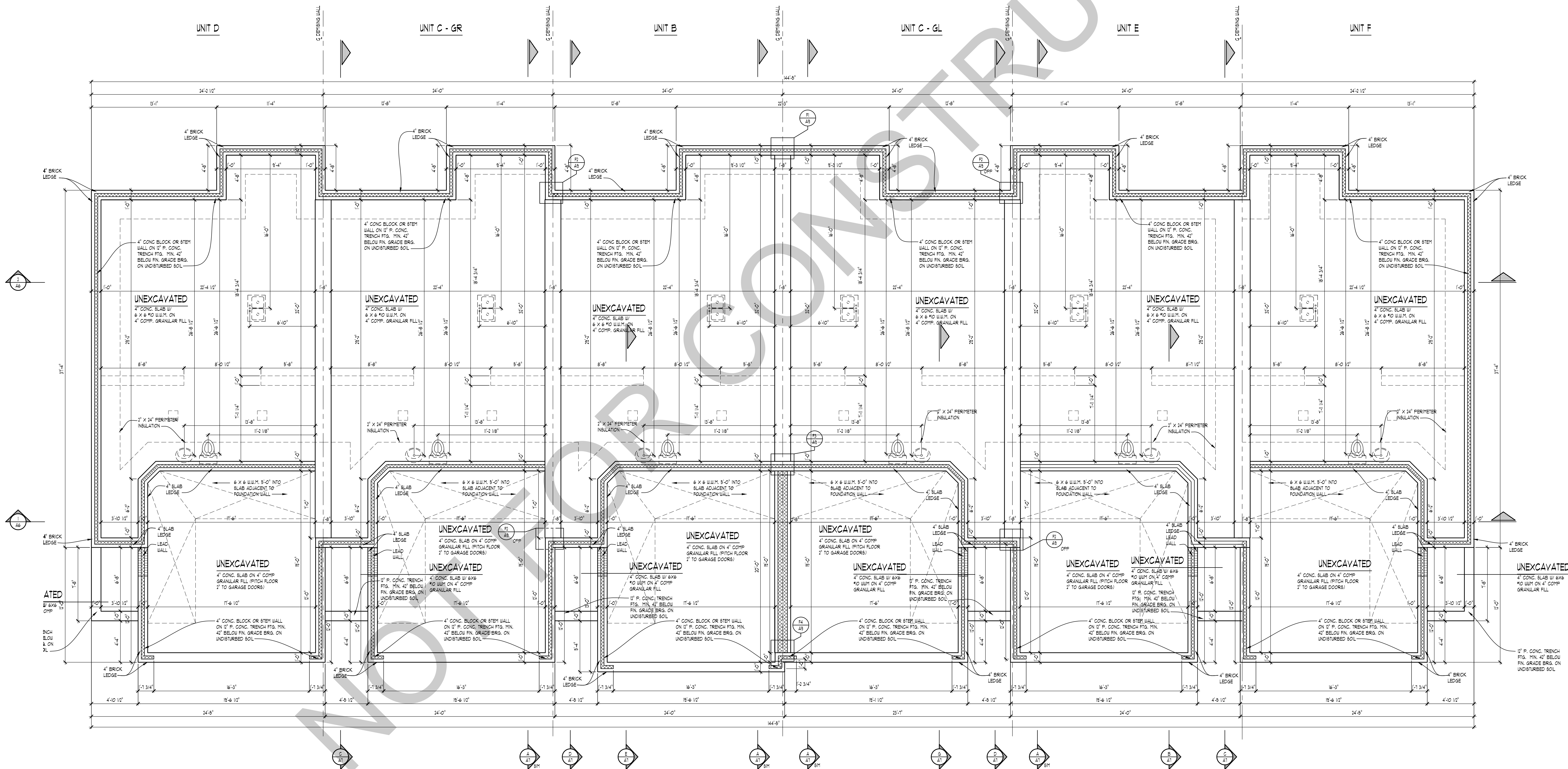
NOTE:
PROVIDE MIN. (1) 2 X 4 HEADER AT ALL INTERIOR & EXTERIOR DOORS & WINDOWS (UNLESS NOTED OTHERWISE).

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

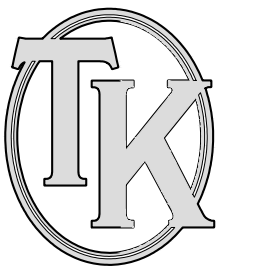
NOTE:
GROUT ALL CONCRETE BLOCK CORES SOLID THAT SUPPORT POINT LOADS FROM ABOVE (TYPICAL)

NOTE:
1. 100% BRG.
2. STEEL BEAM
3. BRG. WALL
4. BRG. WALL ABOVE
5. BRG. WALL & BRG. WALL ABOVE

■ POINT LOAD
○ POINT LOAD FROM ABOVE



FOUNDATION PLAN
SCALE 1/4" = 1'-0"



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SOUTH LYONS, MI 48187
PHONE: (248) 846-1900
FAX: (248) 446-1901

CLIENT / PROJECT

ROBERTSON
TROYER
MULTI-FAMILY
6 UNIT

JOB No. WG 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. 3/4" THICK TYPICAL (UNLESS NOTED OTHERWISE). ALL DIMENSIONS TAKEN FROM STUD EDGES.
- EXTERIOR WALLS:**
BUILT WITH AIRSPACE MOISTURE BARRIER PAPER (HOUSE WRAP) ON 1x4" O.S.B. SHEATHING ON 2x4 WOOD STUDS @ 16" O.C. OR AS NOTED. MIN. R-5 WALL CONSTRUCTION (1/2" GYPSUM WALL BOARD (5/8" & 5/16") WALL TO BE 4" THICK WITH BONDING TYPICAL (UNLESS NOTED OTHERWISE). ALL DIMENSIONS TAKEN FROM FRAMING (FLOOR PLANS) OR FOUNDATION CORNERS (FOUNDATION PLAN).
1. OPENINGS BETWEEN THE GARAGE AND RESIDENCE SHALL BE EQUIPPED WITH 30-MINUTE FIRE RATED DOORS (OR EQUIVALENT PER 203 TBC SECTION R302.3.1).
 2. VENT ALL EXHAUST FANS TO EXTERIOR.
 3. WHEN POSSIBLE DIRECT ALL RUES 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'-6" 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 DOWNSIDE OF THE POINT OF DELIVERY SHALL NOT EXTEND THROUGH ANY TOWNHOUSE UNIT OTHER THAN UNIT SERVED PER SECTION 5449.5.

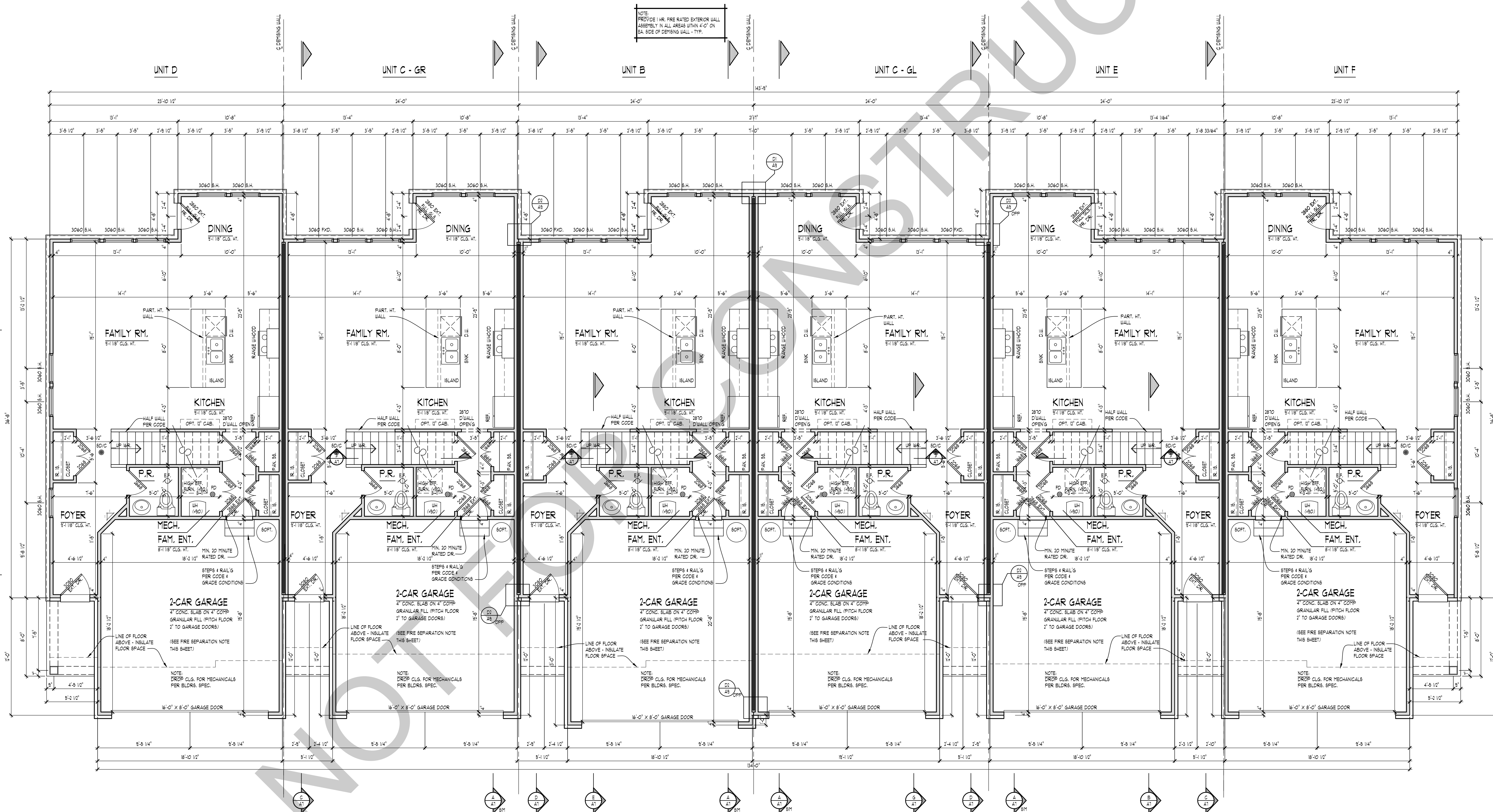
NOTE:
PROVIDE MIN. (2) 2 X 4 HEADERS AT ALL INTERIOR & EXTERIOR DOOR & WINDOW OPENINGS (UNLESS NOTED OTHERWISE).

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:
8/0" O
8/0" C
ALL STROKS & 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 CARBS UNLESS NOTED OTHERWISE.



FIRST FLOOR PLAN

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

NOTE:
DROP CLG. TO 8'-0" IN FAMILY ENTRY 4" HIGH RY. STAIRS ABOVE.

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CLIENT / PROJECT

ROBERTSON
BROOKLYN
MULTI-FAMILY
6 UNIT

JOB No. WG 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 # 8" O.C. 3/16" THICK TYPICAL (UNLESS NOTED OTHERWISE). ALL DIMENSIONS TAKEN FROM STUD EDGES.
- EXTERIOR WALLS:**
BEING WITH AIRSPACE. MOISTURE BARRIER PAPER (HOUSE WRAP) ON 1x4" O.S.B. SHEATHING ON 2x4 WOOD STUDS # 8" O.C. OR AS NOTED. MIN. R-5 WALL CONSTRUCTION. 1/2" GYPSUM WALL BOARD (5/8" & 5/16") WALL TO BE 4" THICK WITH BEING TYPICAL (UNLESS NOTED OTHERWISE). ALL DIMENSIONS TAKEN FROM FRAMING FLOOR PLANS OR FOUNDATION CORNERS FOUNDATION PLANS.
1. OPENINGS BETWEEN THE GARAGE AND RESIDENCE SHALL BE EQUIPPED WITH JOINTS IN THE RATED DOORS OR EQUIVALENT PER 203 TBC SECTION R301.5.1.
 2. VENT ALL EXHAUST FANS TO EXTERIOR.
 3. WHEN POSSIBLE DIRECT ALL RUES 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'-6" UNLESS NOTED OTHERWISE. VENTRY U/ BULDER.
 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 DOWNSIDE OF THE POINT OF DELIVERY SHALL NOT EXTEND THROUGH ANY TOWNHOUSE UNIT OTHER THAN UNIT SERVED PER SECTION 5449.5.

NOTE:
PROVIDE MIN. (2) 1 X 4 HEADERS 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).

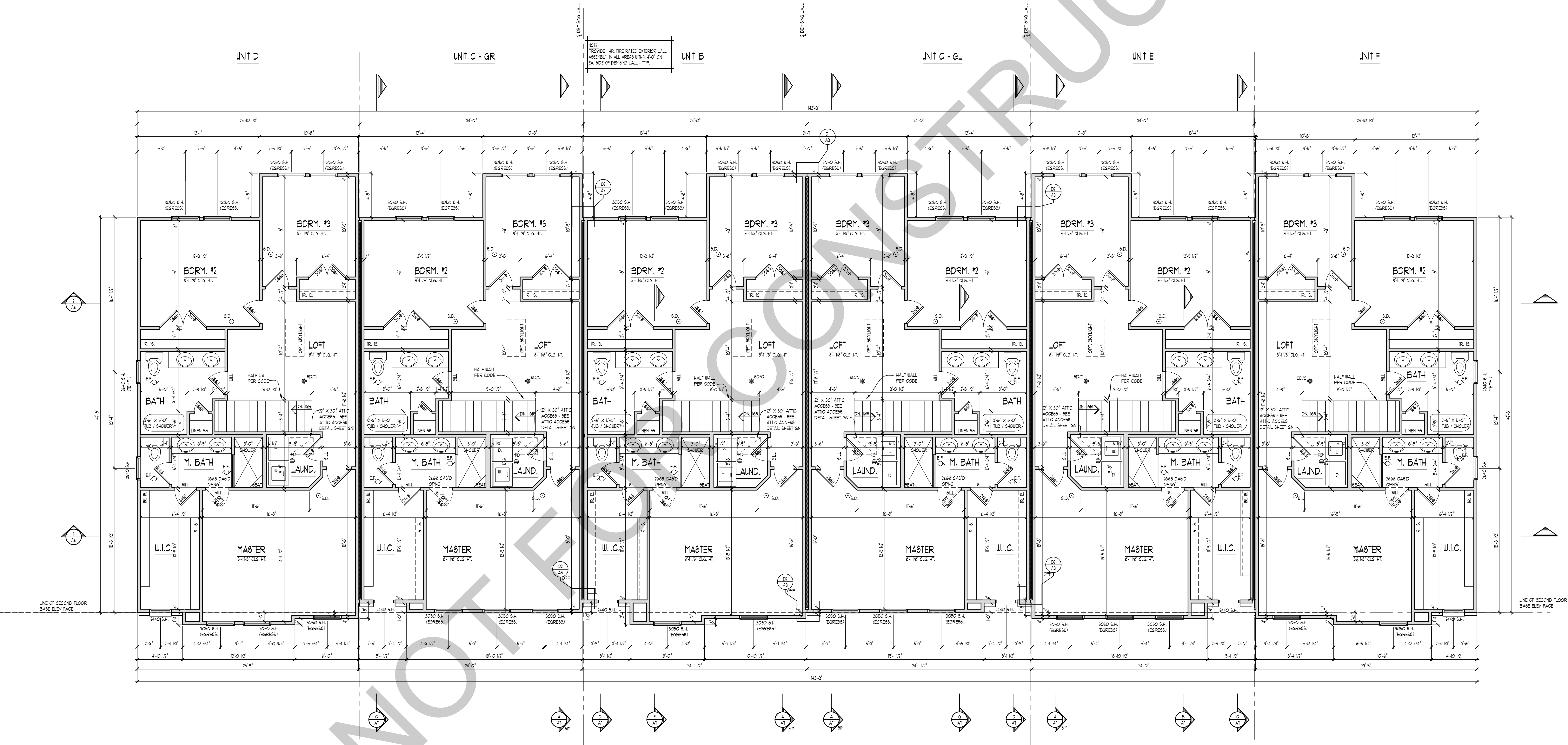
NOTE:
PROVIDE MIN. (1) JOIST OR LADDER FRAMING UNDER ALL UPPER FLOOR PARALLEL PARTITIONS.

NOTE:
S.D. ○
S.D.C. ●

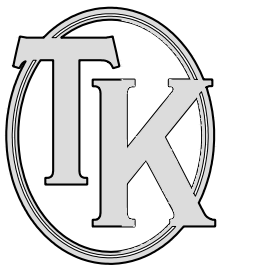
ALL SPOKE & CARBON MONOXIDE DETECTORS INTERCONNECTED U/ BATTERY BACK-UP PER CODE.

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 CABS UNLESS NOTED OTHERWISE.



SECOND FLOOR PLAN
SCALE 1/4" = 1'-0"



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PHONE: (248) 446-1960
FAX: (248) 446-1961

CLIENT / PROJECT

ROBERTSON
TOWNHOMES
TROY, MI
MULTI-FAMILY
6 UNIT

JOB No. WG 1370-22

DRAWN: AG

CHECKED: -

REVIEW 3-18-22

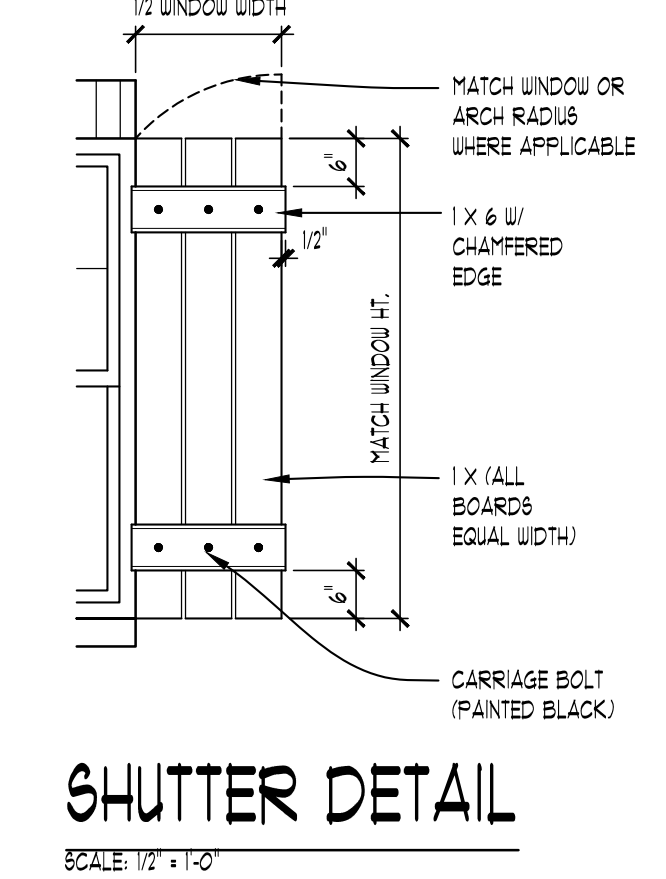
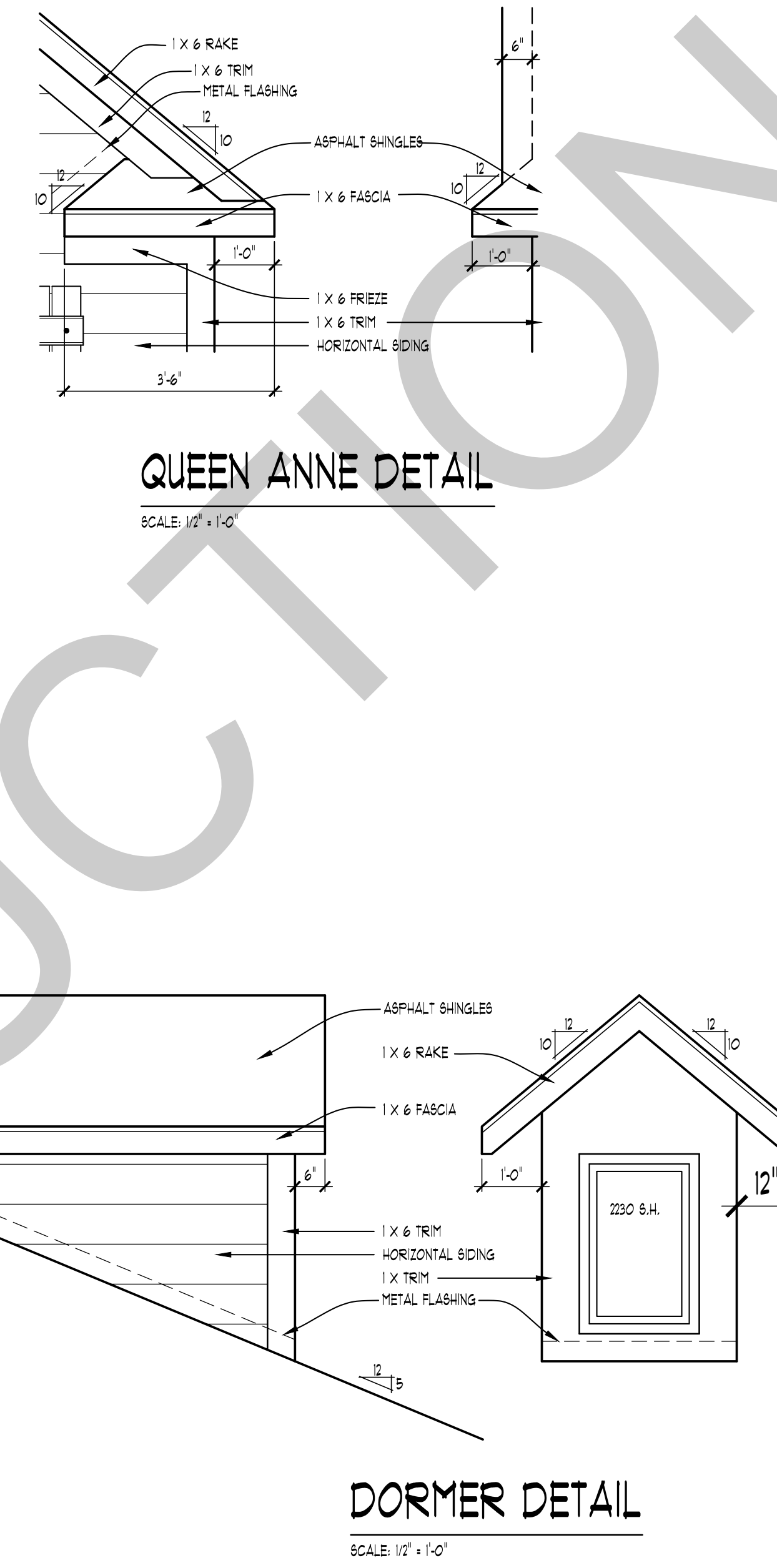
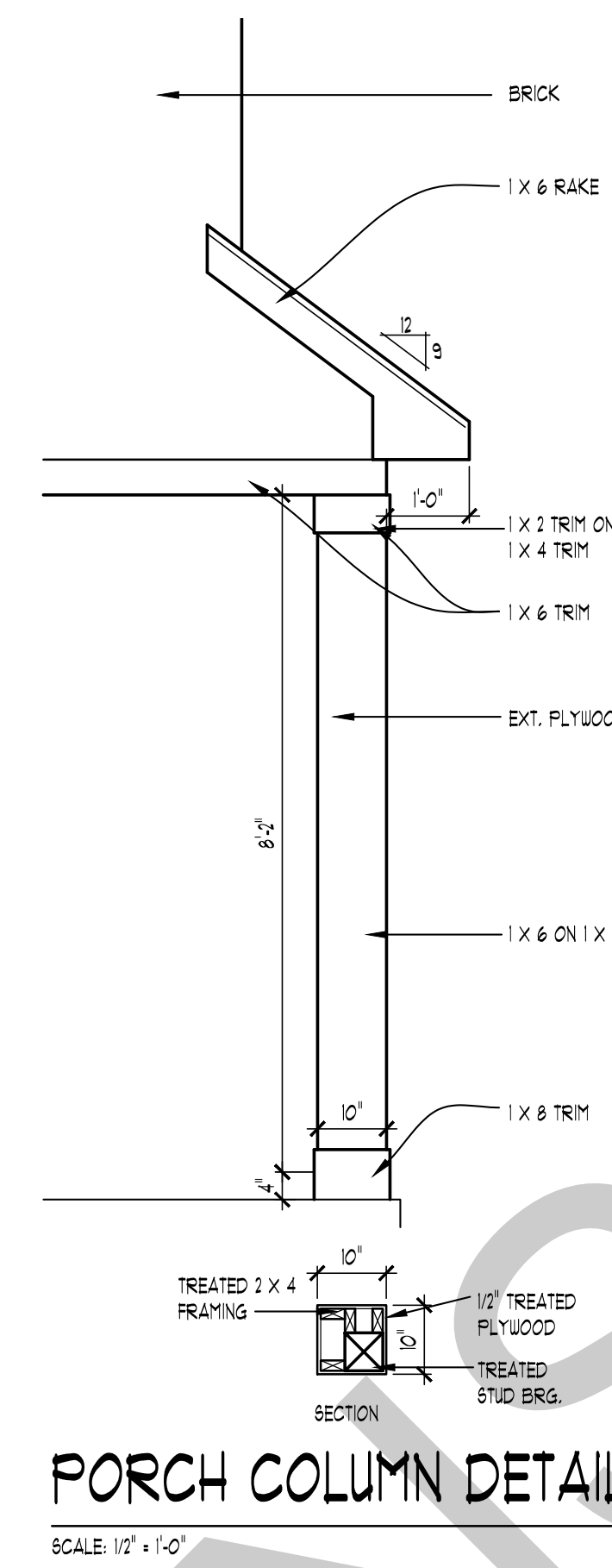
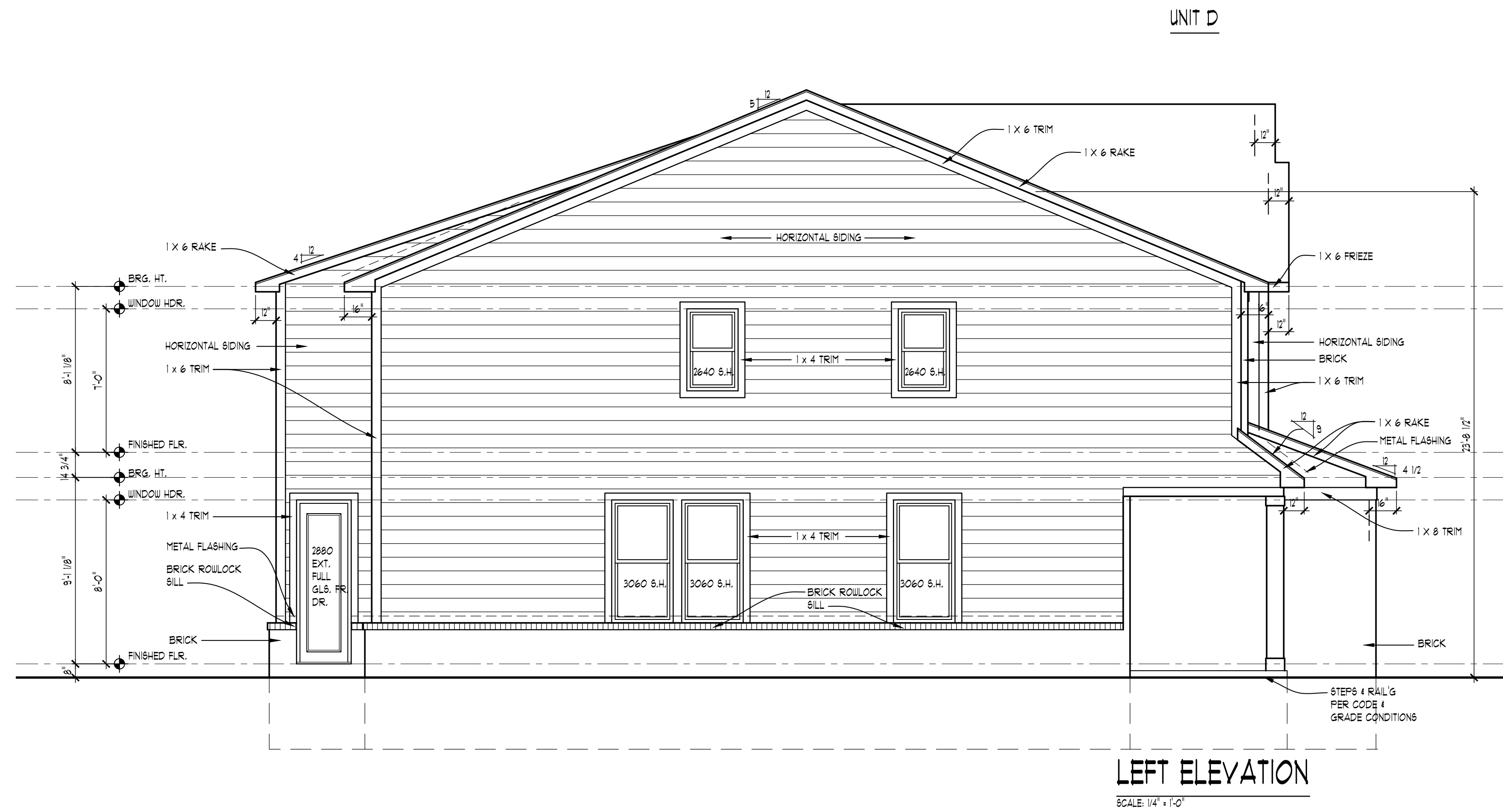
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SCALE:

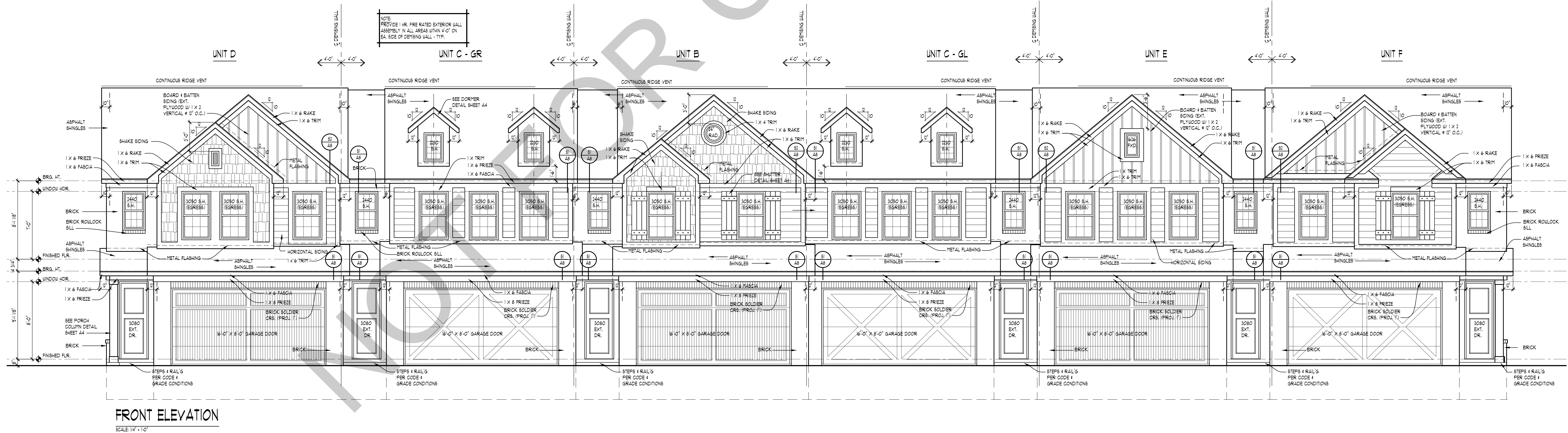
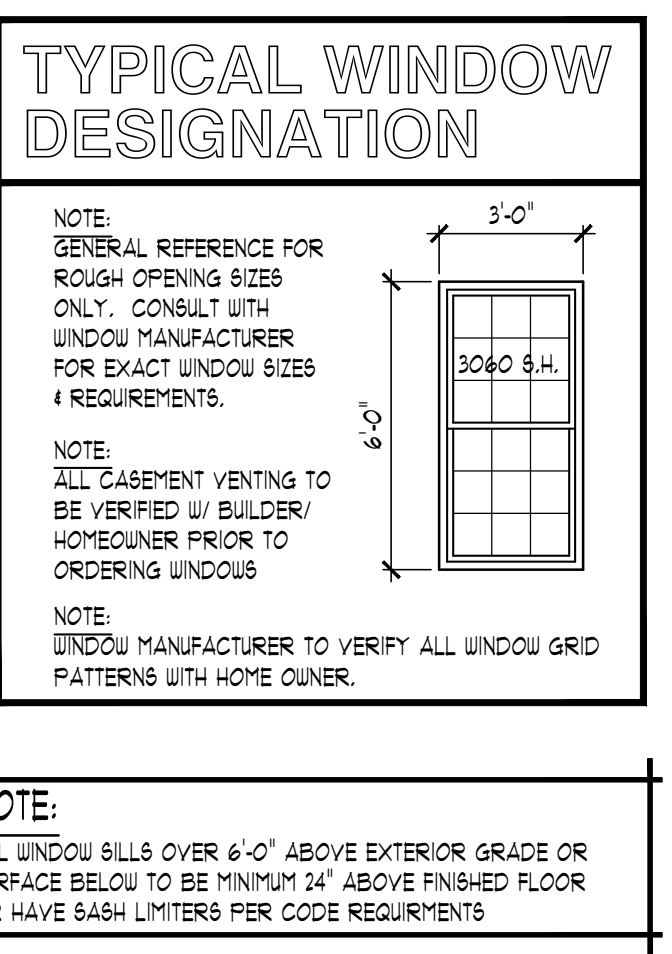
PER PLAN

SHEET #

A-3



- ELEVATION NOTES**
- ALL ROOF SLOPES TO BE 0.5:12. SHEATHED WITH 1/2" WATER SHIELD AND SHINGLES.
 - PROVIDE ICE & WATER SHIELD WITH 6" COVERAGE AT ALL VALLEYS.
 - FIREPLACE FLUE TO BE DETERMINED PER MANUFACTURER'S SPECIFICATION.
 - METAL FLASHING AS REQUIRED BY CODE.
 - ROOF & SOFFIT VENTS AS REQUIRED BY CODE.
 - PROVIDE GUTTERS & DOWNSPOUTS FOR DRAINAGE OF ROOF. LINTERS & DOWNSPOUTS ARE TO BE LOCATED SO THAT THE DISCHARGE WILL NOT SPILL ON OR FLOW ACROSS ANY PORCHES, WALKS OR DRIVES.
 - CARPENTER TO VERIFY THICKNESS OF MASONRY PRIOR TO BUILDING BRICK ROOF.
- NOTE:**
OVERHANG DIMENSIONS (O.H.) ARE FROM SHEATHING U.N.D.



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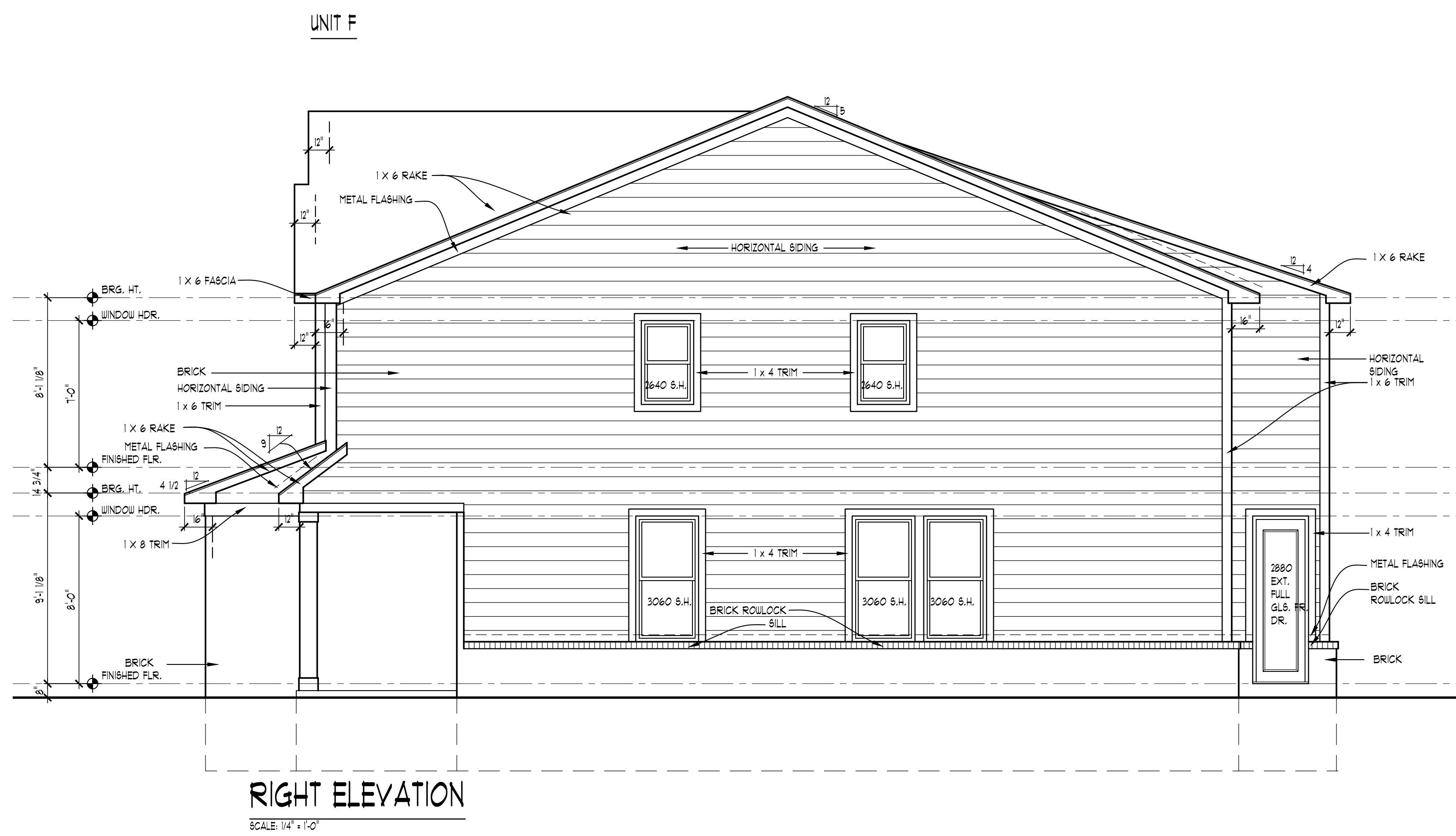
2000 N. HUNTER C. TRAIL
SOUTH LYON, MI 48178
PHONE: (248) 446-1960
FAX: (248) 446-1961

CLIENT / PROJECT
ROBERTSON
BROOKLYN
MULTI-FAMILY
6 UNIT

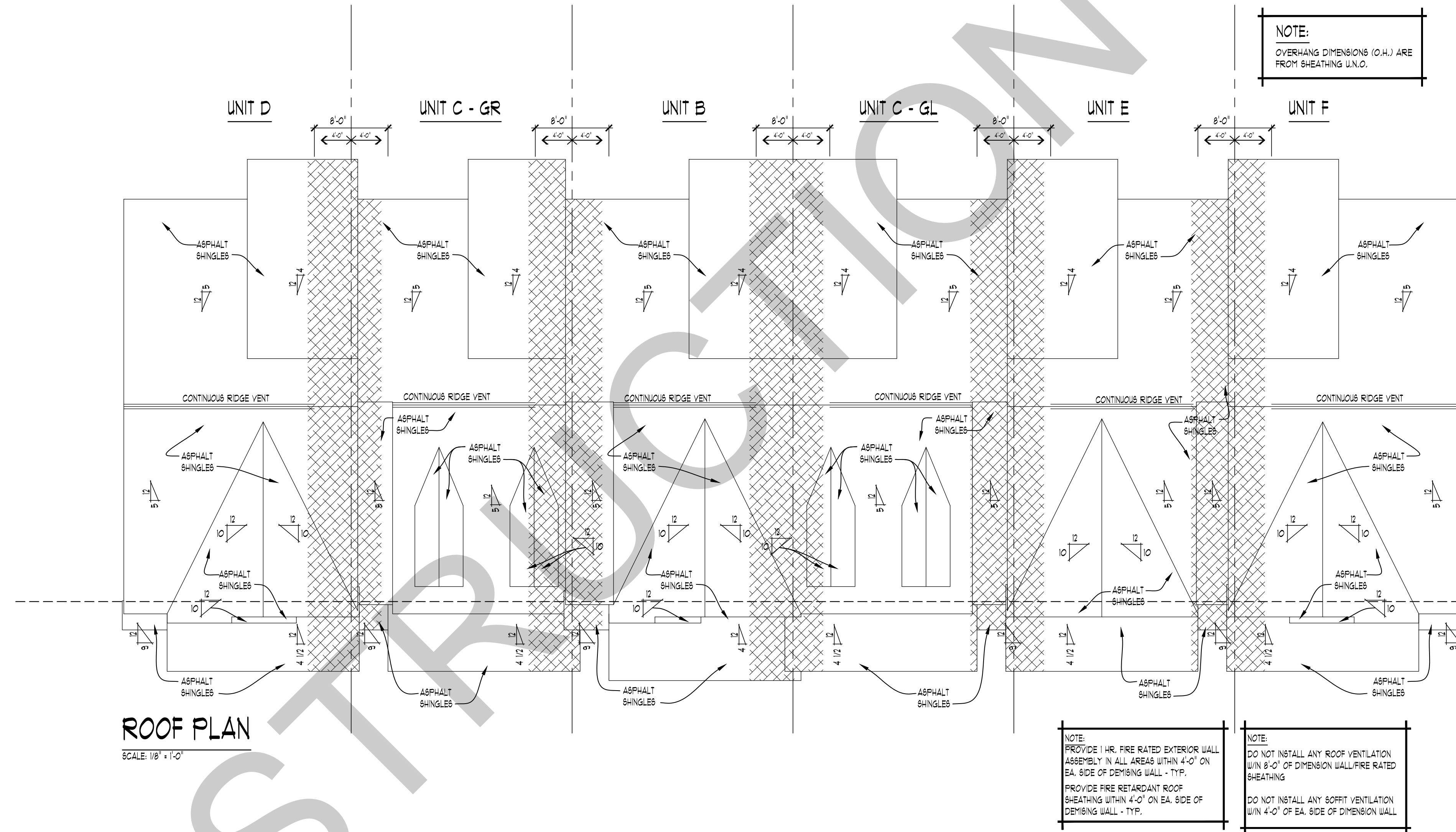
JOB No. WG 1370-22
DRAWN: AG
CHECKED: -
REVIEW: 3-18-22
FINAL:

SCALE:
PER PLAN

SHEET #
A-4

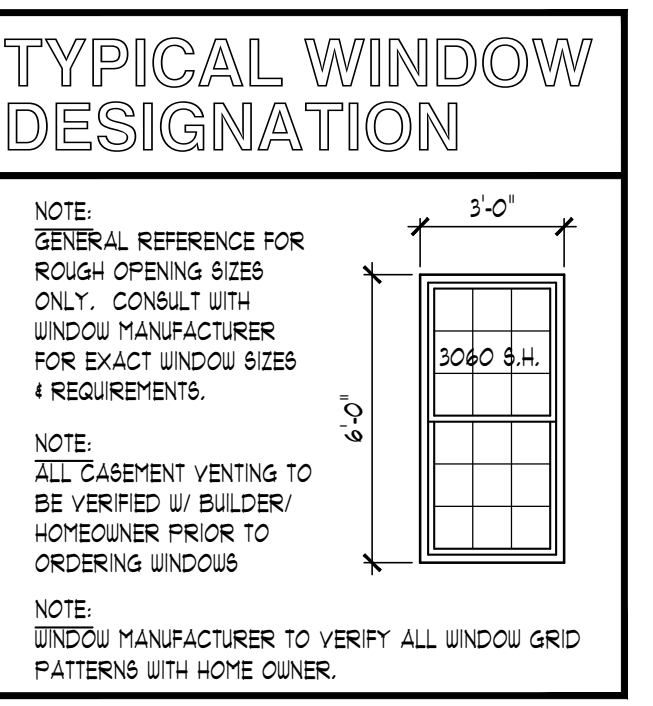


RIGHT ELEVATION
SCALE 1/4" = 1'-0"



ROOF PLAN
SCALE 1/8" = 1'-0"

- ELEVATION NOTES**
- ALL ROOF SADDLES TO BE 0.8.8. SHEATHED WITH ICE & WATER SHIELD AND SHINGLES.
 - PROVIDE ICE & WATER SHIELD MIN. 6'-0" COVERAGE AT ALL VALLEYS.
 - FLASHING FLUE TO BE DETERMINED PER MANUFACTURER'S SPECIFICATION.
 - METAL FLASHING AS REQUIRED BY CODE.
 - ROOF & SOFFIT VENTS AS REQUIRED BY CODE.
 - 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.
 - CARPENTER TO VERIFY THICKNESS OF MASONRY PRIOR TO BUILDING BRICK BACK.



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

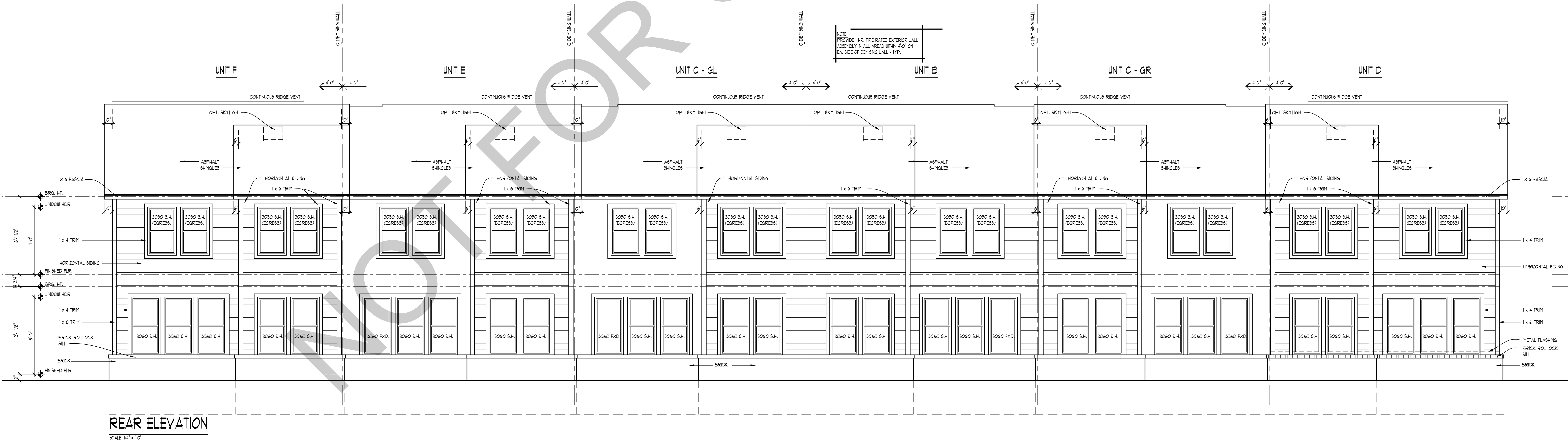
NOTE:
ALL WINDOWS SHALL OVER 6'-0" ABOVE EXTERIOR GRADE OR SURFACE BELOW TO BE MINIMUM 14" ABOVE FINISHED FLOOR OR HAVE BASH LINTERS PER CODE REQUIREMENTS.

ATTIC VENTILATION CALCULATIONS:

AREA OF ATTIC OVER HEATED SPACE = 4360 SQ. FT.
4360/80 = 54.5 (SQ. FT. REQ'D)
75' X 144" = 486" (SQ. INCH CONVERSION)
RIDGE VENTING:
486" / 8" = 60.75 (LINEAR FT. OF RIDGE VENT REQ'D)
EAVE OR CORNER VENTING:
1860' X 0.35 = 651' (SQ. INCHES REQ'D)

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

NOTE:
DO NOT INSTALL ANY ROOF VENTILATION WITHIN 8'-0" OF OPENING WALL, FIRE RATED SHEATHING.
DO NOT INSTALL ANY SOFFIT VENTILATION WITHIN 8'-0" OF EA. SIDE OF OPENING WALL.



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

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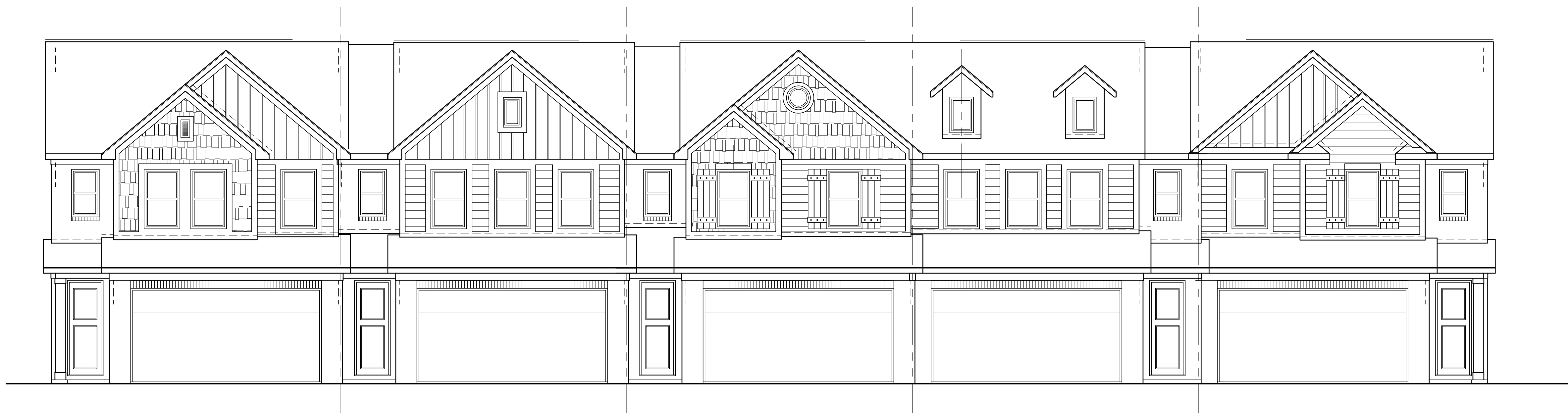
CLIENT / PROJECT
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TRIO
MULTI-FAMILY
6 UNIT

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DRAWN: AG
CHECKED: -
REVIEW: 3-18-22
FINAL:

SCALE:
PER PLAN

SHEET #
A-5

TROY GOODMAN



5 UNIT TOWNHOME

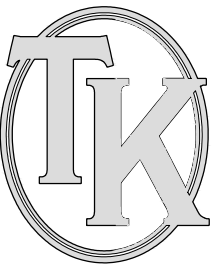
PLAN DRAWING INDEX

REV. DATE	CIVIL
	SITE PLAN
	ARCHITECTURAL BUILDING COMPOSITION
GN1	GENERAL NOTES & DETAILS
GN21	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 TO NATIONAL ELECTRICAL CODE - 2011	
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 (FER 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.	GARAGE	OUTDOOR LIVING
	FIRST FLOOR	SECOND FLOOR			
UNIT D	802	1063	1865	388	31
UNIT E	795	1041	1836	388	36
UNIT B	793	1042	1835	406	36
UNIT C	793	1030	1823	388	36
UNIT F	802	1063	1865	388	31
BLDG TOTAL S.F. F.T *			9,224	1,858	182



DESIGN

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CALL AND DO AT AND NOT 10 DAYS PRIOR TO ANY EXCAVATION
CONSTRUCTION. THE SOLE RESPONSIBILITY OF THE OWNER/OWNER

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. 14-02

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 R402.11, R402.12, & R402.13) OF THE 2015 IBC.

- 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)
- WHERE STEEL BEAMS REST ON FOUNDATION WALLS, SIZE BEAM POCKET APPROPRIATELY AND SHIM AS REQUIRED.
- VERIFY ALL UTILITY LOCATIONS W/ BUILDER.
- PROVIDE LADDERS UNDER ANY WALL RUNNING PARALLEL W/ JOIST THAT DOES NOT LAND DIRECTLY ON A JOIST
- PROVIDE SQUASH BLOCKS UNDER ALL BEARING CONDITIONS.
- GROUT SOLID # BEARING CONDITIONS WHERE BLOCK IS USED.
- PROVIDE 1" X 24" (MIN. R-10) RIGID PERIMETER INSULATION AT ALL BASEMENT SLABS THAT ARE LESS THAN 42" BELOW EXTERIOR FINISHED GRADE
- GAS LINES SHALL RUN UNDER SLAB

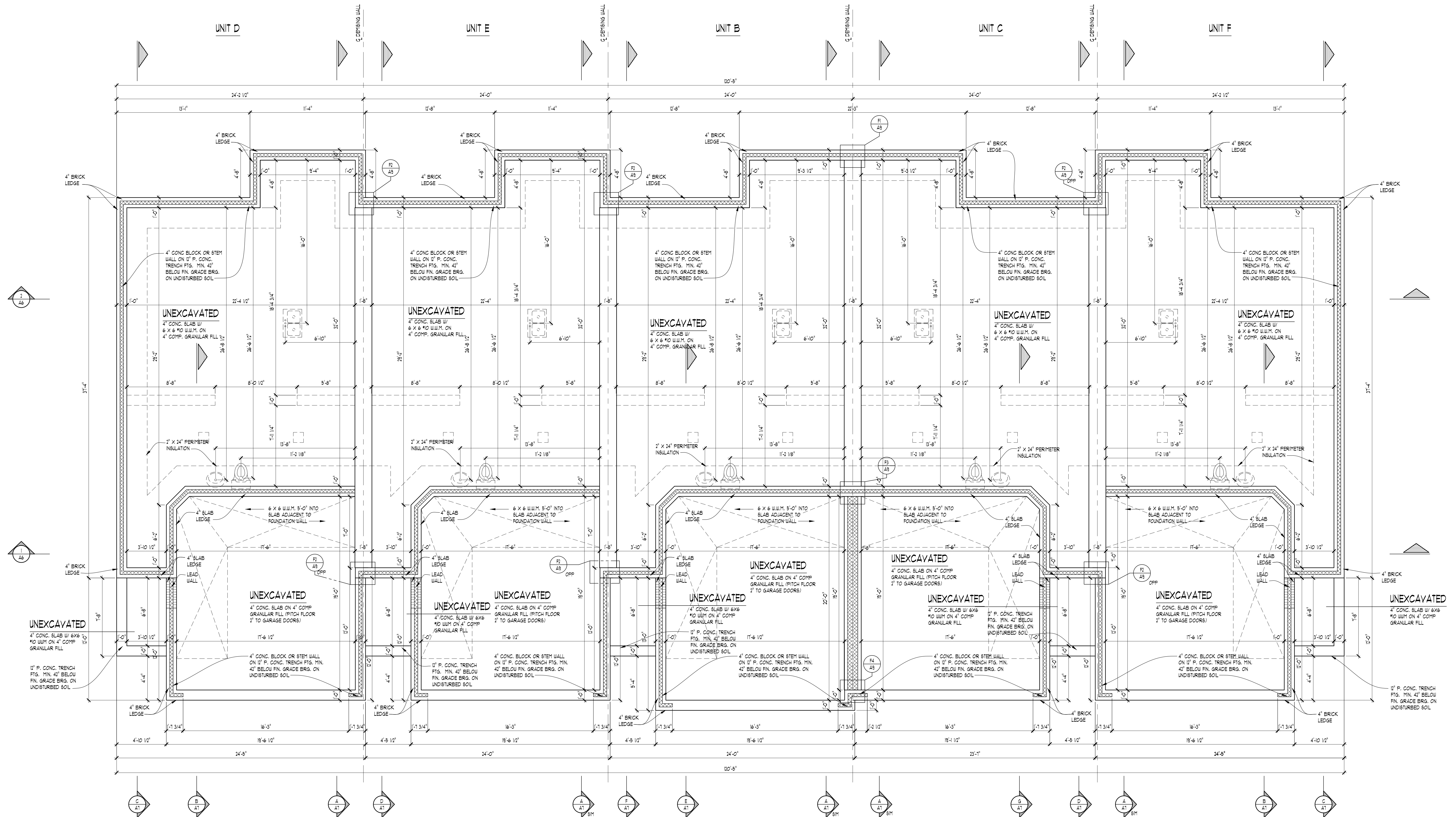
NOTE:
PROVIDE MIN. (2) 2 X 4 HEADERS AT ALL INTERIOR & EXTERIOR DOOR & WINDOW OPENINGS (UNLESS NOTED OTHERWISE).

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

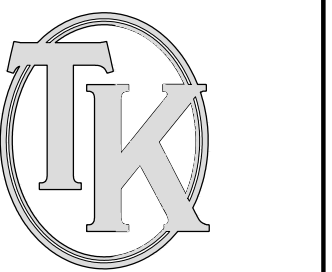
NOTE:
GROUT ALL CONCRETE BLOCK CORES SOLID THAT SUPPORT POINT LOADS FROM ABOVE (TYPICAL)

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"



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CONSTRUCTION TO THE EXISTING DEPTHS OF THE PERMIT RECORD.

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

JOB No. WO 2331-21

DRAWN: AG

CHECKED: BF

REVIEW: 11-1-21

FINAL: 12-6-21

Δ R VALUE REV. 1-0-22

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 1/16" O.S.B. SHEATHING ON 2X4 WOOD STUDS @ 16" O.C. OR AS NOTED. MIN. R-9 WALL CONSTRUCTION 1/2" GYPSUM WALL BOARD (GIE & GORELLI) WALL TO BE 4" THICK WITH SIDING (TYPICAL UNLESS NOTED OTHERWISE). ALL DIMENSION TAKEN FROM FRAMING (FLOOR PLANS) OR FOUNDATION CORNERS (FOUNDATION PLAN).
- OPENINGS BETWEEN THE GARAGE AND RESIDENCE SHALL BE EQUIPPED WITH 20-MINUTE FIRE RATED DOORS (OR EQUIVALENT PER 2019 IRC SECTION R302.5.1).
 - VENT ALL EXHAUST FANS TO EXTERIOR.
 - WHEN POSSIBLE DIRECT ALL FLUES AND VENTS THAT PENETRATE ROOF BEHIND MAIN RIDGE.
 - INSTALL WATER SUPPLY AND DRAIN BOX (GREY BOX) AT WASHING MACHINE LOCATION.
 - USE MOISTURE RESISTANT DRYWALL AT ALL AREAS SUSCEPTIBLE TO MOISTURE.
 - 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.
 - PROVIDE GUARDRAIL AT STAIRS DURING CONSTRUCTION.
 - PROVIDE SQUASH BLOCKS UNDER ALL BEARING CONDITIONS.
 - GARAGE WALLS TO BE 2X6 STUDS IF OVER 10'-0" TALL.
 - PIPING INSTALLED DOWNSTREAM OF THE POINT OF DELIVERY SHALL NOT EXTEND THROUGH ANY TOWNHOUSE UNIT OTHER THAN UNIT SERVED PER SECTION 0405.3.

NOTE:
FLOOR 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:
ALL SPOKE & CARBON MONOXIDE DETECTORS INTERCONNECTED W/ BATTERY BACK-UP PER CODE.

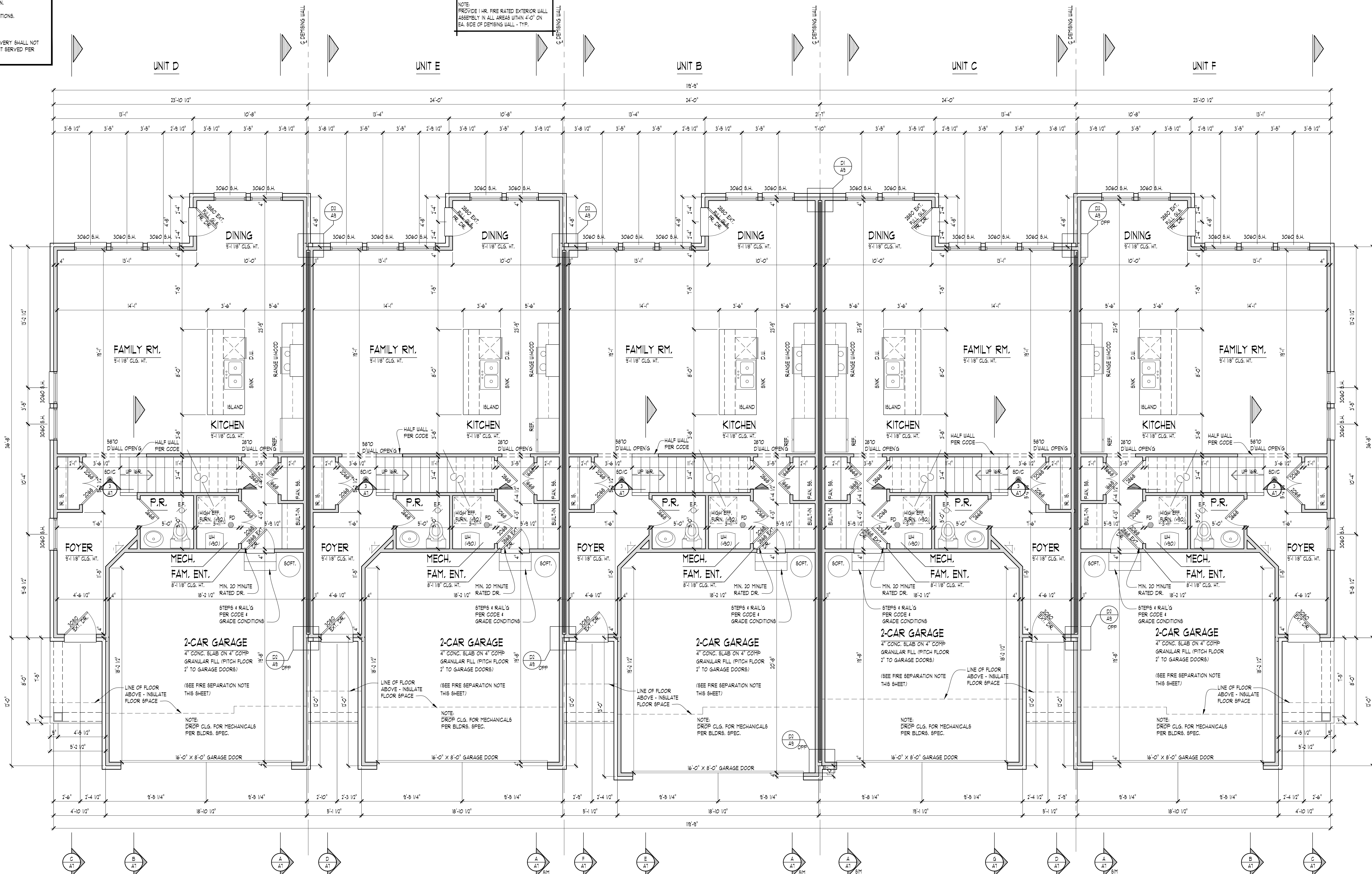
FIRE SEPARATION NOTE

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. DROP CLG. UNDER F.L.R. ABV. (ENCLOSE MECHANICAL AND STRUCTURAL ELEMENTS) VERIFY W/ BLDG.

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

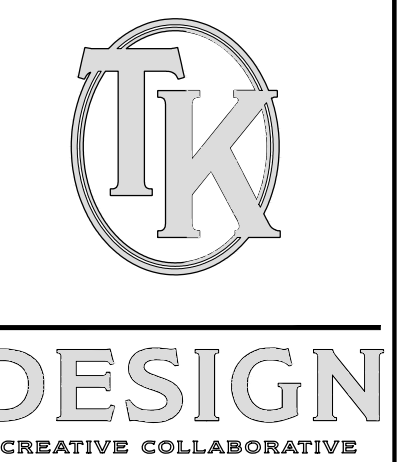
NOTE:
PROVIDE 1 HR. FIRE RATED EXTERIOR WALL ASSEMBLY IN ALL AREAS WITH 4'-0" OR ON EA. SIDE OF DEMISING WALL - TYP.



FIRST FLOOR PLAN

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

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



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CLIENT / PROJECT
ROBERTSON 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. 1-0-22

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. 3/4" THICK TYPICAL (UNLESS NOTED OTHERWISE). ALL DIMENSION TAKEN FROM STUD EDGES.
- EXTERIOR WALLS:**
SIDING WITH AIRSPACE, MOISTURE BARRIER PAPER (HOUSE WRAP) ON 1/16" O.S.B. SHEATHING ON 2x4 WOOD STUDS @ 16" O.C. OR AS NOTED. MIN. R-9 WALL CONSTRUCTION 1/2" GYPSUM WALL BOARD (GUESS) 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 2019 IRC 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 5.4.5.3.

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

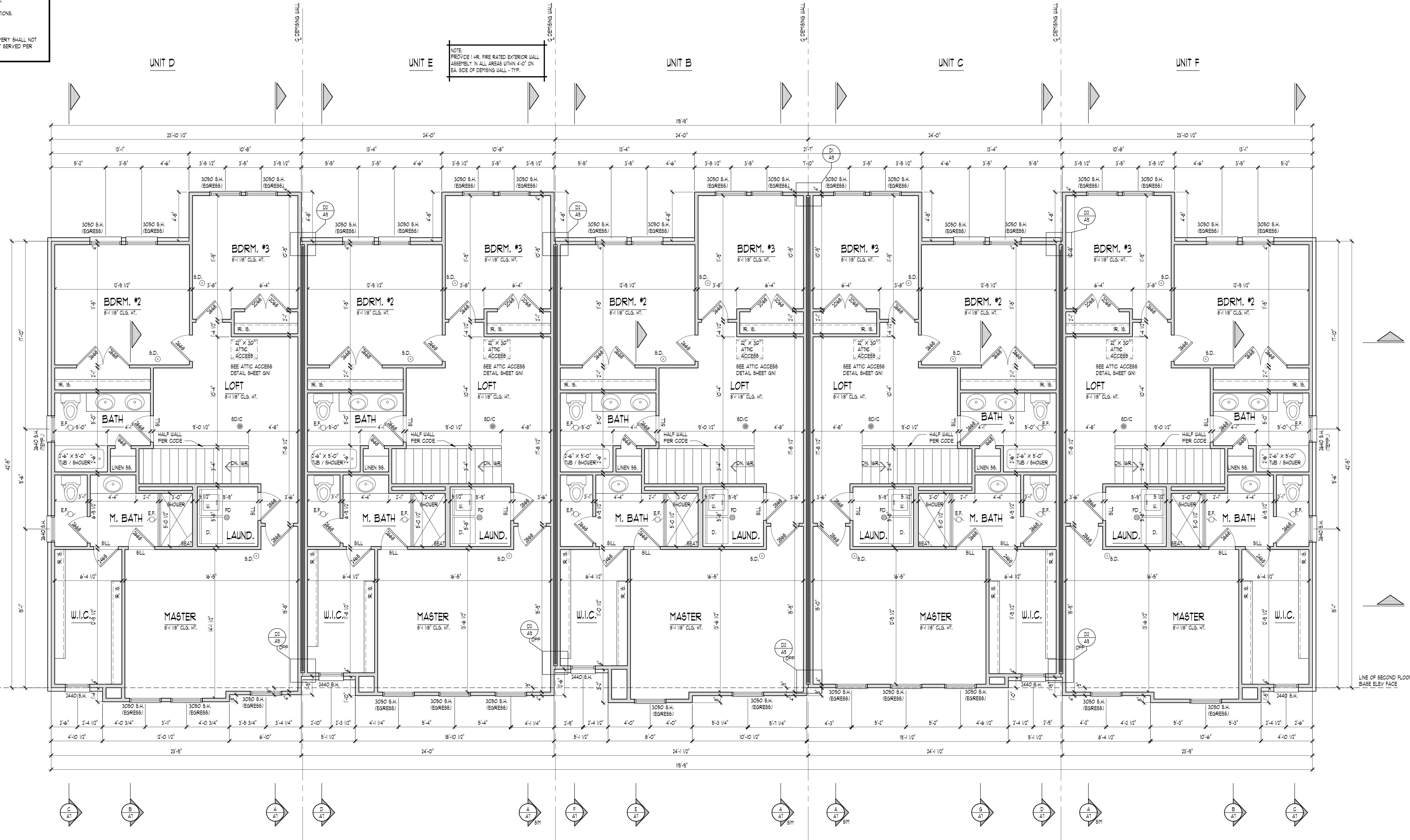
NOTE:
PROVIDE MIN. (1) JACK STUD & (1) KING STUD AT EACH END OF ALL HEADERS (UNLESS NOTED OTHERWISE).

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

NOTE:
S.D. 80/C
ALL SMOKE & CARBON MONOXIDE DETECTORS INTERCONNECTED W/ BATTERY BACK-UP PER CODE.

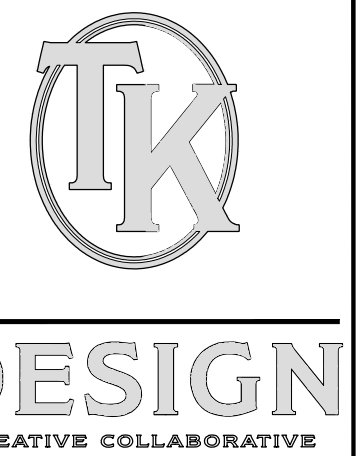
NOTE:
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ALL DOORS & WINDOWS ARE ASSUMED TO BE EITHER IN THE CENTER OF THE WALL MASS OR MIN. 4 INCHES FROM PERPENDICULAR WALL FOR CASING UNLESS NOTED OTHERWISE.

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. (CHECK C.O.G. UNDER 5.4.5.3.1). (ENCLOSE MECHANICAL AND STRUCTURAL ELEMENTS) VERIFY W/ BLDG.



SECOND FLOOR PLAN

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



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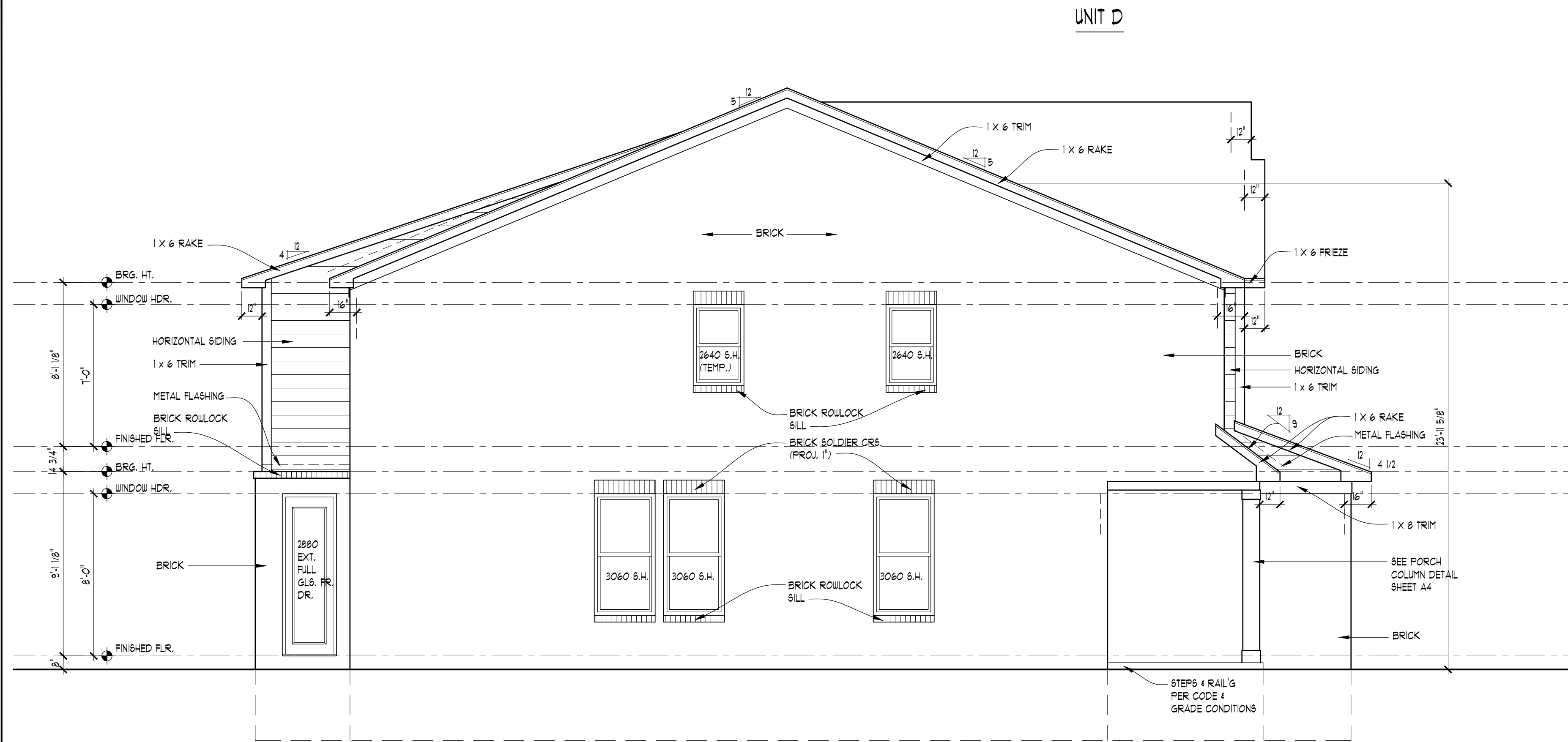
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BROTHERS HOMES
TROY GOODMAN
MULTI-FAMILY
5 UNIT

JOB No. WO 2331-21
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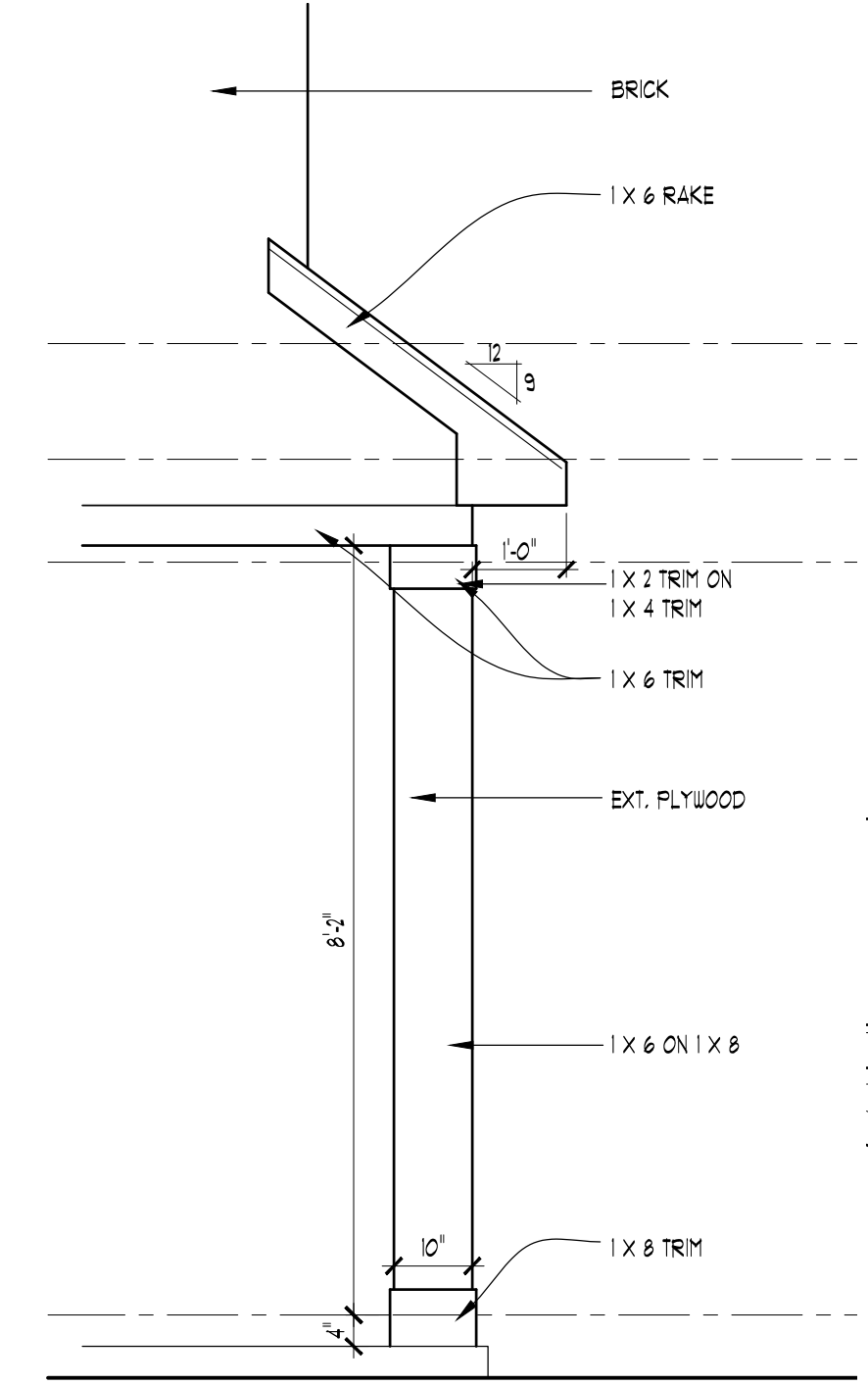
△ R VALUE REV. 1-2-22

SCALE:
PER PLAN

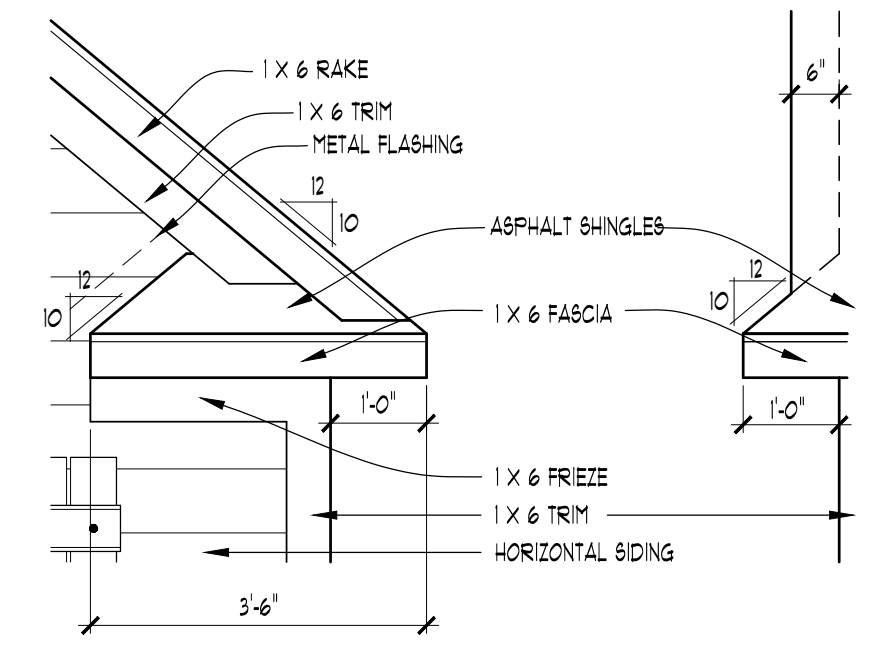
SHEET #
A-3



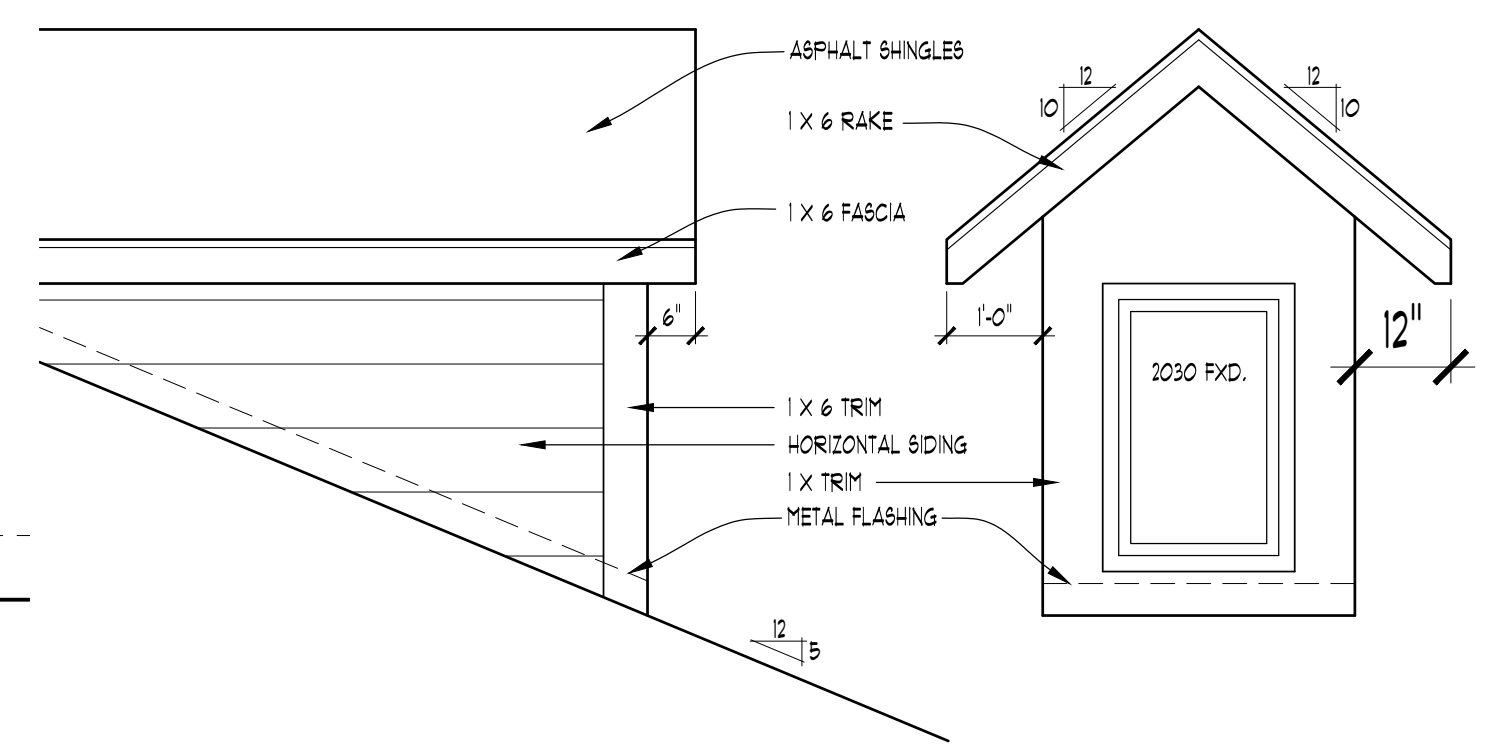
LEFT ELEVATION
SCALE: 1/4" = 1'-0"



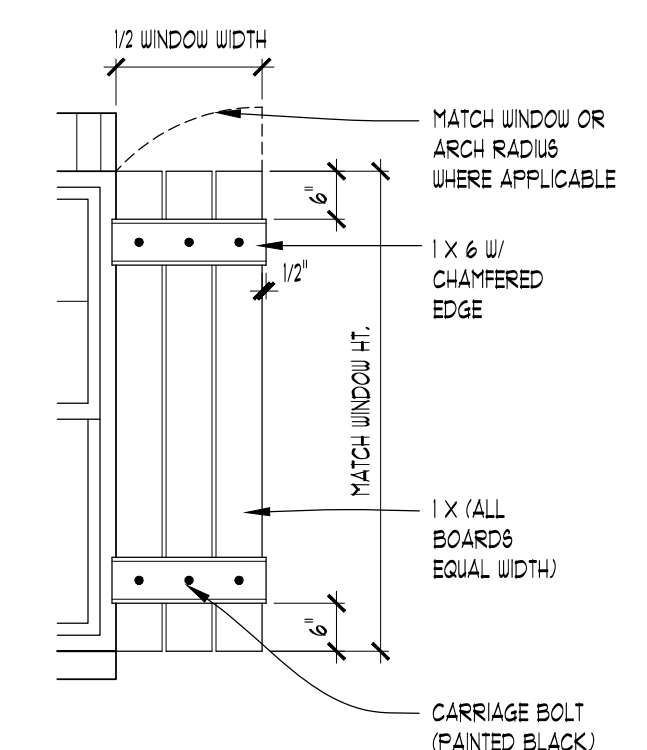
PORCH COLUMN DETAIL
SCALE: 1/2" = 1'-0"



QUEEN ANNE DETAIL
SCALE: 1/2" = 1'-0"



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



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

- ### ELEVATION NOTES
- ALL ROOF SADDLES TO BE O.S.B. SHEATHED WITH ICE & WATER SHIELD AND SHINGLES.
 - PROVIDE ICE & WATER SHIELD MIN. 6'-0" COVERAGE AT ALL VALLEYS.
 - FIREPLACE FLUE TO BE DETERMINED PER MANUFACTURER'S SPECIFICATION.
 - METAL FLASHING AS REQUIRED BY CODE.
 - ROOF & GABLE VENTS AS REQUIRED BY CODE.
 - 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.
 - CARPENTER TO VERIFY THICKNESS OF MASONRY PRIOR TO BUILDING BRICK RACK.
- NOTE:**
OVERHANG DIMENSIONS (O.H.) ARE FROM SHEATHING U.N.O.

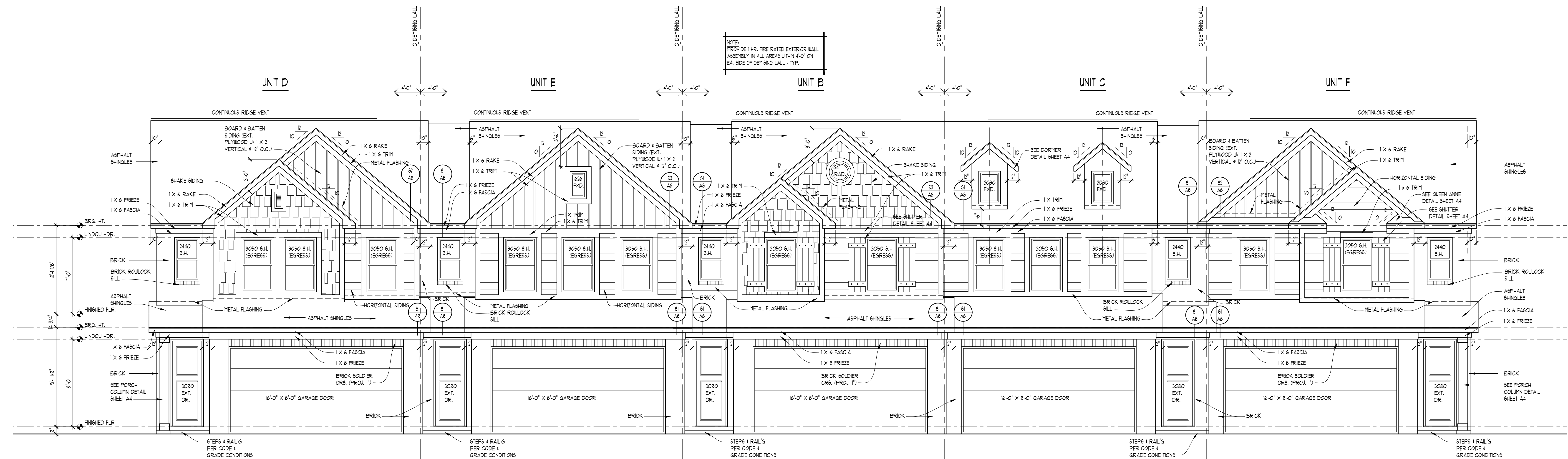
TYPICAL WINDOW DESIGNATION

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 1/4" ABOVE FINISHED FLOOR OR HAVE 5/8" MIN. LITERS PER CODE REQUIREMENTS.



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



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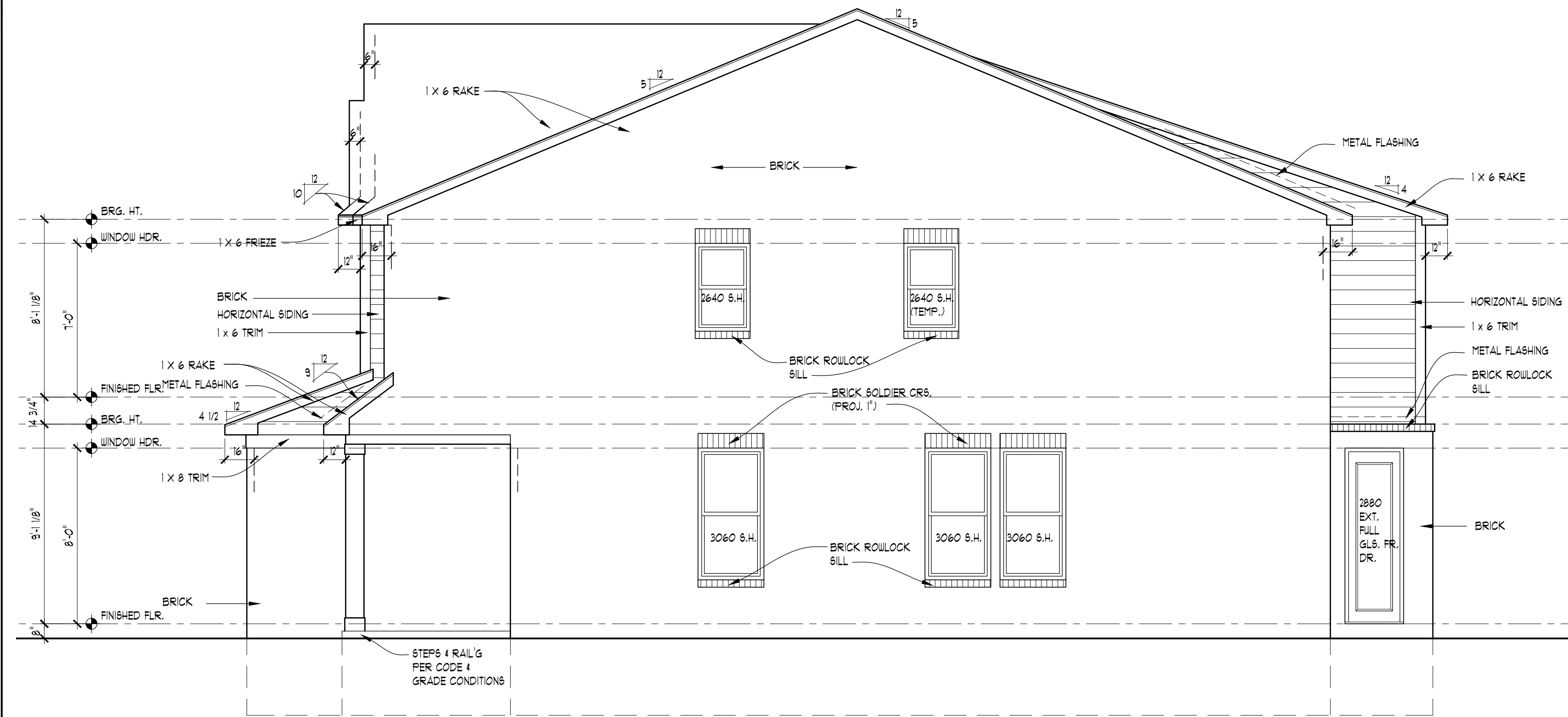
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CALL AND NO LATER THAN 30 DAYS PRIOR TO ANY EXCAVATION
CONSTRUCTION OR THE SOLE RESPONSIBILITY OF THE HOMEOWNER.

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

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

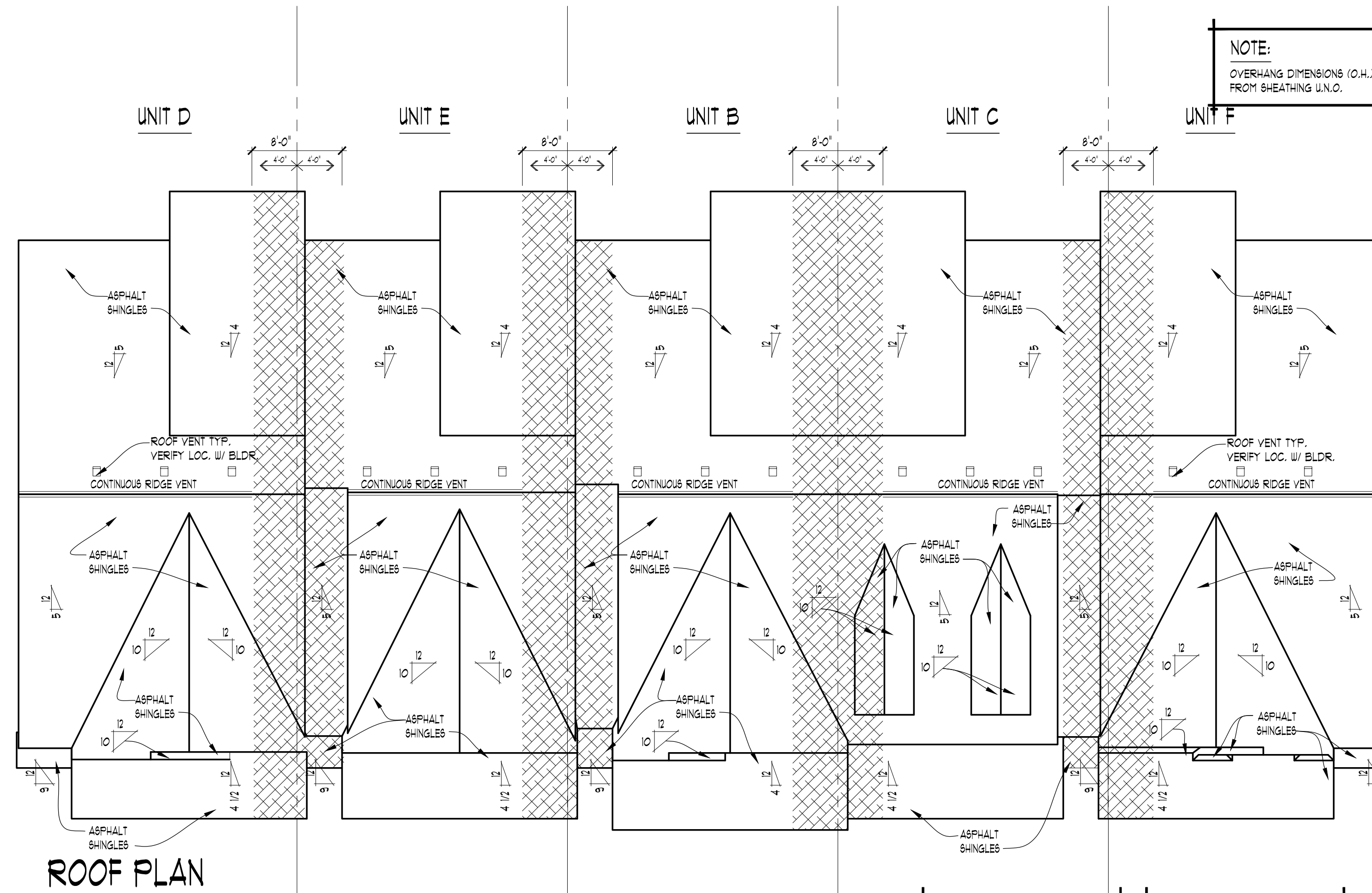
SCALE:
PER PLAN

SHEET #
A-4



RIGHT ELEVATION

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



ROOF PLAN

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

ELEVATION NOTES

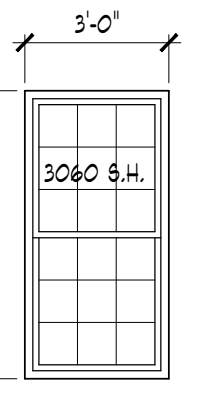
- ALL ROOF SADDLES TO BE O.S.B. SHEATHED WITH ICE & WATER SHIELD AND SHINGLES.
- PROVIDE ICE & WATER SHIELD MIN. 6'-0" COVERAGE AT ALL VALLEYS.
- FIREPLACE FLUE TO BE DETERMINED PER MANUFACTURER'S SPECIFICATION.
- METAL FLASHING AS REQUIRED BY CODE.
- ROOF & SOFFIT VENTS AS REQUIRED BY CODE.
- PROVIDE 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.
- 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 1/4" ABOVE FINISHED FLOOR OR HAVE 60MIN. LITERS PER CODE REQUIREMENTS

ATTIC VENTILATION CALCULATIONS:

AREA OF ATTIC OVER HEATED SPACE = 5047 SQ. FT.
5047/60 = 84.1 (SQ. FT. REQ'D)
34.3 X 144" = 5028" (SQ. INCH CONVERSION)
RIDGE VENTING:
8028" X 0.45" = 3612" (SQ. INCHES REQ'D)
2867" / 8" = 358" (LINEAR FT. OF RIDGE VENT REQ'D)
EAVE OR CORNICE VENTING:
8028" X 0.35" = 2810" (SQ. INCHES REQ'D)

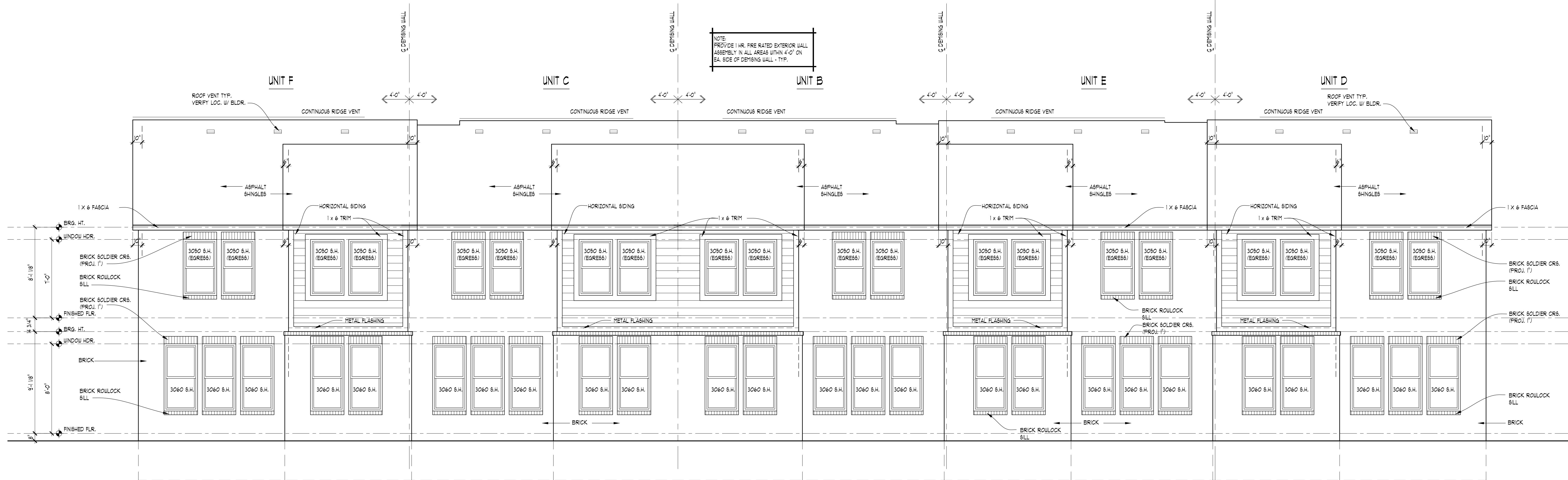
UNVENTILATED RIDGE:
126" - 8" (AVAIL. RIDGE) = 118" (UNVENTILATED RIDGE)
39" X 18" = 702" (REMAINING SQ. INCHES)
702" / 50" = 14" (ROOF VENTS REQ'D)

NOTE:

PROVIDE 1 HR. FIRE RATED EXTERIOR WALL ASSEMBLY IN ALL AREAS WITHIN 4'-0" ON EA. SIDE OF DEISING WALL - TYP.
PROVIDE FIRE RETARDANT ROOF SHEATHING WITHIN 4'-0" ON EA. SIDE OF DEISING WALL - TYP.

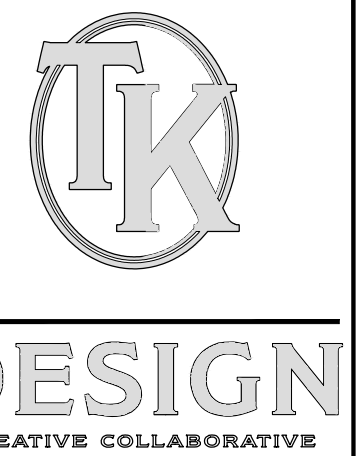
NOTE:

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.



REAR ELEVATION

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



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DO NOT SCALE DRAWINGS. USE CALCULATED DIMENSIONS ONLY.
CONTRACTOR TO VERIFY ALL DRAWING DETAILS BEFORE CONSTRUCTION. USE DIMENSIONS AND DESIGN CHANGES SHALL BE REPORTED TO THE DESIGNER IN WRITING FOR IMMEDIATELY CALL AND DO AT OWNERS RISK 3 DAYS PRIOR TO ANY EXCAVATION OR CONSTRUCTION TO THE DOWNSIDE OF THE PROJECT.

CLIENT / PROJECT
ROBERTSON 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. 1-0-22

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.

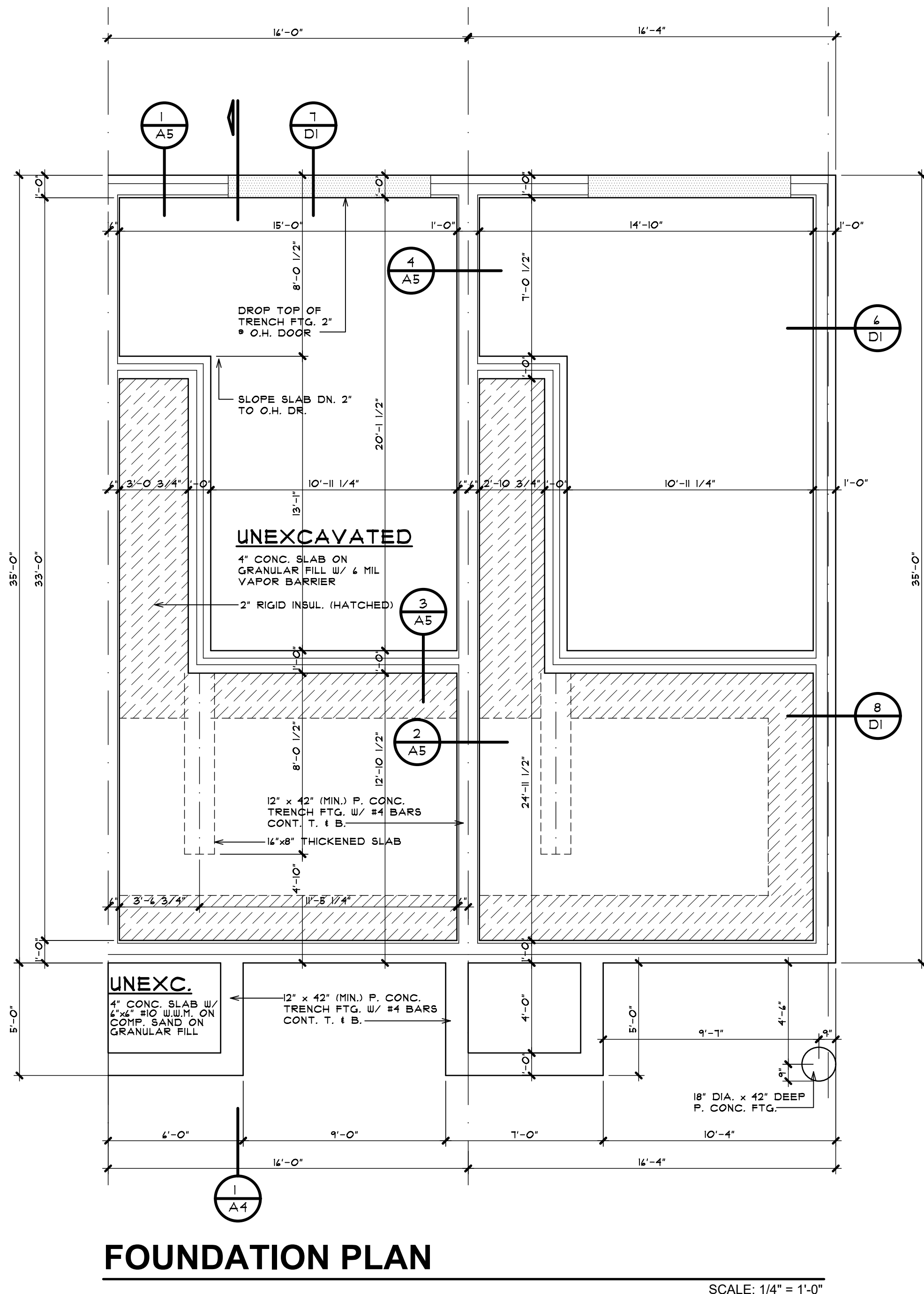
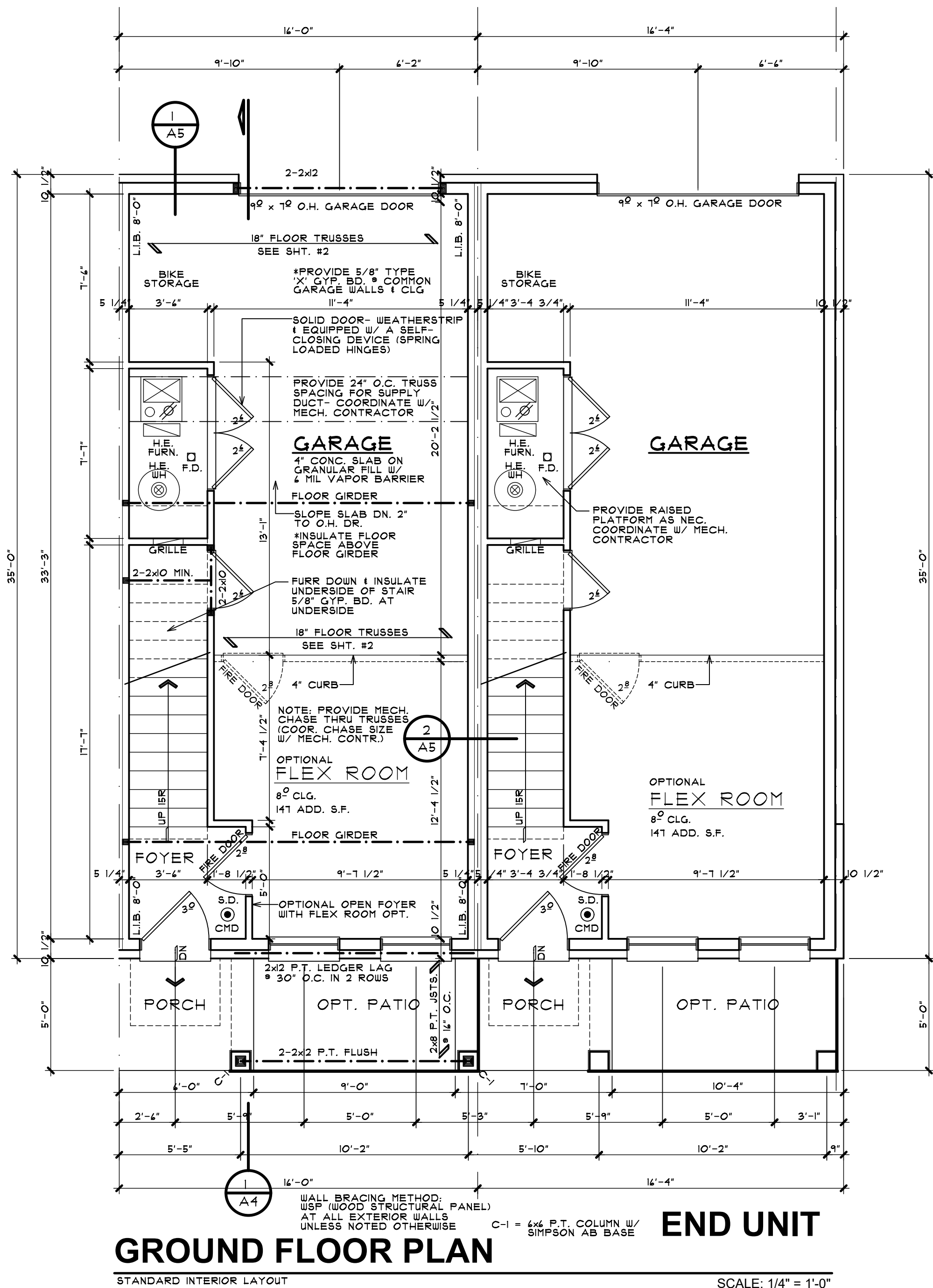
ALL PRE-ENGINEERED LUMBER HEADERS SHALL BE BUILT-UP FROM THE NUMBER OF HEADERS INDICATED ON DRAWINGS. ALL MEMBERS SHALL BE SECURED WITH NAILS OR BOLTS AS SPECIFIED BY THE MANUFACTURER FOR SIZES INDICATED.

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 I LAYOUT DRAWINGS CLEARLY INDICATING LOCATION OF VARIOUS HANGERS REQUIRED.

CARPENTER CONTRACTOR TO INSTALL NAIL SIZES I 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)



STRUCTURAL NOTES:

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

(2) 2x10 (1) 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.

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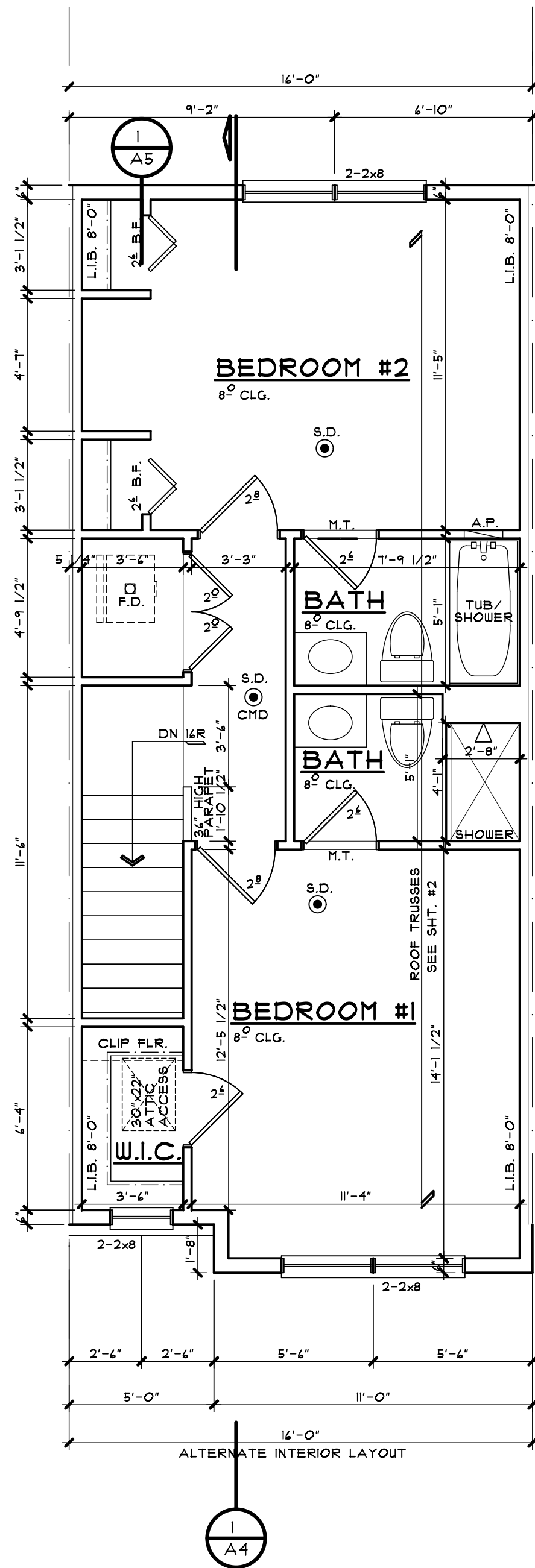
ALL GIRDER TRUSSES TO BEAR ON (2) TWO STUDS MINIMUM OR AS REQUIRED TO MATCH NUMBER OF TRUSS PLYS, WHICH EVER IS GREATER.

TRUSS FABRICATOR/CONTRACTOR TO PROVIDE ALL HANGERS W/ MODEL No. CLEARLY STAMPED (1) LAYOUT DRAWINGS CLEARLY INDICATING LOCATION OF VARIOUS HANGERS REQUIRED.

CARPENTER CONTRACTOR TO INSTALL NAIL SIZES (1) NUMBER REQ'D. AS SPECIFIED FOR EACH TYPE OF HANGER.

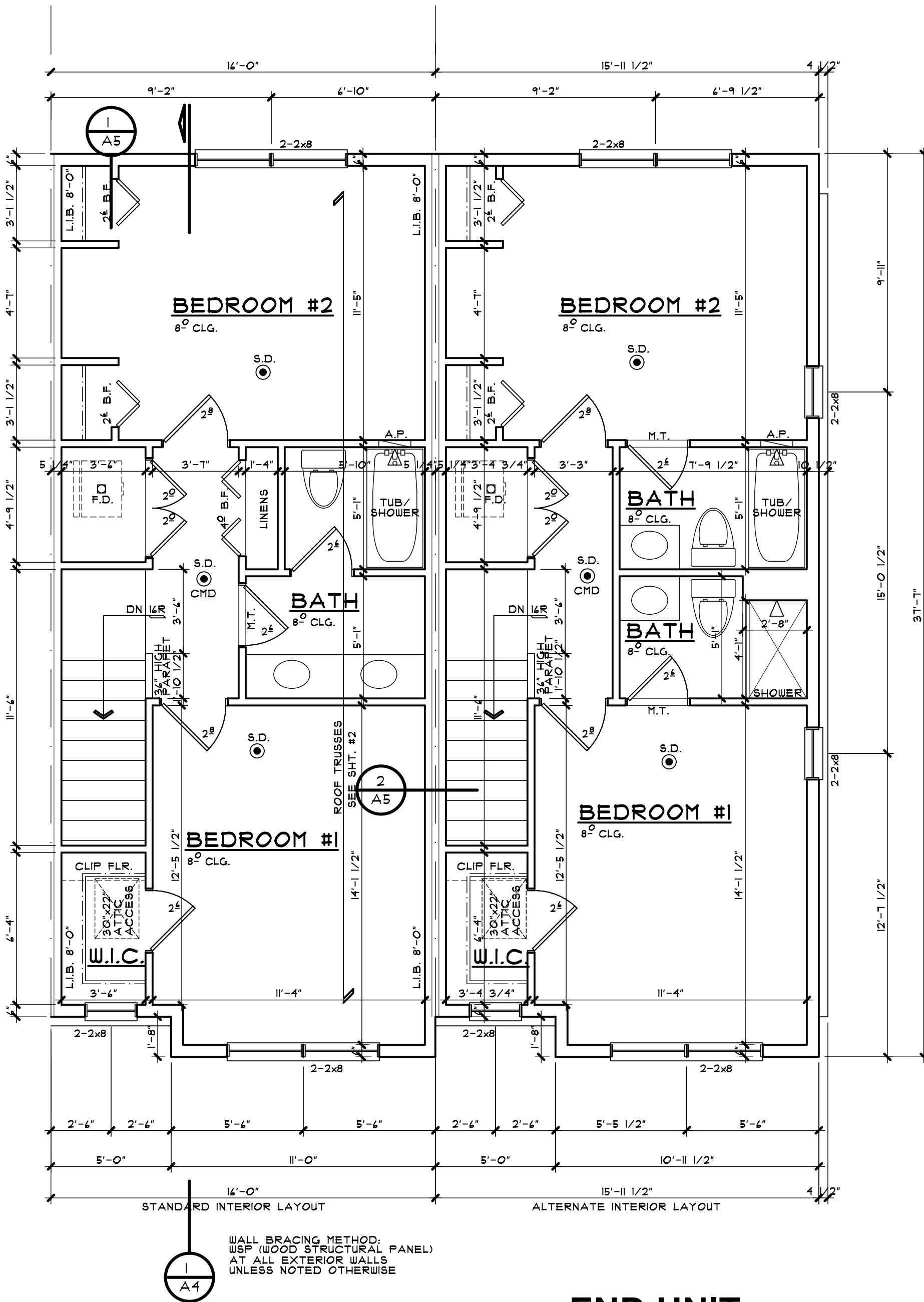
LVL DESIGN VALUES FOR MODULUS OF ELASTICITY (E) SHALL BE 2,000,000 PSI (2.0 E)

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	141 SQ FT
TOTAL W/ OPT.	1,331 SQ FT



SECOND FLOOR PLAN

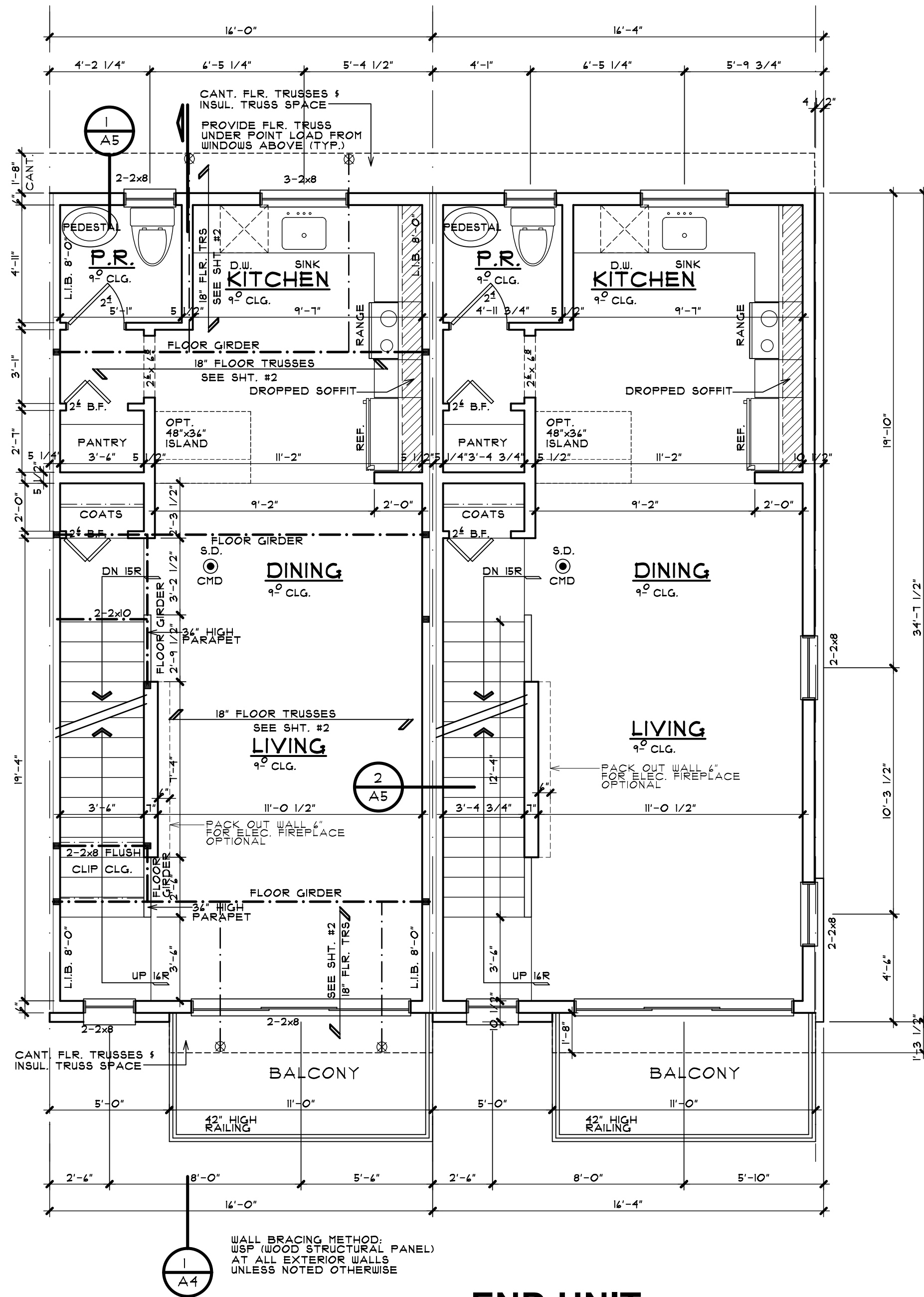
SCALE: 1/4" = 1'-0"



SECOND FLOOR PLAN

END UNIT

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



FIRST FLOOR PLAN

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

END UNIT

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



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UNIT PLANS

PRELIMINARY

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

PRELIMINARY	6-18-20
BIDS	
PERMITS	
FINAL	
REVISIONS	

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JOB NUMBER 21038
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CHECKED BY

SHEET NUMBER
A-2

WINDOW SILLS

IN DUELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 12" 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 2010.

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 4" AT BRICK AND 4" 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	4" 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.

RIGHT SIDE ELEVATION

LEFT SIDE ELEVATION - OPPOSITE - SIMILAR

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

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.

ELEVATION 'C'

ELEVATION 'B'

ELEVATION 'A'

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

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DESIGN - PLANNING - INTERIORS

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BRIANNEE@BNA.COM

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SHEET TITLE

UNIT ELEVATIONS

FRONTS AND SIDE

PRELIMINARY

CLIENT / PROJECT

ROBERTSON HOMES

HUDSON TOWNS

1/2' TOWNHOME UNITS

SOUTH LYON, MICHIGAN

PRELIMINARY

BIDS

PERMITS

FINAL

REVISIONS

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A-3

WINDOW SILLS

IN DUELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 12" 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.

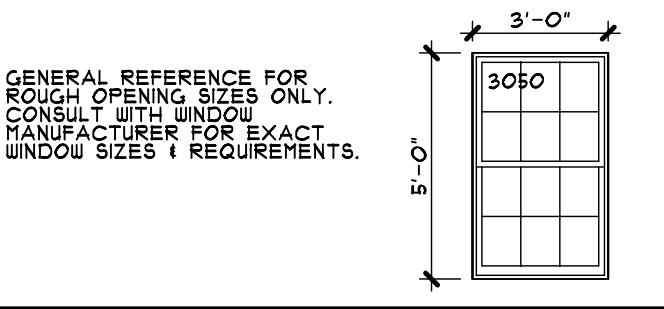
OVERHANGS & DRAINAGE

PROVIDE GUTTERS (DOWNSPOUTS FOR DRAINAGE OF ROOF WATER. DOWNSPOUTS ARE TO BE LOCATED SO THAT THE DISCHARGE 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 4" AT SIDING.

STEEL LINTEL SCHEDULE

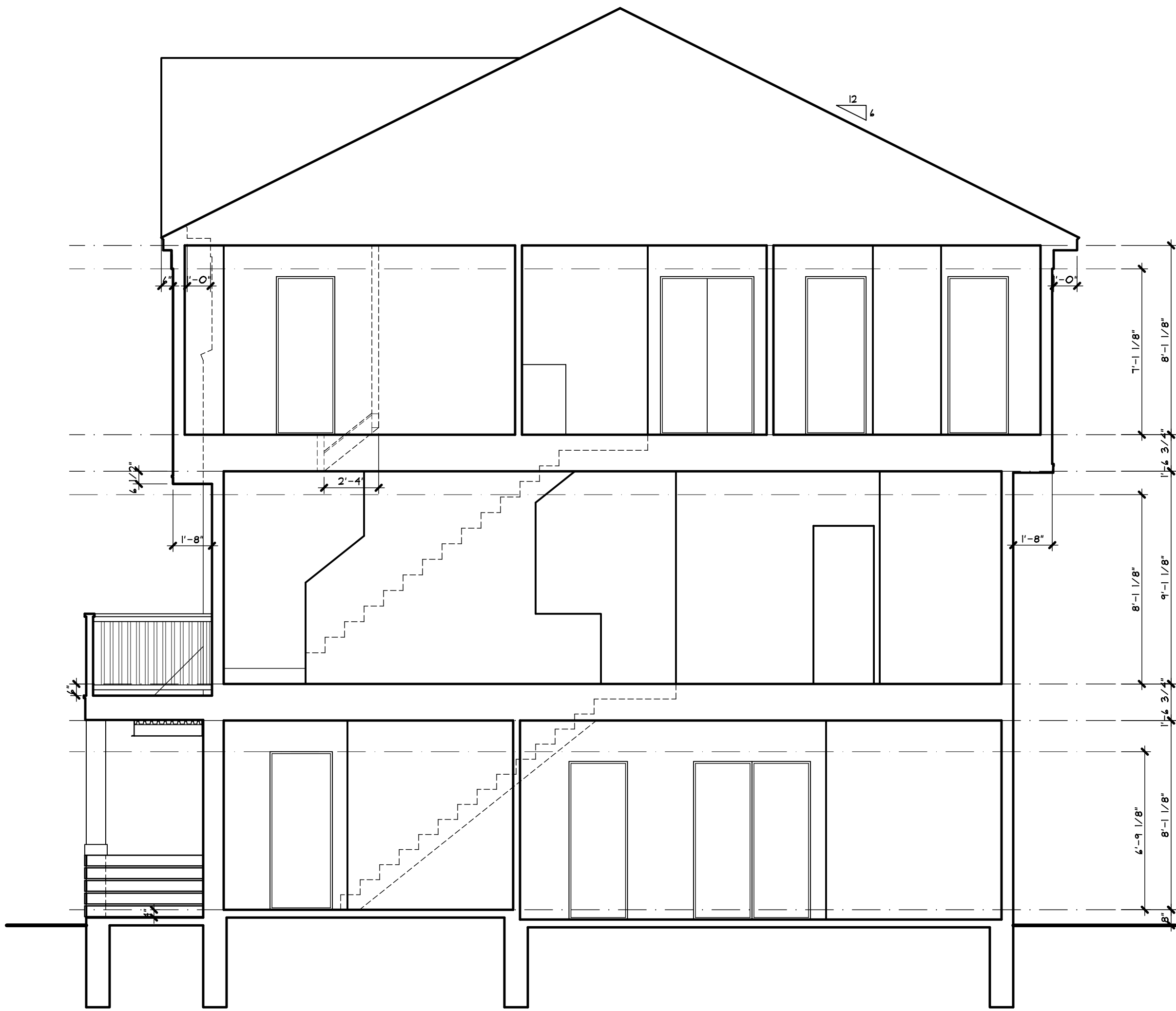
LOOSE STEEL LINTELS FOR MASONRY - EXTERIOR ANGLES FOR BRICK OR STONE (NO FLOOR LOAD)	
MAX. CLEAR SPAN	LINTEL SIZE
5'-0" OR LESS	3 1/2" x 3 1/2" x 5/16"
7'-0" OR LESS	4" x 3 1/2" x 5/16"
8'-0" OR LESS	5" x 3 1/2" x 5/16"
9'-0" OR LESS	5" x 3 1/2" x 3/8"
10'-0" OR LESS	6" x 3 1/2" x 3/8"
NOTE: THIS SCHEDULE 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



EGRESS WINDOW

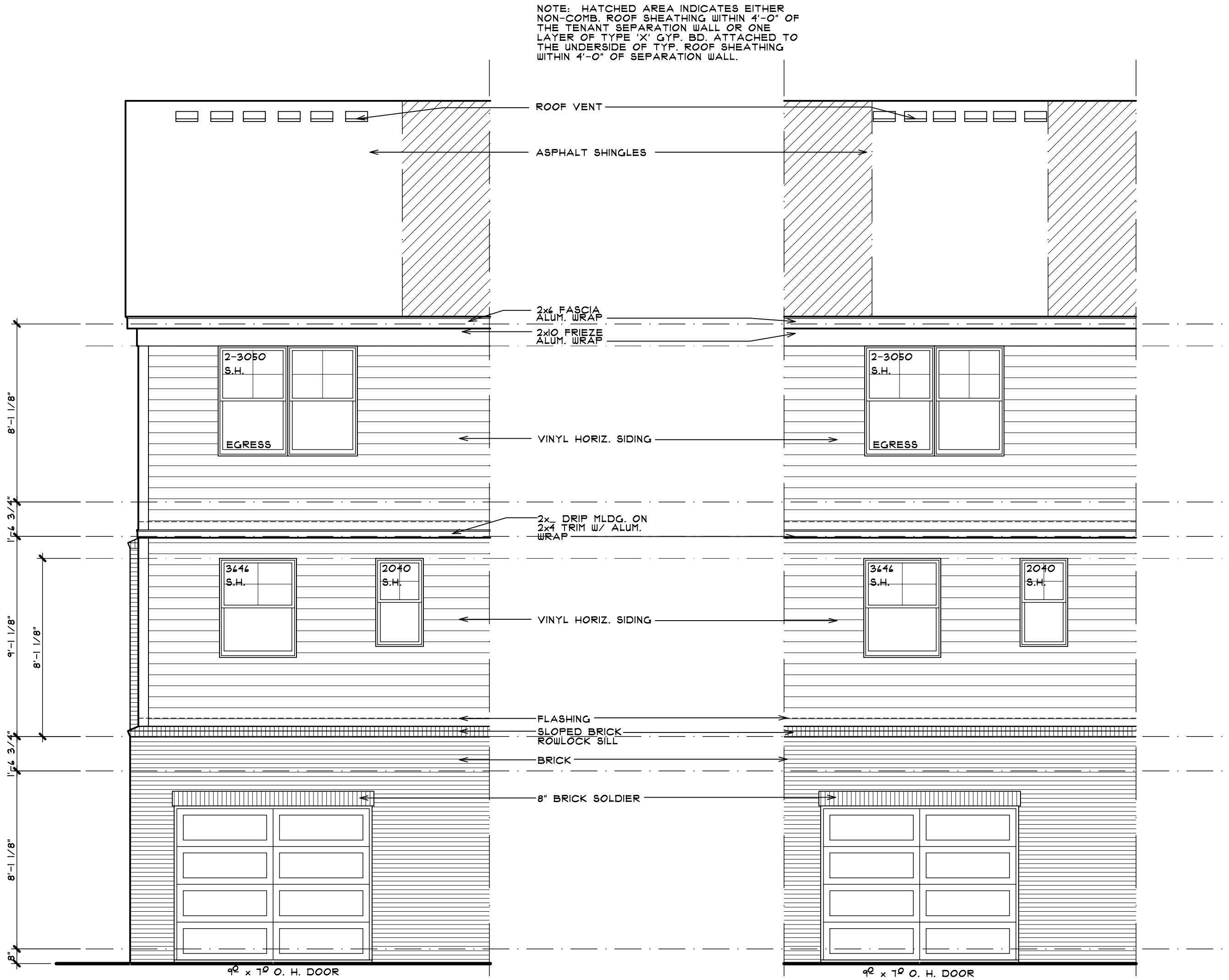
EVERY SLEEPING ROOM SHALL HAVE AT LEAST ONE OPERABLE WINDOW OR EXTERIOR DOOR APPROVED FOR EMERGENCY EGRESS OR RESCUE. THE UNITS MUST BE OPERABLE FROM THE INSIDE TO A FULL CLEAR OPENING WITHOUT THE USE OF SEPARATE TOOLS. WHERE WINDOWS ARE PROVIDED AS A MEANS OF EGRESS, OR RESCUE, THEY SHALL HAVE SILL 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
A4

BUILDING SECTION

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



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

REAR ELEVATION

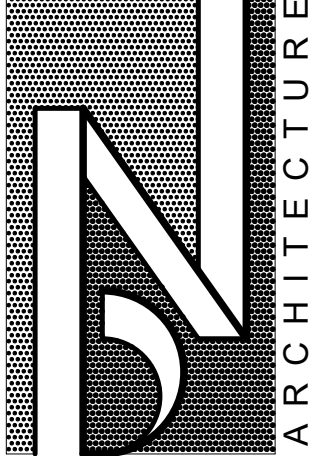
END UNIT

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

PROPOSED VENT AREA PER UNIT
VENT AREA RATIO 1:50
ATTIC AREA = 401 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. = 4 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.

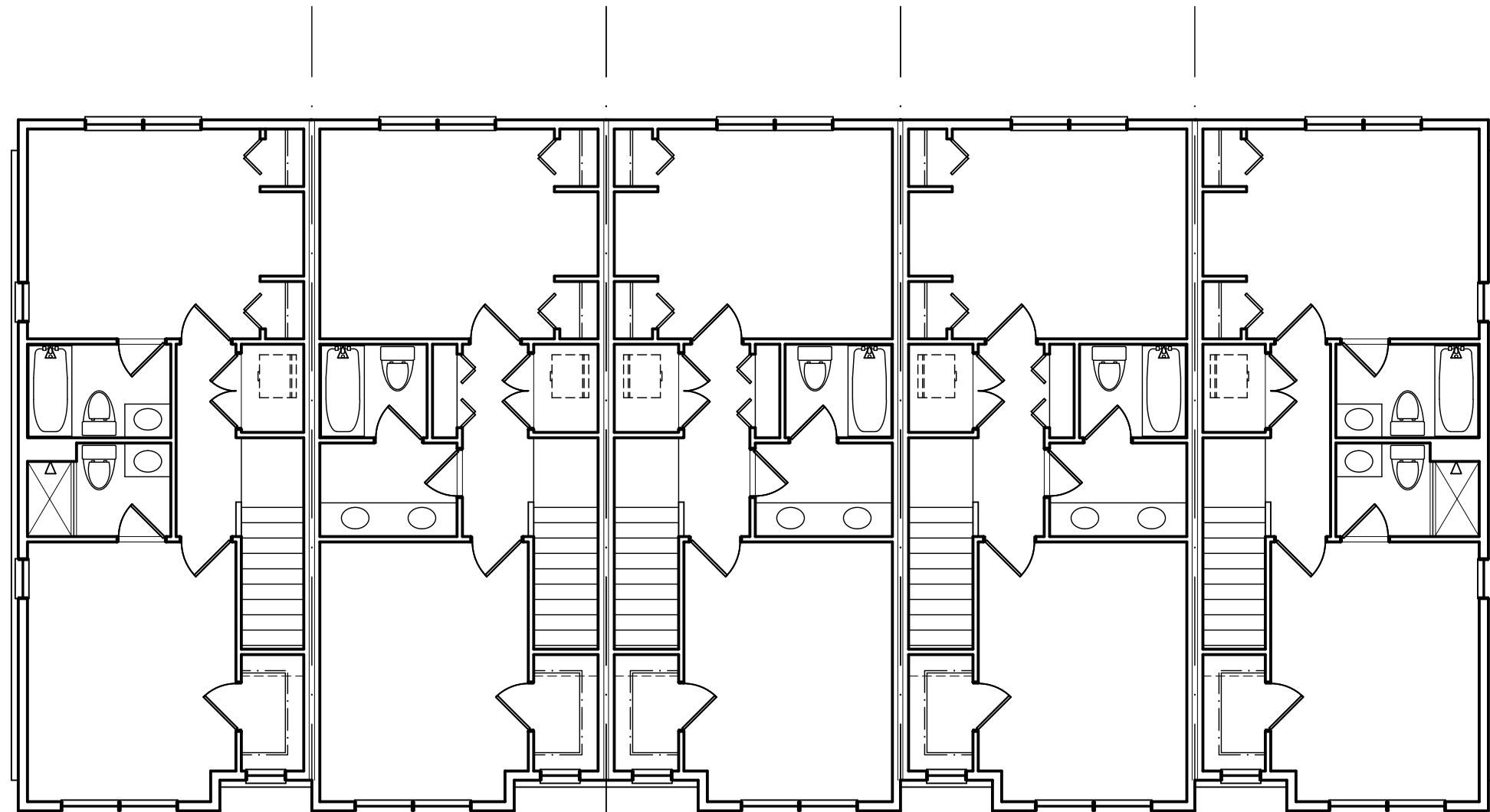


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SHEET TITLE
**REAR ELEVATIONS
BUILDING SECTIONS**
PRELIMINARY

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

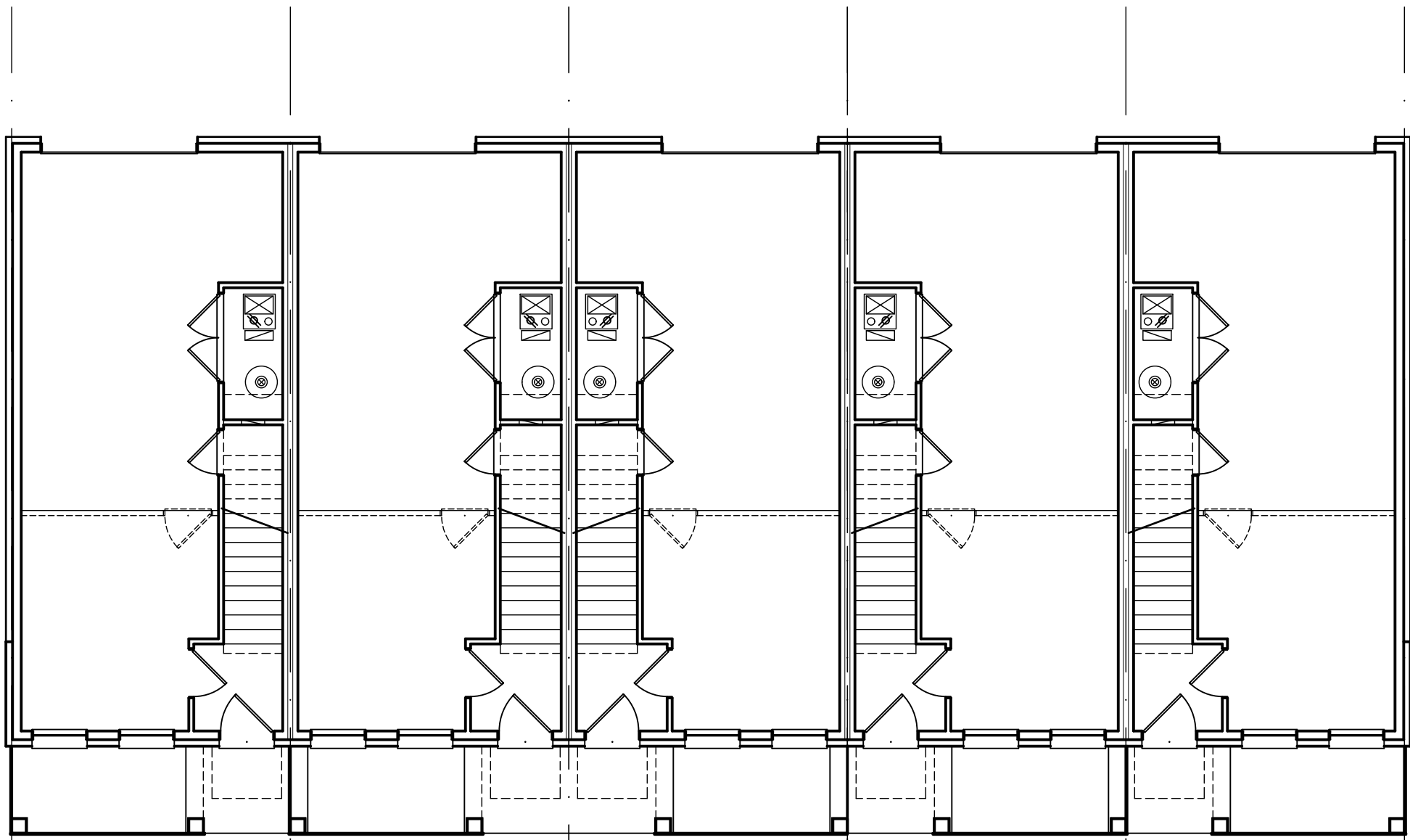
PRELIMINARY	6-18-20
BIDS	
PERMITS	
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JOB NUMBER	21038
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SHEET NUMBER	A-4



** COORDINATE SECOND FLOOR UNIT LAYOUT OPTIONS WITH DEVELOPER

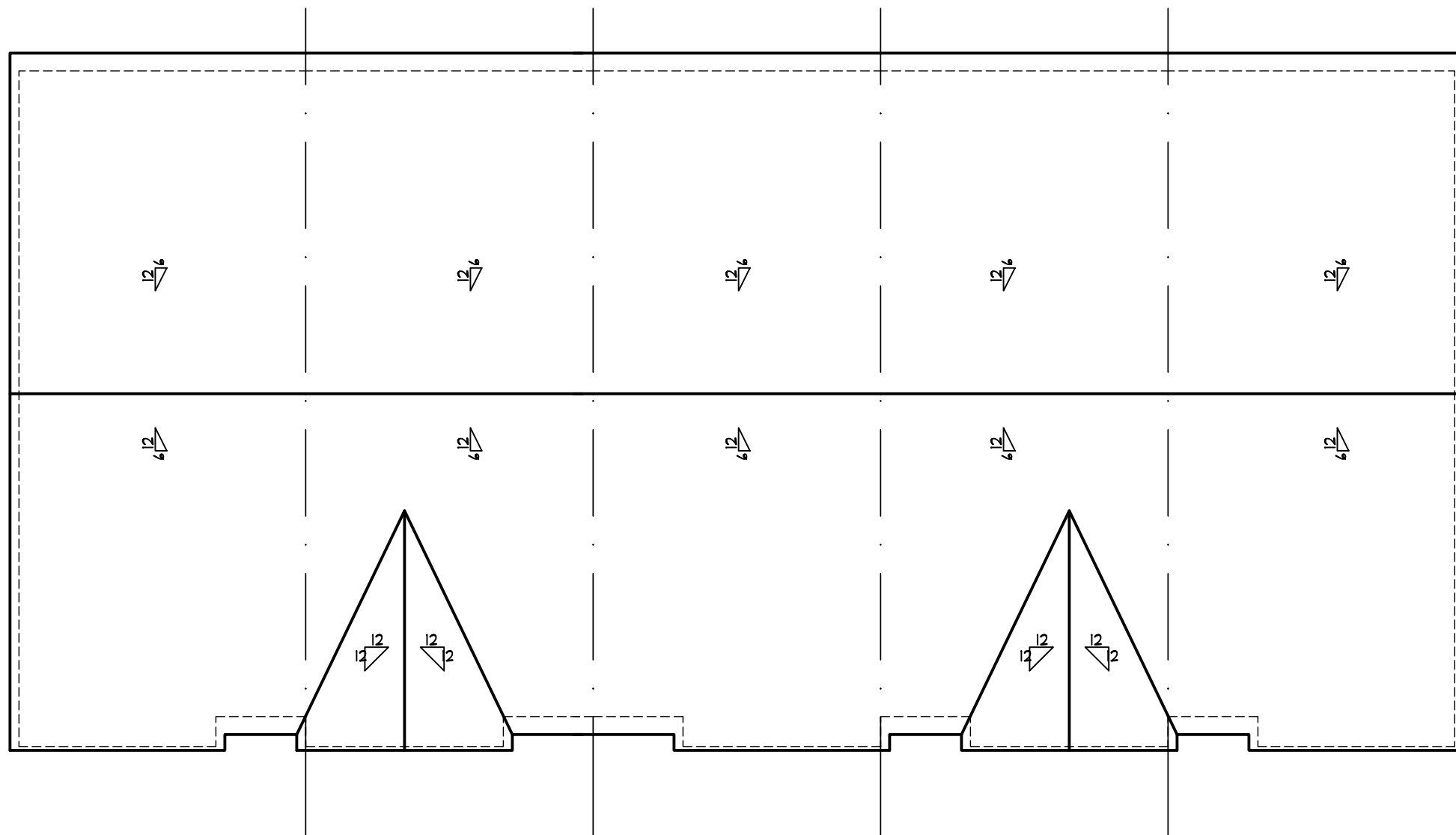
SECOND FLOOR PLAN
5 UNIT BUILDING

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



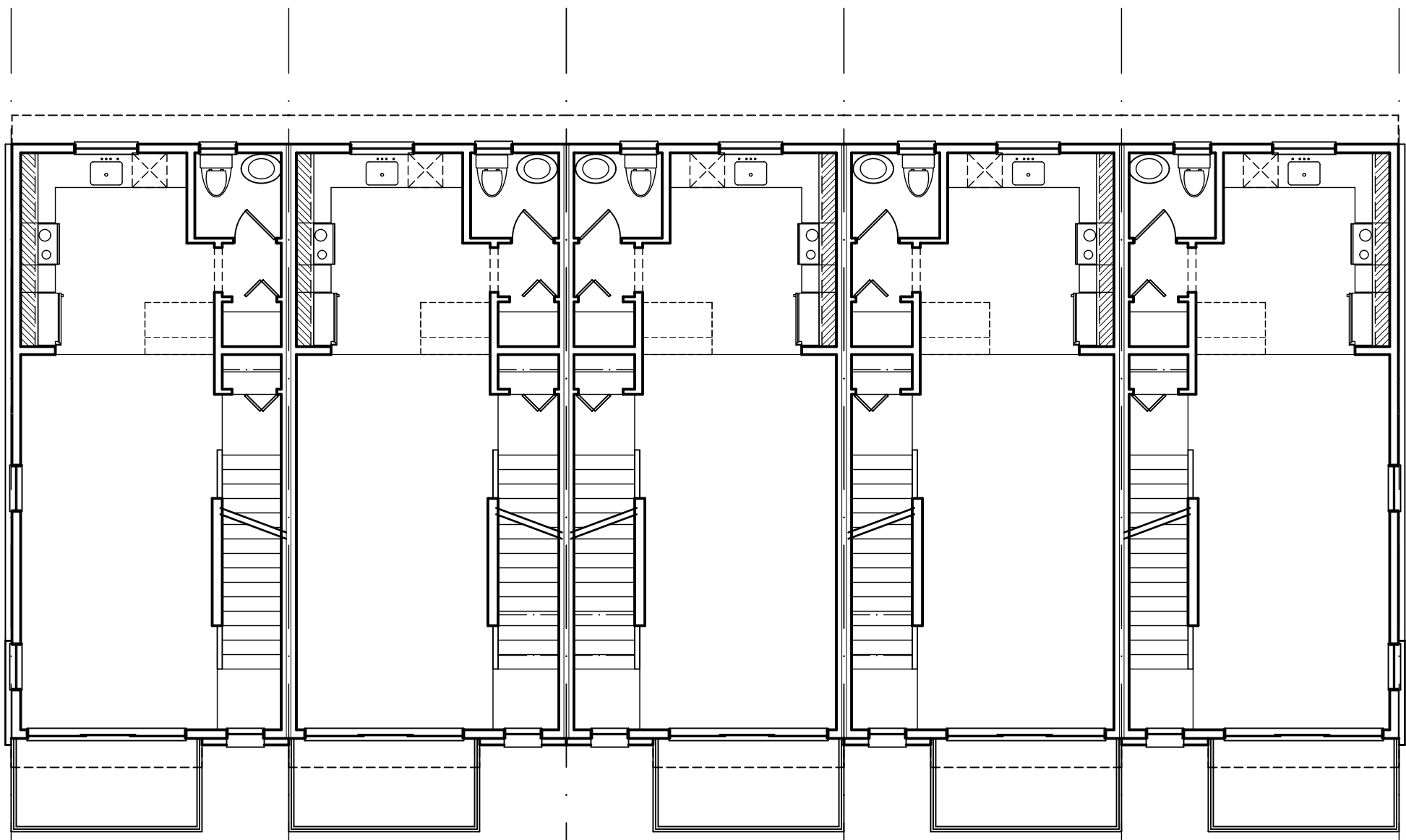
LOWER LEVEL PLAN
5 UNIT BUILDING

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



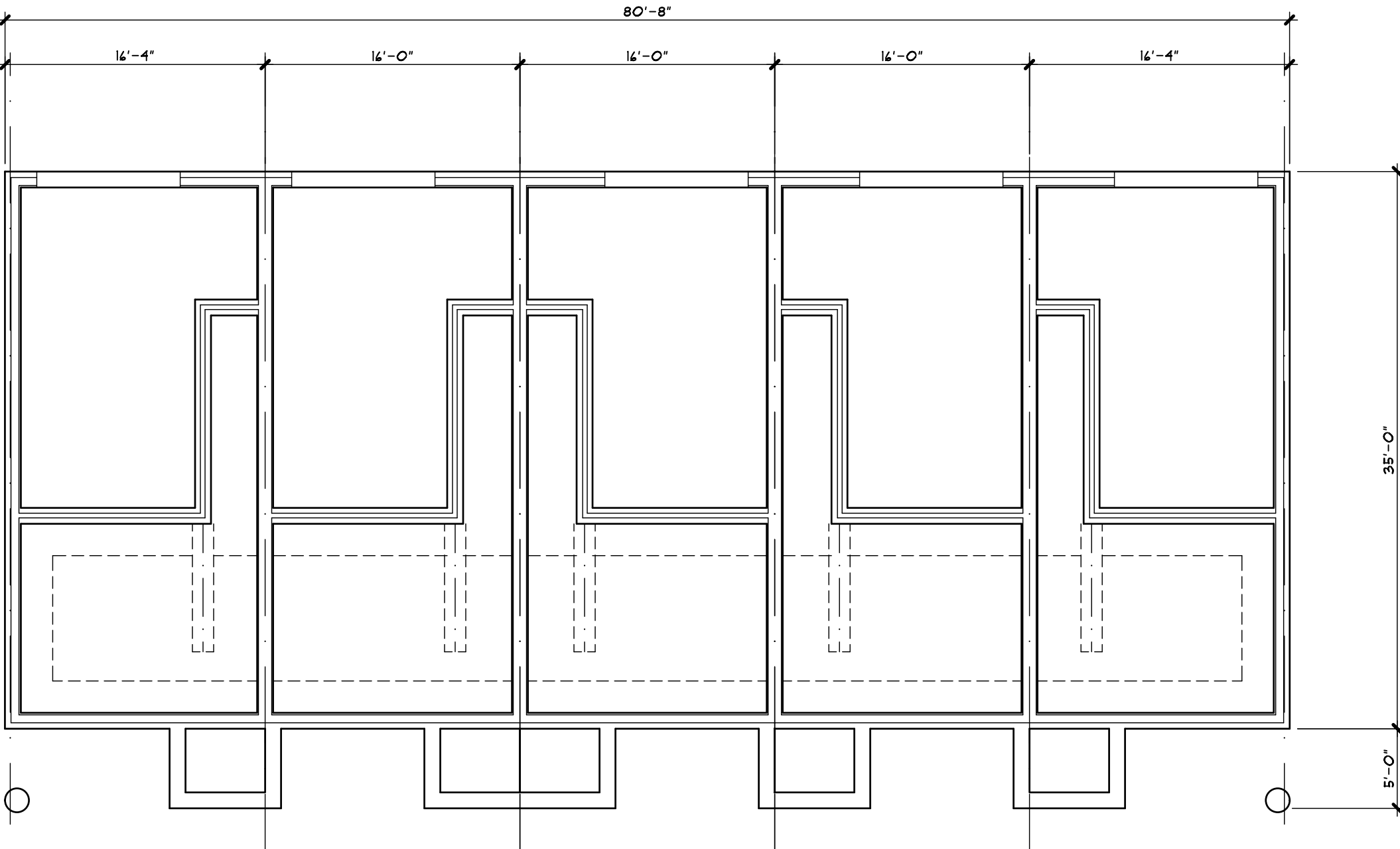
ROOF PLAN
5 UNIT BUILDING

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



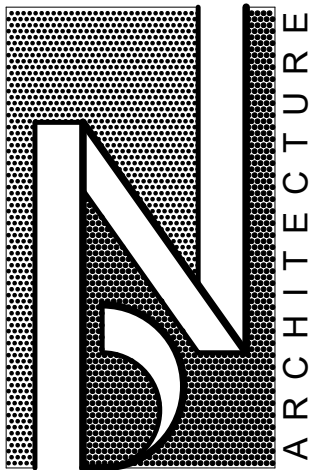
FIRST FLOOR PLAN
5 UNIT BUILDING

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



FOUNDATION PLAN
5 UNIT BUILDING

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



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SHEET TITLE
5 UNIT BUILDING
BUILDING PLANS
PRELIMINARY

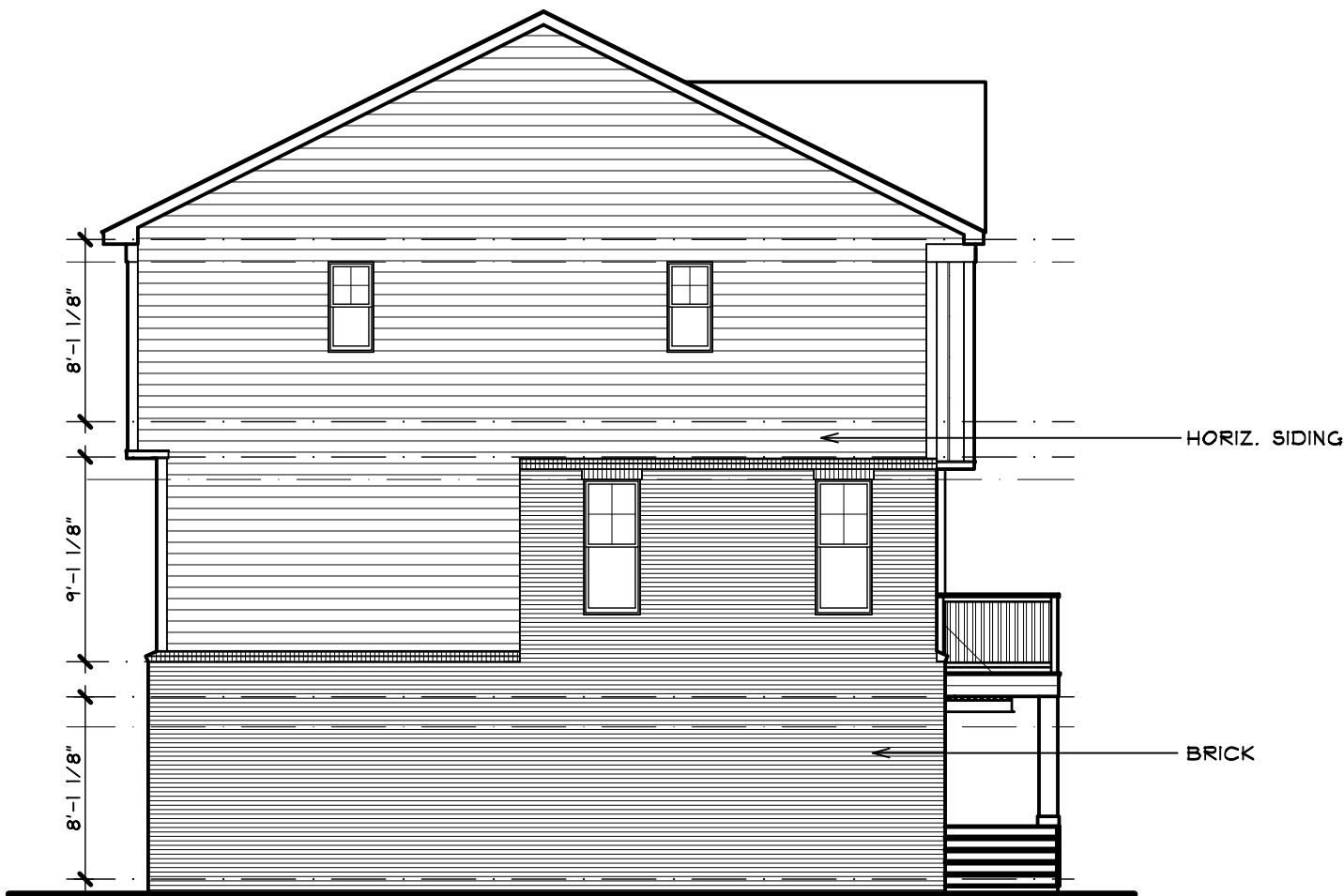
CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
1/2' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-20
BIDS	
PERMITS	
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SHEET NUMBER	A-6



REAR ELEVATION
5 UNIT BUILDING

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



LEFT SIDE ELEVATION

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



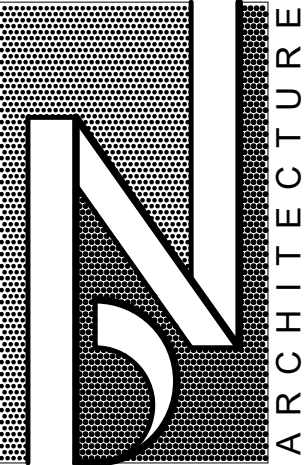
RIGHT SIDE ELEVATION

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



FRONT ELEVATION
5 UNIT BUILDING

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



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SHEET TITLE
5 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
1/2' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-20
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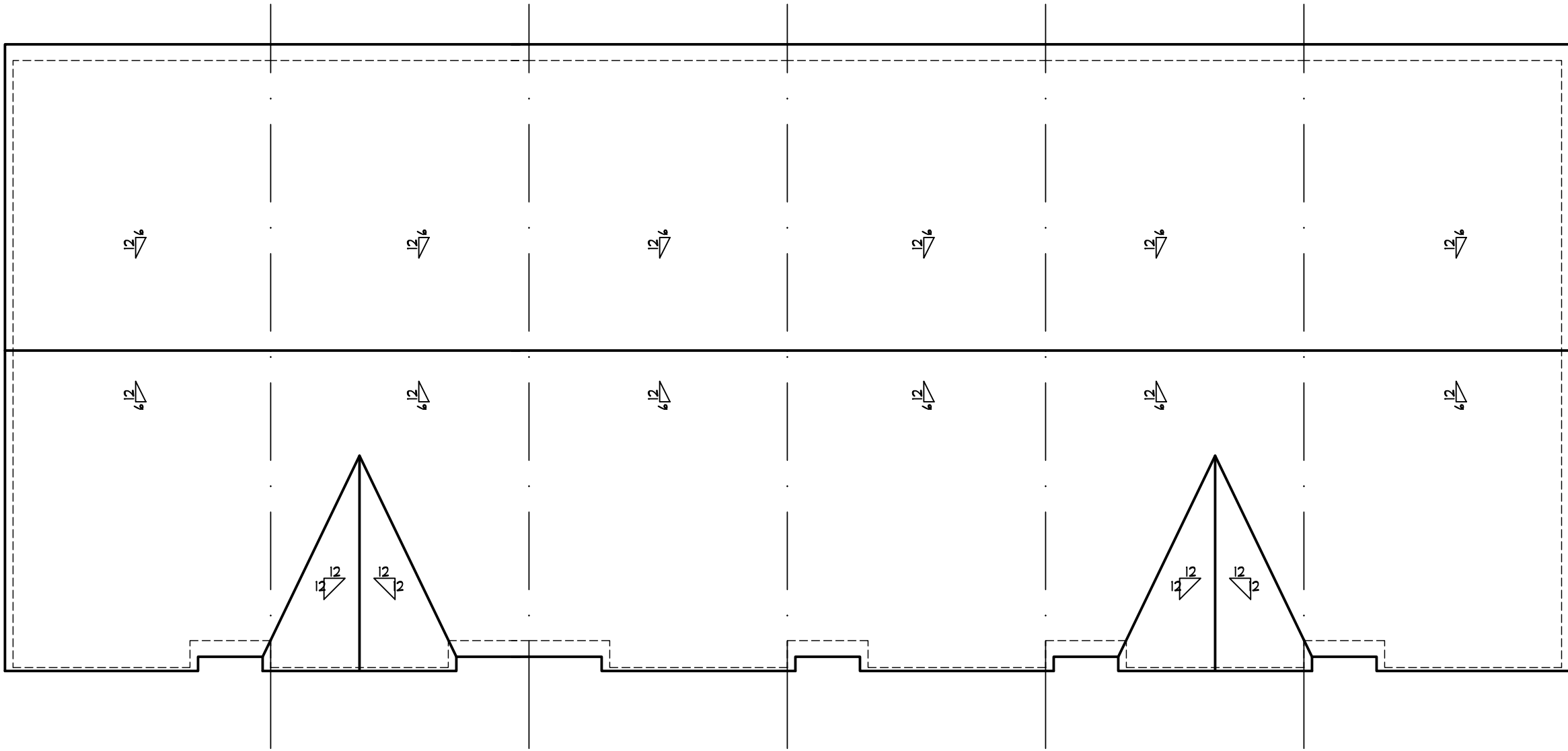


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SHEET TITLE
6 UNIT BUILDING
BUILDING PLANS
PRELIMINARY

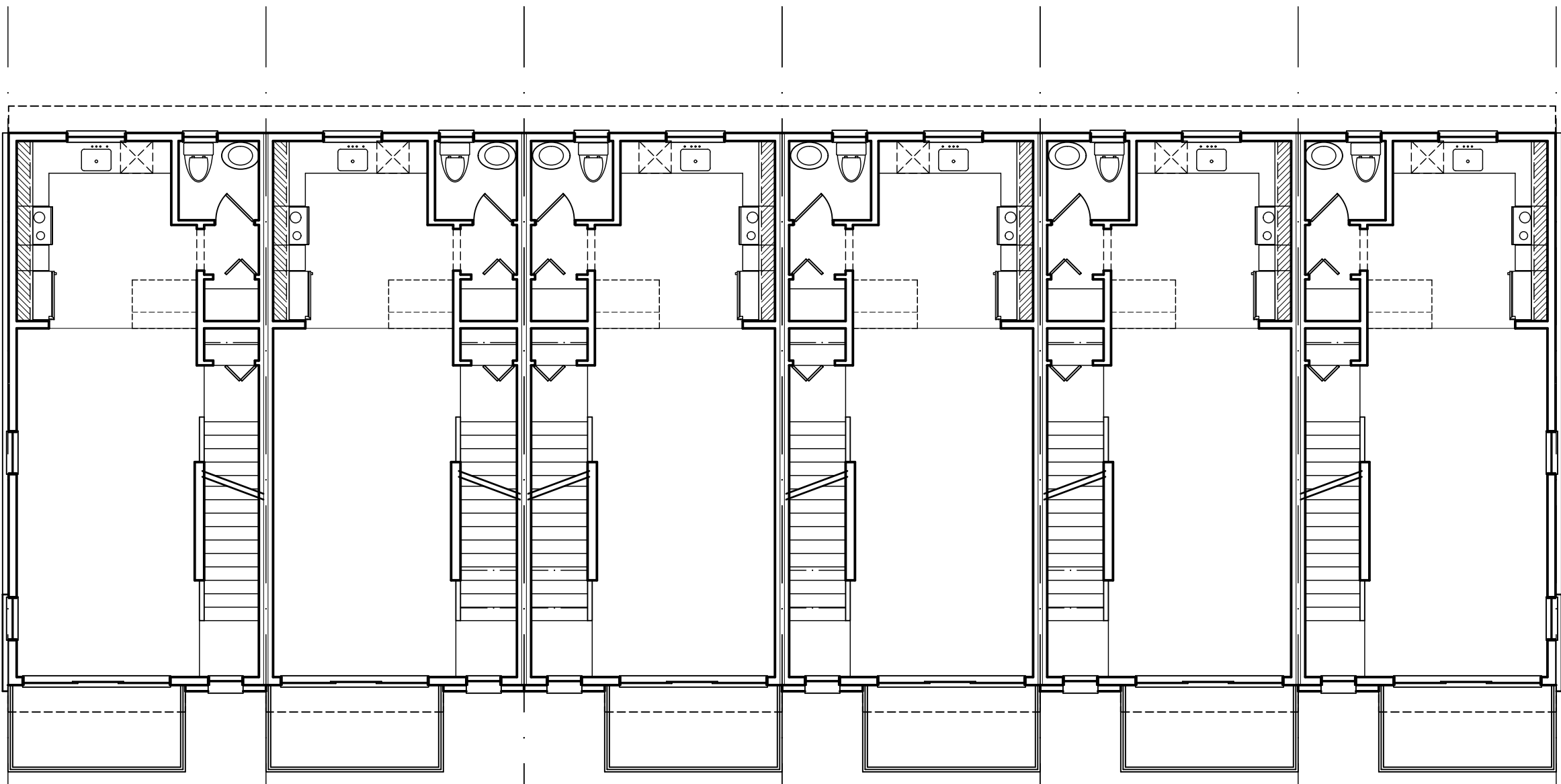
CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
16' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

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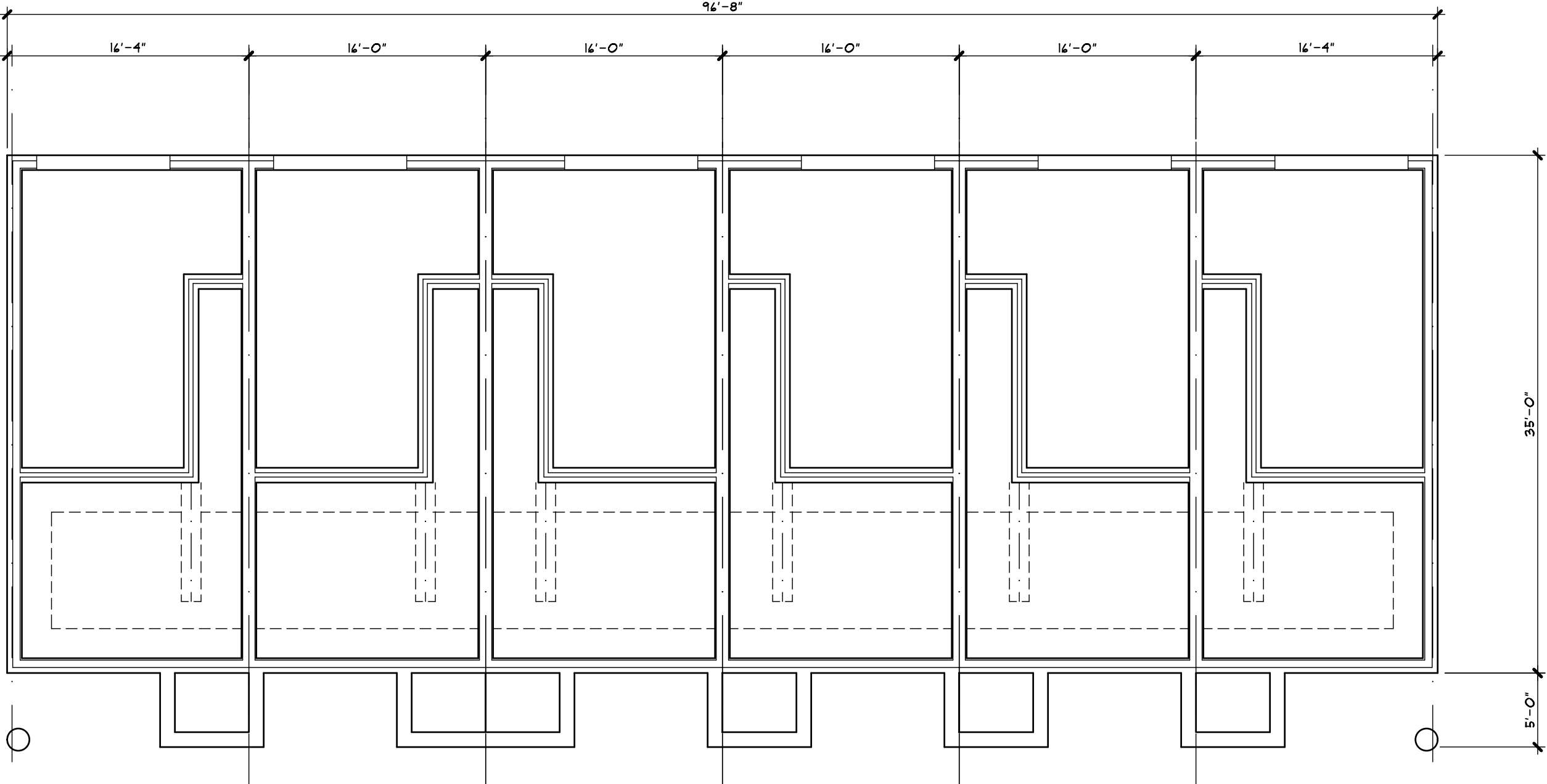
ROOF PLAN
6 UNIT BUILDING

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



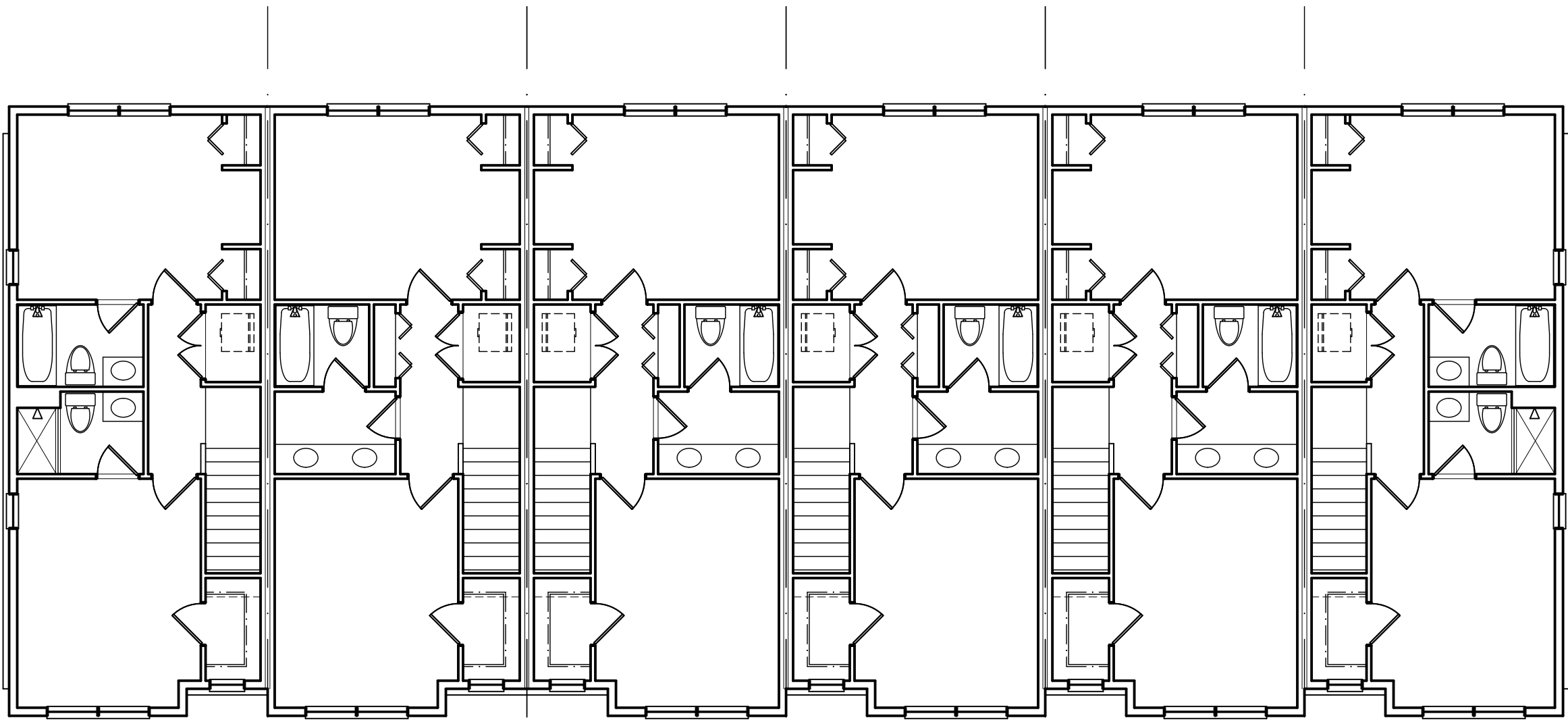
FIRST FLOOR PLAN
6 UNIT BUILDING

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



FOUNDATION PLAN
6 UNIT BUILDING

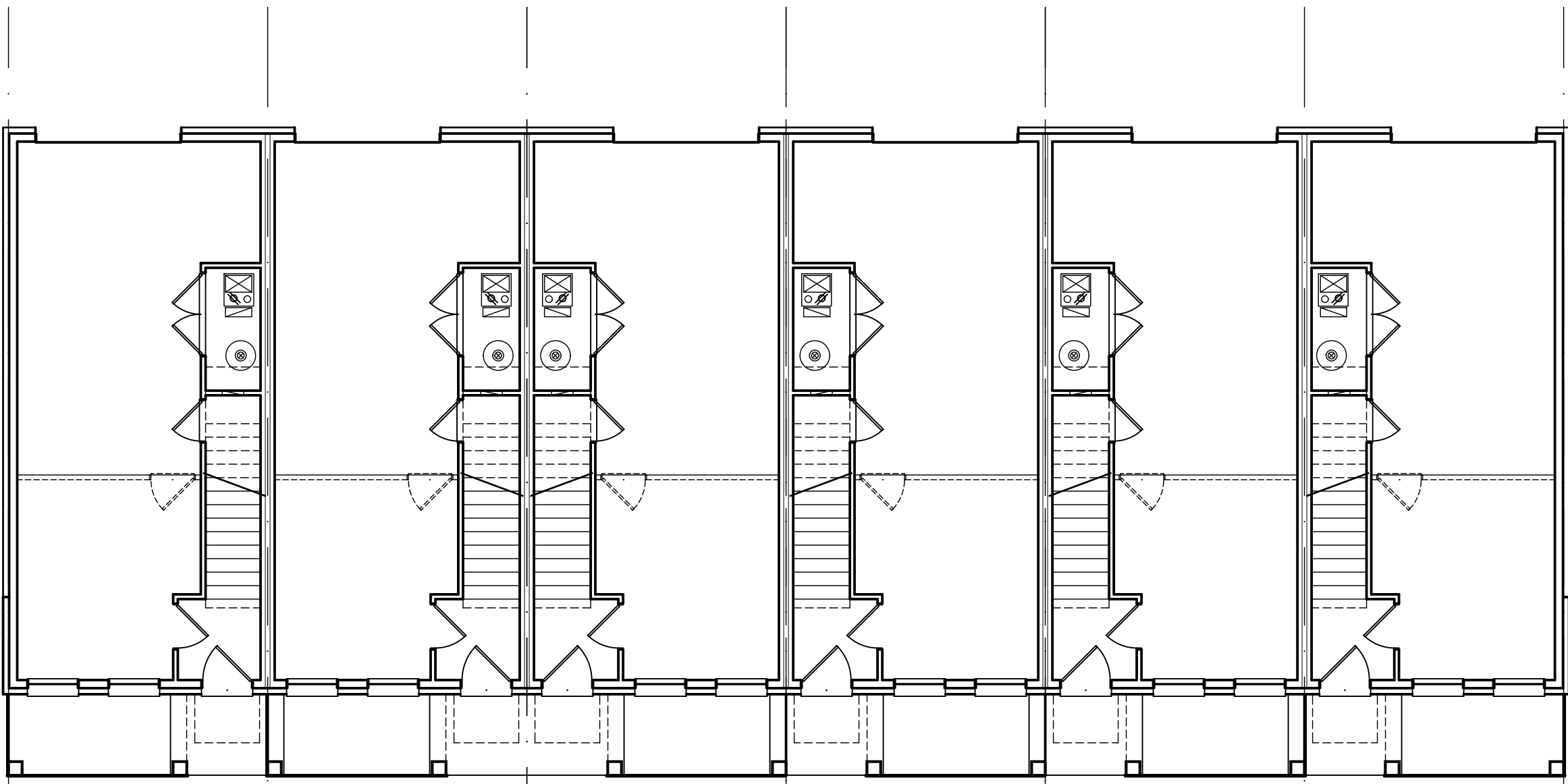
SCALE: 1/8" = 1'-0"



SECOND FLOOR PLAN
6 UNIT BUILDING

** COORDINATE SECOND FLOOR UNIT LAYOUT OPTIONS WITH DEVELOPER

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



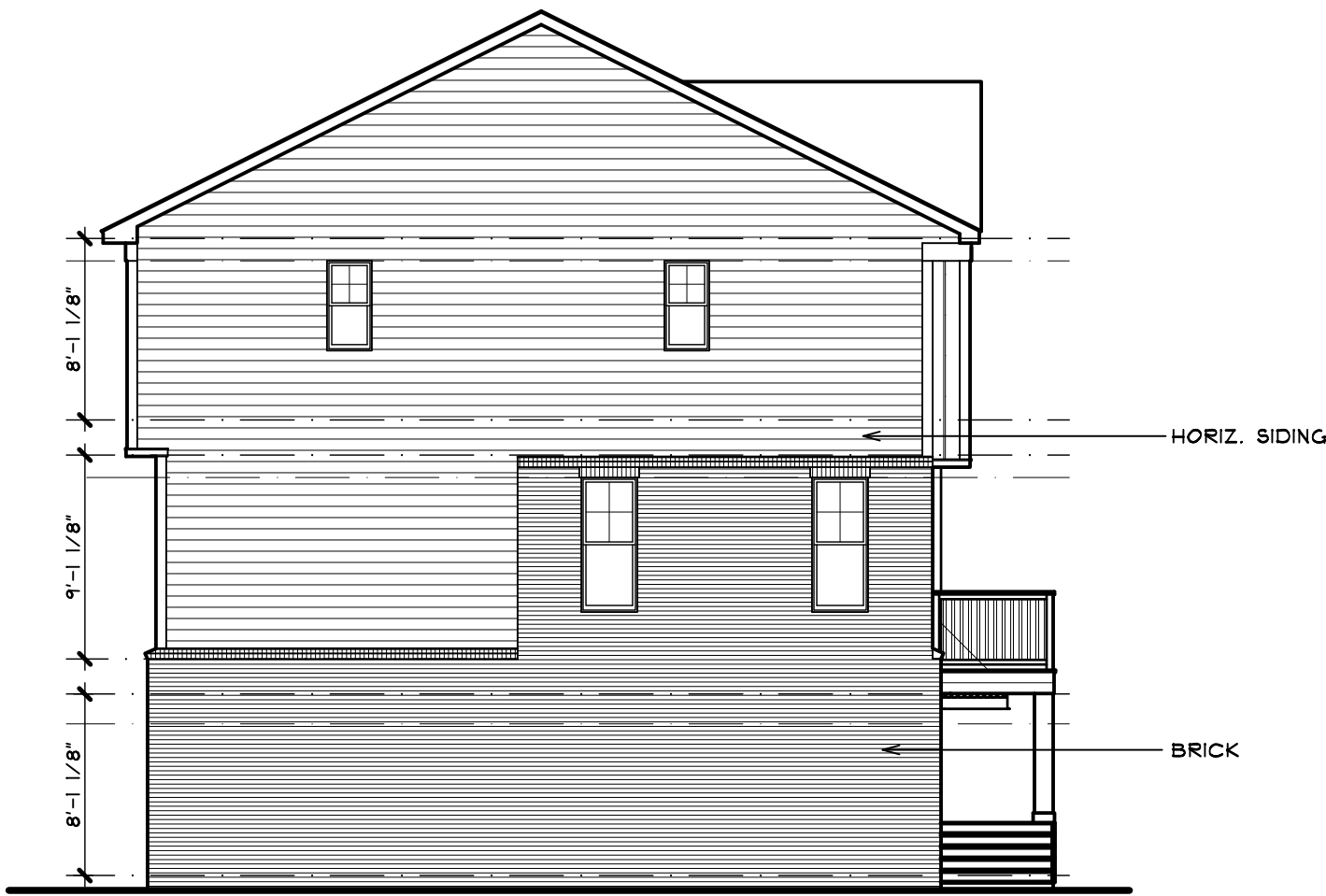
LOWER LEVEL PLAN
6 UNIT BUILDING

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



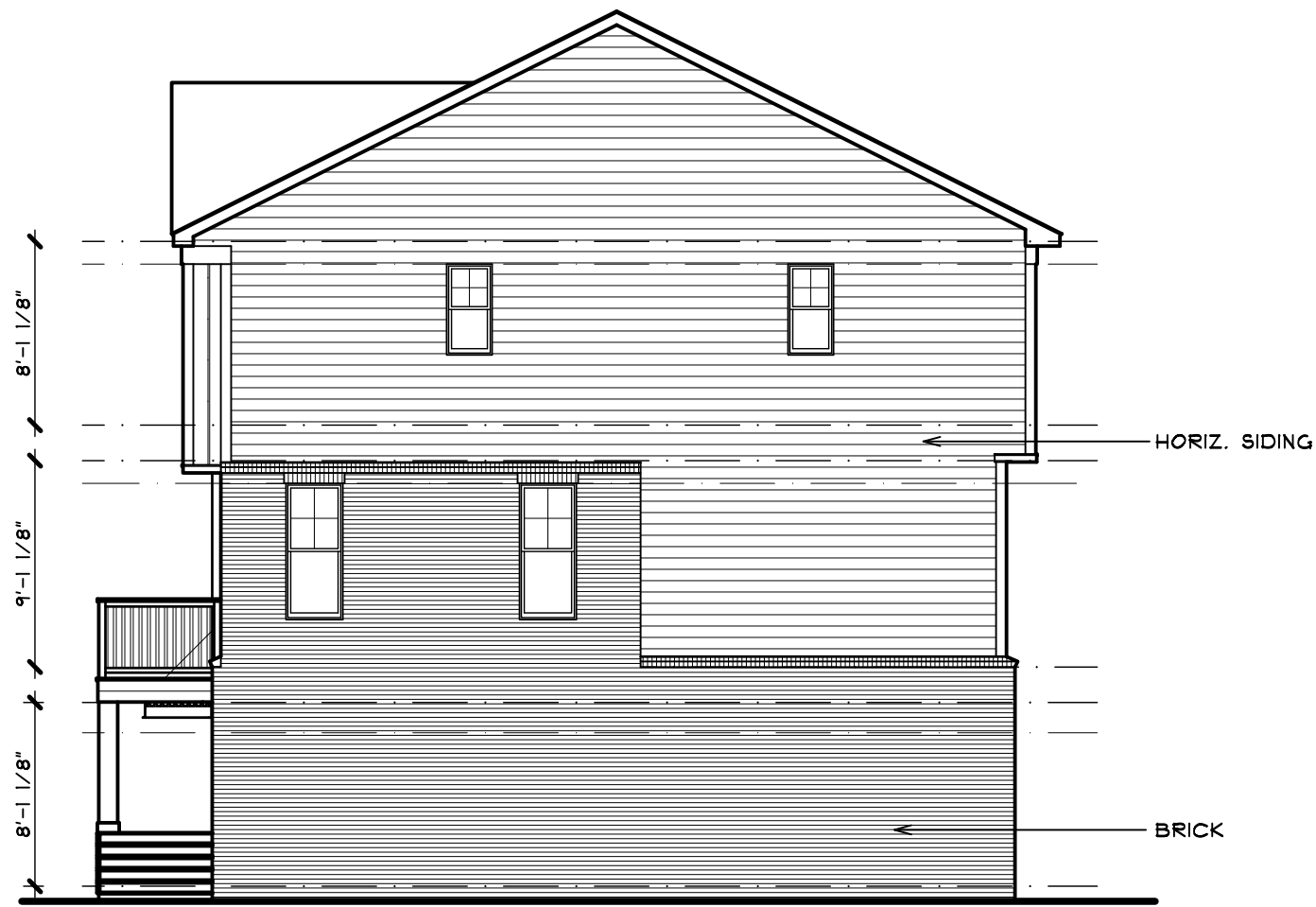
REAR ELEVATION
6 UNIT BUILDING

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"

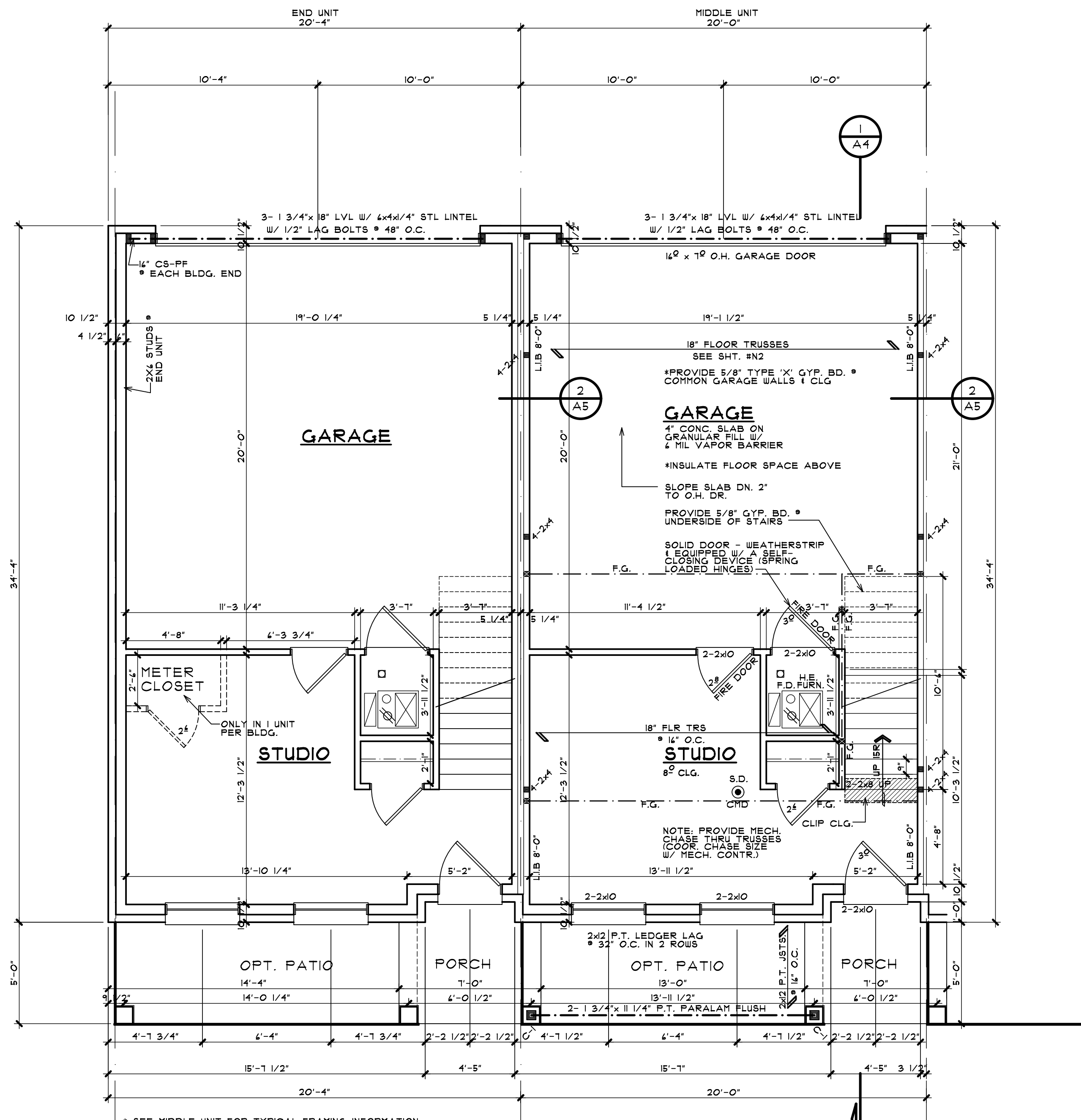


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DESIGN - PLANNING - INTERIORS
650 North Old Woodward, Suite 203
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BRIANNEEPER.COM
248.259.1784

SHEET TITLE
6 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

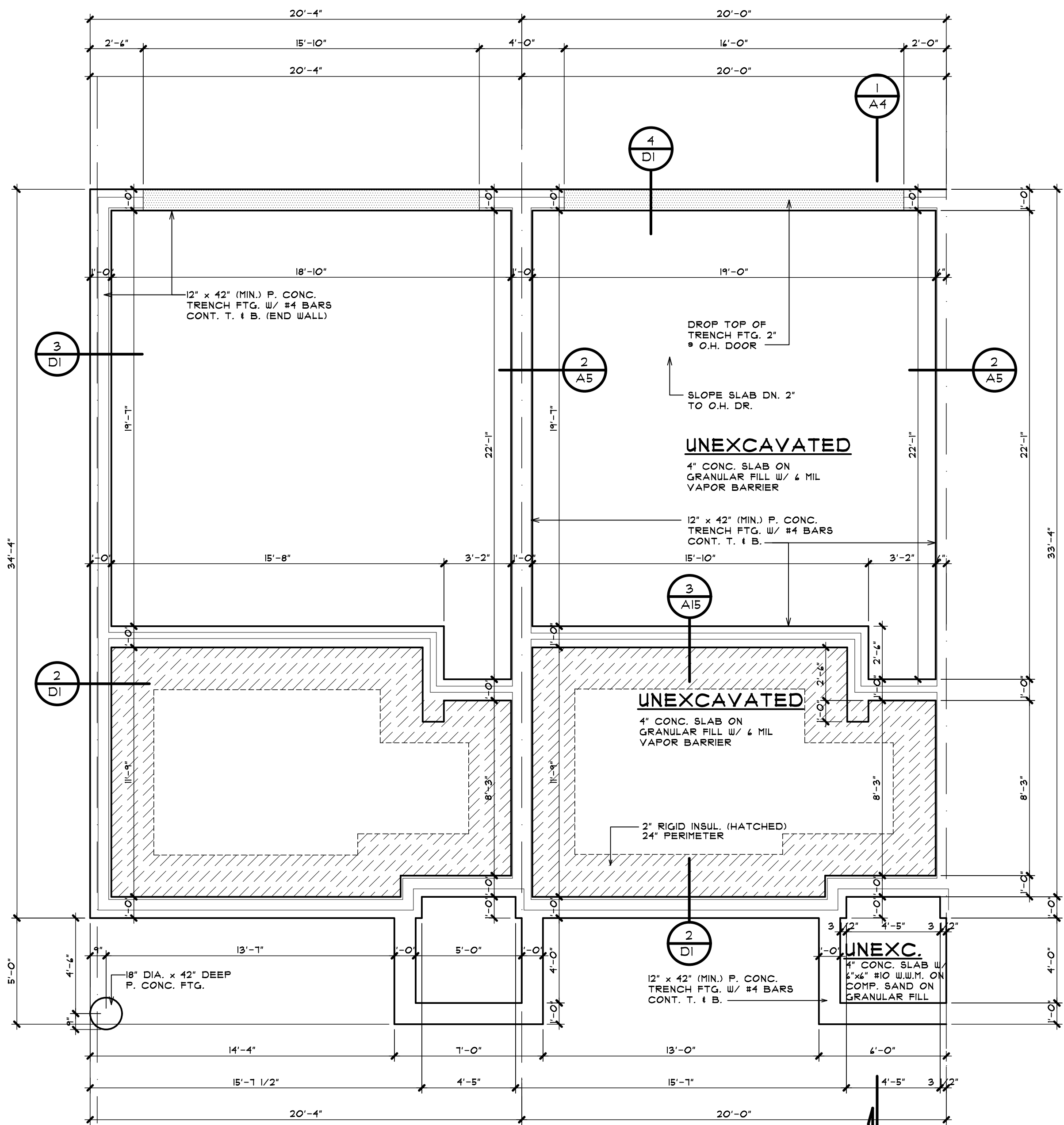
CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
1/2' TOWNHOME UNITS
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-20
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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"

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) 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" (2x4) 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.

STRUCTURAL NOTES:

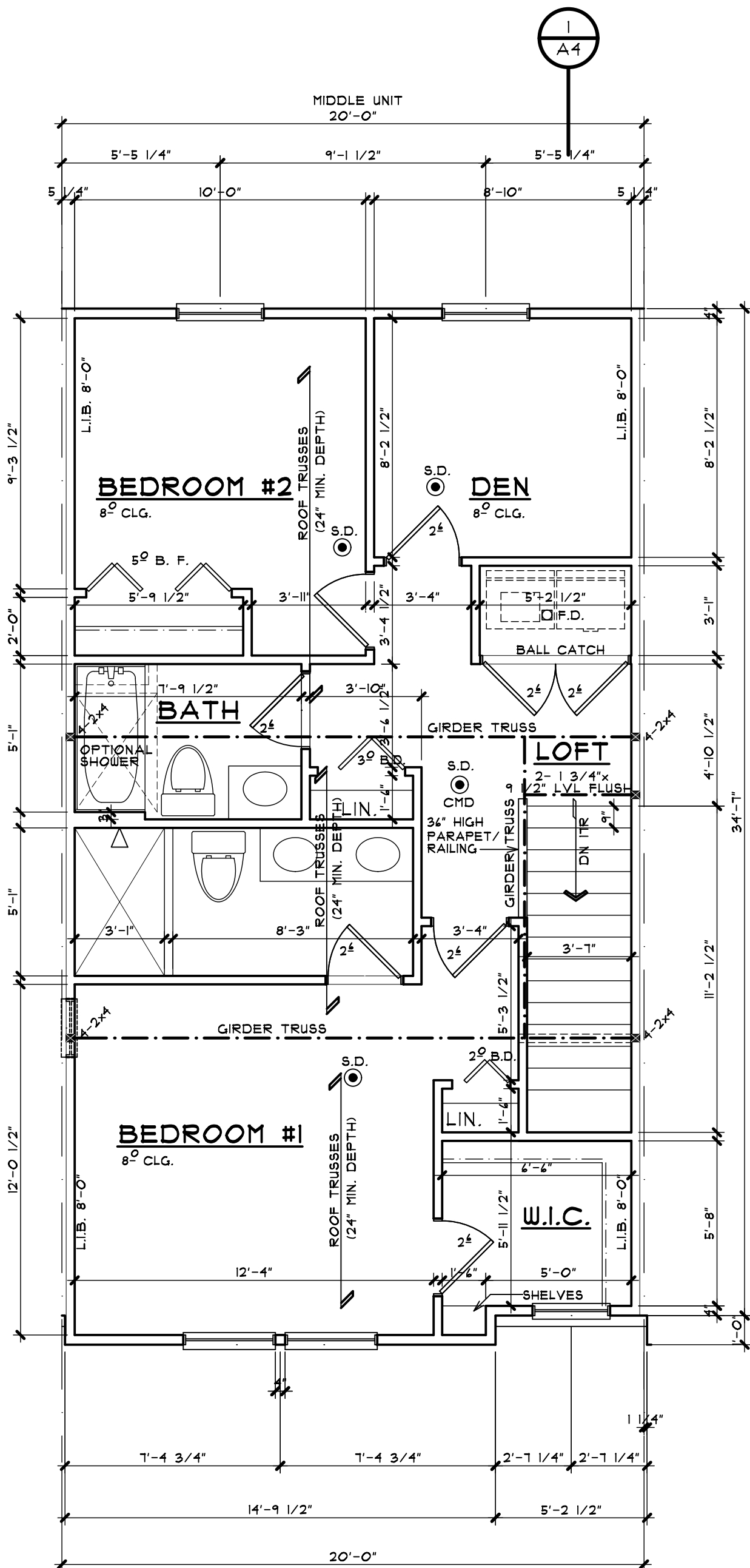
- (2) 2x8 HEADERS TO BEAR ON (1) ONE JACK STUD UNLESS NOTED OTHERWISE.
- (2) 2x10 & LARGER HEADERS TO BEAR ON (2) TWO JACK STUDS UNLESS NOTED OTHERWISE.
- ALL PRE-ENGINEERED HEADERS FRAMED PERPENDICULAR TO WALL LINE SHALL BEAR ON REQUIRED NUMBER OF STUDS TO MATCH WIDTH OF HEADER MATERIAL.
- ALL PRE-ENGINEERED 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.
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- 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 3/2" (2x4) UNLESS NOTED OR DIMENSIONED OTHERWISE. EXTERIOR FRAME WALLS INCLUDE 1/2" NOMINAL DIMENSION FOR EXTERIOR SHEATHING. EXTERIOR FRAME WALLS ARE 4" (2x4) 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

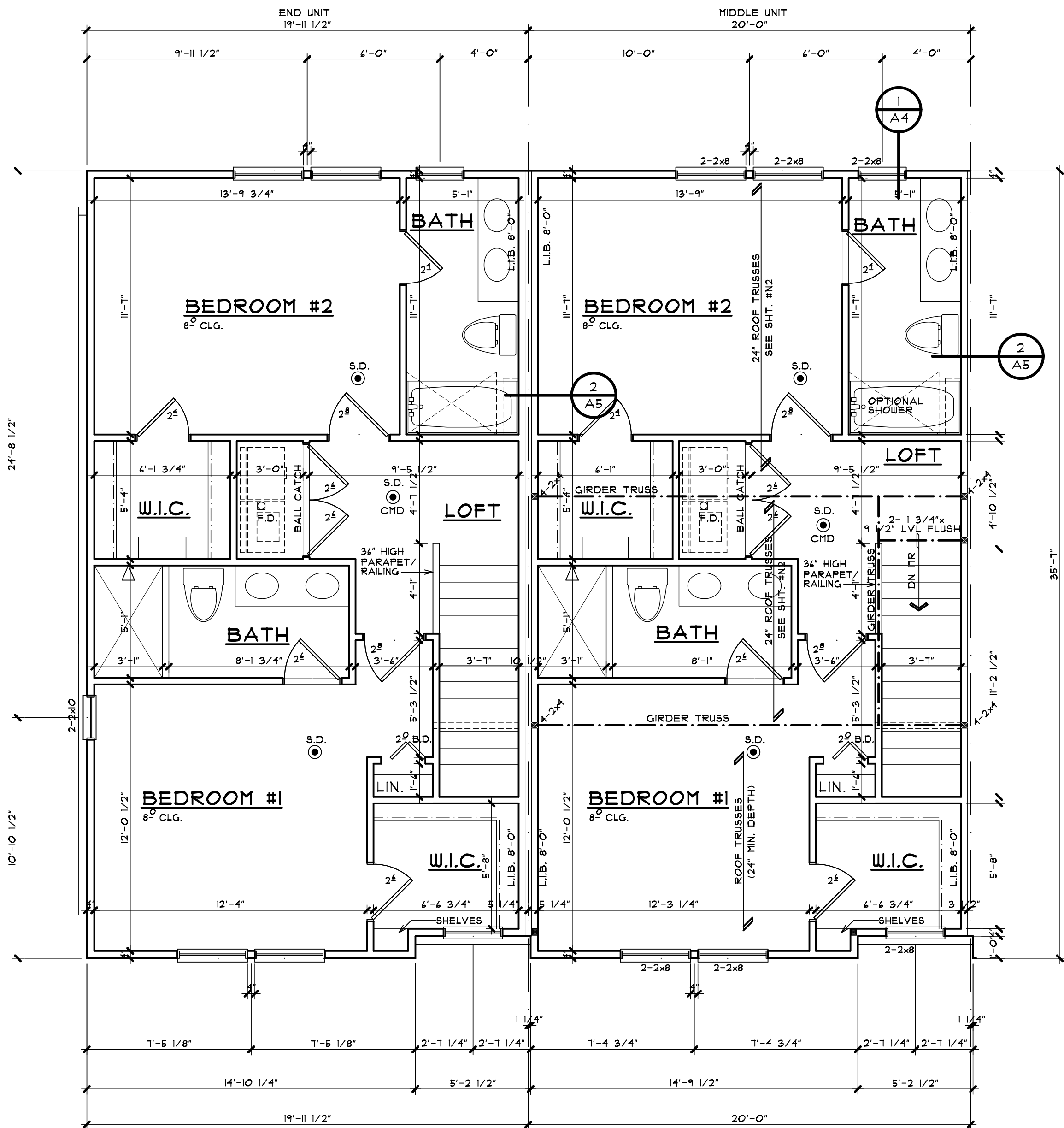
LOWER LEVEL	231 SQ FT
1ST FLOOR	668 SQ FT
2ND FLOOR	101 SQ FT
TOTAL	1,612 SQ FT



SECOND FLOOR PLAN

2 BEDROOM/DEN

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

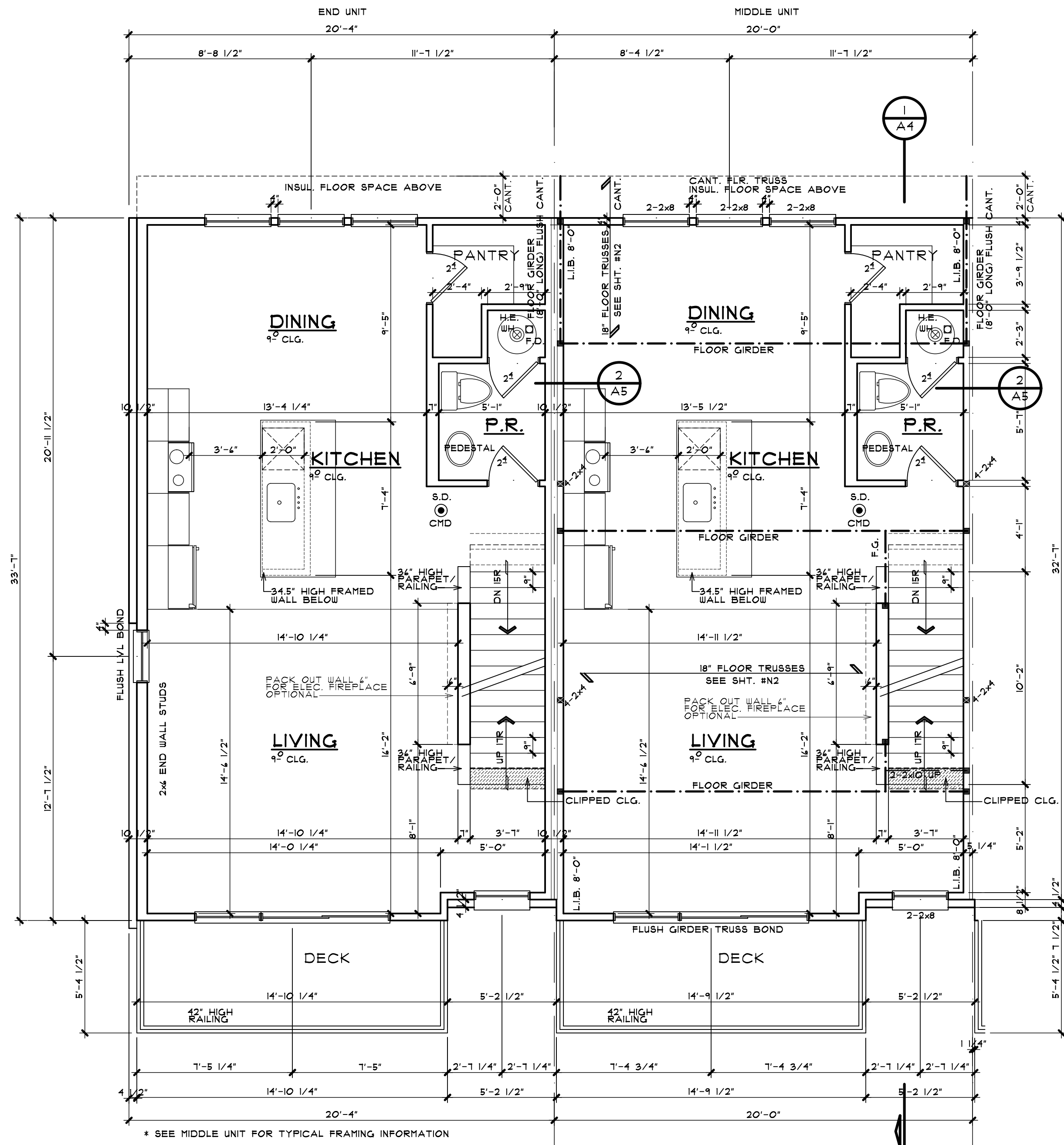


* SEE MIDDLE UNIT FOR TYPICAL FRAMING INFORMATION

SECOND FLOOR PLAN

2 BEDROOM

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

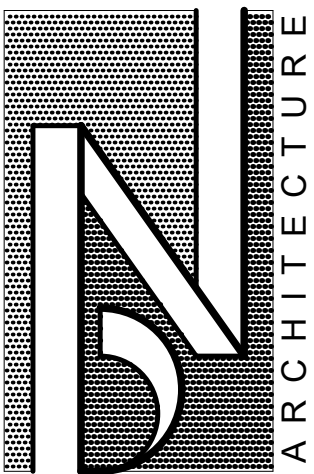


* SEE MIDDLE UNIT FOR TYPICAL FRAMING INFORMATION

FIRST FLOOR PLAN

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

WALL BRACING METHOD:
USP (WOOD STRUCTURAL
AT ALL EXTERIOR WALLS
UNLESS NOTED OTHERWISE



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SHEET TITLE
FIRST FLOOR PLAN
SECOND FLOOR PLAN
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY
BIDS
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A-2

WINDOW SILLS

IN DWELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 12" 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 2" 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.

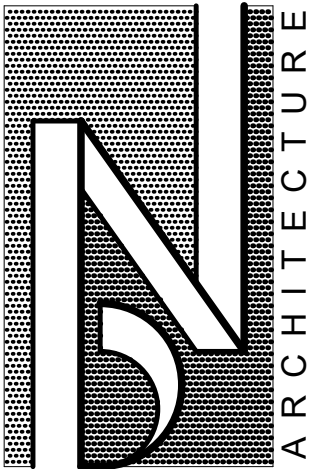


SIDE ELEVATION

OPPOSITE HAND REVERSE
SCALE: 1/4" = 1'-0"

FRONT ELEVATION

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



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SHEET TITLE
ELEVATIONS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	
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SHEET NUMBER
A-3

WINDOW SILLS

IN DWELLING UNITS, WHERE THE OPENING OF AN OPERABLE WINDOW IS LOCATED MORE THAN 12" 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:

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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.

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STEEL LINTEL SCHEDULE

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

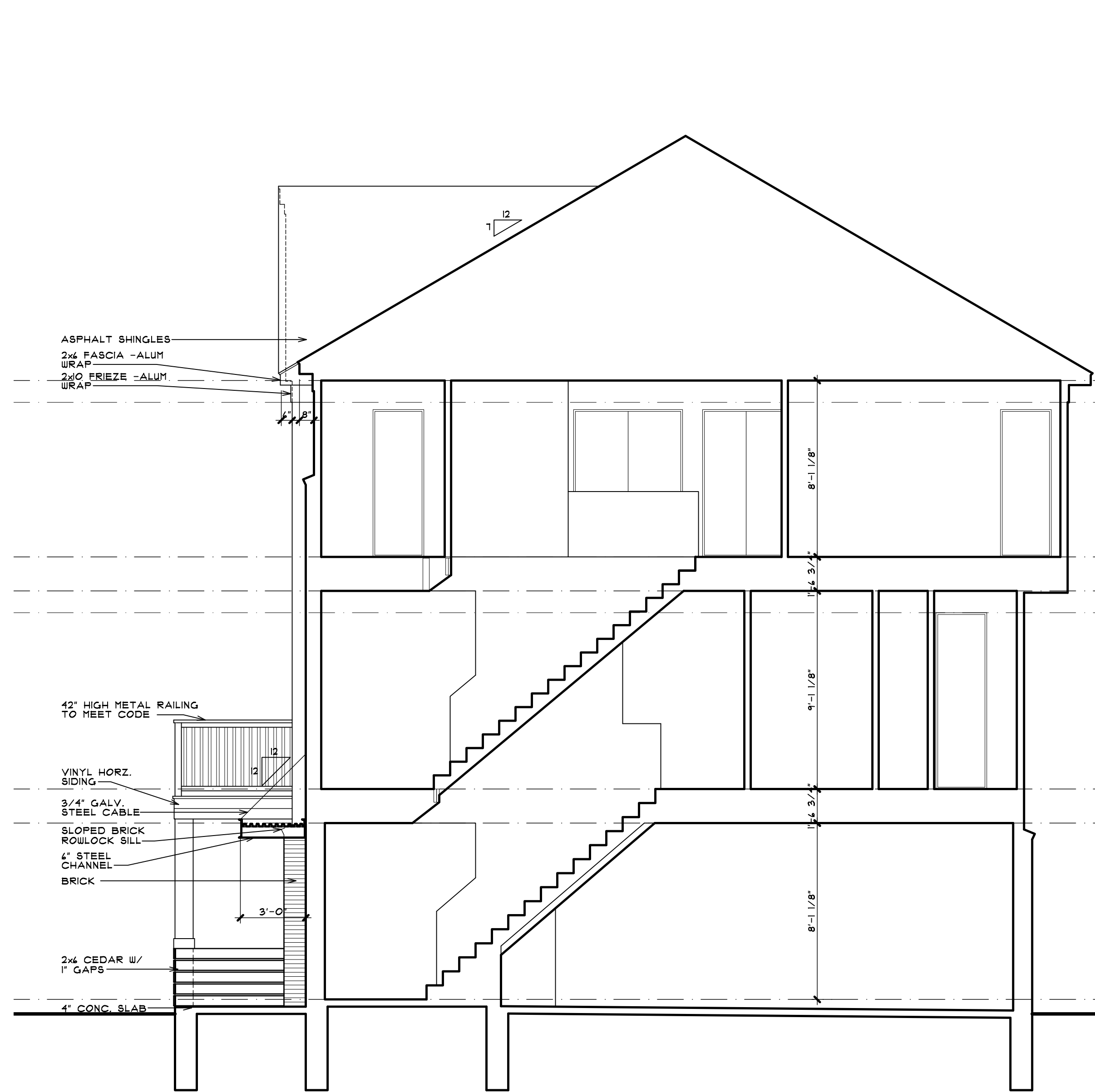
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1

A5

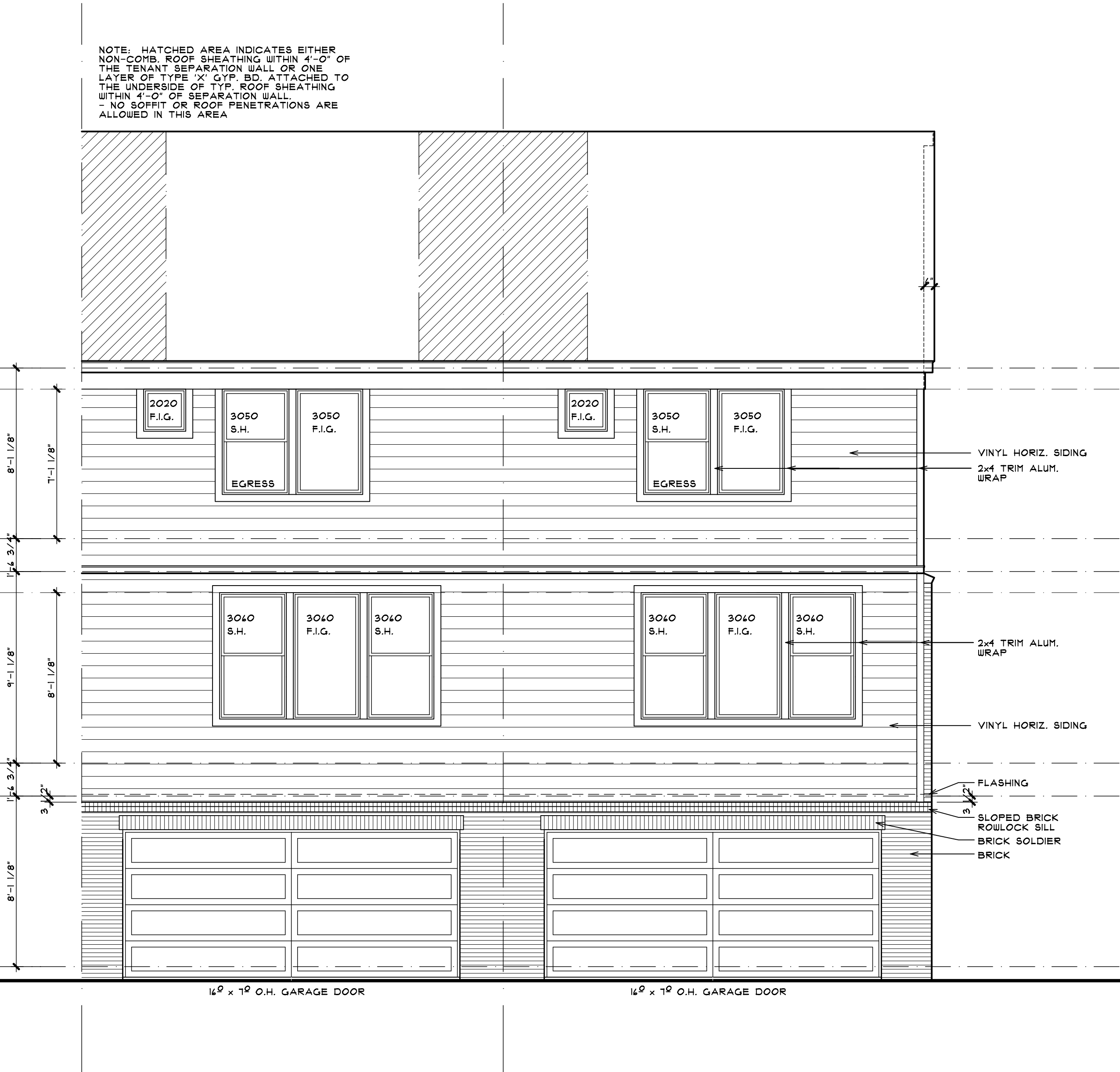
BUILDING SECTION

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



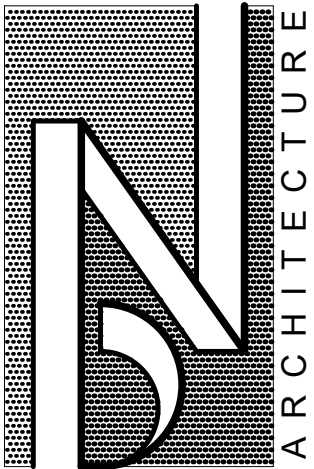
ALT. REAR ELEVATION

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



REAR ELEVATION

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



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SHEET TITLE

ELEVATIONS

WALL SECTION

PRELIMINARY

CLIENT / PROJECT

ROBERTSON HOMES

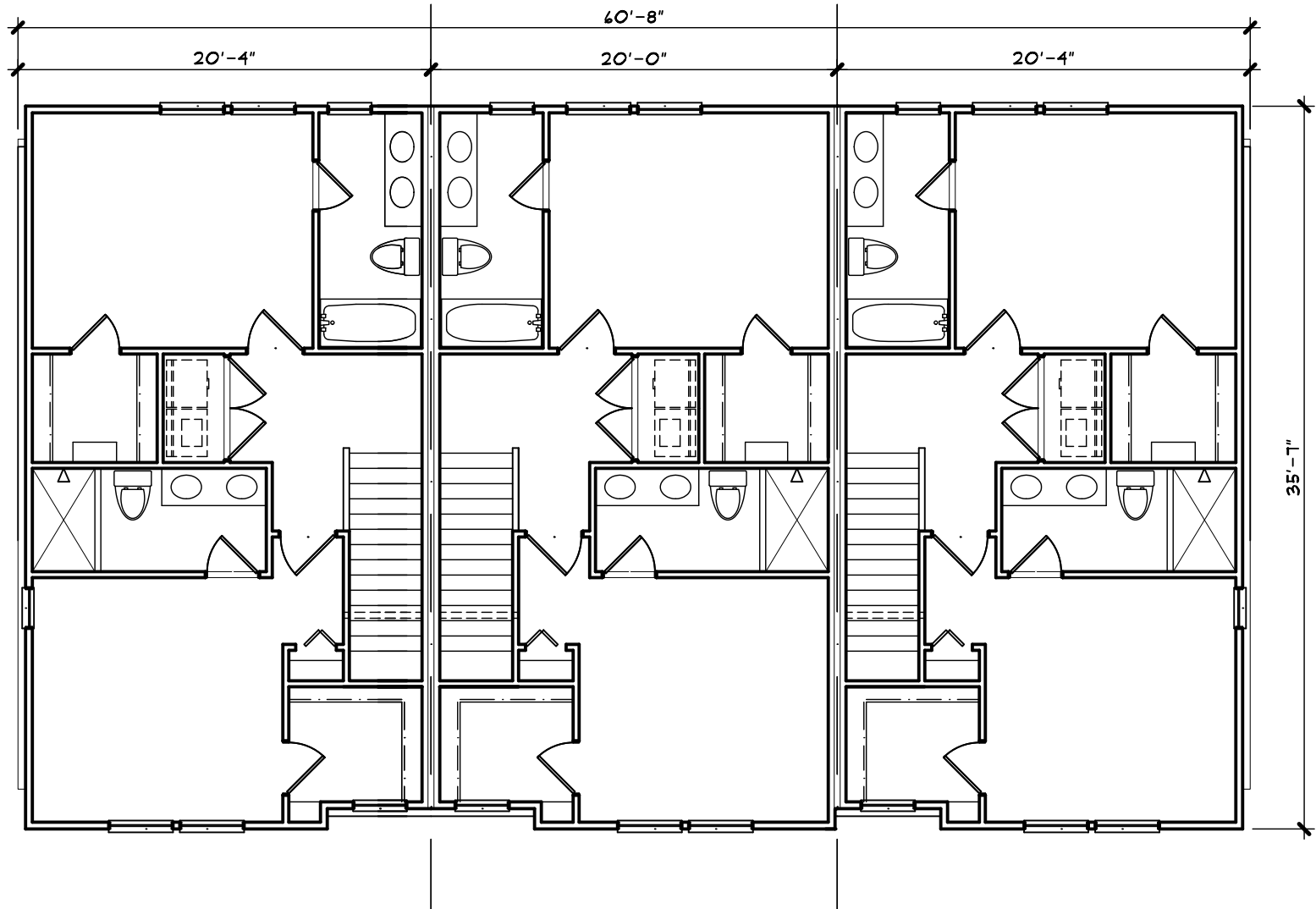
HUDSON TOWNS

20' TOWNHOUSE UNIT

SOUTH LYON, MICHIGAN

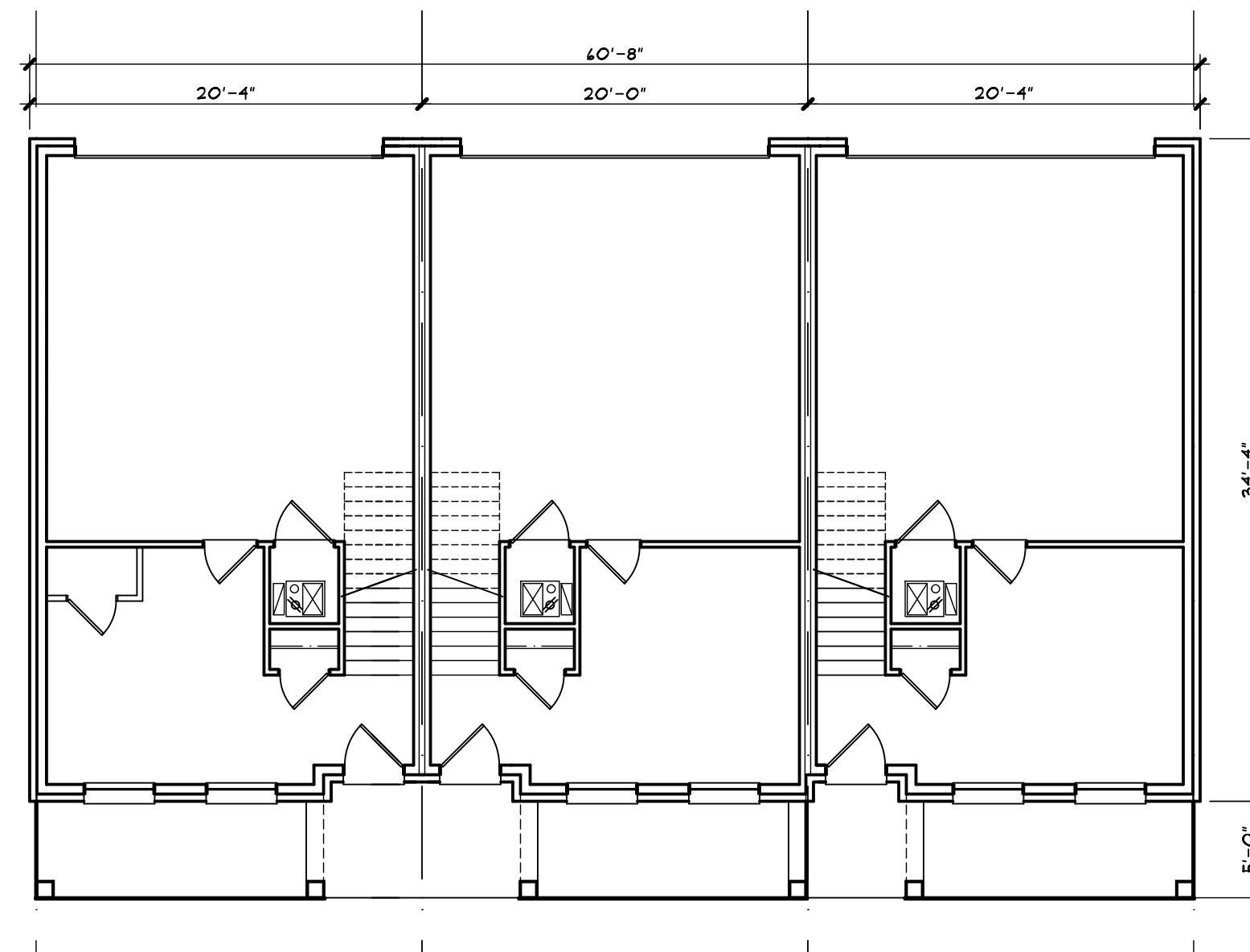
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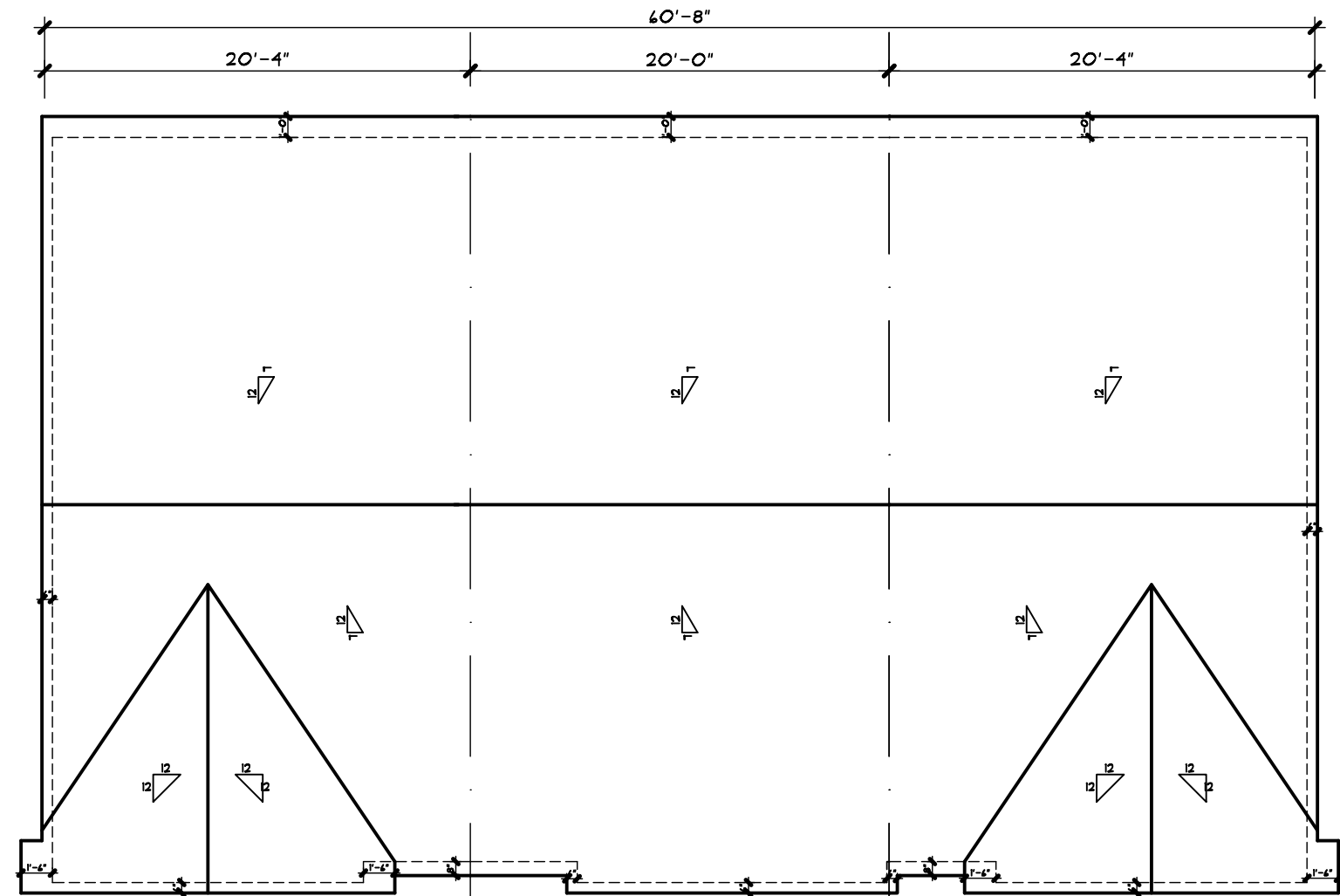
SECOND FLOOR PLAN
3 UNIT BUILDING

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



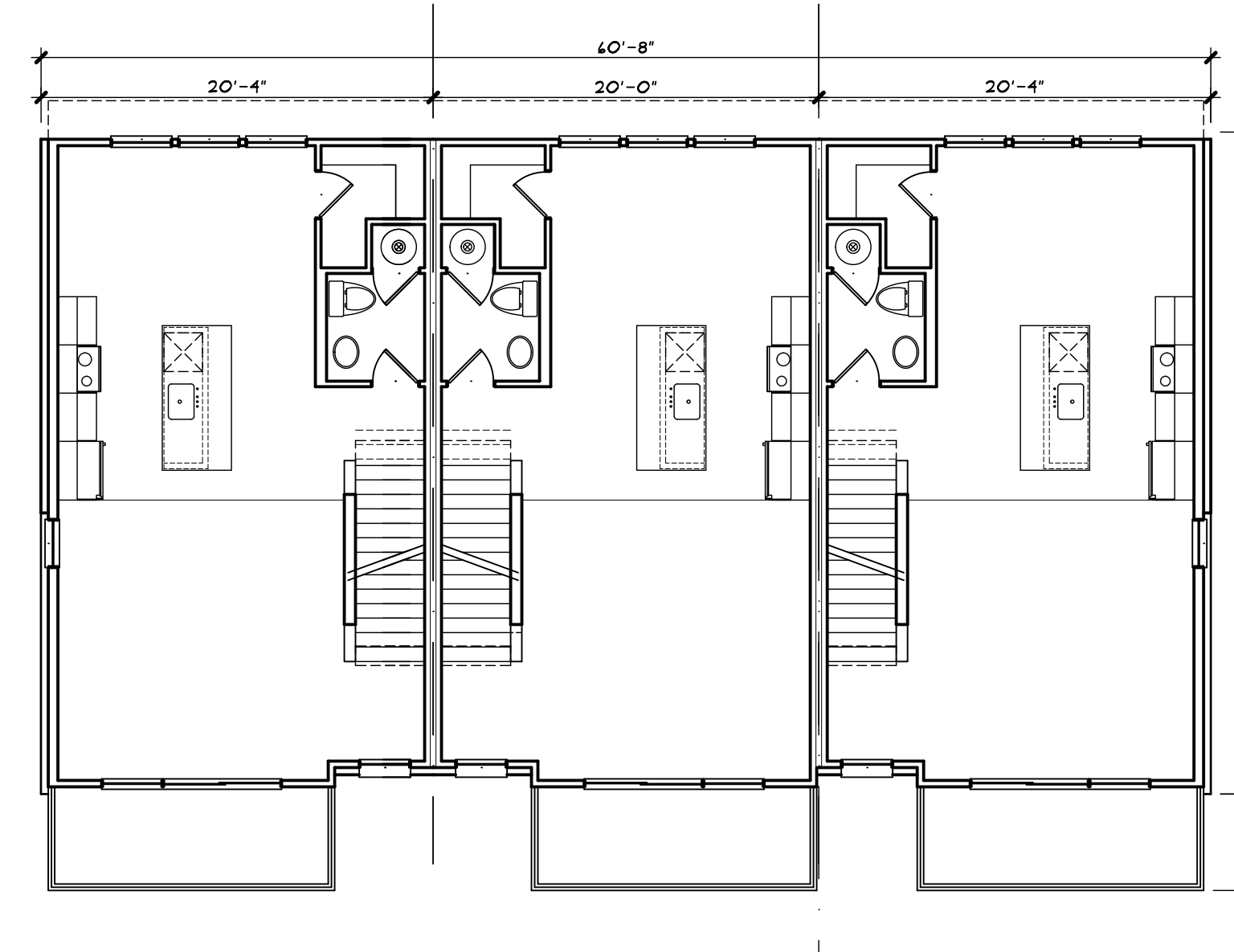
LOWER LEVEL PLAN
3 UNIT BUILDING

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



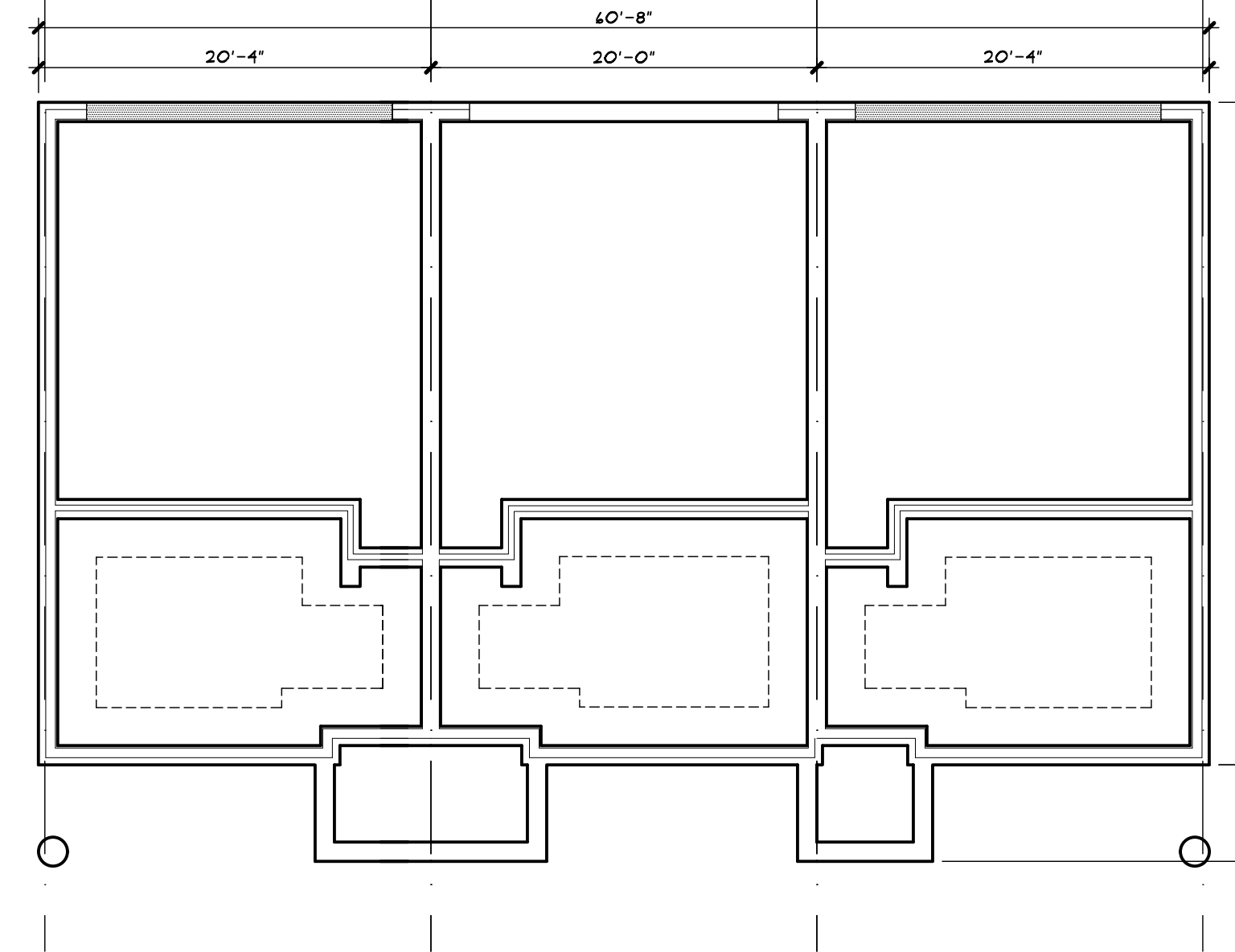
ROOF PLAN
3 UNIT BUILDING

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



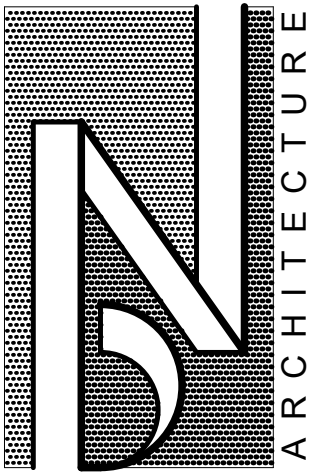
FIRST FLOOR PLAN
3 UNIT BUILDING

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



FOUNDATION PLAN
3 UNIT BUILDING

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



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BUILDING PLANS
PRELIMINARY

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ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
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LEFT SIDE ELEVATION

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



RIGHT SIDE ELEVATION

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



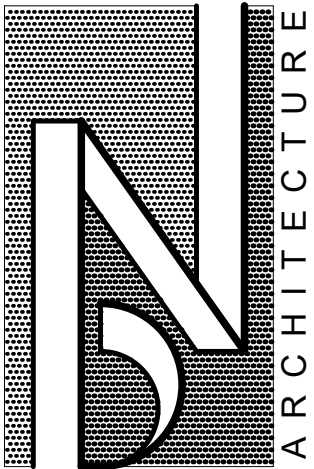
FRONT ELEVATION
3 UNIT BUILDING

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



REAR ELEVATION
3 UNIT BUILDING

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



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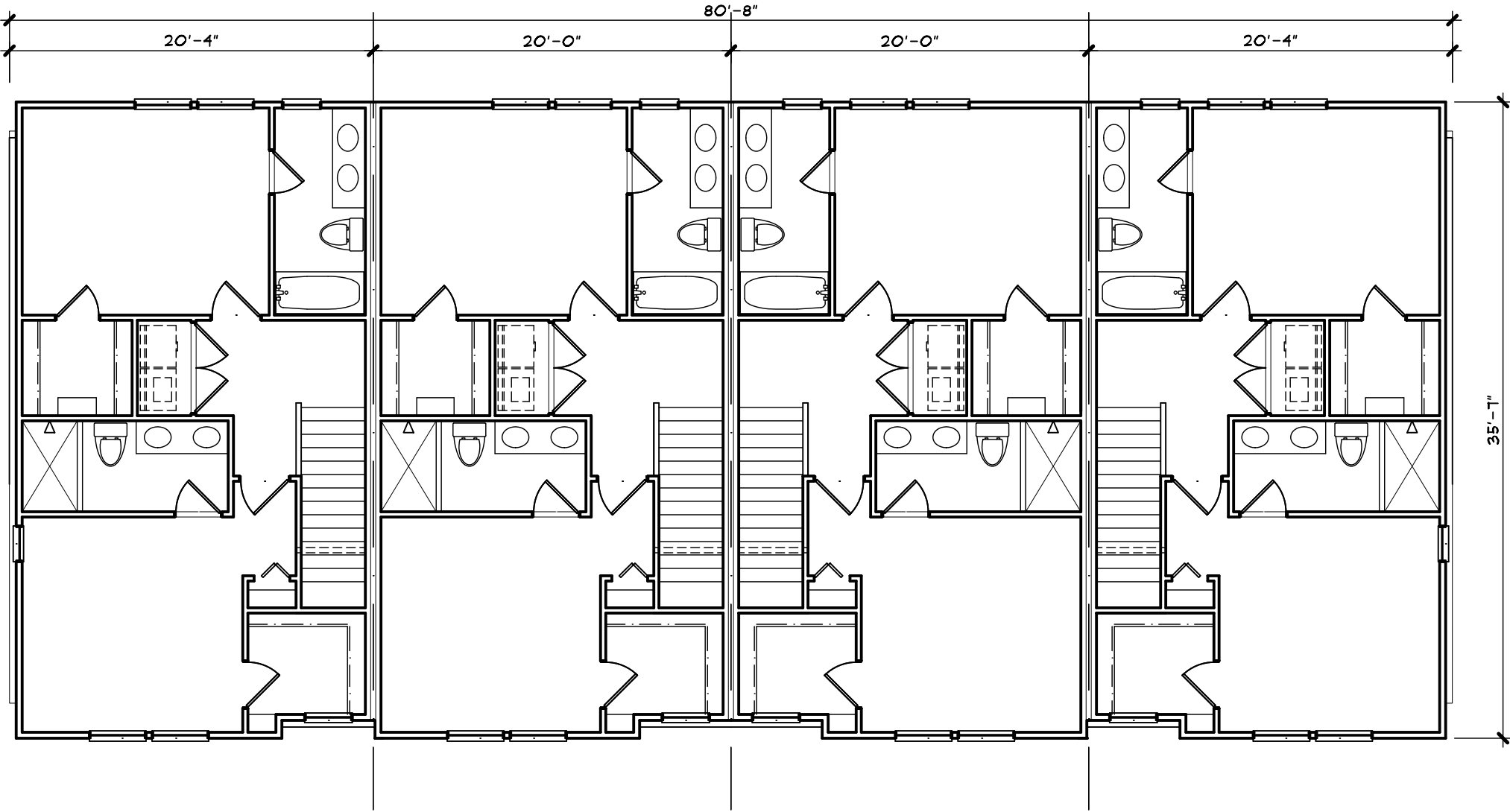
SHEET TITLE
3 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

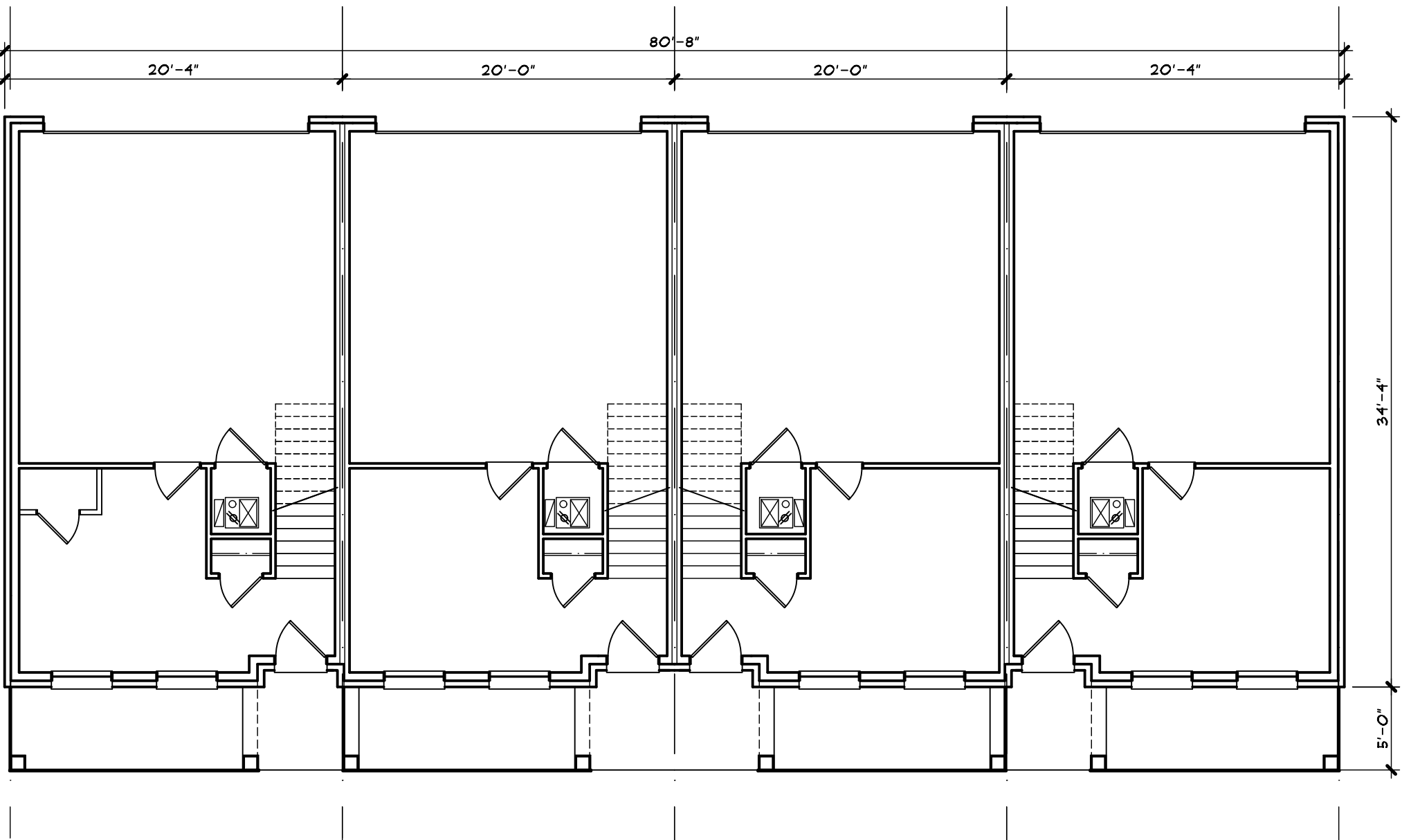
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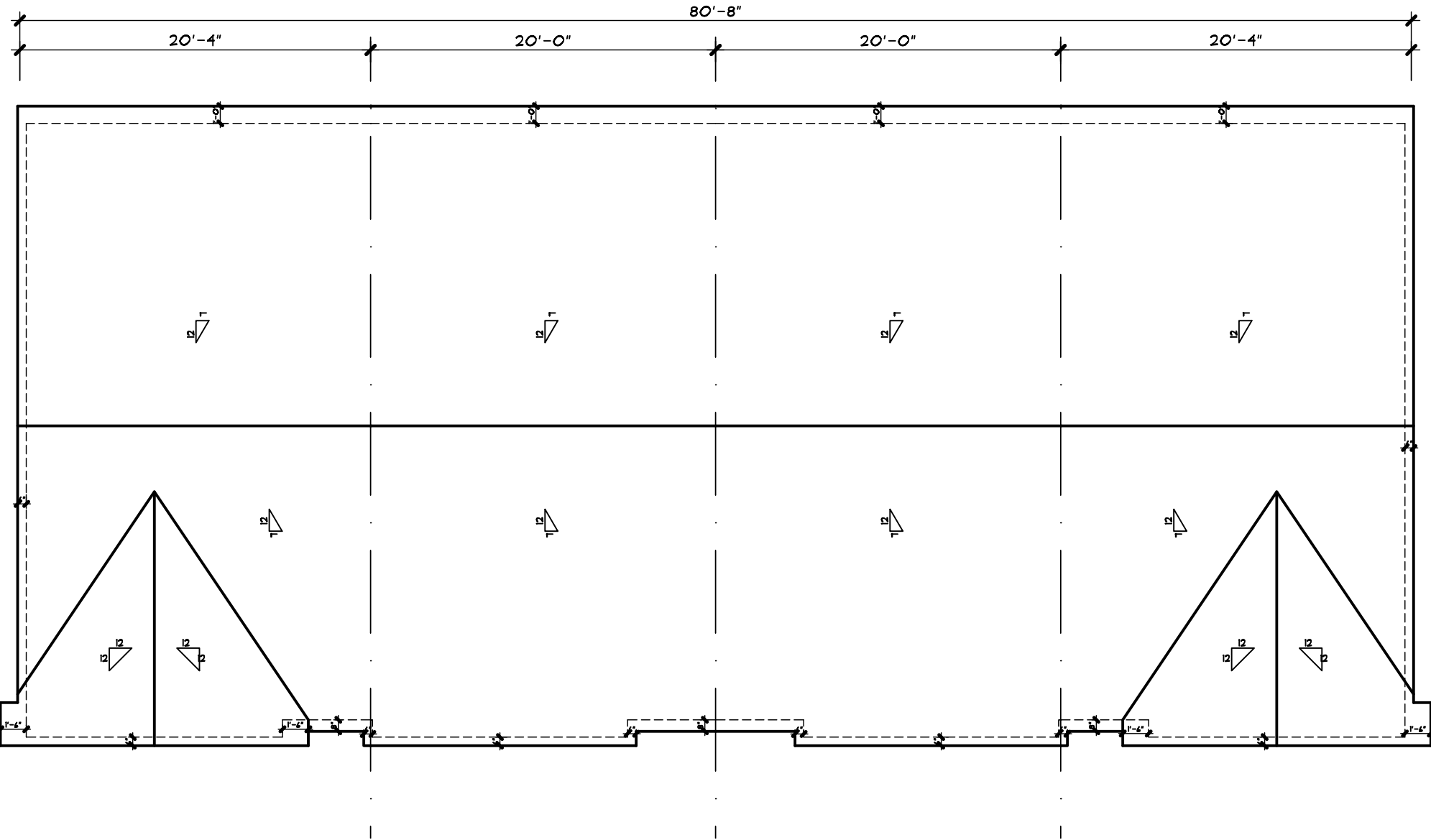
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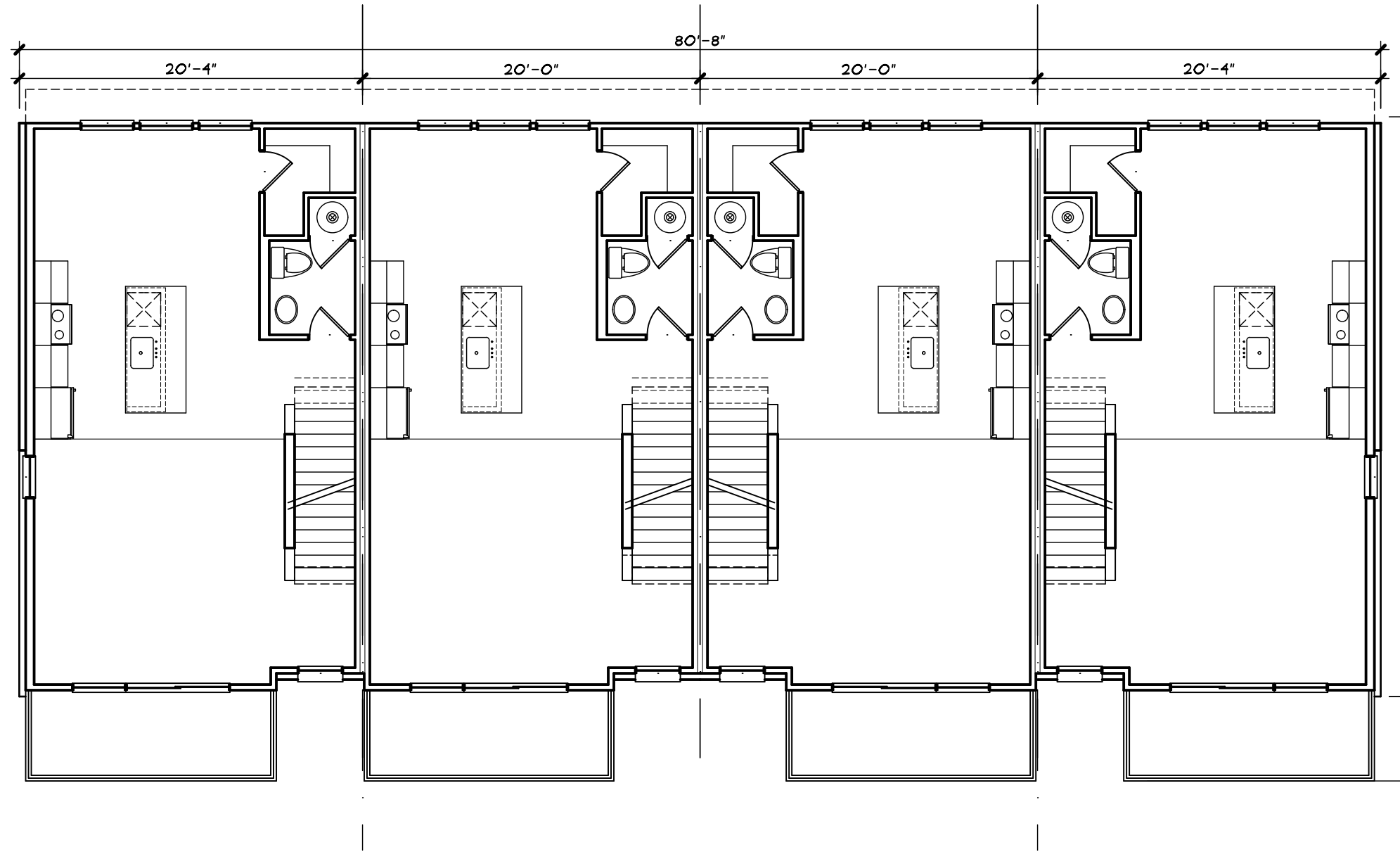
SECOND FLOOR PLAN
4 UNIT BUILDING



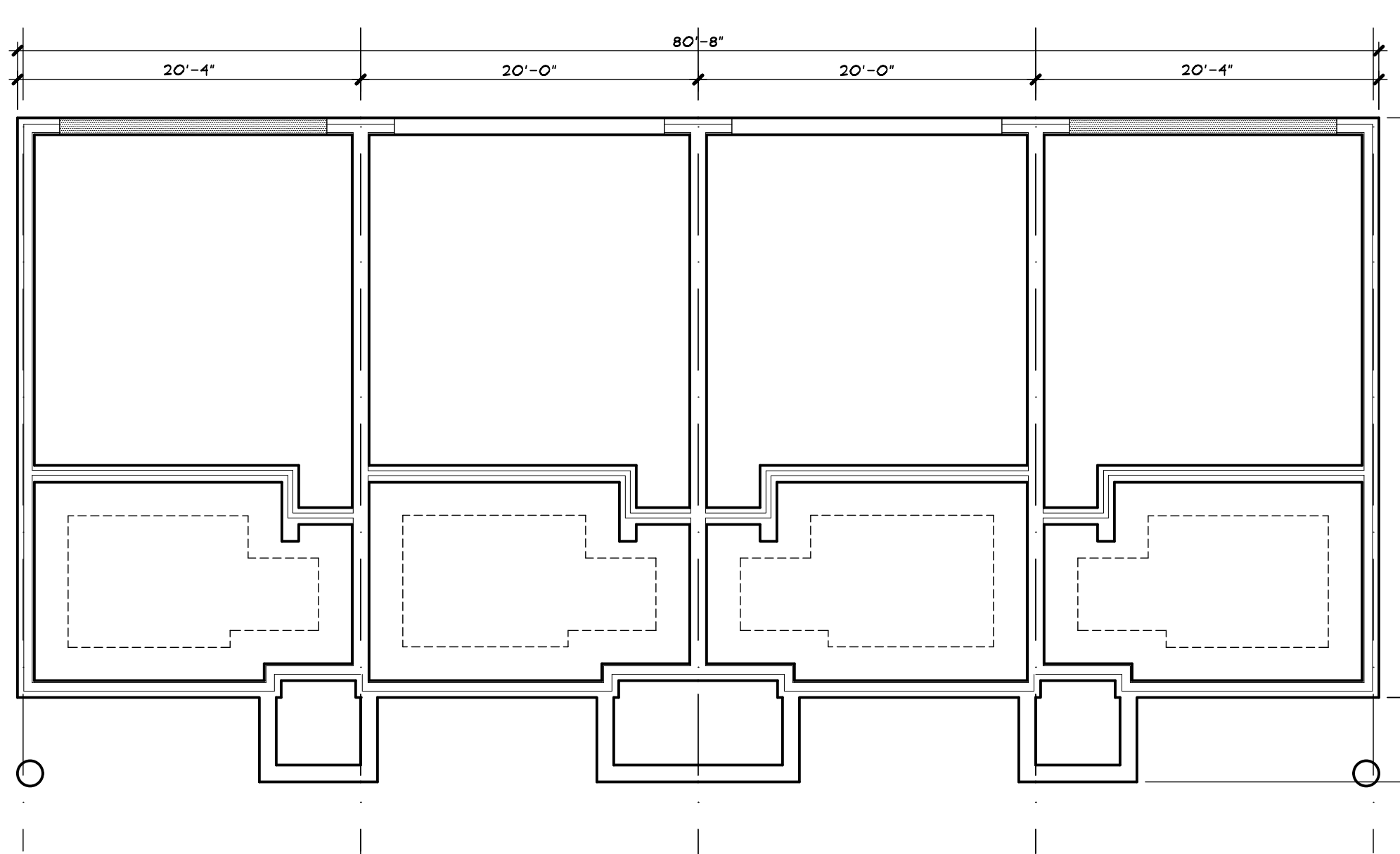
LOWER LEVEL PLAN
4 UNIT BUILDING



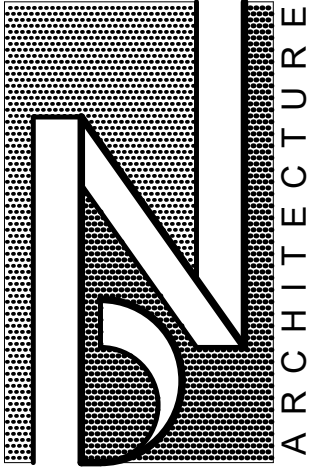
ROOF PLAN
4 UNIT BUILDING



FIRST FLOOR PLAN
4 UNIT BUILDING



FOUNDATION PLAN
4 UNIT BUILDING



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4 UNIT BUILDING
BUILDING PLANS
PRELIMINARY

ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

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REAR ELEVATION
4 UNIT BUILDING

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



LEFT SIDE ELEVATION

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



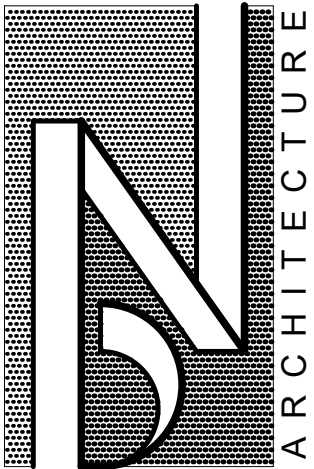
RIGHT SIDE ELEVATION

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



FRONT ELEVATION
4 UNIT BUILDING

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



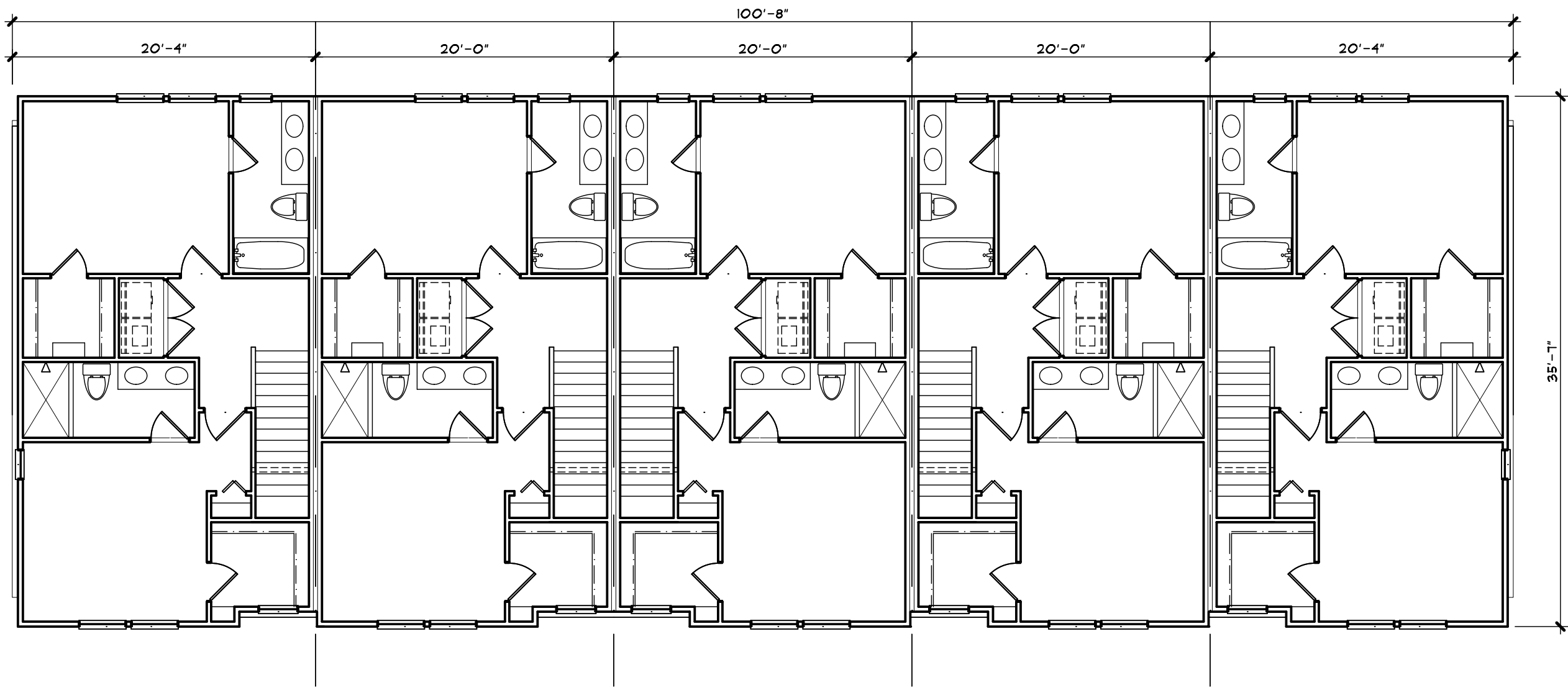
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SHEET TITLE
4 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

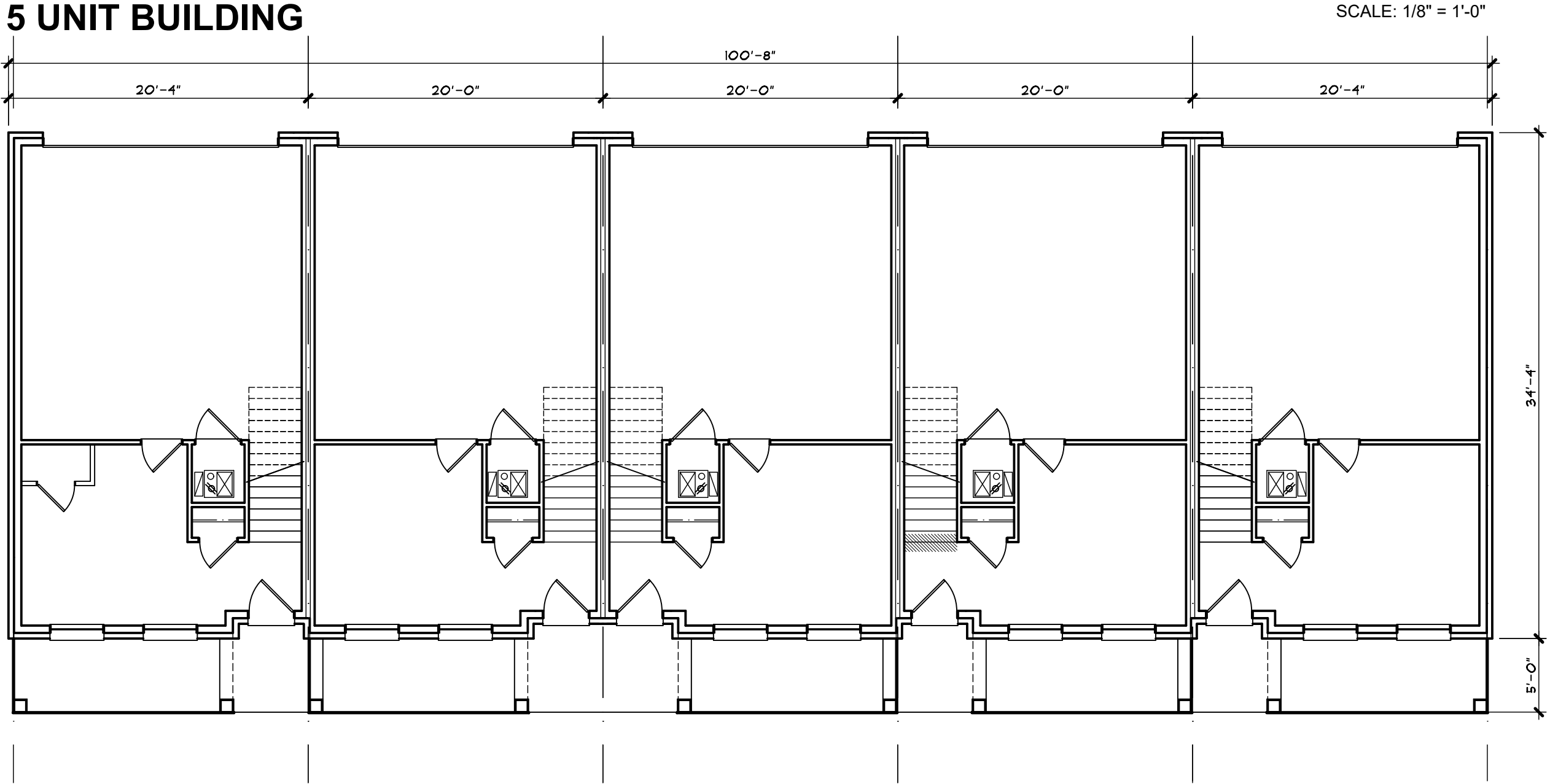
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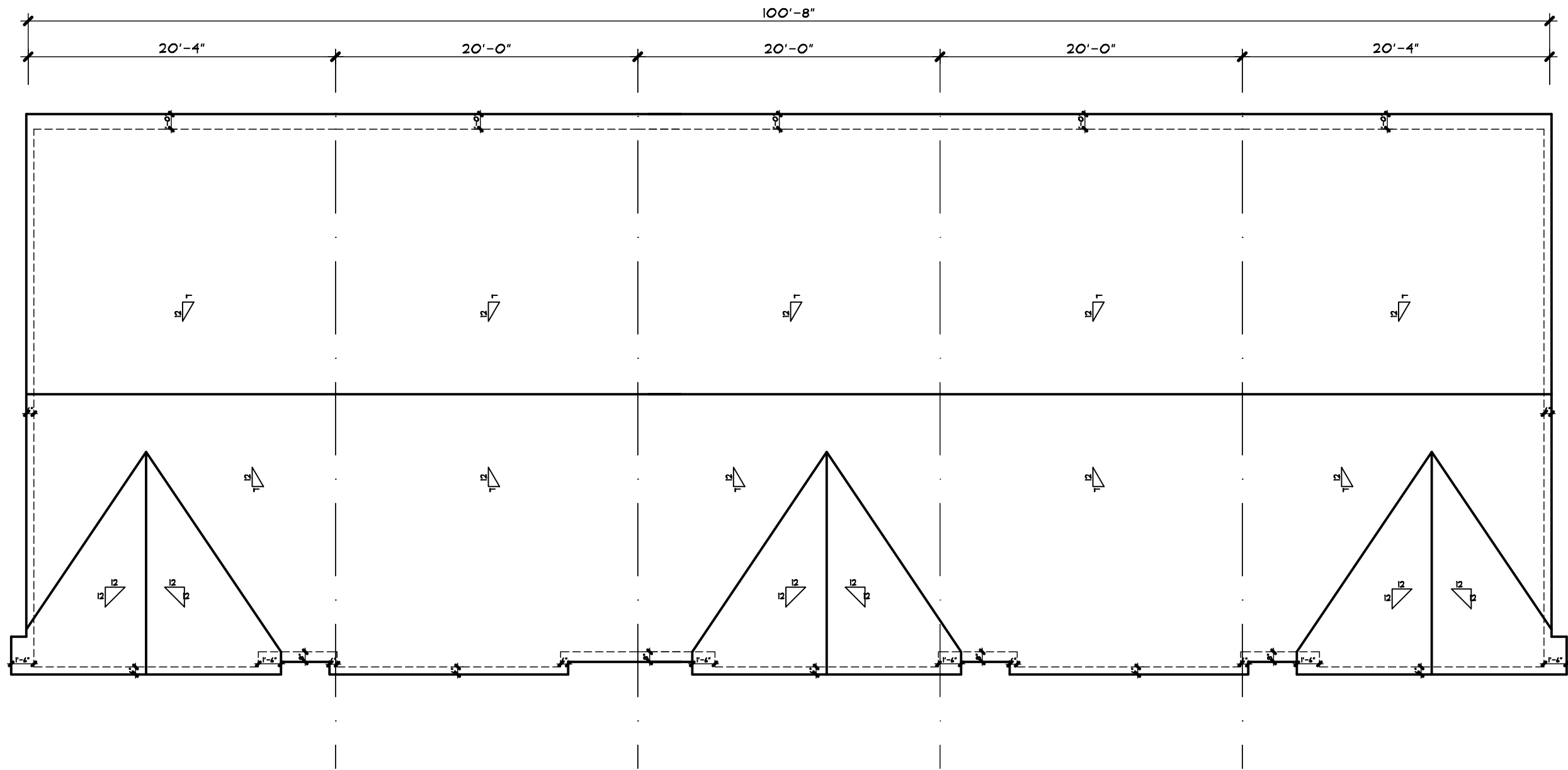
SHEET NUMBER
A-9



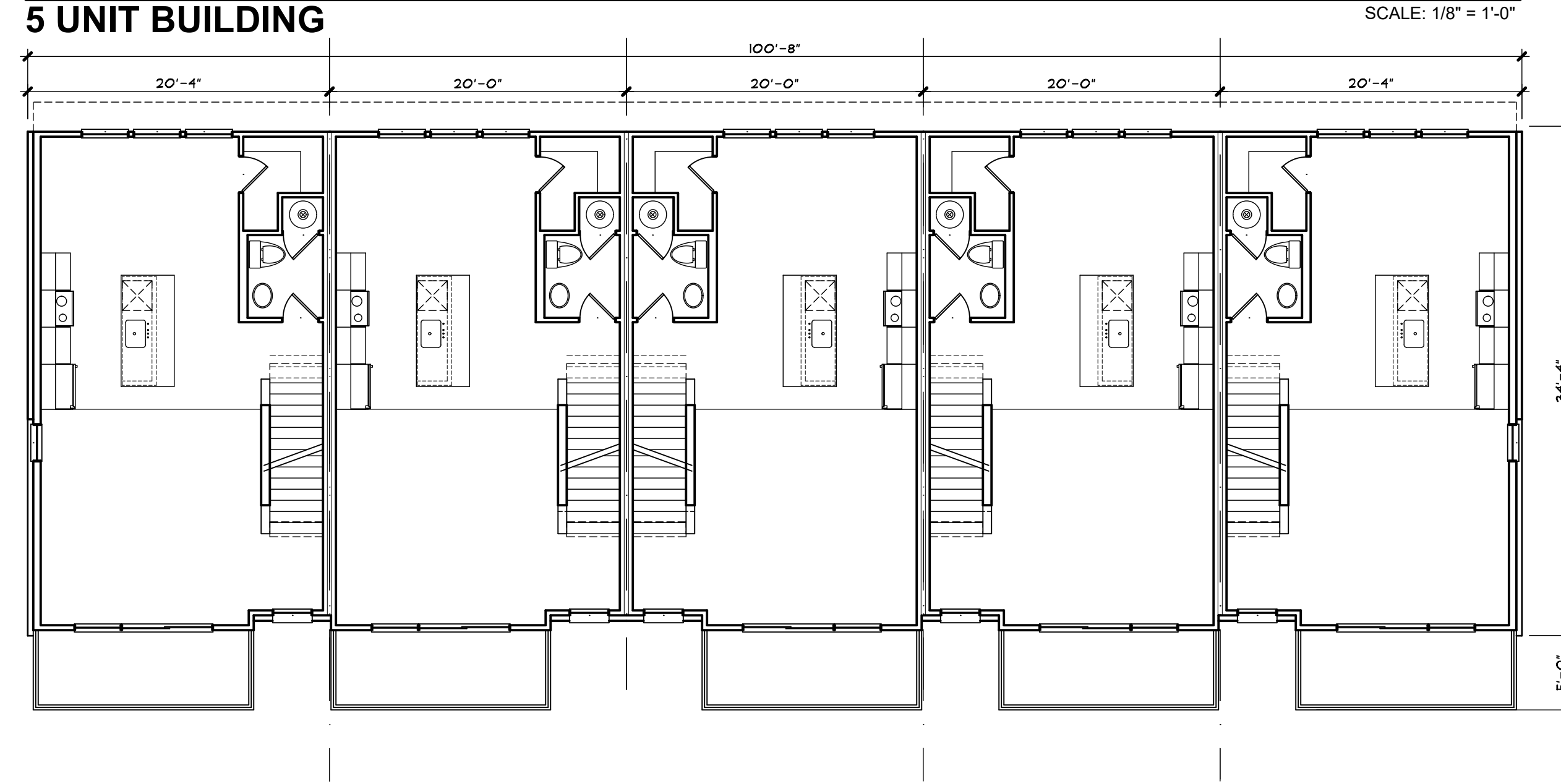
SECOND FLOOR PLAN
5 UNIT BUILDING



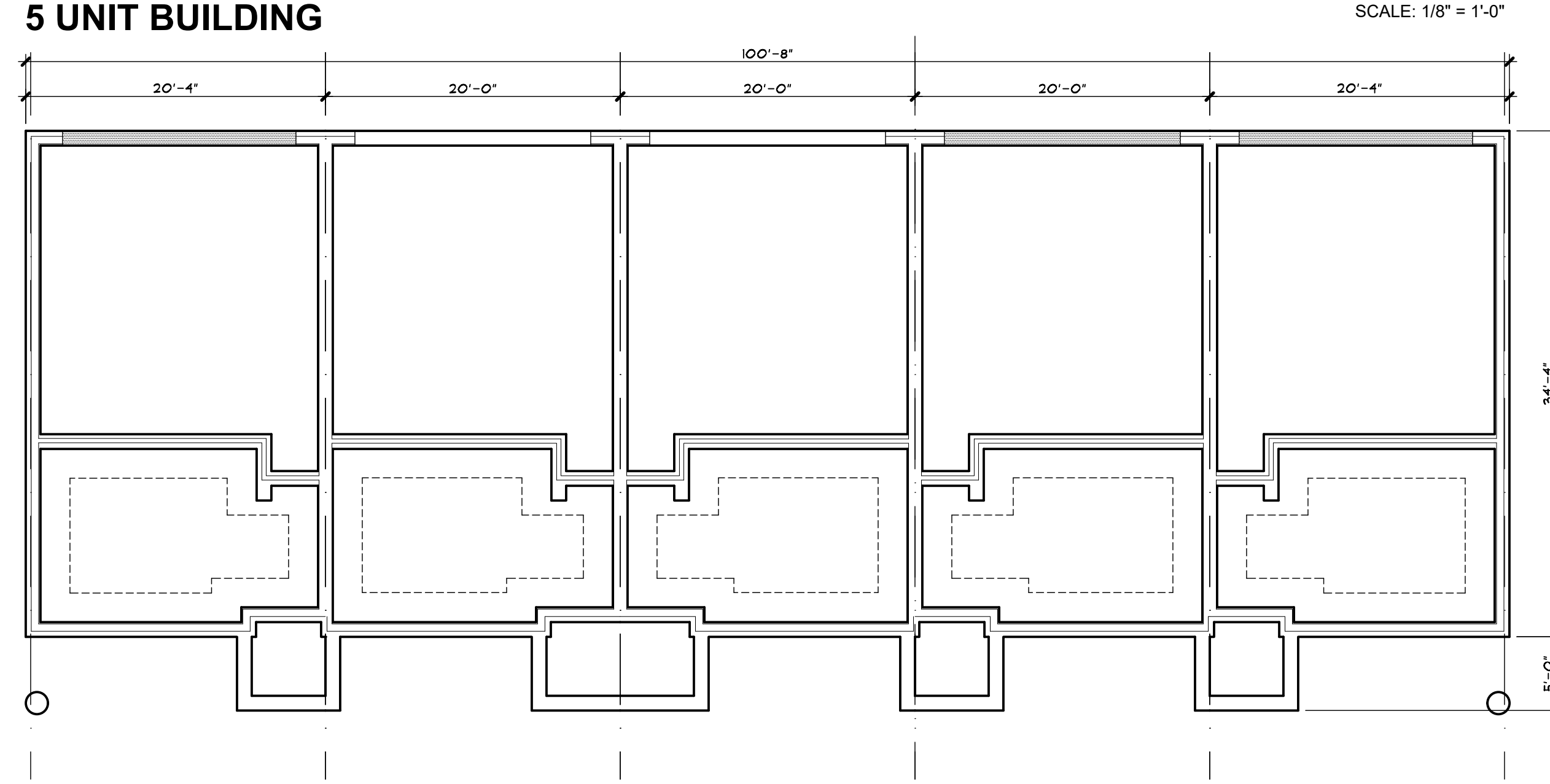
LOWER LEVEL PLAN
5 UNIT BUILDING



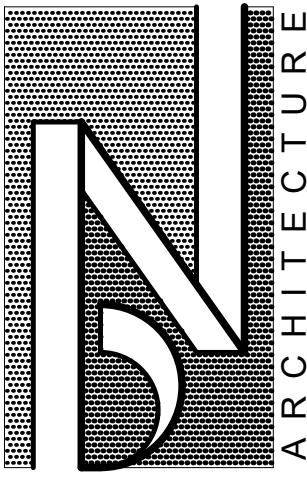
ROOF PLAN
5 UNIT BUILDING



FIRST FLOOR PLAN
5 UNIT BUILDING



FOUNDATION PLAN
5 UNIT BUILDING

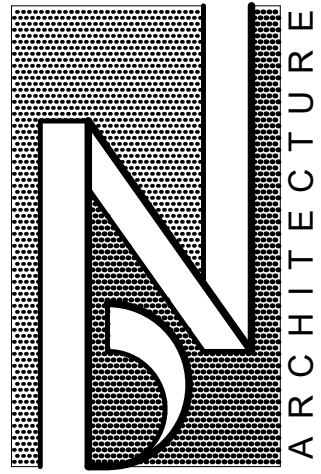
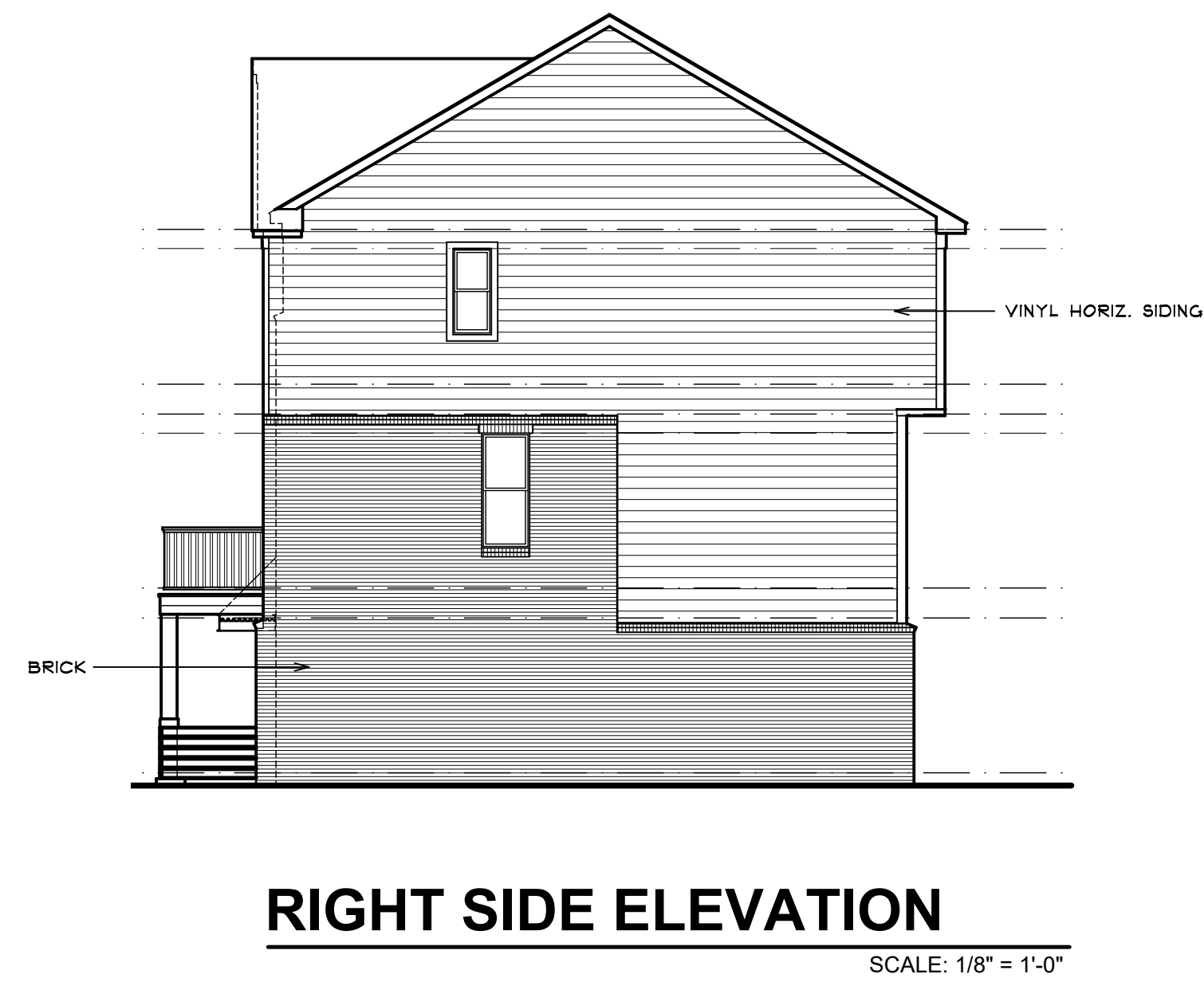
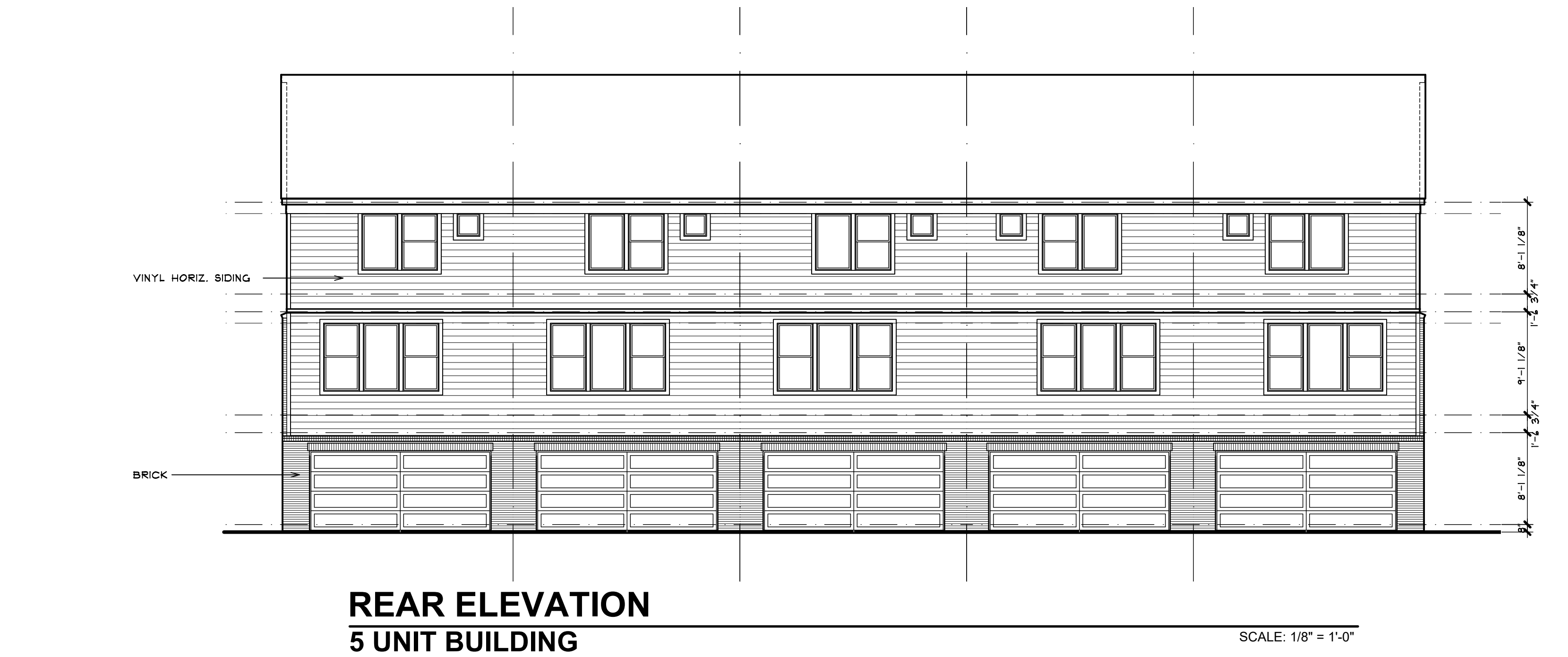


BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248.259.1784

5 UNIT BUILDING
BUILDING PLANS
PRELIMINARY

ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	
COPYRIGHT 2021 BRIAN NEEPER ARCHITECTURE P.C.	
JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	
SHEET NUMBER	A-10



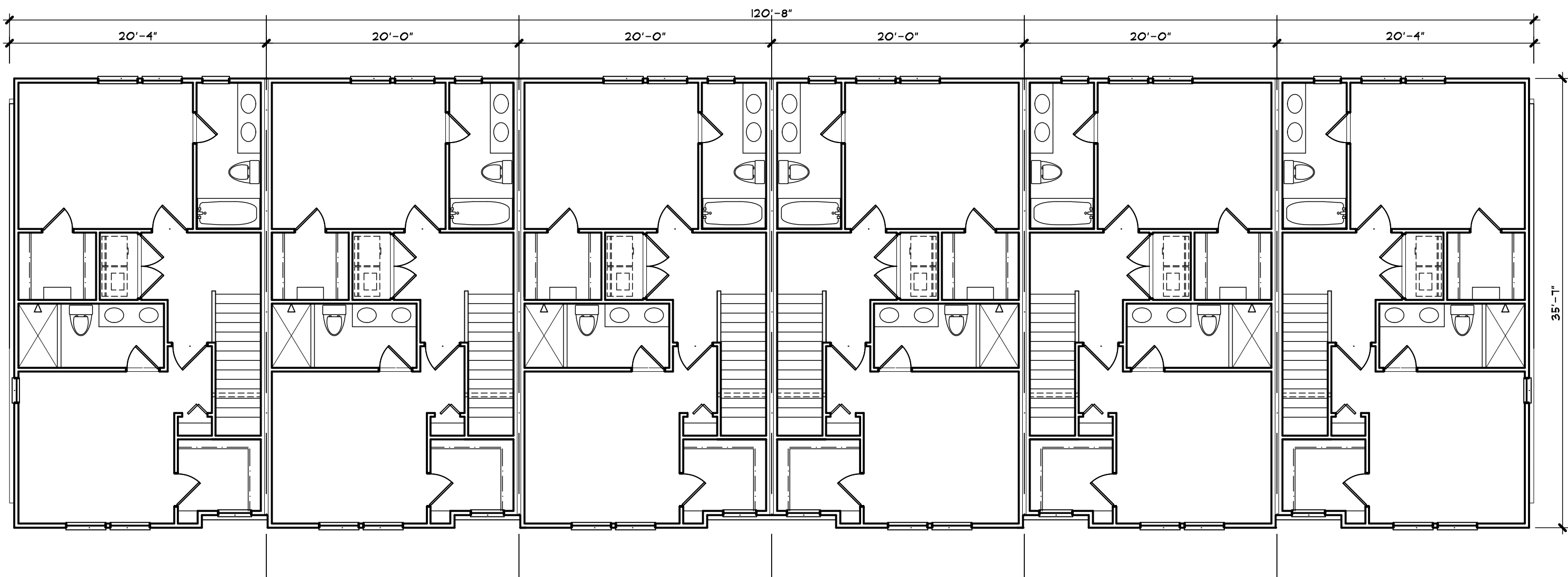
BRIAN NEEPER ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEPER.COM
248.259.1784

SHEET TITLE
5 UNIT BUILDING
BUILDING ELEVATIONS
PRELIMINARY

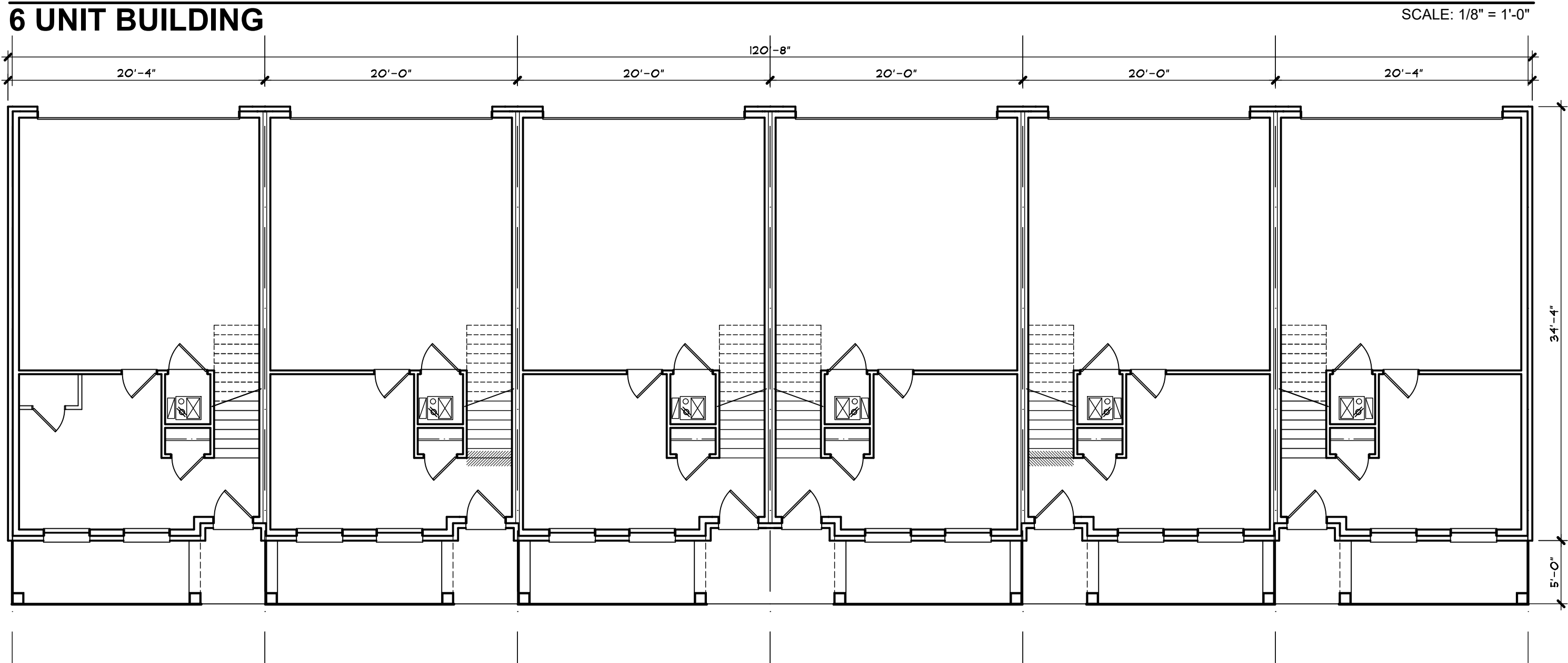
CLIENT / PROJECT
ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	
COPYRIGHT 2021 BRIAN NEEPER ARCHITECTURE P.C.	
JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	

SHEET NUMBER
A-11

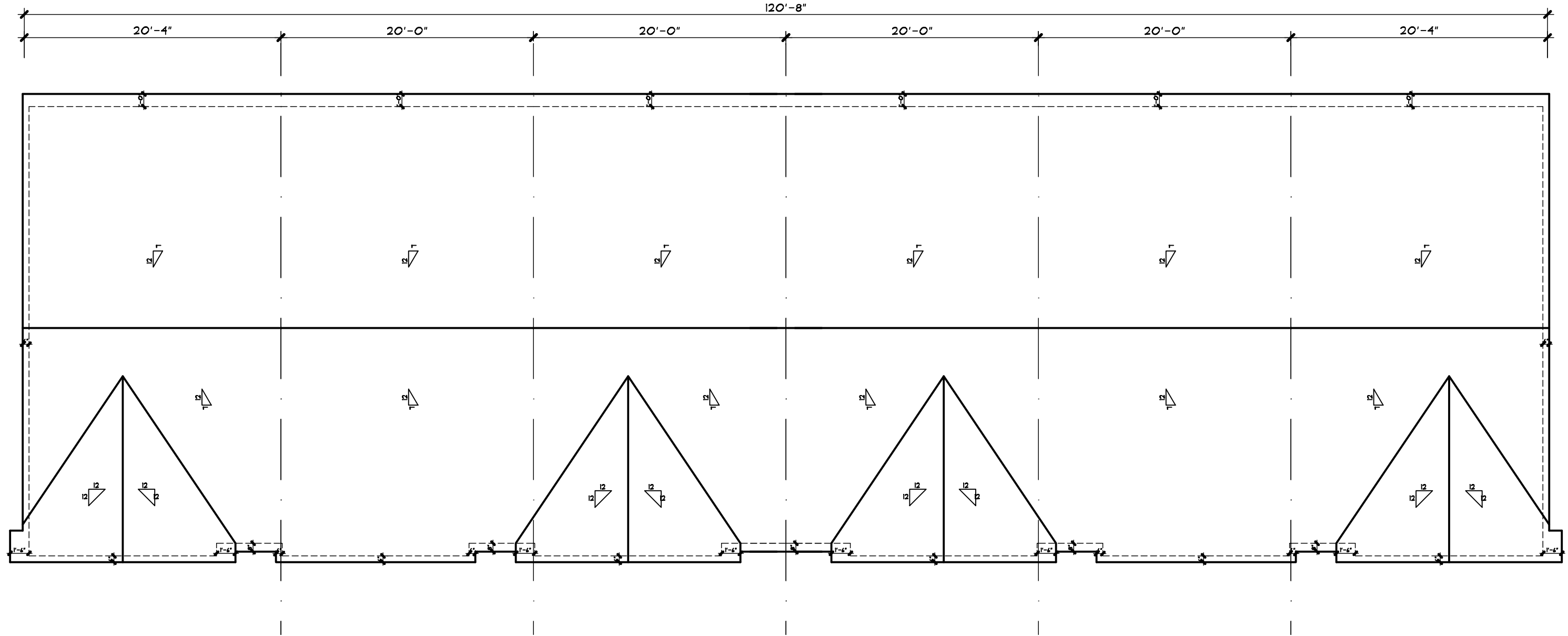


SECOND FLOOR PLAN
6 UNIT BUILDING

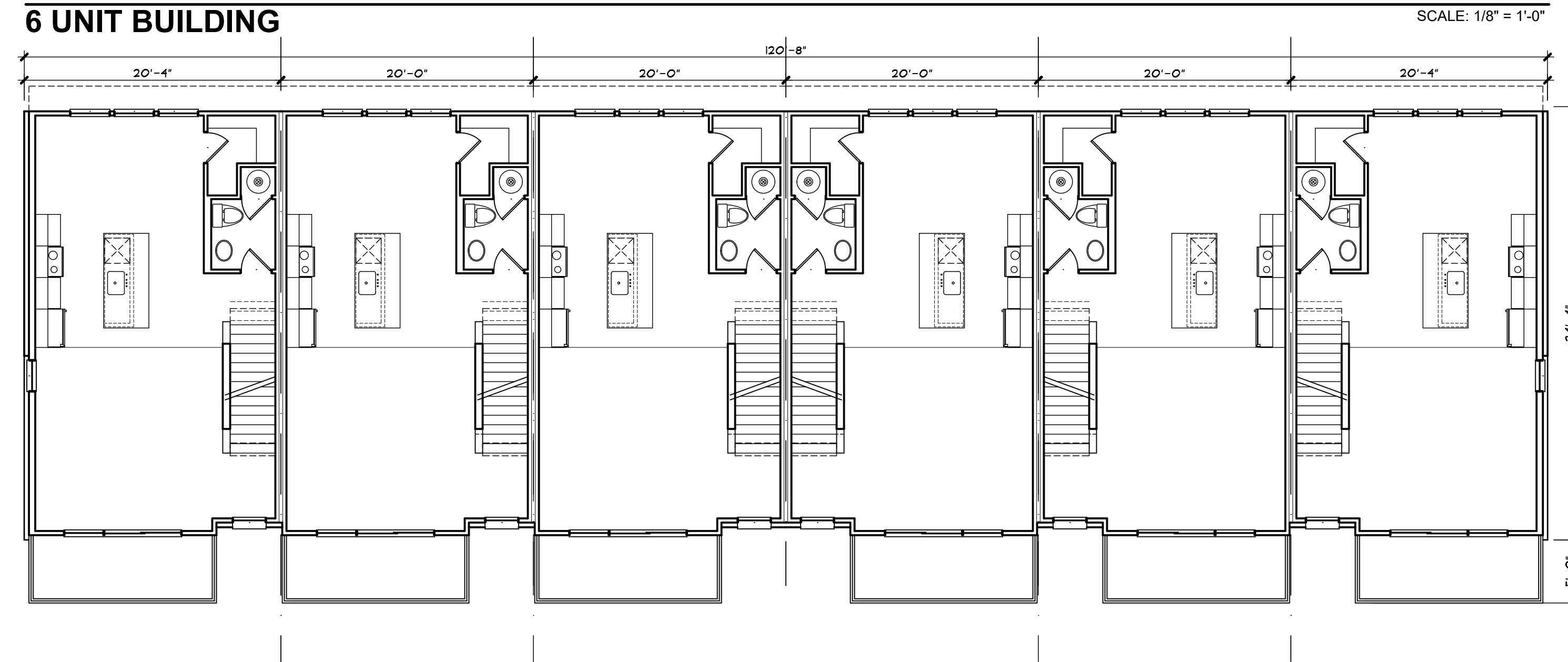


LOWER LEVEL PLAN
6 UNIT BUILDING

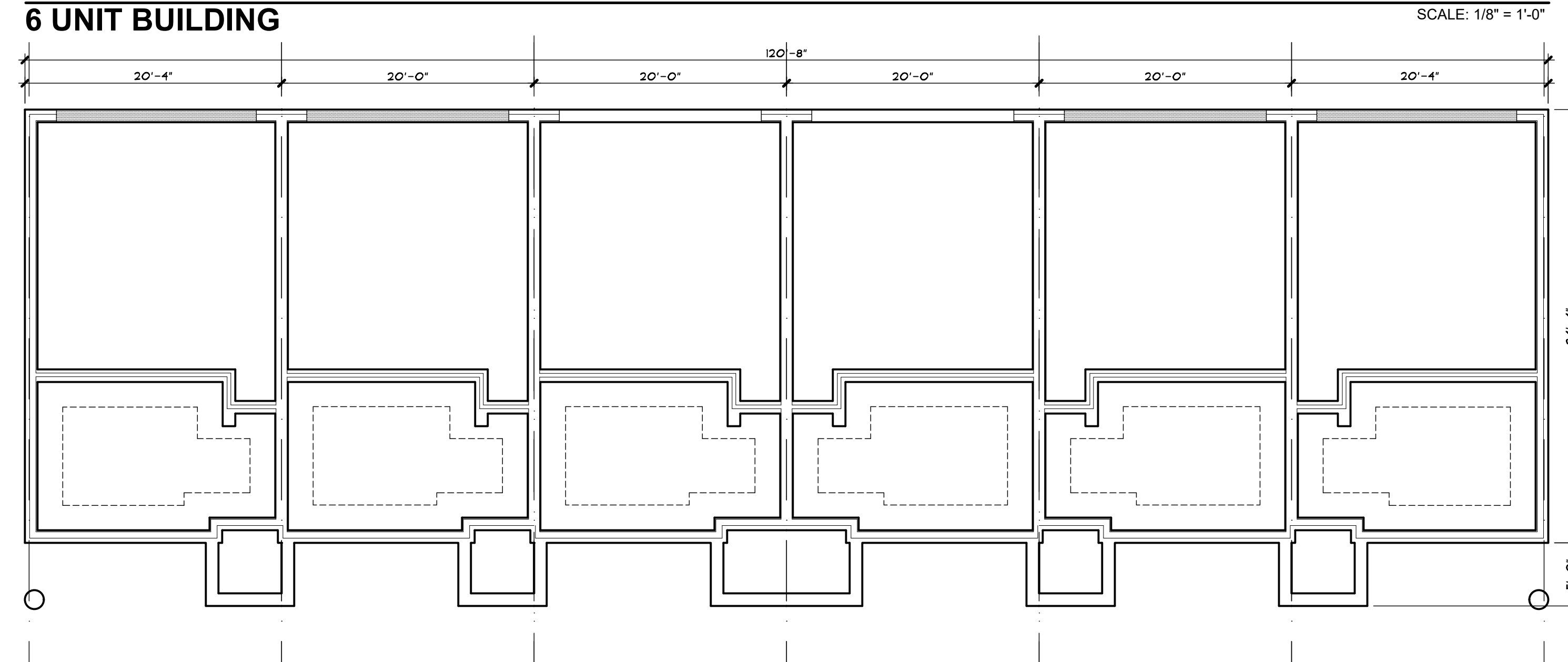
SCALE: 1/8" = 1'-0"



ROOF PLAN
6 UNIT BUILDING

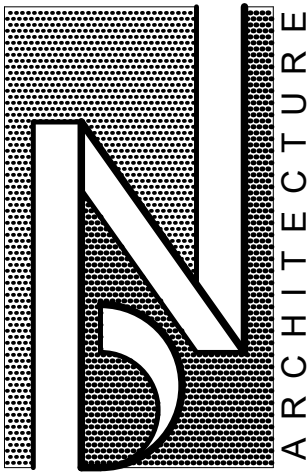


FIRST FLOOR PLAN
6 UNIT BUILDING



FOUNDATION PLAN
6 UNIT BUILDING

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



BRIAN NEEP ARCHITECTURE P.C.
DESIGN - PLANNING - INTERIORS
BLOOMFIELD HILLS, MICHIGAN
BRIANNEEP.COM
248.259.1784

6 UNIT BUILDING
BUILDING PLANS
PRELIMINARY

ROBERTSON HOMES
HUDSON TOWNS
20' TOWNHOUSE UNIT
SOUTH LYON, MICHIGAN

PRELIMINARY	6-18-21
BIDS	
PERMITS	
FINAL	
REVISIONS	
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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"



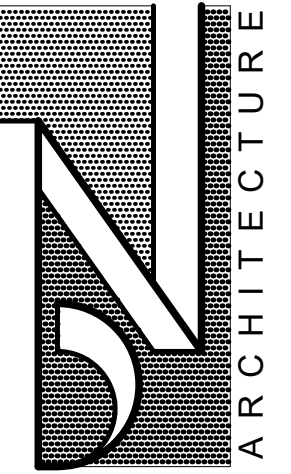
RIGHT SIDE ELEVATION

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

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	
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JOB NUMBER	21038
DRAWN BY	BN / RR
CHECKED BY	

SHEET NUMBER

A-13

CLAREMONT

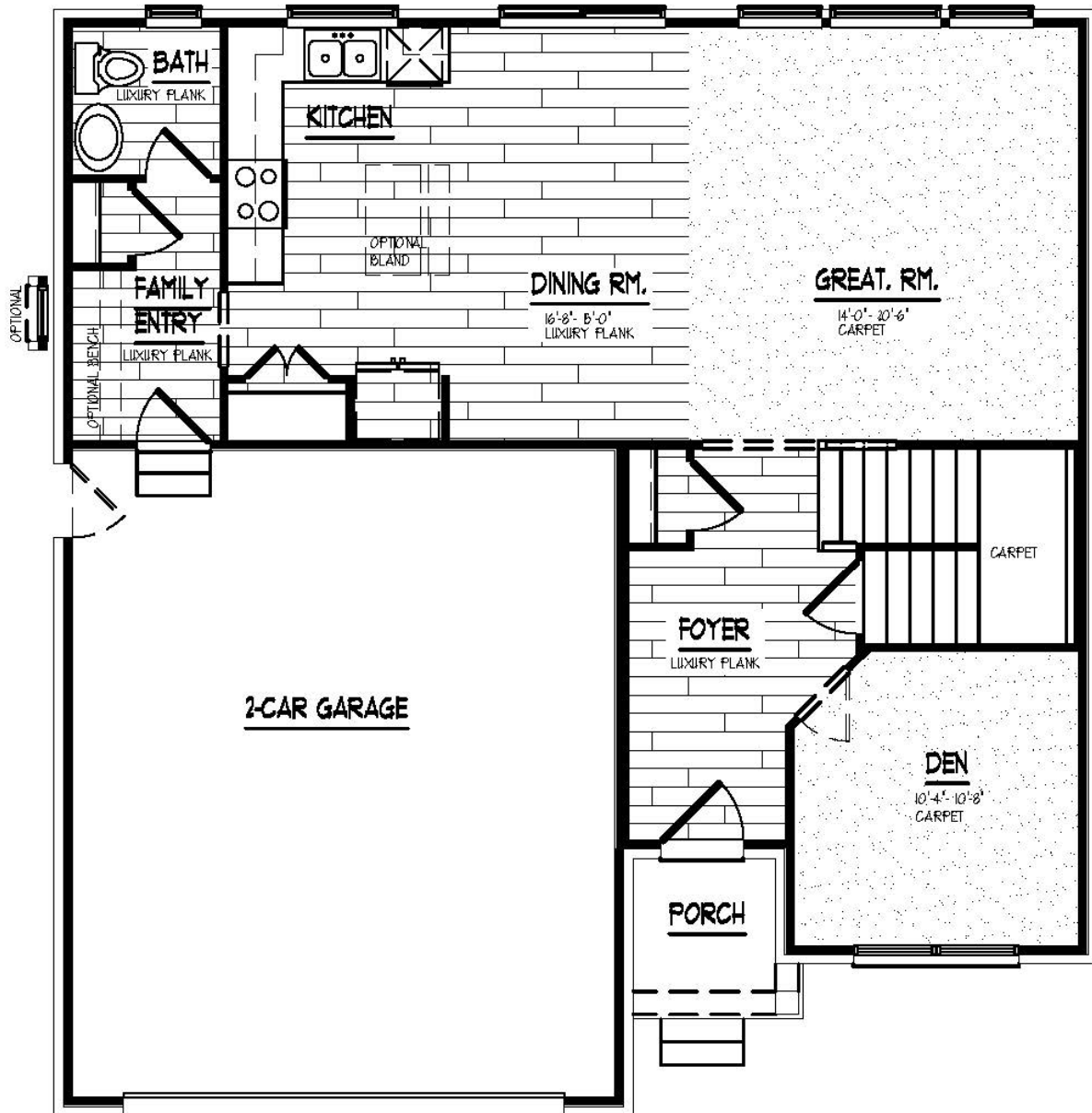
ELEVATIONS



CLAREMONT

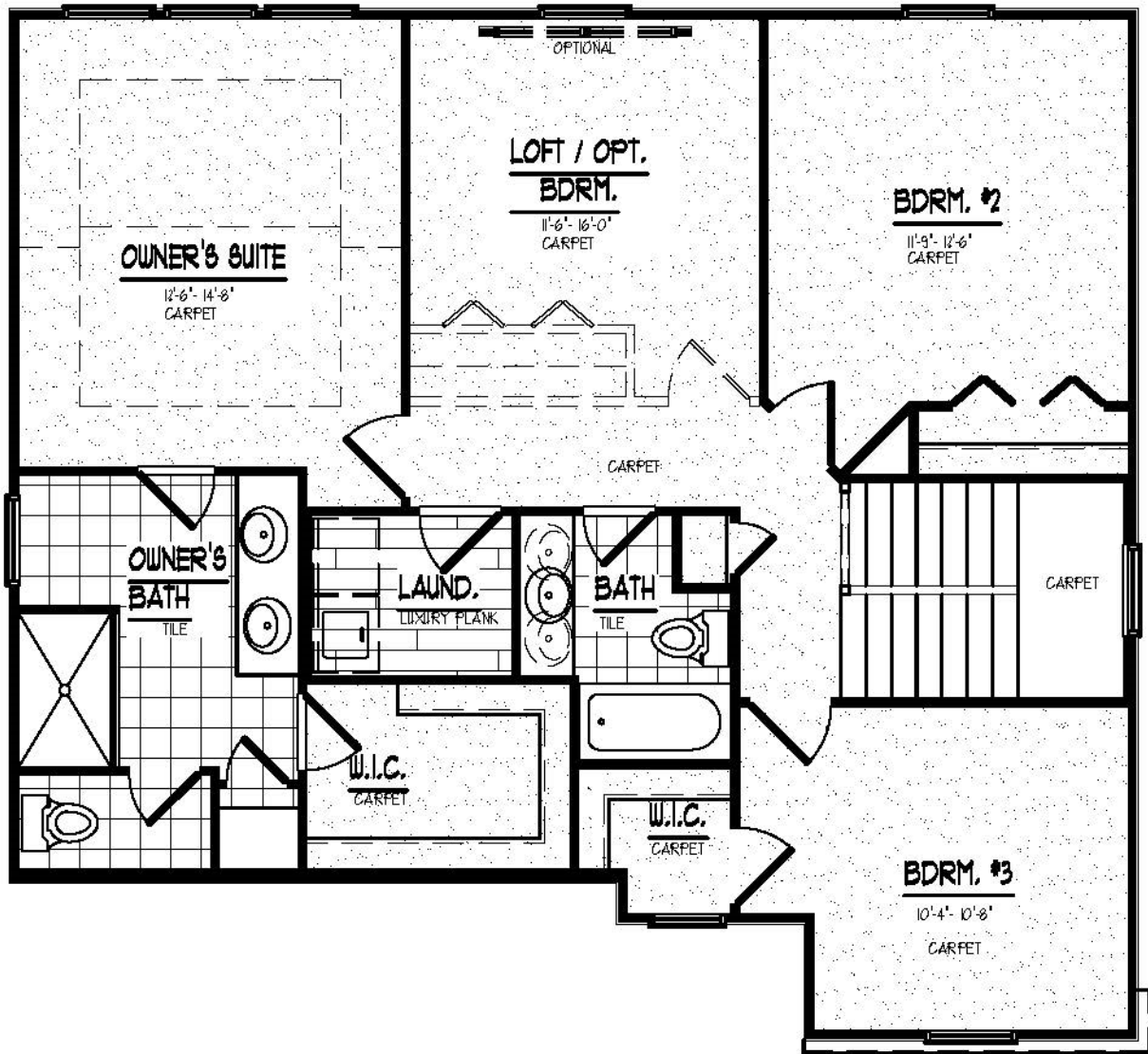
MAIN LEVEL

1,939 sqft.



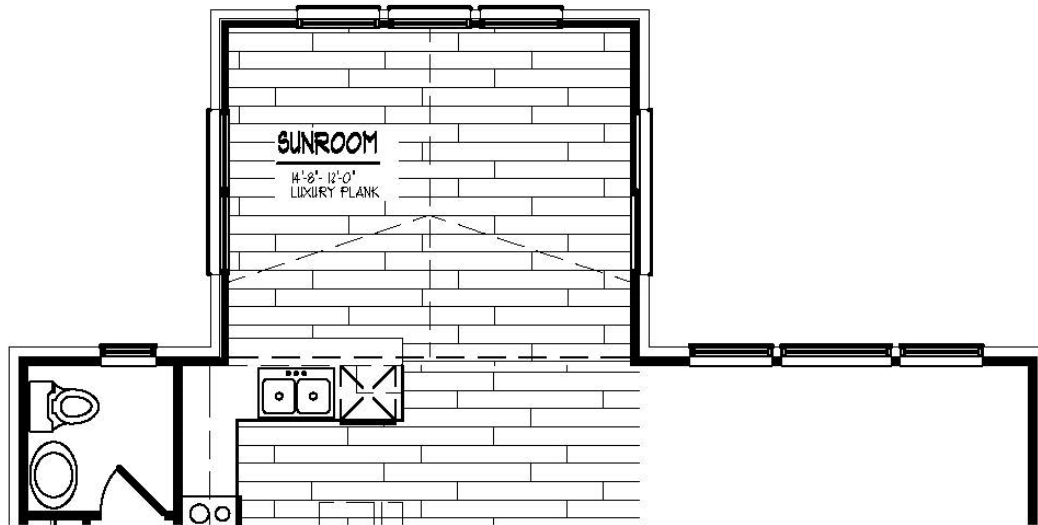
CLAREMONT

SECOND LEVEL

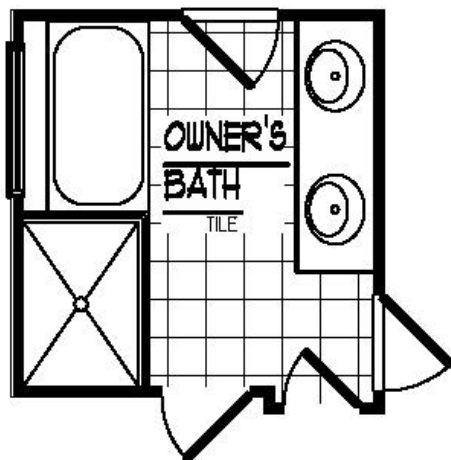


CLAREMONT

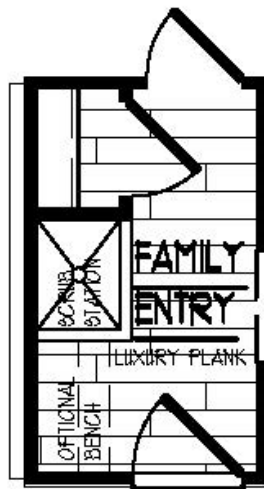
OPTIONS



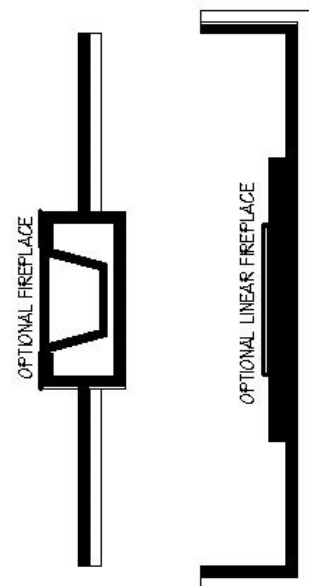
OPT. SUNROOM



OPT. OWNER'S BATH



OPT. FAMILY ENTRY



HAWTHORNE

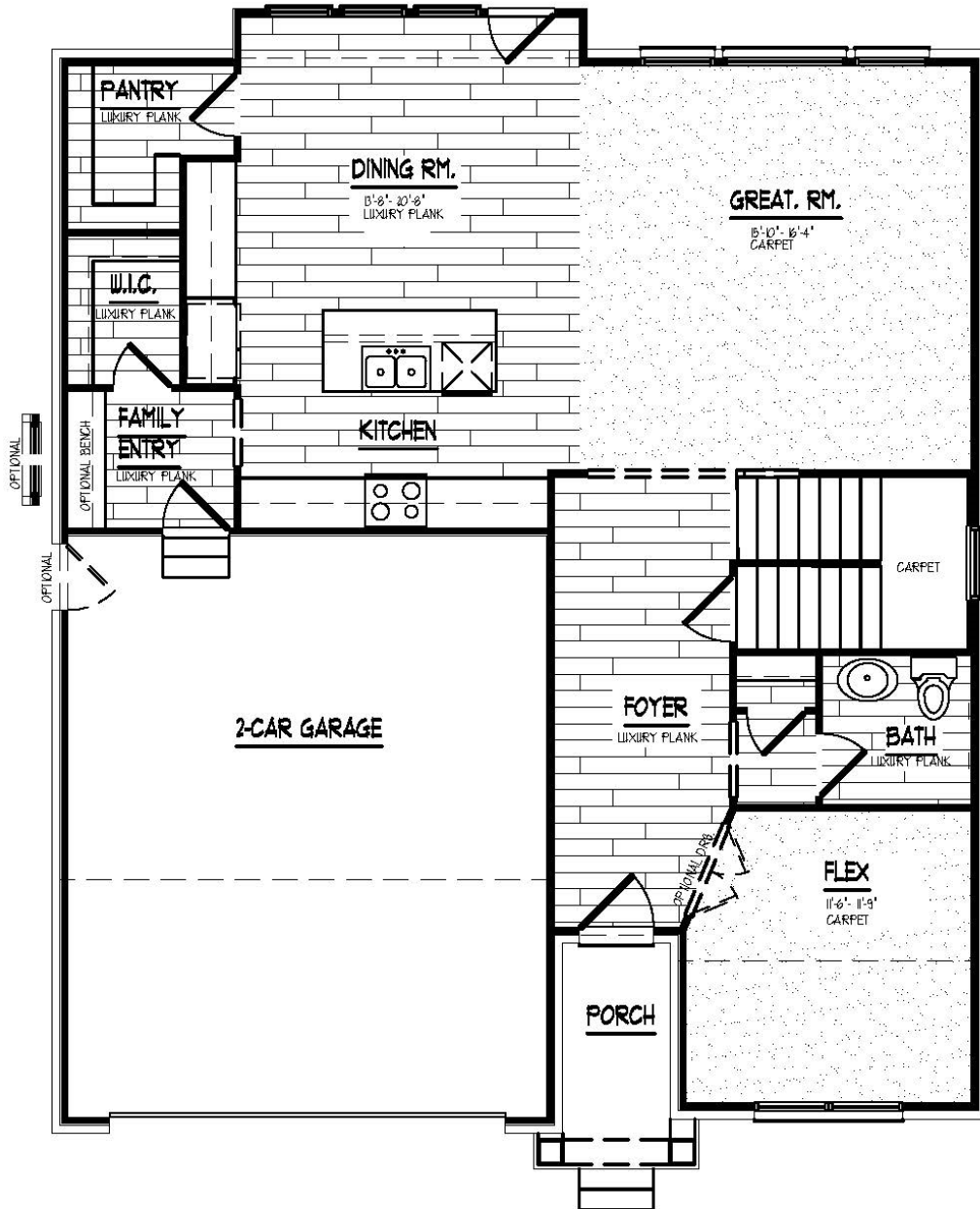
ELEVATIONS



HAWTHORNE

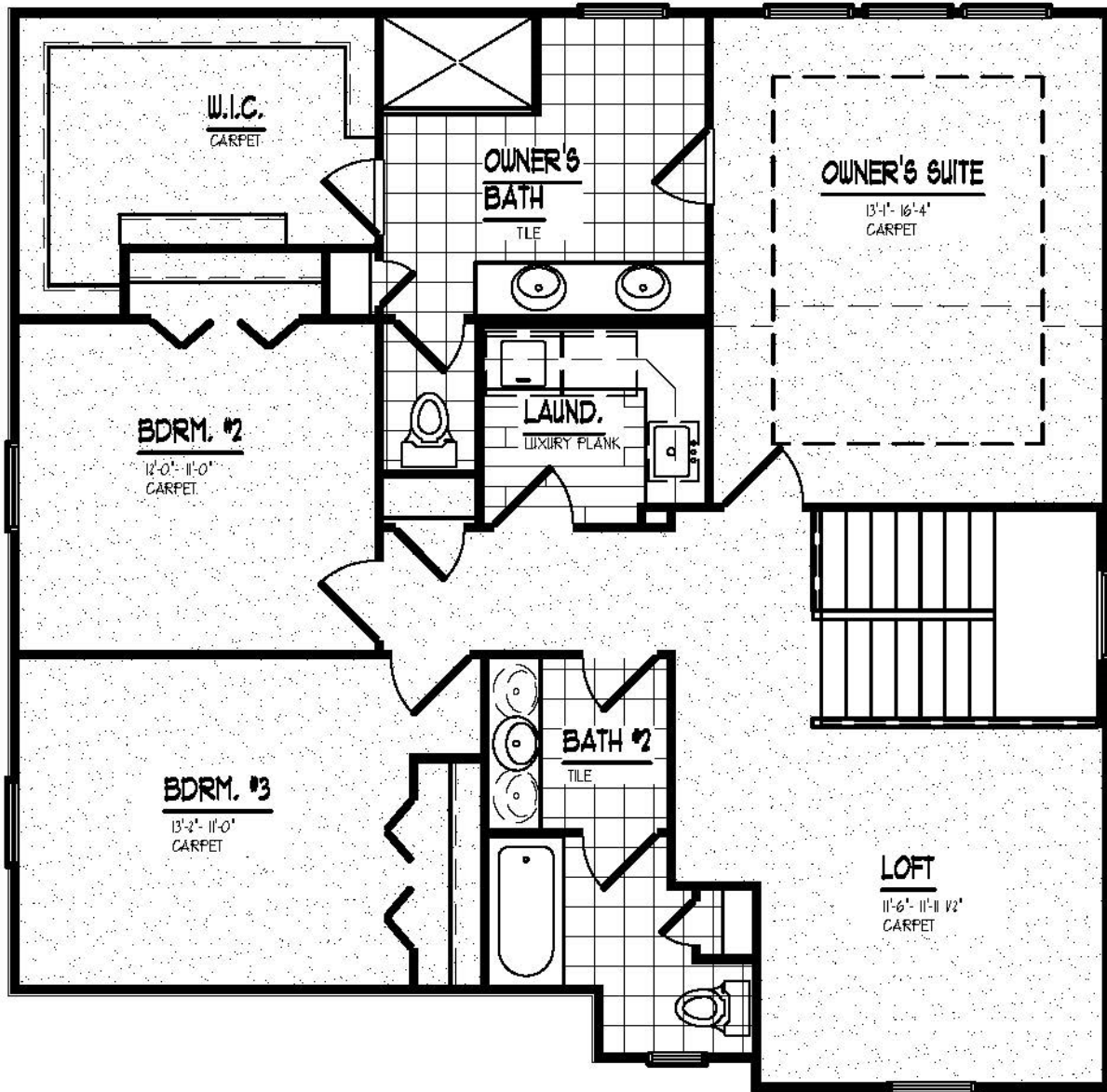
MAIN LEVEL

2,336 sqft.



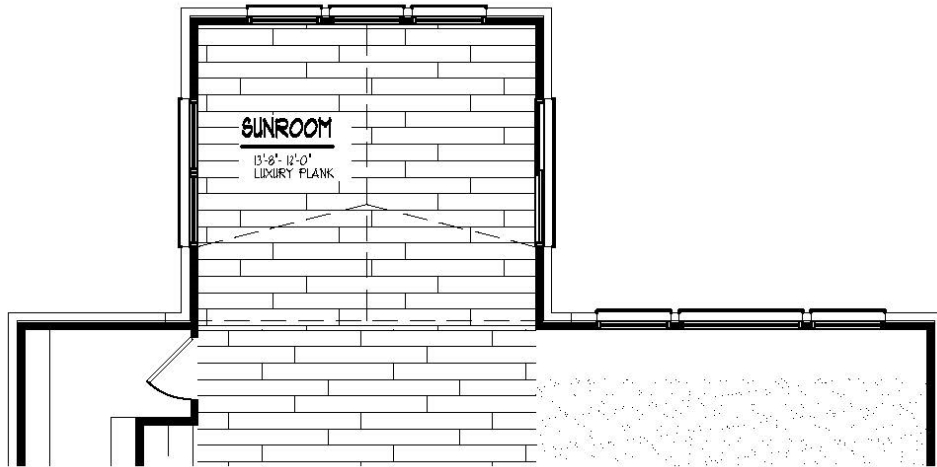
HAWTHORNE

SECOND LEVEL

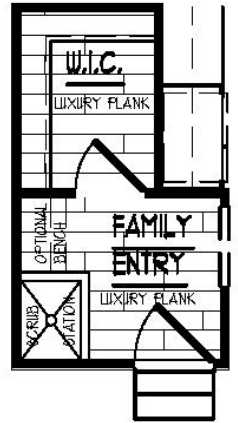
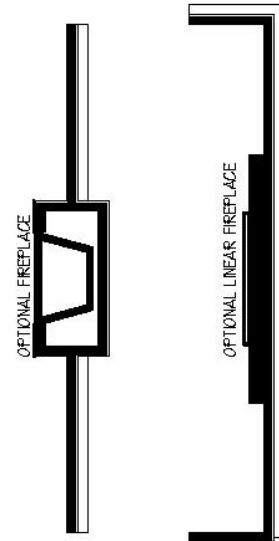


HAWTHORNE

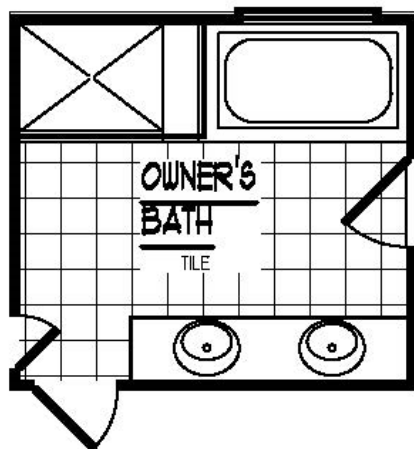
OPTIONS



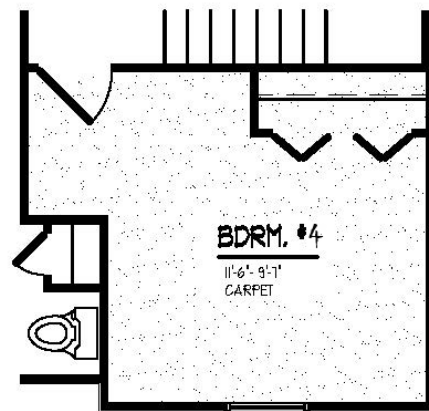
OPT. SUNROOM



OPT. FAMILY ENTRY



OPT. OWNER'S BATH



OPT. BDRM. #4

NORWOOD

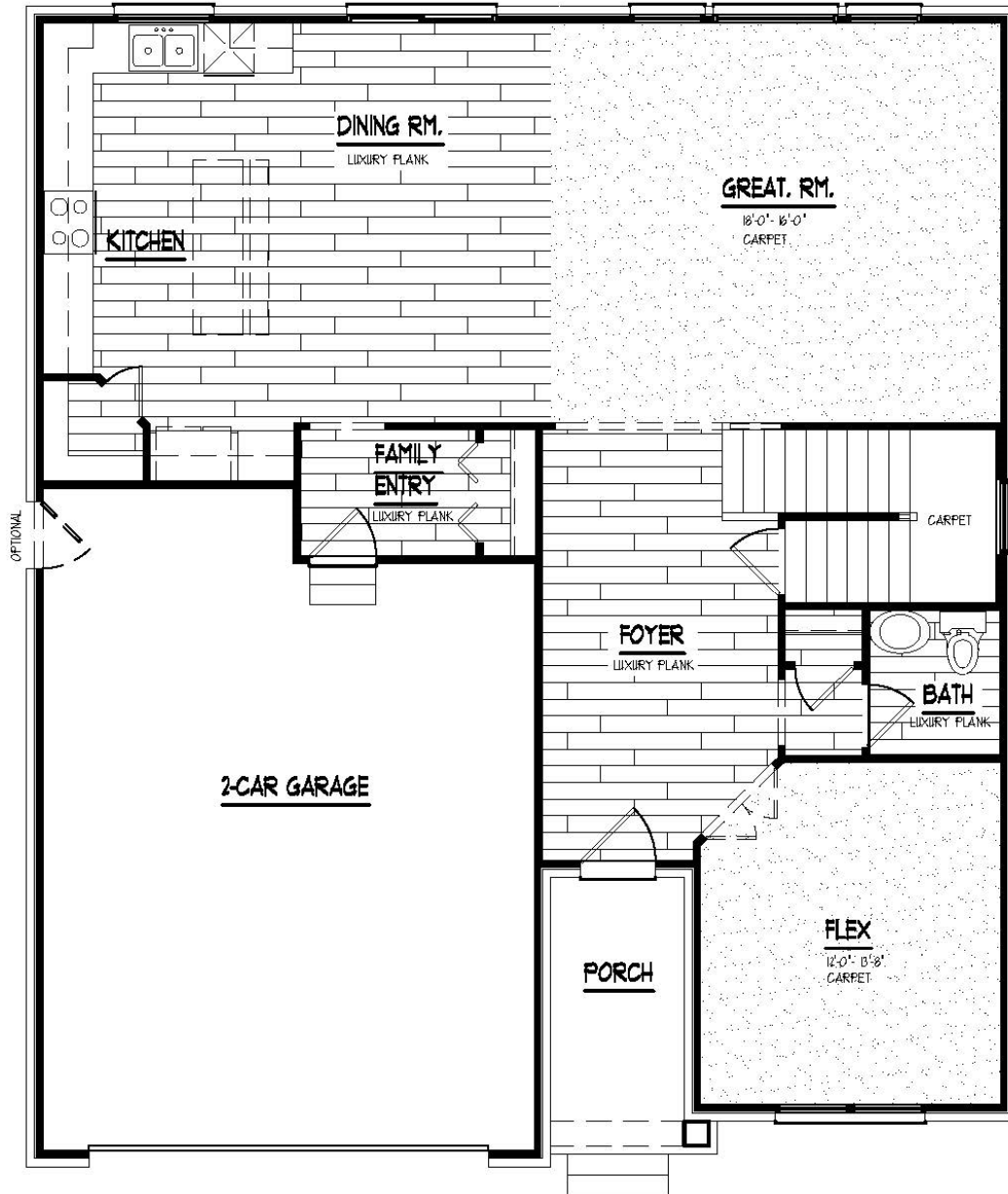
ELEVATIONS



NORWOOD

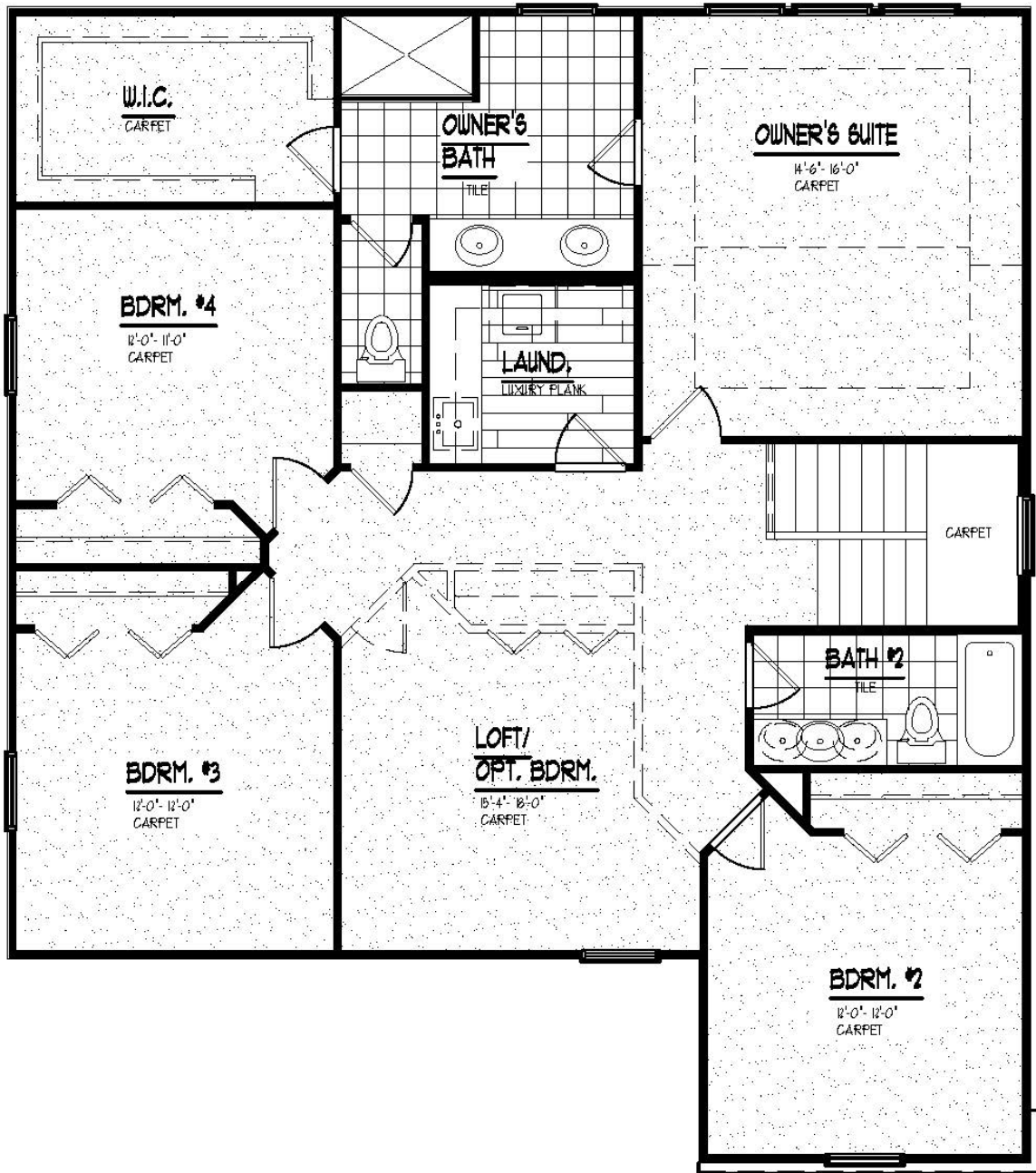
MAIN LEVEL

2,632 sqft.



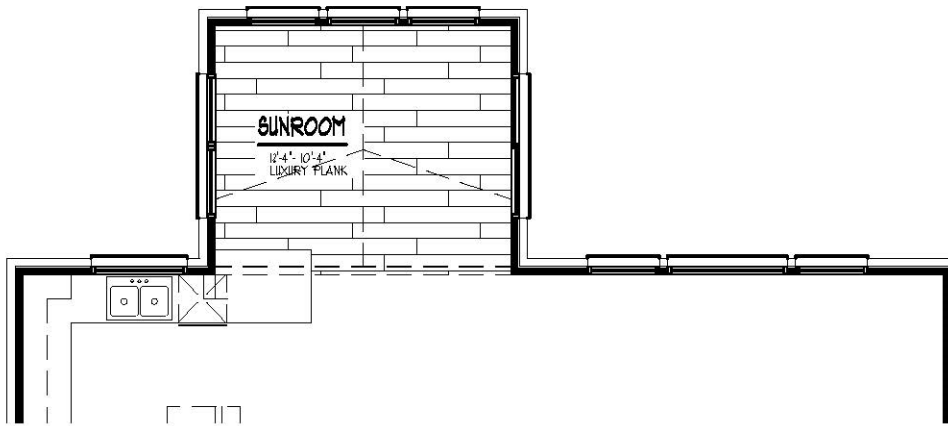
NORWOOD

SECOND LEVEL

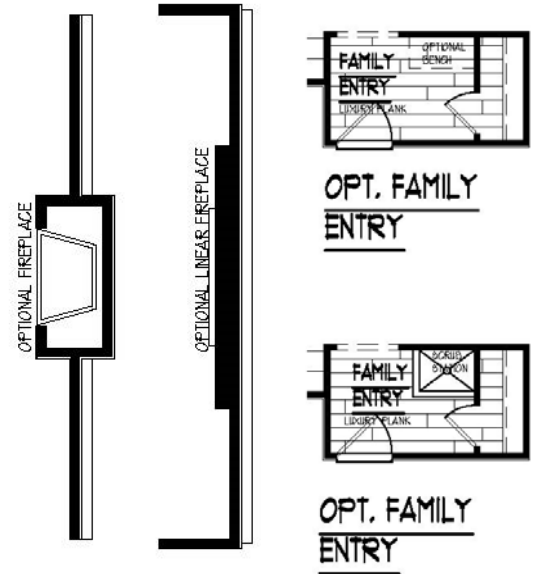


NORWOOD

OPTIONS

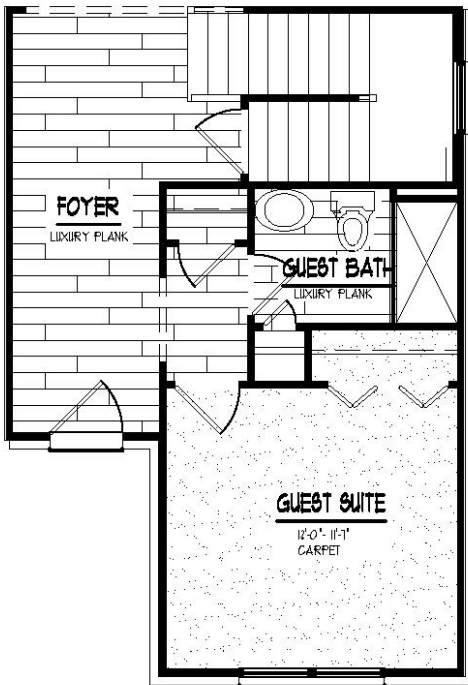


OPT. SUNROOM



OPT. FAMILY ENTRY

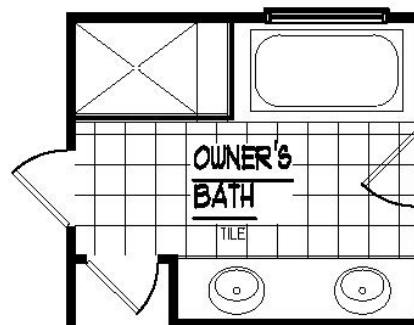
OPT. FAMILY ENTRY



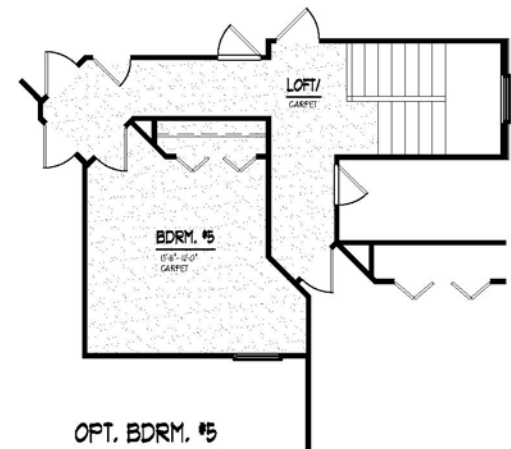
GUEST SUITE

12'-0" x 11'-7"

CARPET



OPT. OWNER'S BATH



OPT. BDRM. #5

RALEIGH

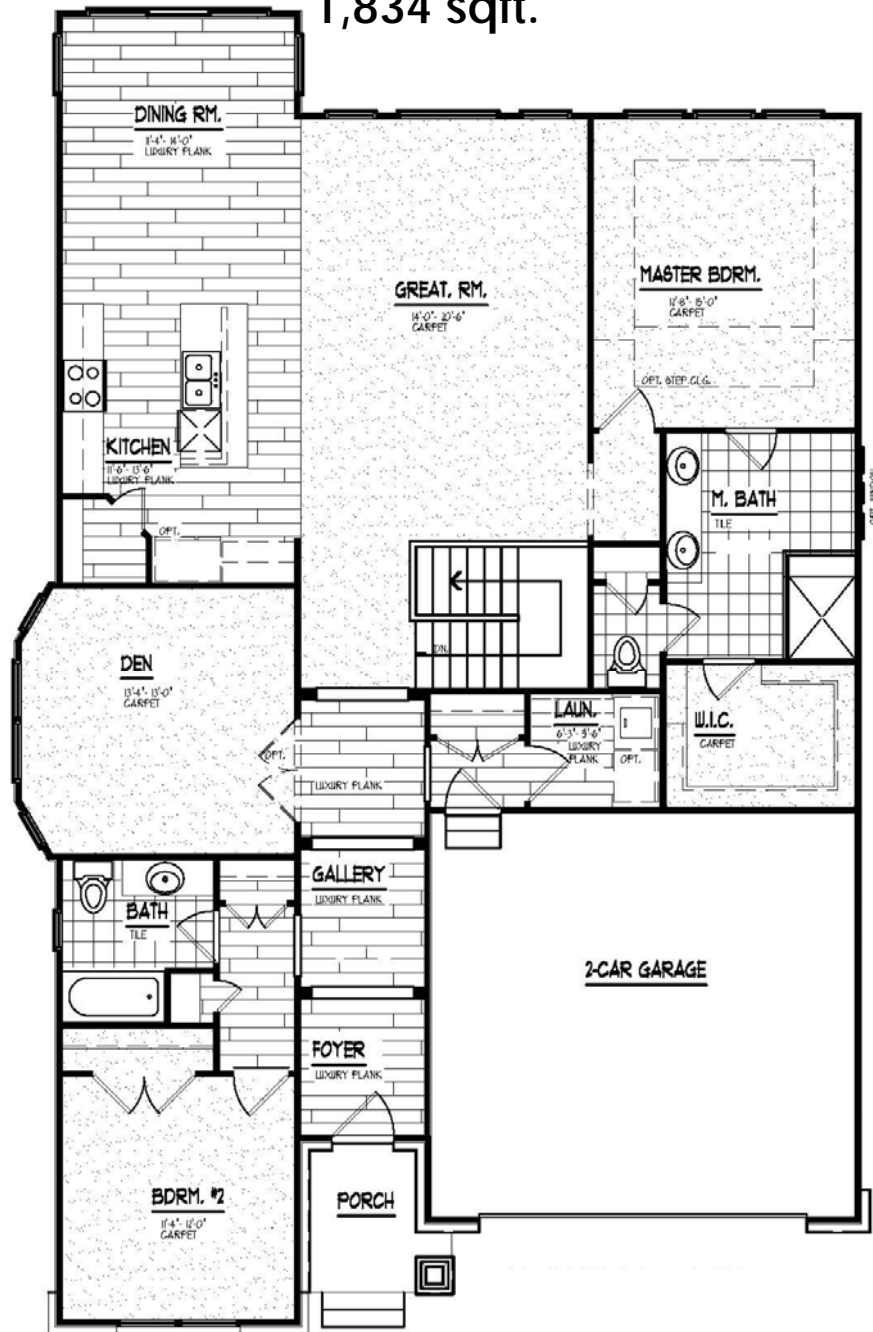
ELEVATIONS



RALEIGH

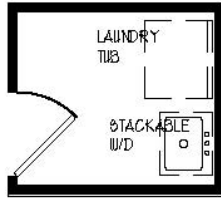
MAIN LEVEL

1,834 sqft.

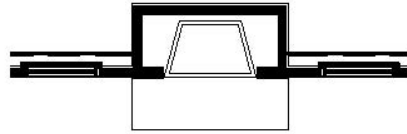


RALEIGH

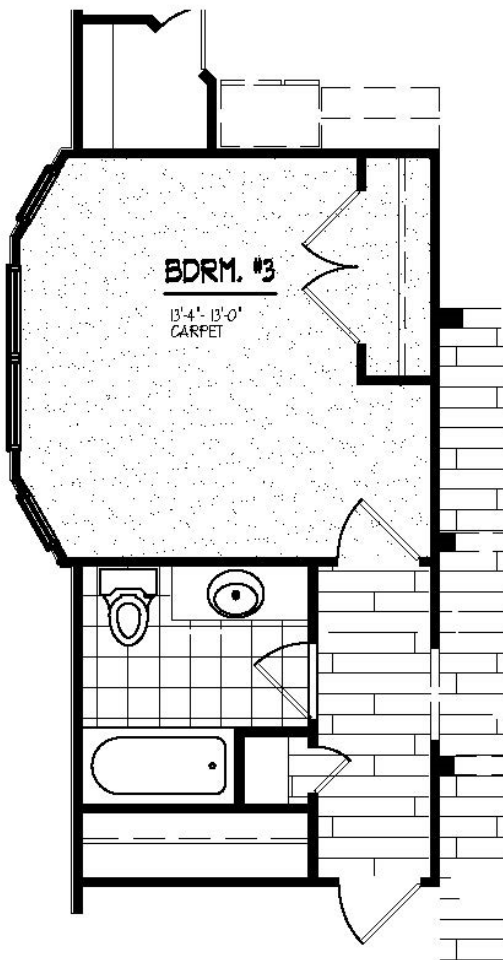
OPTIONS



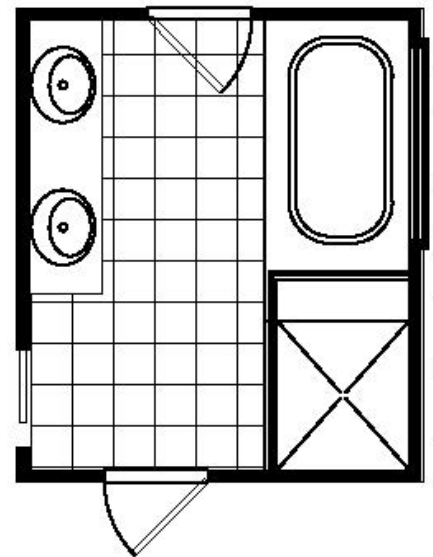
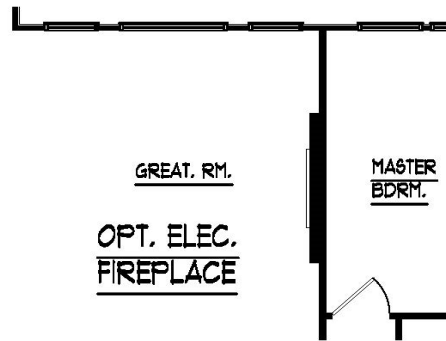
OPT. LAUNDRY



OPT. FIREPLACE



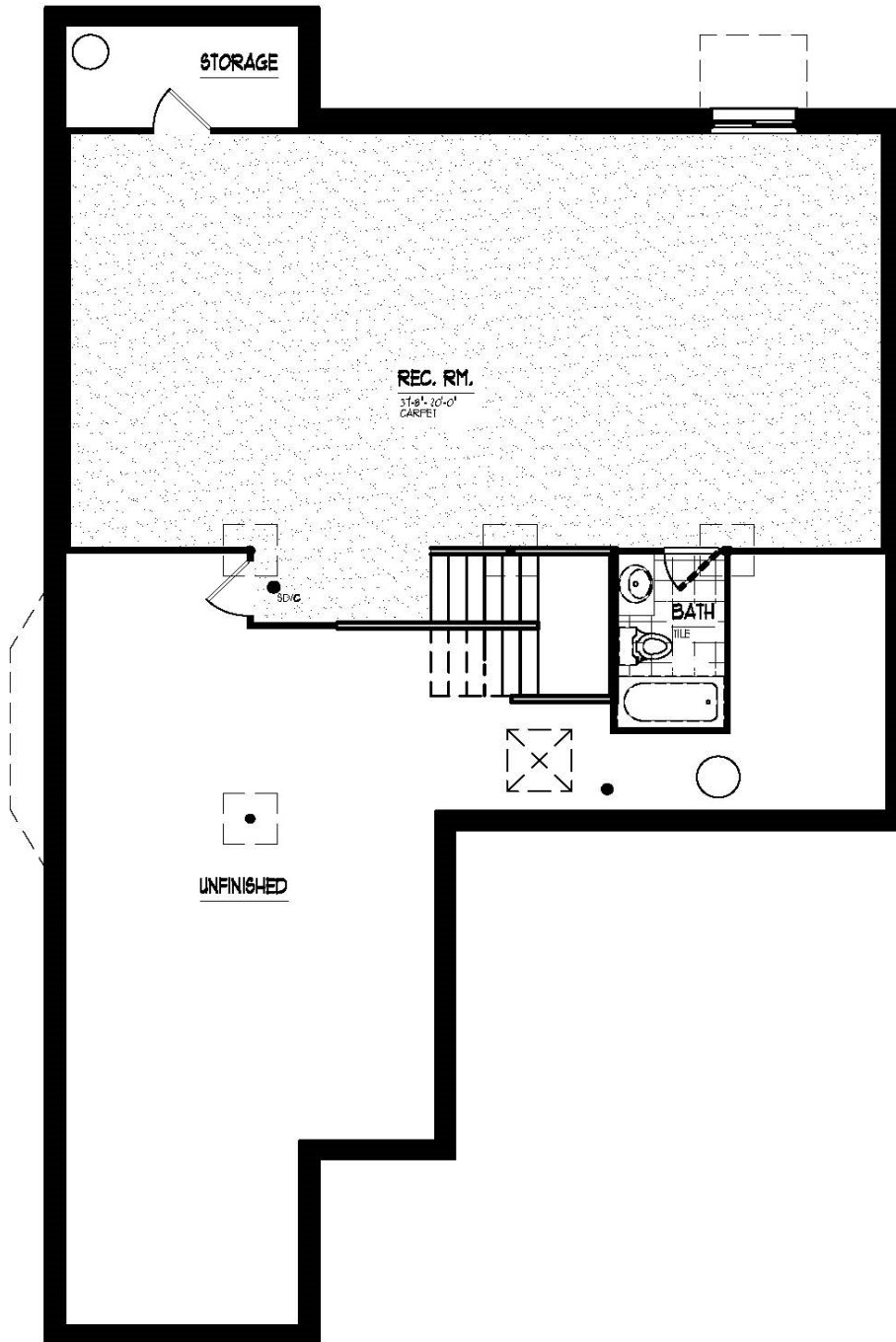
OPT. BEDROOM



OPT. M.BATH

RALEIGH

LOWER LEVEL OPTION 1 936 SQFT



SHERIDAN

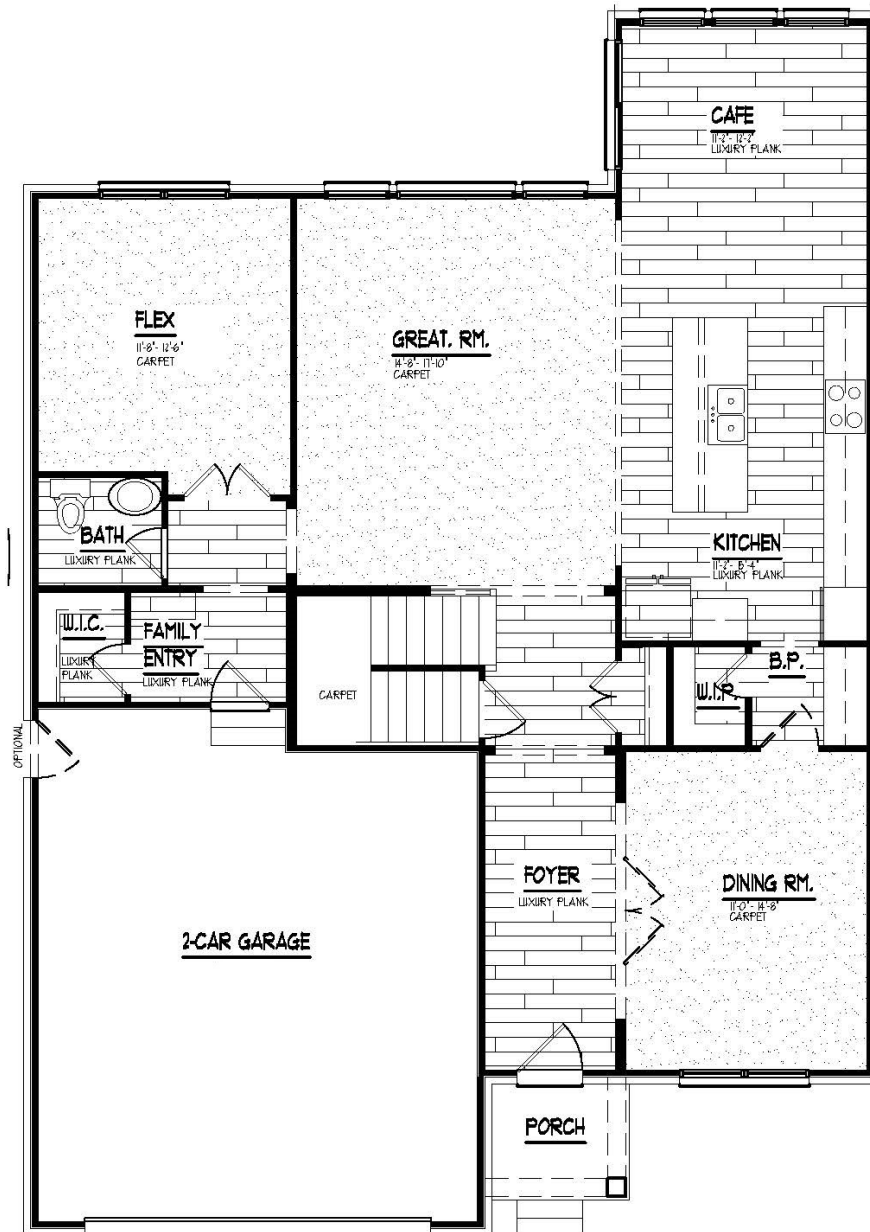
ELEVATIONS



SHERIDAN

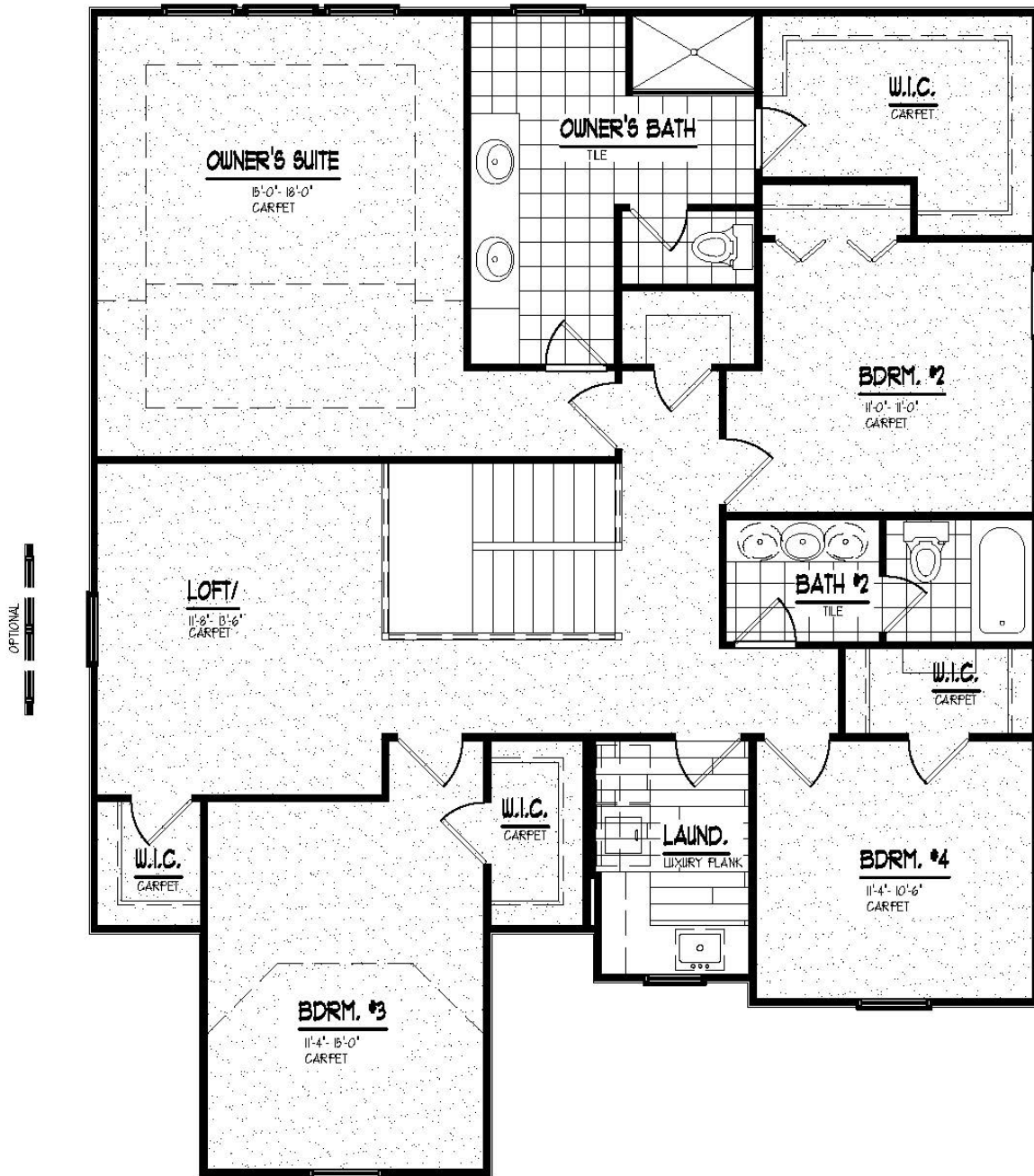
MAIN LEVEL

2,948 sqft.



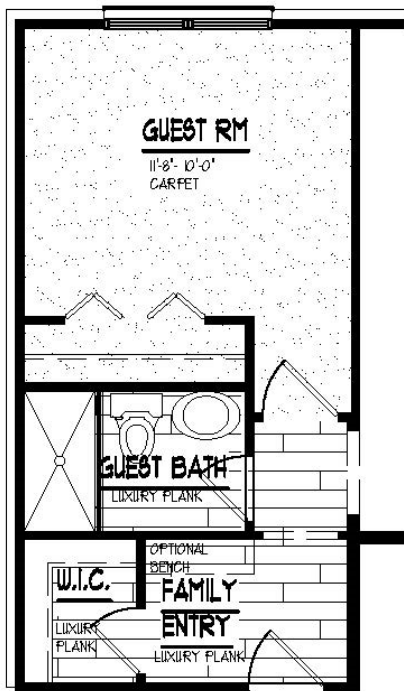
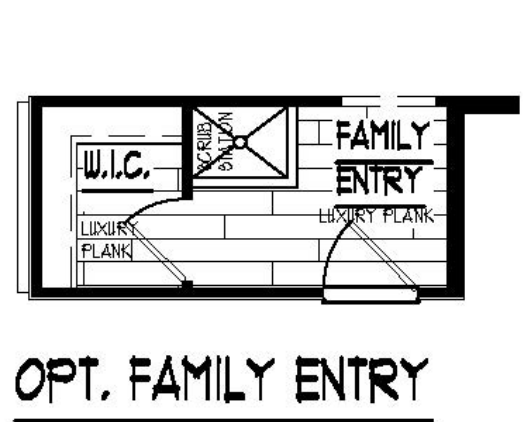
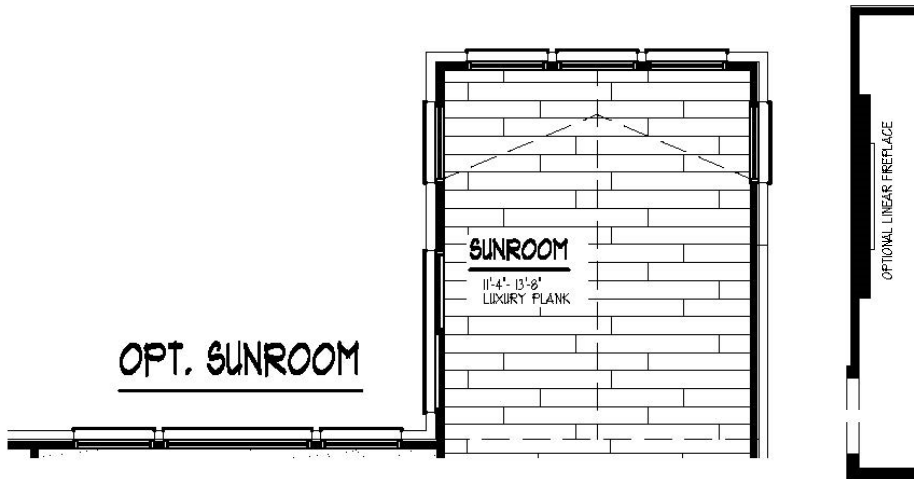
SHERIDAN

SECOND LEVEL

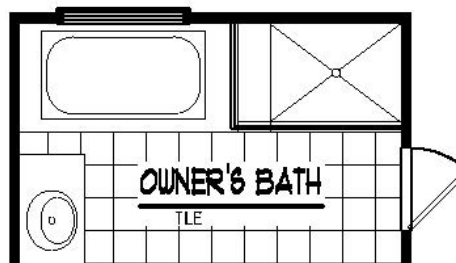


SHERIDAN

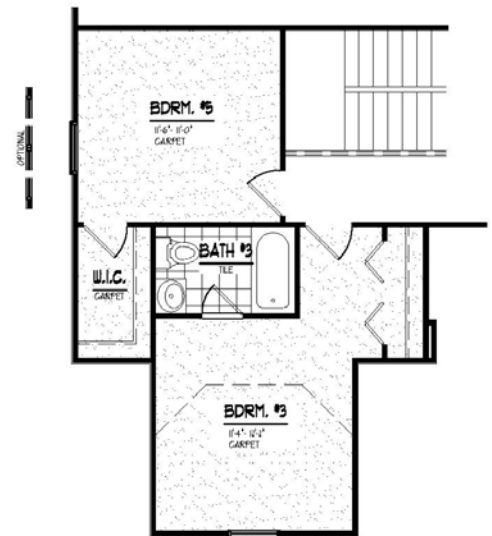
OPTIONS



OPT. GUEST RM.



OPT. OWNER'S BATH



OPT. BDRM. #5 & BATH

WHITMORE

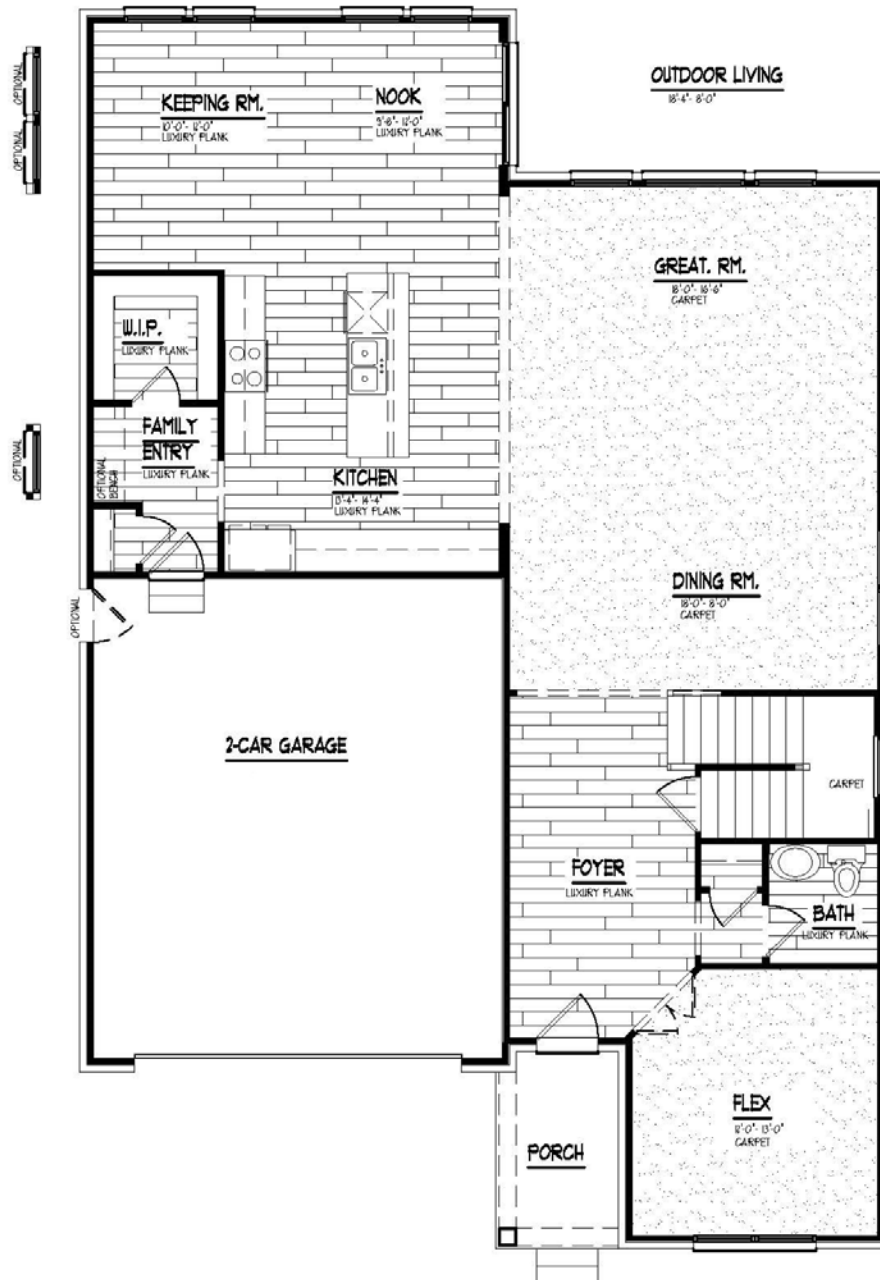
ELEVATIONS



WHITMORE

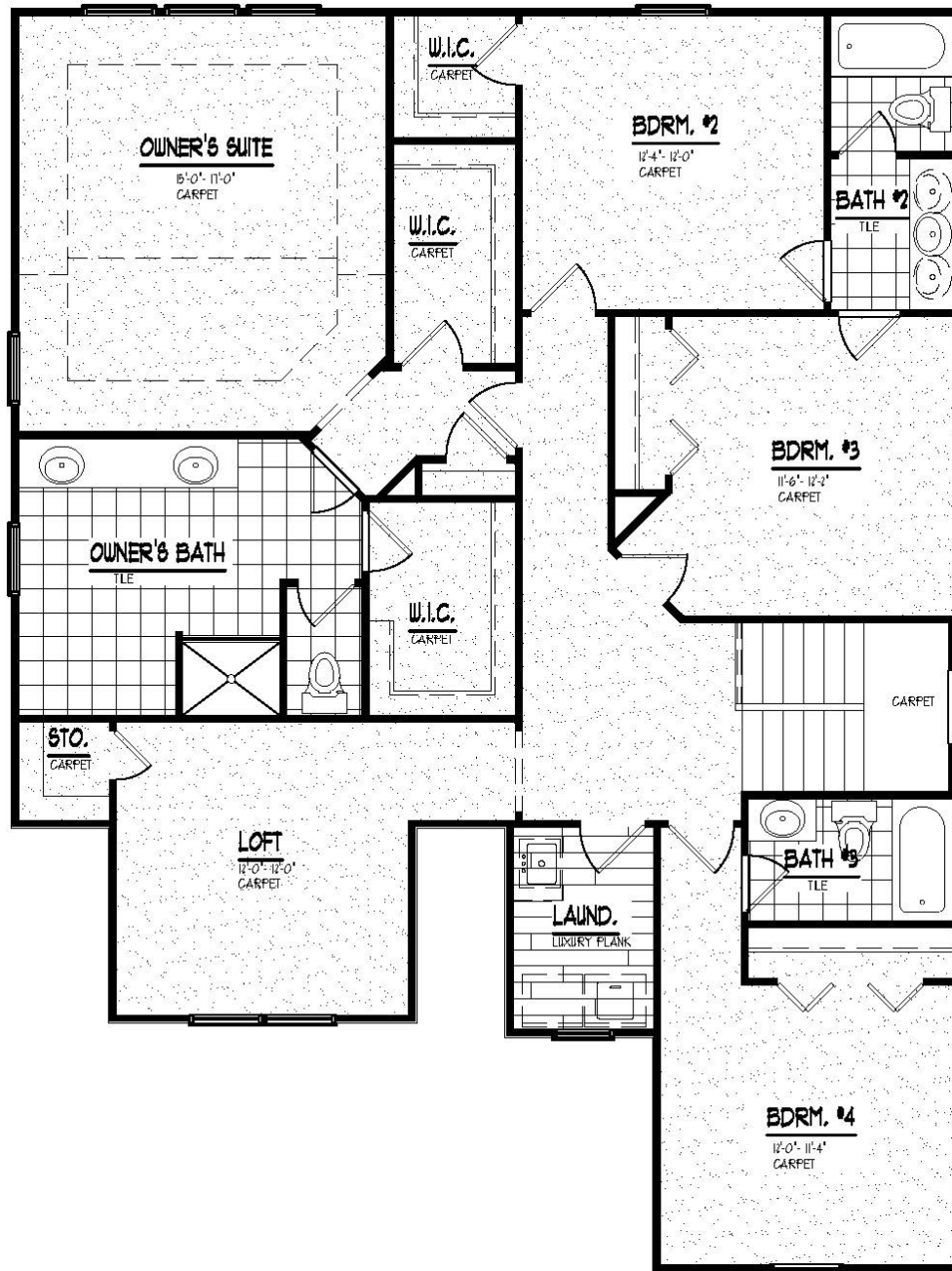
MAIN LEVEL

3,110 sqft.



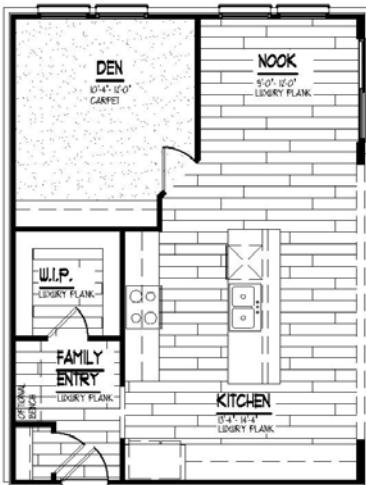
WHITMORE

SECOND LEVEL

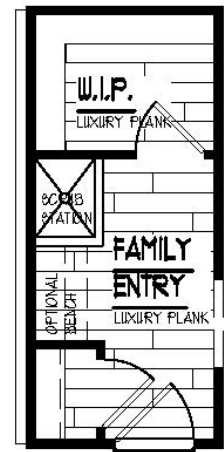
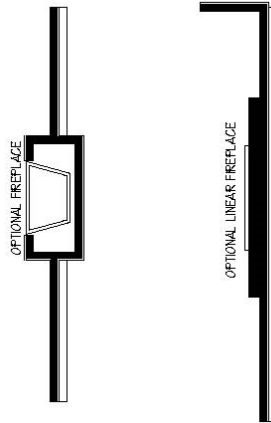


WHITMORE

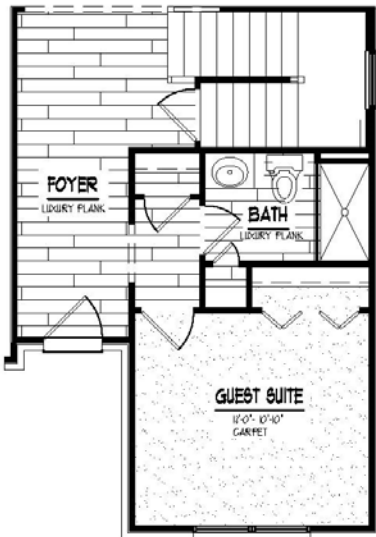
OPTIONS



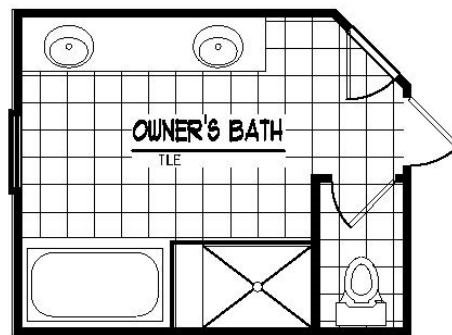
ALT. DEN OPT.



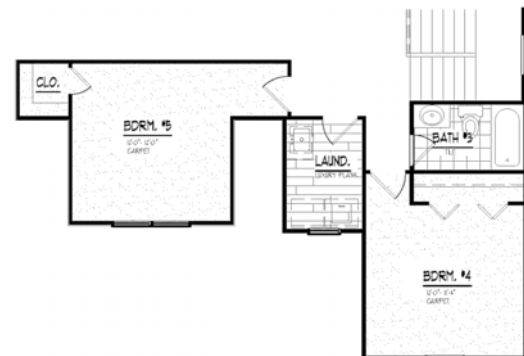
OPT. FAMILY ENTRY



OPT. GUEST SUITE



OPT. OWNER'S BATH



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), Aqueuts (sandy, loamy, undulating), and Urban land. According to the WSS, Lenawee and Aqueuts 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

Wetland Delineation and Jurisdictional Determination

Goodman Property

City of Troy, Oakland Co., MI

ASTI File No. 11812

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.

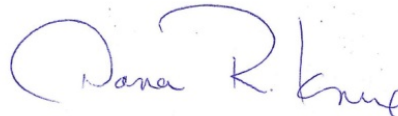
Thank you for the opportunity to assist you with this project. Please let us know if we can be of any further assistance in moving your project forward.

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



Goodman Property

Long Lake Road and Rochester Road,
Troy, Oakland Co., MI

Figure 1 - GPS-Surveyed Wetland Boundaries

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 <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of two required)</u>	
<u>Primary Indicators (minimum of one is required; check all that apply)</u>			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes _____ No <u>X</u>	Depth (inches): _____	Wetland Hydrology Present? Yes _____ No _____	
Water Table Present? Yes _____ No <u>X</u>	Depth (inches): _____		
Saturation Present? Yes _____ No <u>X</u>	Depth (inches): _____		
(includes capillary fringe)			
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: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50.0%</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
=Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>20</u></td> <td>x 3 = <u>60</u></td> </tr> <tr> <td>FACU species <u>12</u></td> <td>x 4 = <u>48</u></td> </tr> <tr> <td>UPL species <u>5</u></td> <td>x 5 = <u>25</u></td> </tr> <tr> <td>Column Totals: <u>47</u> (A)</td> <td><u>153</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>3.26</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>20</u>	x 3 = <u>60</u>	FACU species <u>12</u>	x 4 = <u>48</u>	UPL species <u>5</u>	x 5 = <u>25</u>	Column Totals: <u>47</u> (A)	<u>153</u> (B)	Prevalence Index = B/A = <u>3.26</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>10</u>	x 2 = <u>20</u>																			
FAC species <u>20</u>	x 3 = <u>60</u>																			
FACU species <u>12</u>	x 4 = <u>48</u>																			
UPL species <u>5</u>	x 5 = <u>25</u>																			
Column Totals: <u>47</u> (A)	<u>153</u> (B)																			
Prevalence Index = B/A = <u>3.26</u>																				
=Total Cover																				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																				
1. <u>Pinus sylvestris</u>	<u>5</u>	<u>No</u>	<u>UPL</u>																	
2. <u>Juniperus virginiana</u>	<u>5</u>	<u>No</u>	<u>FACU</u>																	
3. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																	
4. <u>Rhamnus cathartica</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
=Total Cover				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
=Total Cover																				
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Phleum pratense</u>	<u>2</u>	<u>Yes</u>	<u>FACU</u>																	
2. <u>Solidago canadensis</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
=Total Cover																				
Woody Vine Stratum (Plot size: <u>30'</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
=Total Cover																				

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
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[illegible]

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: 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 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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes _____ No <u>X</u>	
Wetland Hydrology Present?	Yes _____ No <u>X</u>	
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: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>4</u> (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <u>X</u>
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: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
=Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>85</u></td> <td>x 2 = <u>170</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>85</u> (A)</td> <td><u>170</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.00</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>85</u>	x 2 = <u>170</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>85</u> (A)	<u>170</u> (B)	Prevalence Index = B/A = <u>2.00</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>85</u>	x 2 = <u>170</u>																			
FAC species <u>0</u>	x 3 = <u>0</u>																			
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UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>85</u> (A)	<u>170</u> (B)																			
Prevalence Index = B/A = <u>2.00</u>																				
=Total Cover																				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
=Total Cover				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
=Total Cover																				
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Phragmites australis</u>	<u>70</u>	<u>Yes</u>	<u>FACW</u>																	
2. <u>Juncus dudleyi</u>	<u>15</u>	<u>No</u>	<u>FACW</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
85 =Total Cover				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.																
=Total Cover																				
Woody Vine Stratum (Plot size: <u>30'</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
=Total Cover																				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point	U2
----------------	----

[illegible]

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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
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: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <u>X</u>
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: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u><i>Ulmus pumila</i></u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50.0%</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
	<u>10</u>	=Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>105</u></td> <td>x 2 = <u>210</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>29</u></td> <td>x 4 = <u>116</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>134</u> (A)</td> <td><u>326</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>2.43</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>105</u>	x 2 = <u>210</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>29</u>	x 4 = <u>116</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>134</u> (A)	<u>326</u> (B)	Prevalence Index = B/A = <u>2.43</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>105</u>	x 2 = <u>210</u>																			
FAC species <u>0</u>	x 3 = <u>0</u>																			
FACU species <u>29</u>	x 4 = <u>116</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>134</u> (A)	<u>326</u> (B)																			
Prevalence Index = B/A = <u>2.43</u>																				
1. <u><i>Fraxinus pennsylvanica</i></u>	<u>50</u>	<u>Yes</u>	<u>FACW</u>																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
	<u>50</u>	=Total Cover																		
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
1. <u><i>Phragmites australis</i></u>	<u>50</u>	<u>Yes</u>	<u>FACW</u>																	
2. <u><i>Phalaris arundinacea</i></u>	<u>5</u>	<u>No</u>	<u>FACW</u>																	
3. <u><i>Dipsacus fullonum</i></u>	<u>19</u>	<u>Yes</u>	<u>FACU</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
	<u>74</u>	=Total Cover																		
Woody Vine Stratum (Plot size: <u>30'</u>)				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.																
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
		=Total Cover																		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point	U3
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[illegible]

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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of two required)</u>
<u>Primary Indicators (minimum of one is required; check all that apply)</u>		_____ Surface Soil Cracks (B6)
_____ Surface Water (A1)	_____ Water-Stained Leaves (B9)	_____ Drainage Patterns (B10)
_____ High Water Table (A2)	_____ Aquatic Fauna (B13)	_____ Moss Trim Lines (B16)
_____ Saturation (A3)	_____ Marl Deposits (B15)	_____ Dry-Season Water Table (C2)
<u>X</u> Water Marks (B1)	_____ Hydrogen Sulfide Odor (C1)	_____ Crayfish Burrows (C8)
_____ Sediment Deposits (B2)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Drift Deposits (B3)	_____ Presence of Reduced Iron (C4)	_____ Stunted or Stressed Plants (D1)
_____ Algal Mat or Crust (B4)	_____ Recent Iron Reduction in Tilled Soils (C6)	_____ Geomorphic Position (D2)
_____ Iron Deposits (B5)	_____ Thin Muck Surface (C7)	_____ Shallow Aquitard (D3)
_____ Inundation Visible on Aerial Imagery (B7)	_____ Other (Explain in Remarks)	_____ Microtopographic Relief (D4)
_____ Sparsely Vegetated Concave Surface (B8)		<u>X</u> FAC-Neutral Test (D5)
Field Observations:		Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____	Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____	
Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____	(includes capillary fringe)	
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: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Populus deltoides</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B) Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>57</u></td> <td>x 2 = <u>114</u></td> </tr> <tr> <td>FAC species <u>20</u></td> <td>x 3 = <u>60</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>77</u> (A)</td> <td><u>174</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>2.26</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>57</u>	x 2 = <u>114</u>	FAC species <u>20</u>	x 3 = <u>60</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>77</u> (A)	<u>174</u> (B)	Prevalence Index = B/A = <u>2.26</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>57</u>	x 2 = <u>114</u>																			
FAC species <u>20</u>	x 3 = <u>60</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>77</u> (A)	<u>174</u> (B)																			
Prevalence Index = B/A = <u>2.26</u>																				
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
	<u>15</u>	<u>=Total Cover</u>																		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																				
1. <u>Rhamnus cathartica</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u>Fraxinus pennsylvanica</u>	<u>50</u>	<u>Yes</u>	<u>FACW</u>																	
3. <u>Cornus amomum</u>	<u>2</u>	<u>No</u>	<u>FACW</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
	<u>57</u>	<u>=Total Cover</u>																		
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Phalaris arundinacea</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	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 <u>X</u> No _____																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
	<u>5</u>	<u>=Total Cover</u>																		
Woody Vine Stratum (Plot size: <u>30'</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
	<u>=Total Cover</u>																			

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point	W1
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[illegible]

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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: (Explain alternative procedures here or in a separate report.) 		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) <u>X</u> Water-Stained Leaves (B9) <u>X</u> High Water Table (A2) _____ Aquatic Fauna (B13) <u>X</u> Saturation (A3) _____ Marl Deposits (B15) <u>X</u> Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) <u>X</u> Sparsely Vegetated Concave Surface (B8)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>6</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>5</u> (includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> 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: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer saccharinum</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B) Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>73</u></td> <td>x 2 = <u>146</u></td> </tr> <tr> <td>FAC species <u>15</u></td> <td>x 3 = <u>45</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>88</u> (A)</td> <td><u>191</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>2.17</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>73</u>	x 2 = <u>146</u>	FAC species <u>15</u>	x 3 = <u>45</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>88</u> (A)	<u>191</u> (B)	Prevalence Index = B/A = <u>2.17</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>73</u>	x 2 = <u>146</u>																			
FAC species <u>15</u>	x 3 = <u>45</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>88</u> (A)	<u>191</u> (B)																			
Prevalence Index = B/A = <u>2.17</u>																				
2. <u>Ulmus americana</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																	
3. <u>Acer negundo</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
		<u>55</u>	=Total Cover	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																				
1. <u>Fraxinus pennsylvanica</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____	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.																
		<u>30</u>	=Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Phragmites australis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
		<u>3</u>	=Total Cover																	
Woody Vine Stratum (Plot size: <u>30'</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
		_____	=Total Cover																	

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W2

[illegible]

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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
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: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)		<u>Secondary Indicators (minimum of two required)</u> <u>X</u> 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) <u>X</u> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> 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: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																																									
1. <u>Populus deltoides</u>	15	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Total % Cover of:</th> <th style="width: 10%;"></th> <th style="width: 10%;">Multiply by:</th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;">0</td> <td>x 1 =</td> <td style="text-align: center;">0</td> <td></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;">80</td> <td>x 2 =</td> <td style="text-align: center;">160</td> <td></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;">15</td> <td>x 3 =</td> <td style="text-align: center;">45</td> <td></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;">0</td> <td>x 4 =</td> <td style="text-align: center;">0</td> <td></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;">0</td> <td>x 5 =</td> <td style="text-align: center;">0</td> <td></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align: center;">95</td> <td>(A)</td> <td style="text-align: center;">205</td> <td>(B)</td> </tr> <tr> <td colspan="5">Prevalence Index = B/A = <u>2.16</u></td> </tr> </tbody> </table>	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 = <u>2.16</u>				
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Herb Stratum (Plot size: <u>5'</u>)																																												
1. <u>Phragmites australis</u>	80	Yes	FACW	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> 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 <u>X</u> No <u> </u>																																								
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Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W3

[illegible]

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.

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 site, 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

- 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 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 LOCATION



NORTH
SCALE: NOT TO SCALE

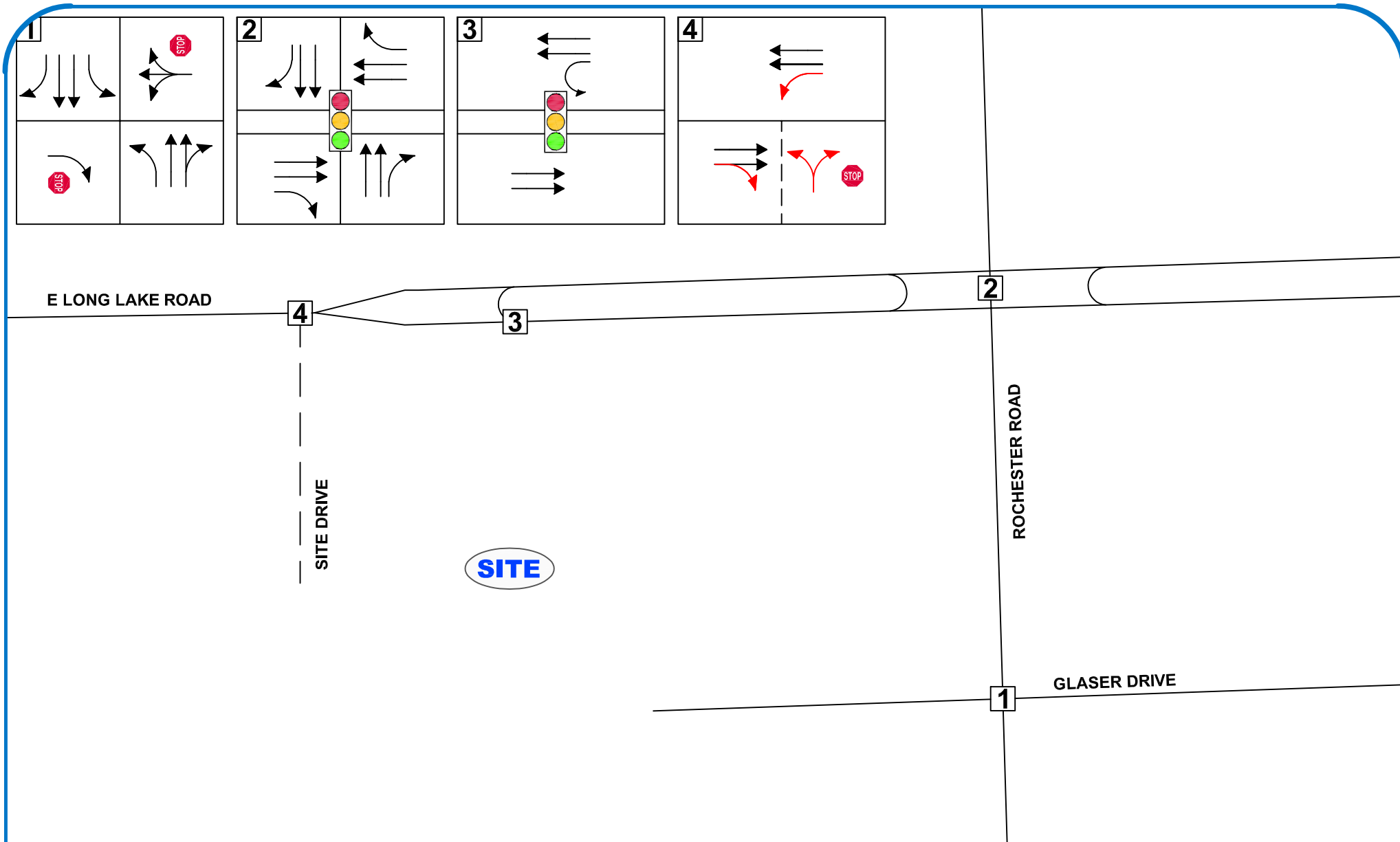


FIGURE 2

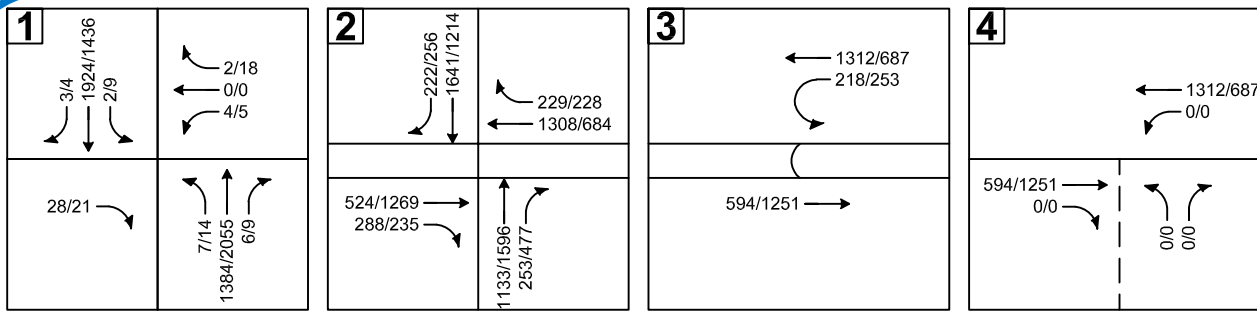
LANE USE AND TRAFFIC CONTROL

Village of Troy PUD - Troy, MI

LEGEND

	ROADS		PROPOSED ROADS
	LANE USE		PROPOSED LANE USE
	SIGNALIZED INTERSECTION		
	UNSIGNALIZED INTERSECTION		
	ROUNDBOUT INTERSECTION		





E LONG LAKE ROAD

4

SITE DRIVE

3

SITE

2

ROCHESTER ROAD

1

GLASER DRIVE



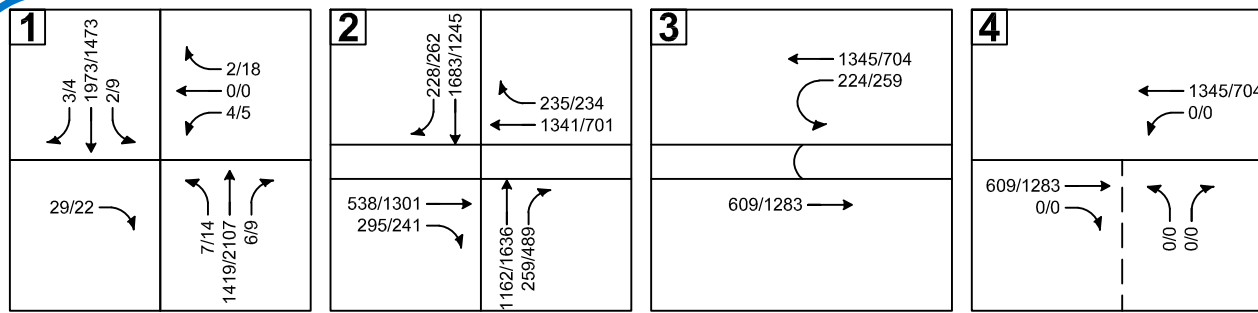
FIGURE 3
EXISTING TRAFFIC VOLUMES

Village of Troy PUD - Troy, MI

LEGEND

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





E LONG LAKE ROAD

4

SITE DRIVE

3

SITE

2

ROCHESTER ROAD

1

GLASER DRIVE



FIGURE 4

BACKGROUND TRAFFIC VOLUMES

Village of Troy PUD - Troy, MI

LEGEND

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



NORTH
SCALE: NOT TO SCALE

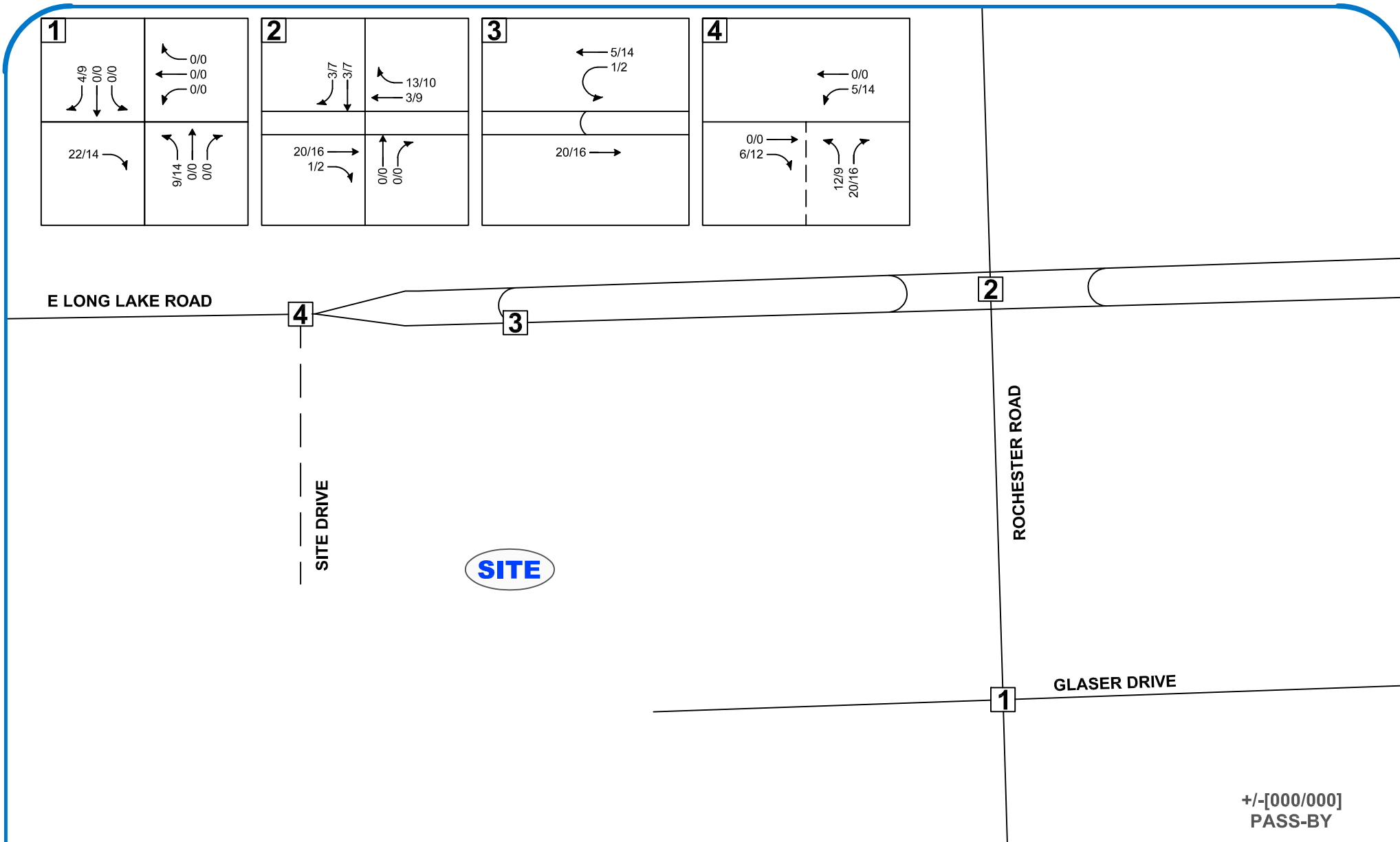


FIGURE 5

SITE-GENERATED TRAFFIC VOLUMES

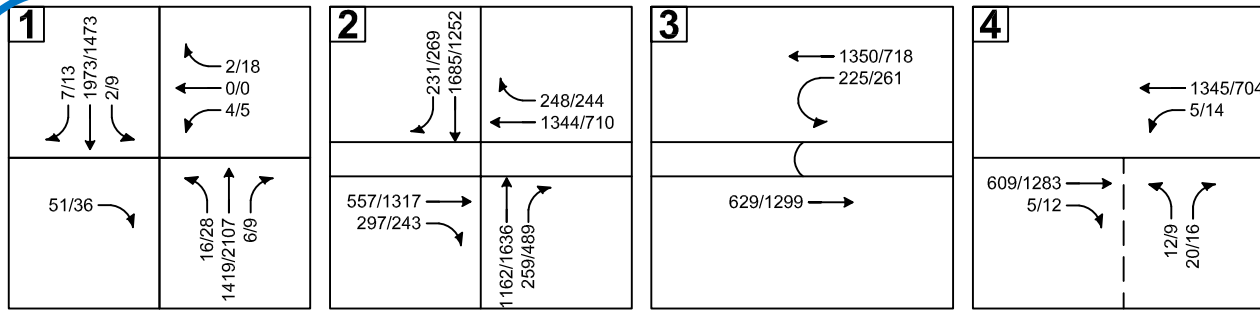
Village of Troy PUD - Troy, MI

LEGEND

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



NORTH
SCALE: NOT TO SCALE



E LONG LAKE ROAD

4

SITE DRIVE

3

SITE

2

ROCHESTER ROAD

1

GLASER DRIVE



FIGURE 6 FUTURE TRAFFIC VOLUMES

Village of Troy PUD - Troy, MI

LEGEND

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



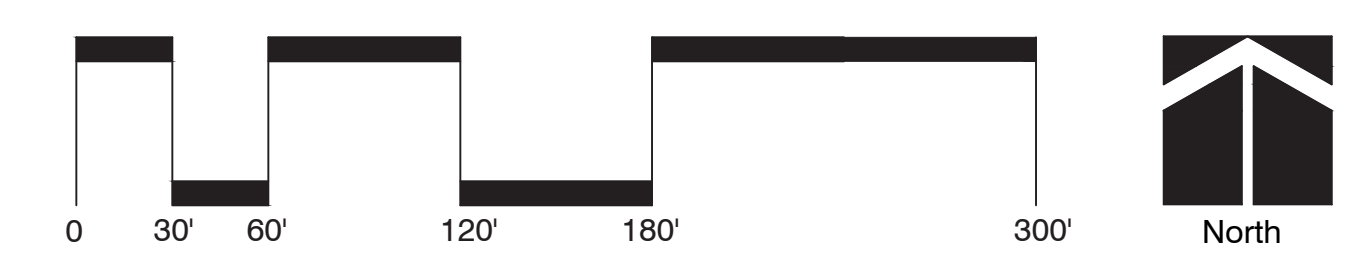
NORTH
SCALE: NOT TO SCALE



Village of Troy

Rendered Site Plan
City of Troy, Michigan

March 2022



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	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 7:00AM	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

[N] Rochester

Total: 12493

In: 6437

Out: 6056

10

6402

24
1

[W] Glaser
Total: 50
In: 0 Out: 50

Out: 0
Total: 116
In: 116
[SW] Slip Lane

Out: 55 In: 55
Total: 110
[E] Glaser

Out: 6523

In: 6076

Total: 12599

[S] Rochester

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)

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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



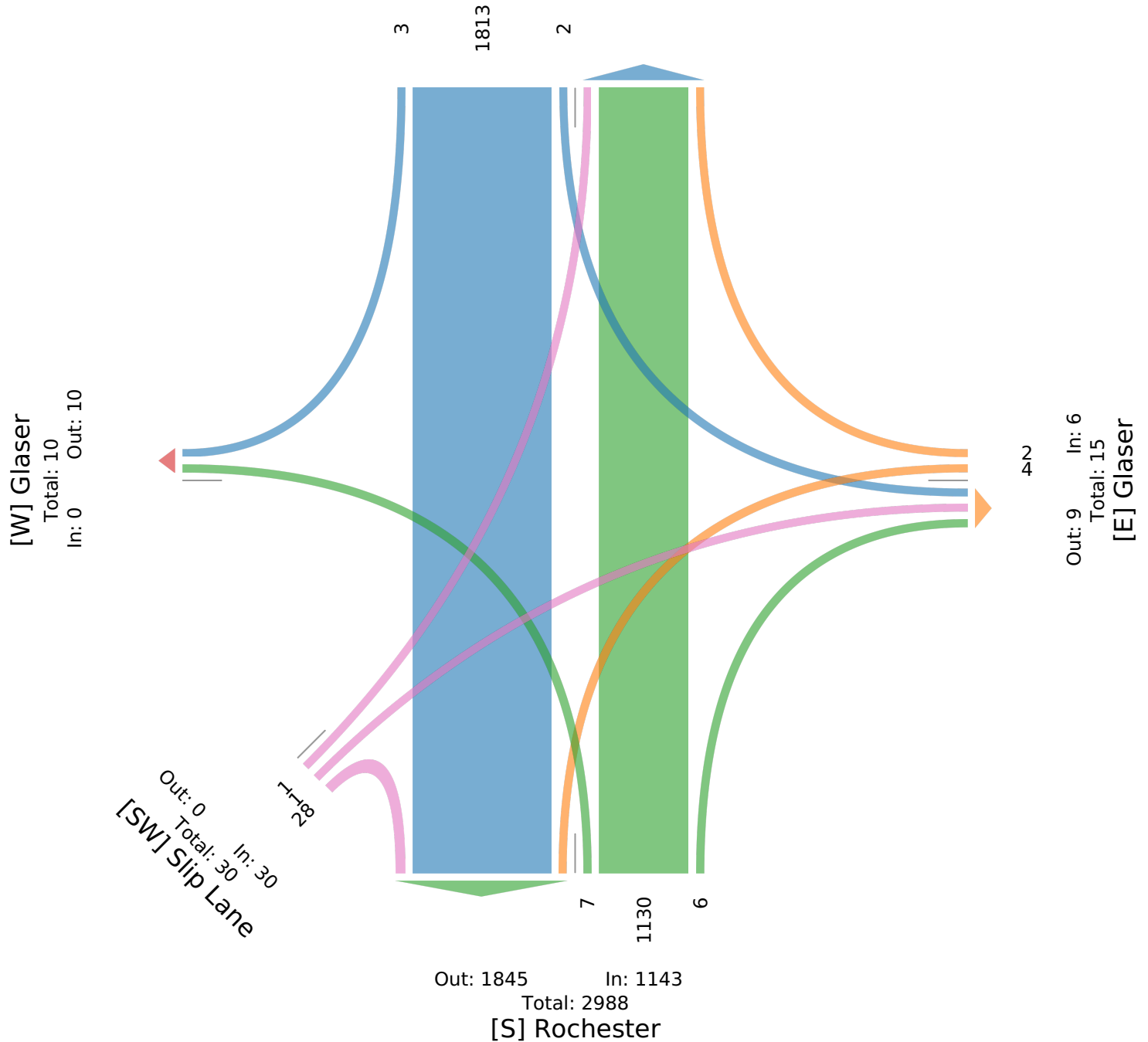
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Rochester

Total: 2951

In: 1818

Out: 1133



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 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 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 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 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



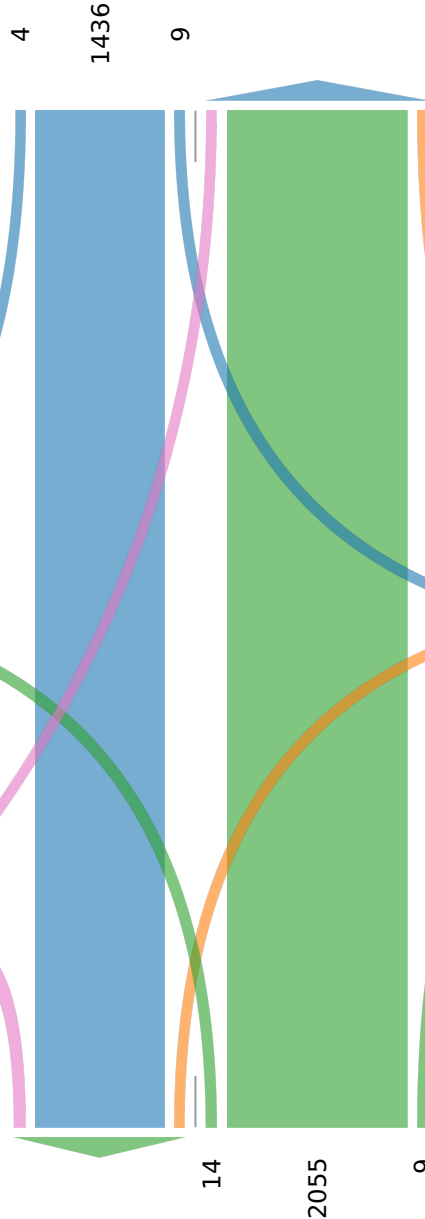
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Rochester

Total: 3526

In: 1449

Out: 2077



[S] Rochester

Total: 3540

Out: 1462

In: 2078

[W] Glaser
Total: 18
In: 0 Out: 18

[SW] Slip Lane
Out: 0 Total: 25 In: 25

Out: 18 In: 23
Total: 41
[E] Glaser

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



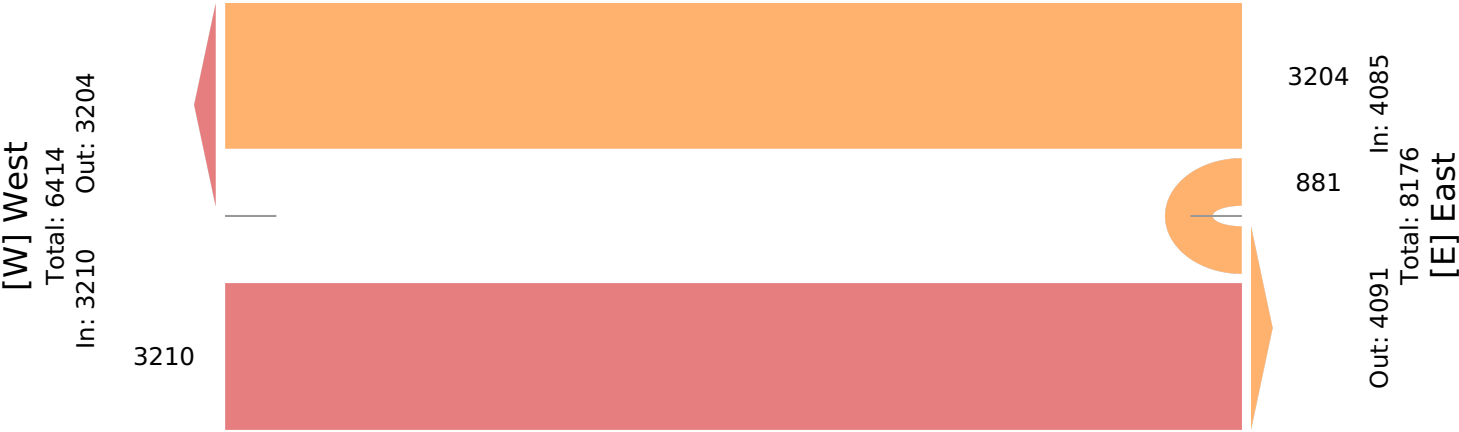
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

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

[N] North



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

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



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



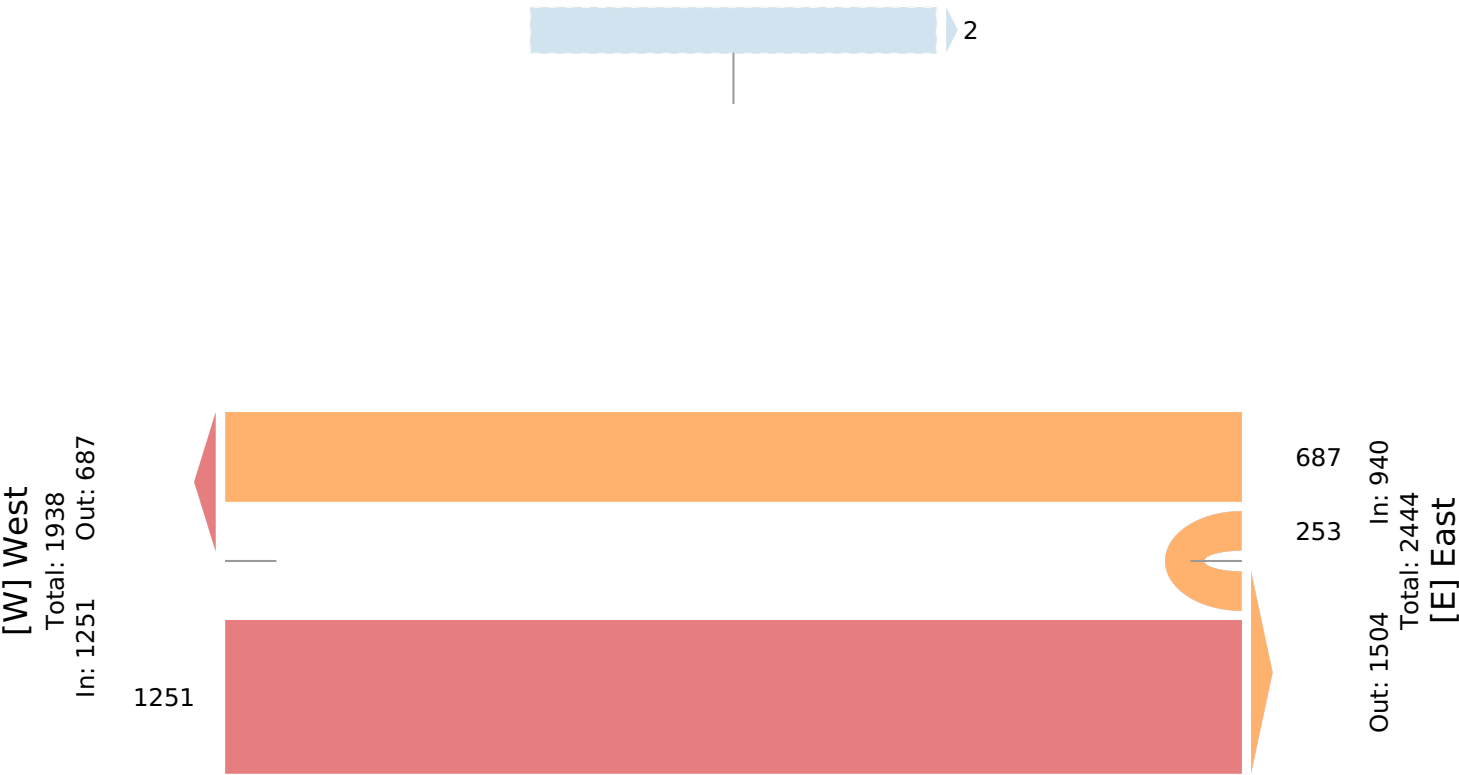
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

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

[N] North



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 Direction	Long Lake Rd Eastbound							Long Lake Rd Westbound							Rochester Northbound							Rochester 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	0	127	22	0	149	0	0	0	167	1	0	168	0	0	0	349	42	0	391	0	708	
7:15AM	0	0	0	0	0	0	0	0	222	40	0	262	0	0	0	177	0	0	177	0	0	0	416	46	0	462	0	901	
7:30AM	0	0	0	0	0	0	0	0	229	38	0	267	0	0	0	202	0	0	202	0	0	0	447	69	0	516	0	985	
7:45AM	0	0	0	0	0	0	0	0	220	47	0	267	0	0	0	261	0	0	261	0	0	0	406	61	0	467	0	995	
Hourly Total	0	0	0	0	0	0	0	0	798	147	0	945	0	0	0	807	1	0	808	0	0	0	1618	218	0	1836	0	3589	
8:00AM	0	0	0	0	0	0	0	0	295	48	0	343	0	0	0	205	0	0	205	0	0	0	360	40	0	400	0	948	
8:15AM	0	0	0	0	0	0	0	0	197	32	0	229	0	0	0	231	0	0	231	0	0	0	428	52	0	480	0	940	
8:30AM	0	0	0	0	0	1	0	0	255	50	0	305	1	0	0	195	0	0	195	0	0	0	359	54	0	413	0	913	
8:45AM	0	0	0	0	0	0	0	0	223	39	0	262	0	0	0	234	0	0	234	0	0	0	353	45	0	398	1	894	
Hourly Total	0	0	0	0	0	1	0	0	970	169	0	1139	1	0	0	865	0	0	865	0	0	0	1500	191	0	1691	1	3695	
4:00PM	0	0	0	0	0	1	0	0	183	56	0	239	0	0	0	321	0	0	321	0	0	0	257	45	0	302	0	862	
4:15PM	0	0	0	0	0	0	0	0	140	42	0	182	0	0	0	371	0	0	371	0	0	0	372	48	0	420	0	973	
4:30PM	0	0	0	0	0	0	0	0	178	73	0	251	0	0	0	362	0	0	362	0	0	0	314	41	0	355	0	968	
4:45PM	0	0	0	0	0	0	0	0	164	50	0	214	0	0	0	396	0	0	396	0	0	0	318	58	0	376	0	986	
Hourly Total	0	0	0	0	0	1	0	0	665	221	0	886	0	0	0	1450	0	0	1450	0	0	0	1261	192	0	1453	0	3789	
5:00PM	0	0	0	0	0	0	0	0	158	60	0	218	0	0	0	361	0	0	361	0	0	0	283	66	0	349	0	928	
5:15PM	0	0	0	0	0	1	0	0	152	65	0	217	0	0	0	405	0	0	405	0	0	0	293	60	0	353	0	975	
5:30PM	0	0	0	0	0	1	0	0	174	53	0	227	0	1	0	419	0	0	420	0	0	0	319	58	0	377	0	1024	
5:45PM	0	0	0	0	0	2	0	0	177	50	0	227	0	0	0	321	0	0	321	0	0	0	306	61	0	367	0	915	
Hourly Total	0	0	0	0	0	4	0	0	661	228	0	889	0	1	0	1506	0	0	1507	0	0	0	1201	245	0	1446	0	3842	
Total	0	0	0	0	0	6	0	0	3094	765	0	3859	1	1	0	4628	1	0	4630	0	0	0	5580	846	0	6426	1	14915	
% Approach	0%	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%	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	-	0	3030	747	0	3777	-	1	4516	1	0	4518	-	0	5500	831	0	6331	-	14626	-	14626	
% Lights	0%	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%	-	98.1%	-	
Single-Unit Trucks	0	0	0	0	0	0	-	0	36	10	0	46	-	0	64	0	0	64	-	0	47	9	0	56	-	166	-	166	
% Single-Unit Trucks	0%	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%	-	1.1%	-	
Articulated Trucks	0	0	0	0	0	0	-	0	8	4	0	12	-	0	37	0	0	37	-	0	26	2	0	28	-	77	-	77	
% Articulated Trucks	0%	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%	-	0.5%	-	
Buses	0	0	0	0	0	0	-	0	20	4	0	24	-	0	9	0	0	9	-	0	7	4	0	11	-	44	-	44	
% Buses	0%	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%	-	0.3%	-	
Bicycles on Road	0	0	0	0	0	0	-	0	0	0	0	0	-	0	2	0	0	2	-	0	0	0	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%	0%	0%	0%	0%	0%	0%	
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	1	-		
% Pedestrians	-	-	-	-	-	33.3%	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-		
Bicycles on Crosswalk	-	-	-	-	-	4	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	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)

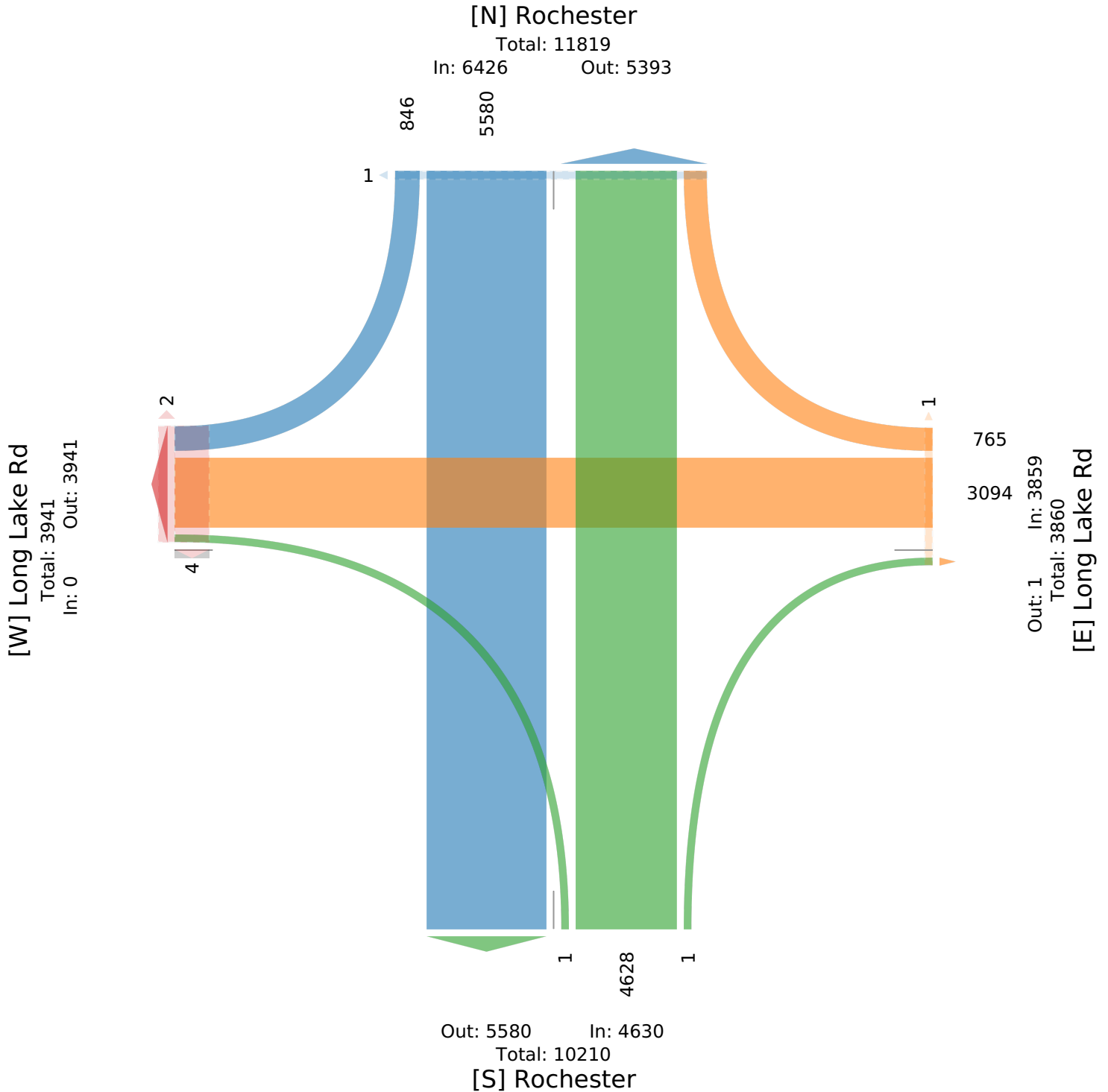
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

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



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Long Lake Rd Eastbound							Long Lake Rd Westbound							Rochester Northbound							Rochester 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	0	229	38	0	267	0	0	0	202	0	0	202	0	0	0	447	69	0	516	0	0	985
7:45AM	0	0	0	0	0	0	0	0	220	47	0	267	0	0	0	261	0	0	261	0	0	0	406	61	0	467	0	0	995
8:00AM	0	0	0	0	0	0	0	0	295	48	0	343	0	0	0	205	0	0	205	0	0	0	360	40	0	400	0	0	948
8:15AM	0	0	0	0	0	0	0	0	197	32	0	229	0	0	0	231	0	0	231	0	0	0	428	52	0	480	0	0	940
Total	0	0	0	0	0	0	0	0	941	165	0	1106	0	0	0	899	0	0	899	0	0	0	1641	222	0	1863	0	0	3868
% Approach	0%	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%	-	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	-	0	923	160	0	1083	-	0	852	0	0	852	-	0	1620	219	0	1839	-	-	-	-	3774
% Lights	0%	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	-	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%	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	-	0	2	2	0	4	-	0	14	0	0	14	-	0	7	1	0	8	-	-	-	-	26
% Articulated Trucks	0%	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	-	0	8	1	0	9	-	0	6	0	0	6	-	0	2	1	0	3	-	-	-	-	18
% Buses	0%	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	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%	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)

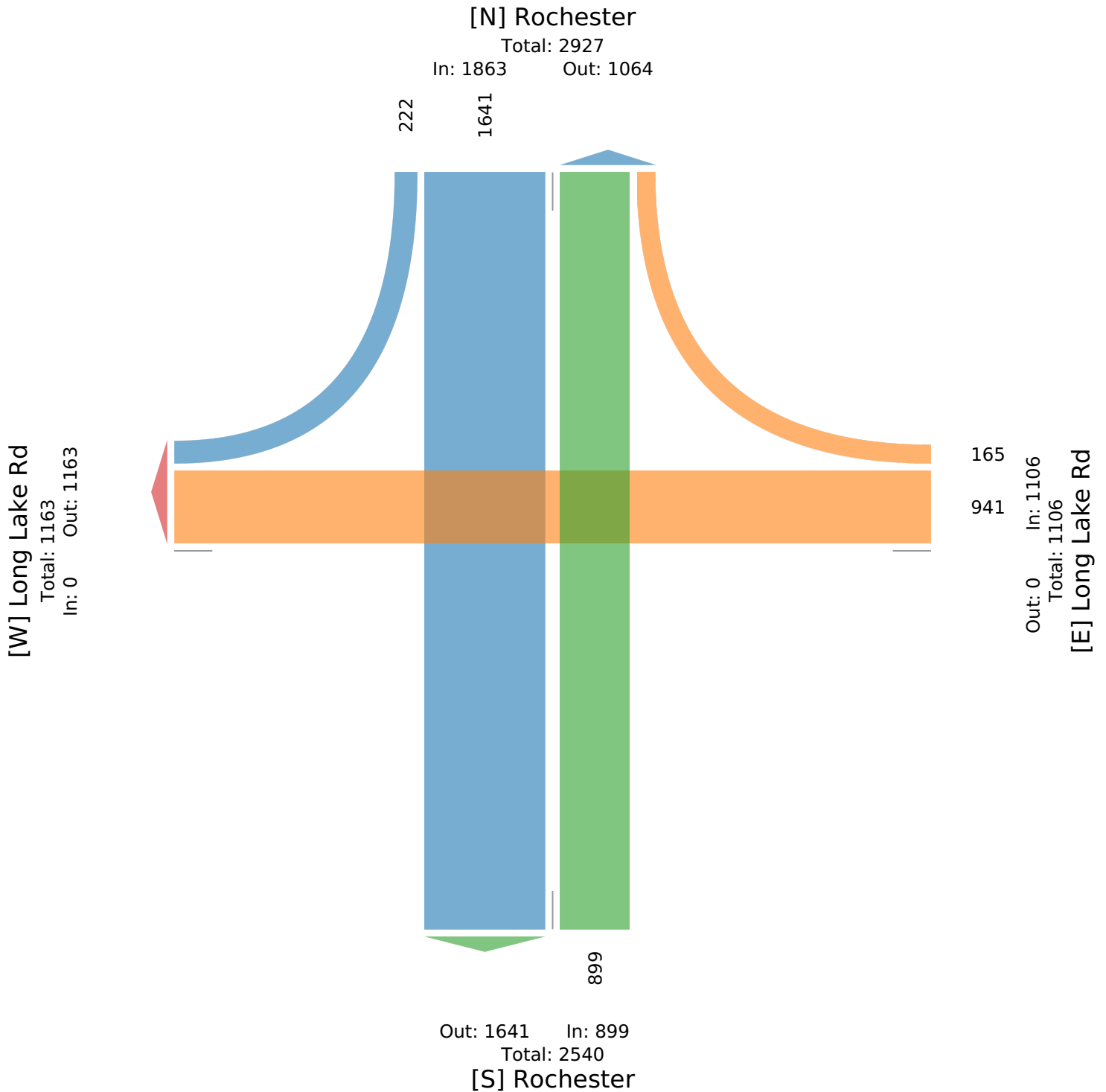
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

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

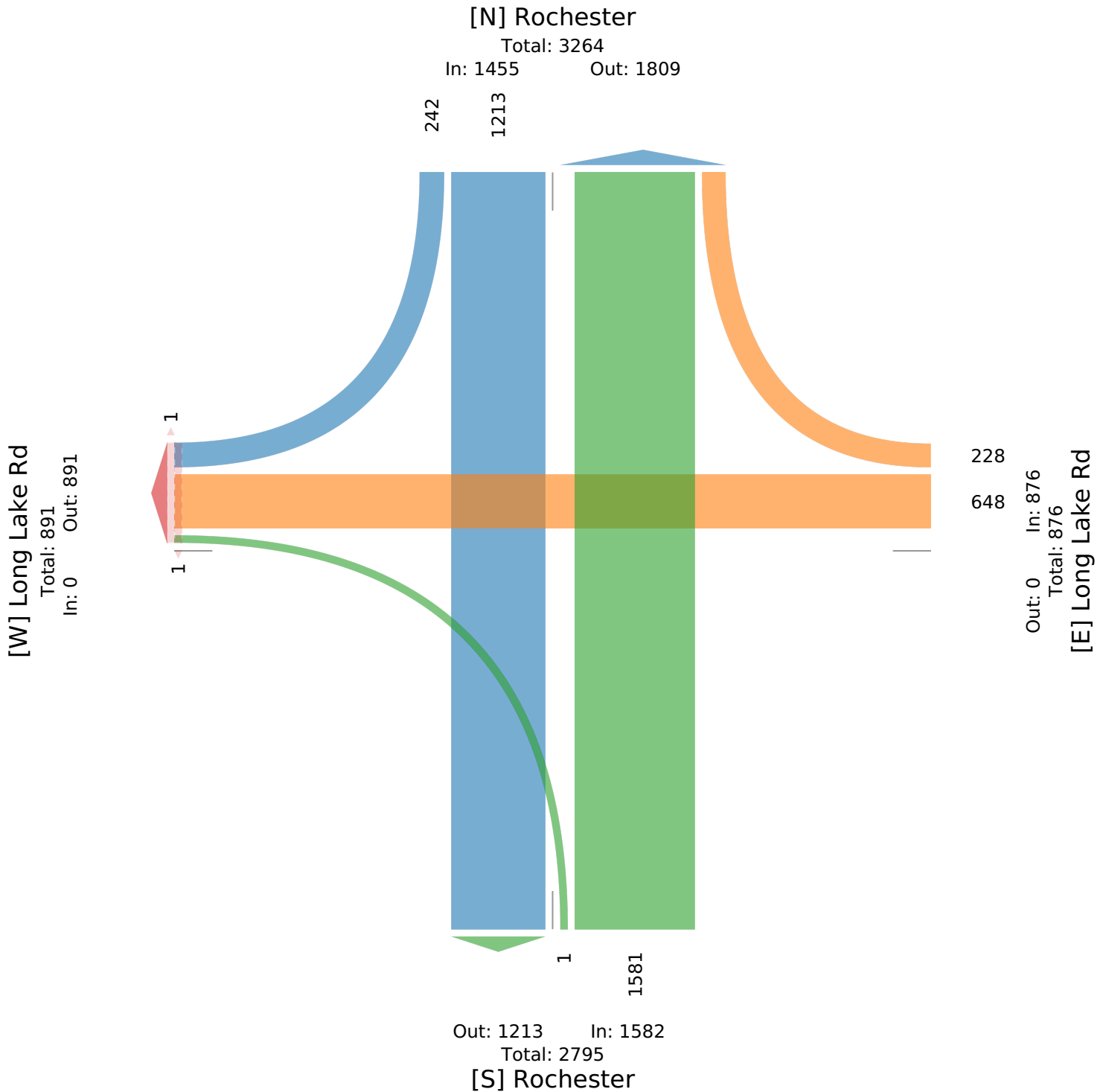


Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Long Lake Rd Eastbound						Long Lake Rd Westbound						Rochester Northbound						Rochester 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%	-	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%	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	0	640	225	0	865	-	1	1569	0	0	1570	-	0	1196	238	0	1434	-	3869
% Lights	0%	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%	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%	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%	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%	-	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



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 Direction	Long Lake Eastbound						Long Lake Westbound		Rochester Northbound					Rochester 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)

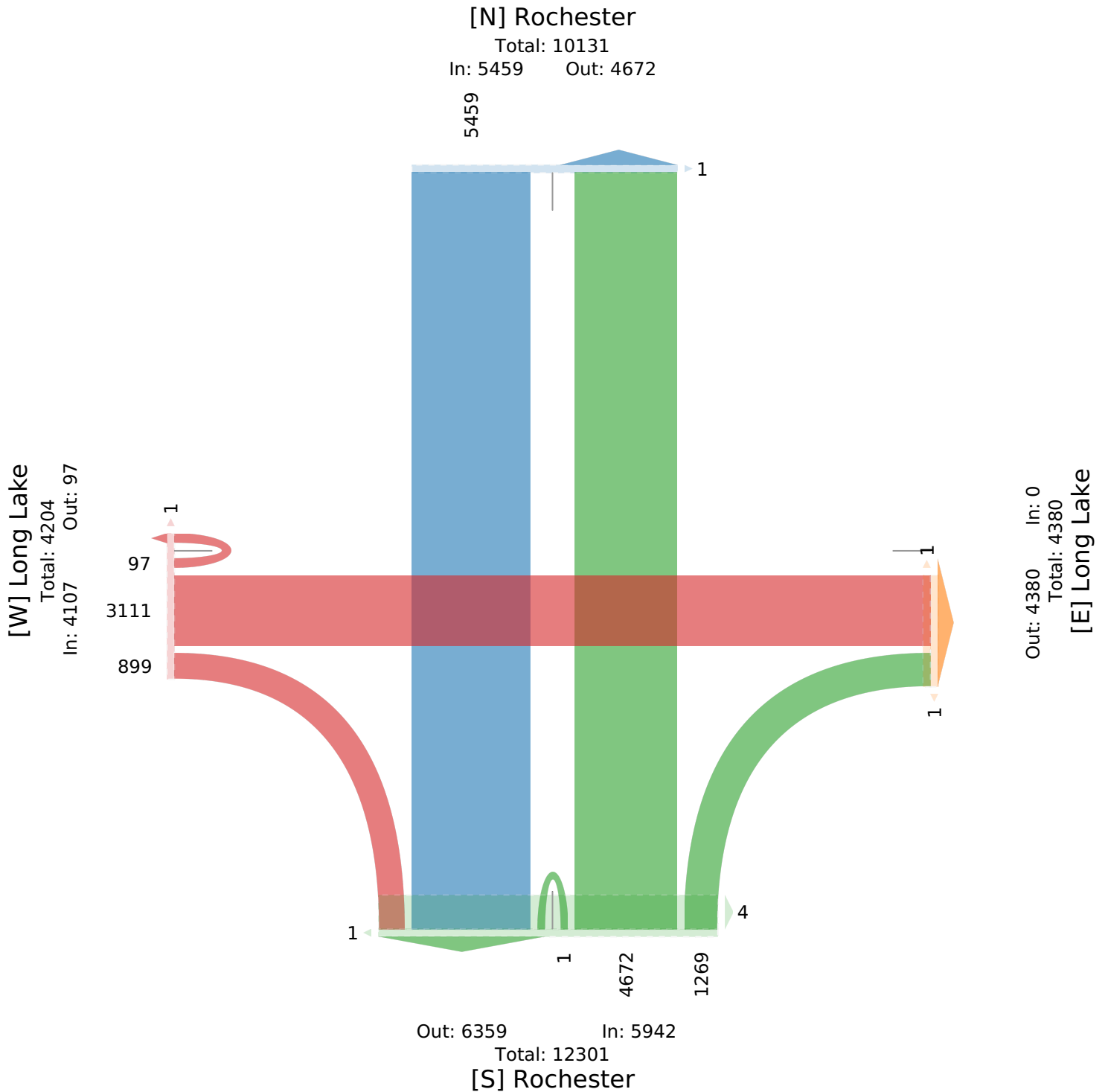
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

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 Direction	Long Lake Eastbound						Long Lake Westbound		Rochester Northbound					Rochester 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)

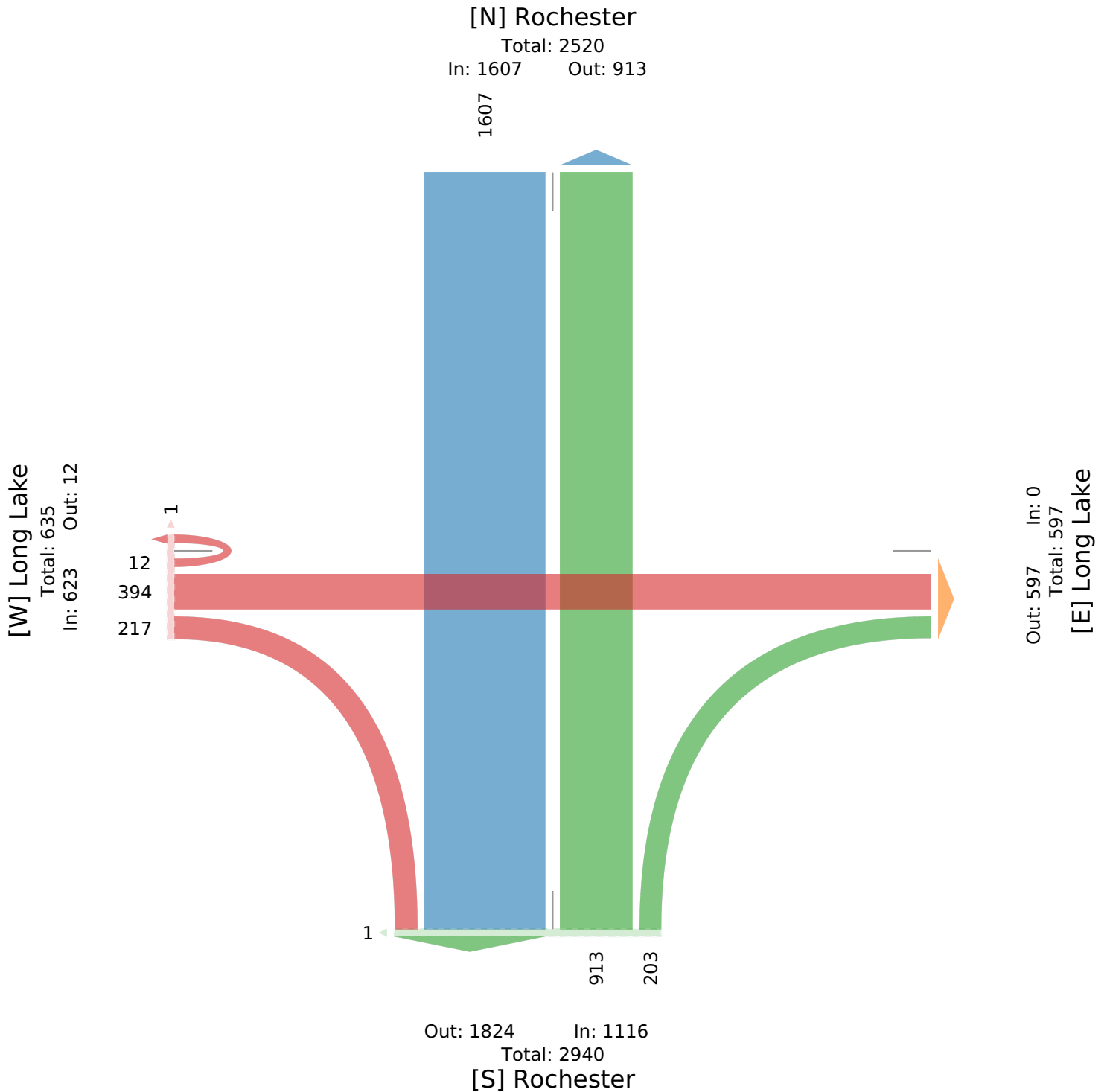
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

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 Direction	Long Lake Eastbound						Long Lake Westbound		Rochester Northbound						Rochester 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



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Rochester

Total: 2793

In: 1216 Out: 1577

1216

1

[W] Long Lake

Total: 1526

In: 1477 Out: 49

49

1198

230

Out: 1669 In: 0

Total: 1669

[E] Long Lake

Out: 1447

In: 2049

Total: 3496

[S] Rochester

1

1577

1

471

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: Long Lake + x/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
<u>—</u> CHANGE TIMING.....																			
<u>—</u> CHANGE OFFSET.....																			
<u>—</u> CHANGE CYCLE LENGTH.....																			
<u>—</u> 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

— REPROGRAM TBC

TRAFFIC OPERATIONS

— 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

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

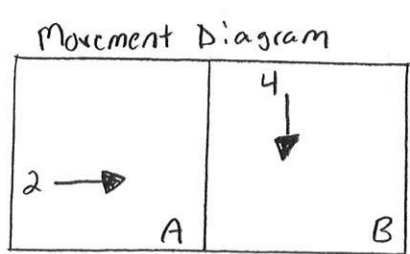
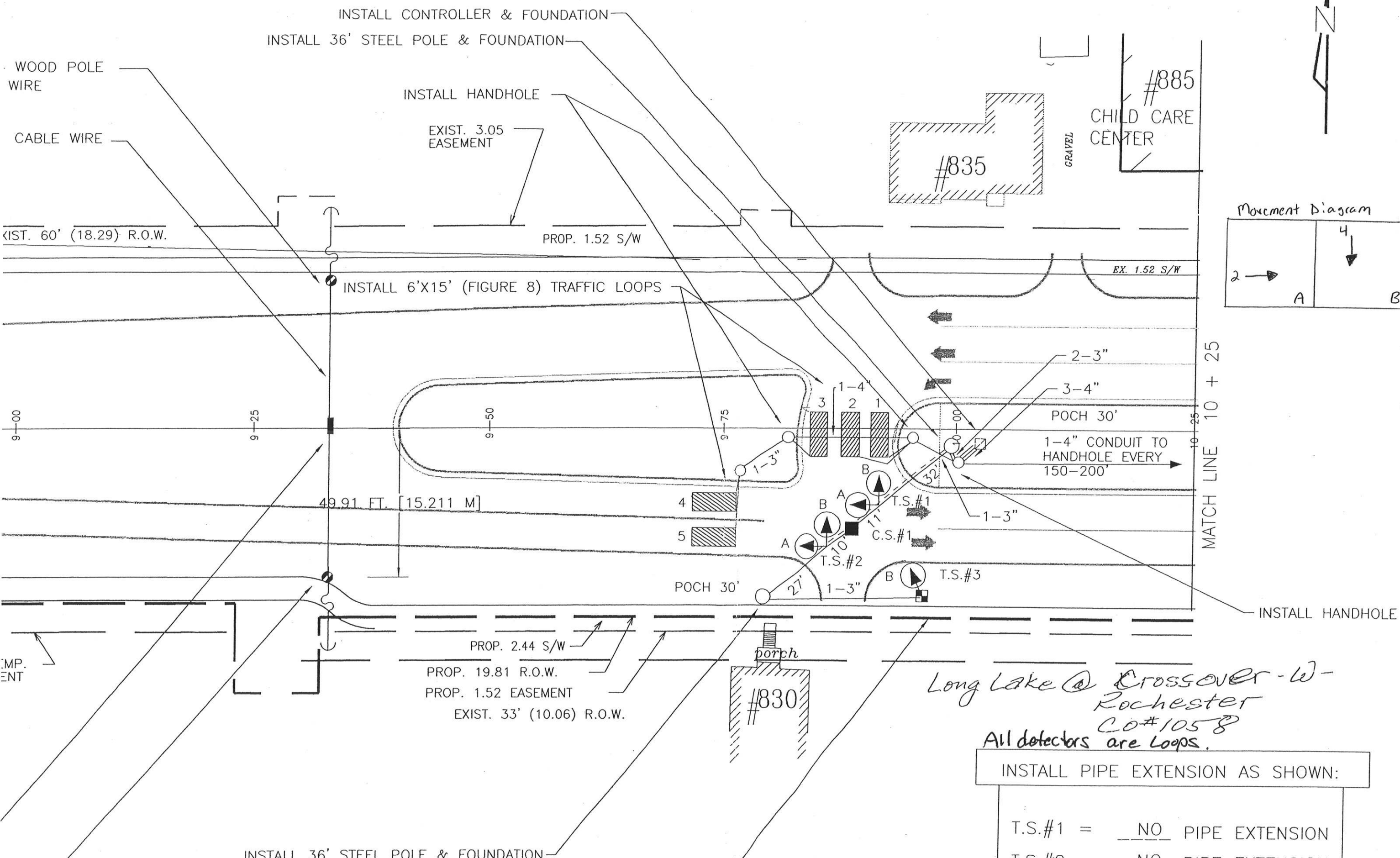
D Connector Form for Mod 52 w/Loops

Intersection Name: Long Lake & X/O W/O Rochester

County No: 1058

Date: 07/30/19

[illegible]



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

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
<u>—</u> CHANGE TIMING.....																			
<u>—</u> CHANGE OFFSET.....																			
<u>—</u> CHANGE CYCLE LENGTH.....																			
<u>—</u> ADD DIAL/SPLIT.....																			

X CHANGE BREAKOUT OR EPROM: Change Personality -> Rev #2
(FlexiLink data, Det Alarm Cat)

— 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: Rick Anderson w/et/IR

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) | 17. - NOTE :- ALL DETECTORS ARE AUTOSCOPE |
| 2. WB LONG LAKE R PRES (LK) | 18. - (2004 CAMEARAS). |
| 3. WB LONG LAKE RT TIMED (3 SEC) | 19. - |
| 4. SB ROCHESTER L PRES (LK) | 20. - |
| 5. SB ROCHESTER C PRES (LK) | 21. - |
| 6. SB ROCHESTER R PRES (LK) | 22. - |
| 7. EB LONG LAKE L PRES (LK) | 23. Opticom 2 (BACKPANEL VD7 (167)) |
| 8. EB LONG LAKE R PRES (LK) | 24. Opticom 1 (BACKPANEL VD8 (175)) |
| 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. - | |

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	A APPR 2 : NB ROCHESTER L,R,RT
B APPR 1 : WB LONG LAKE L,R	B APPR 2 : WB LONG LAKE RT
B APPR 3 : EB LONG LAKE L,R	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 *
* FOR SITE NO. 585 *
* CARISSA MARKEL *
* DATE :- 25-JUL-2019 *

CHECKSUMS
TIMES: 54/124
PERS: E6/346
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

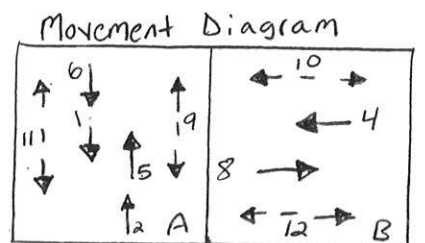
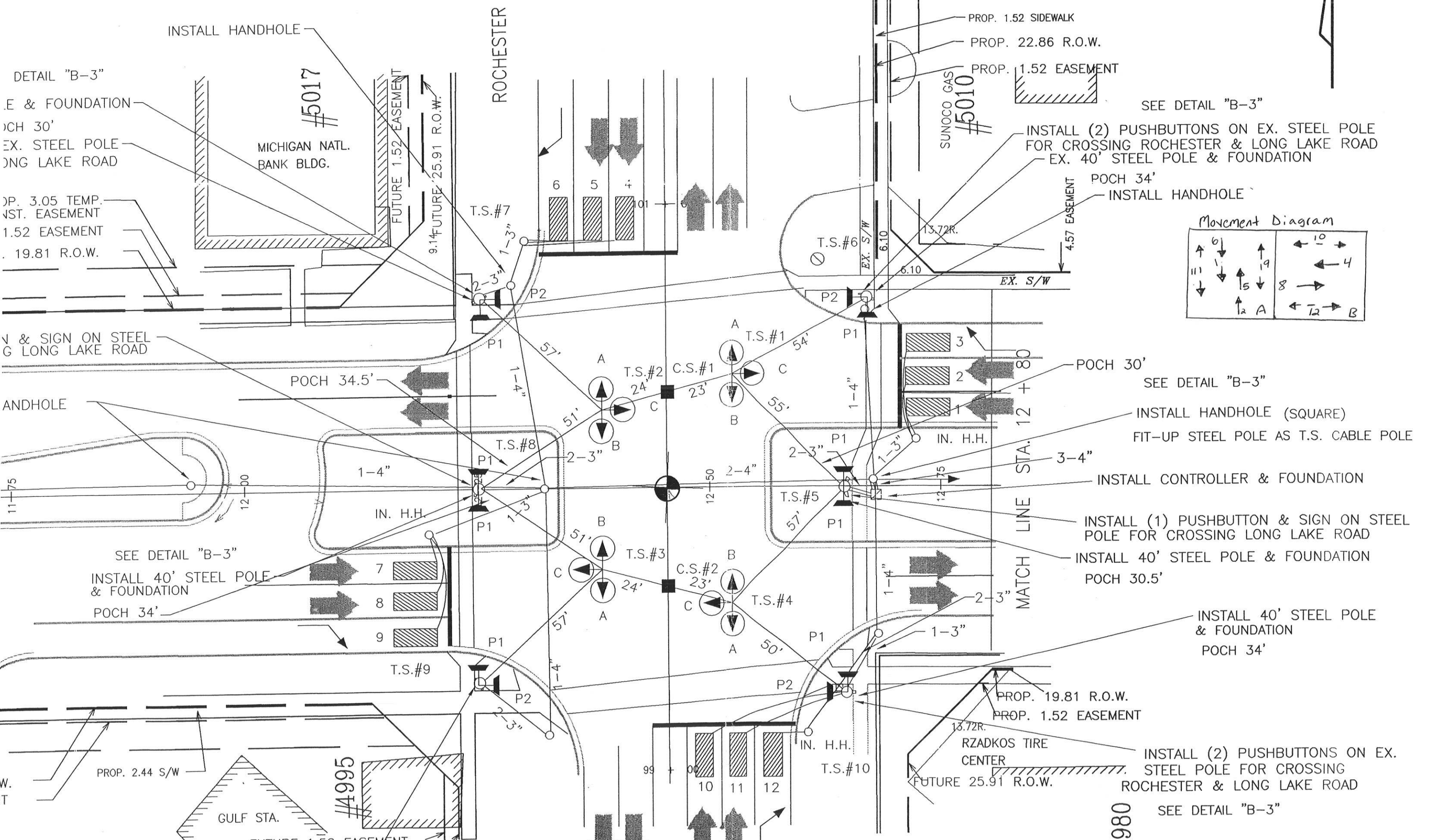
Autoscope Output Harness Pins #1 & #20 to Logic Common & Pins #18 & #37 to +24 VDC

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	



0861

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.

Upstream 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

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

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.

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

Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. LOS can be characterized for the entire intersection, each intersection approach, and each lane group. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle. The criteria are given in Exhibit 19-8. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group in question.

LOS A describes operations with a control delay of 10 s/veh or less. This level is typically assigned when the volume-to-capacity ratio is low and either progression is extremely favorable or the cycle length is very short. If LOS A is the result of favorable progression, most vehicles arrive during a green indication and travel through the intersection without stopping.

LOS B describes operations with control delay between 10 and 20 s/veh. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

Exhibit 19.8. Level-of-Service Criteria for Signalized Intersections (Motorized Vehicles)

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤ 10.0
B	> 10.0 and ≤ 20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	> 80.0

1. If the v/c ratio for a lane group exceeds 1.0, a LOS F is assigned to the individual lane group. LOS for approach-based and intersection-wide assessments are determined solely by the control delay.

LOS C describes operations with control delay between 20 and 35 s/veh. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e. one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicle stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D describes operations with control delay between 35 and 55 s/veh. This level is typically assigned when when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E describes operations with control delay between 55 and 80 s/veh. This level is typically assigned when when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level, considered to be unacceptable to most drivers, often occurs with over-saturation, that is, when arrival flow rates exceed the capacity of the intersection. This level is typically assigned when the volume-to-capacity ratio is high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

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

HCM 6th TWSC
10: Rochester Rd. & Glaser Dr.

Existing
AM Peak Hour

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↱		↕		↱	↕		↱	↕	↱
Traffic Vol, veh/h	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		Major2		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	EBLn1WBLn1	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

HCM Signalized Intersection Capacity Analysis

20: Rochester Rd. & EB Long Lake Rd.













Existing
AM Peak Hour

												
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												

HCM Signalized Intersection Capacity Analysis

25: Rochester Rd. & WB Long Lake Rd.

Existing
AM Peak Hour

												
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												

HCM Signalized Intersection Capacity Analysis

30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Existing
AM Peak Hour



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						

HCM 6th TWSC
40: Site Drive & Long Lake Rd.

Existing
AM Peak Hour

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	-	

HCM 6th TWSC
10: Rochester Rd. & Glaser Dr.

Existing
PM Peak Hour

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		Major2		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	EBLn1WBLn1	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

HCM Signalized Intersection Capacity Analysis

20: Rochester Rd. & EB Long Lake Rd.













Existing
PM Peak Hour

												
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												

HCM Signalized Intersection Capacity Analysis

25: Rochester Rd. & WB Long Lake Rd.

Existing
PM Peak Hour

												
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												

HCM Signalized Intersection Capacity Analysis

30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Existing
PM Peak Hour



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						

HCM 6th TWSC
40: Site Drive & Long Lake Rd.

Existing
PM Peak Hour

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	-	

HCM 6th TWSC
10: Rochester Rd. & Glaser Dr.

Background
AM Peak Hour

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	EBLn1WBLn1	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

HCM Signalized Intersection Capacity Analysis

20: Rochester Rd. & EB Long Lake Rd.













Background
AM Peak Hour

												
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												

HCM Signalized Intersection Capacity Analysis

25: Rochester Rd. & WB Long Lake Rd.

Background
AM Peak Hour

												
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												

HCM Signalized Intersection Capacity Analysis

30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Background
AM Peak Hour



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						

HCM 6th TWSC
40: Site Drive & Long Lake Rd.

Background
AM Peak Hour

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	EBLn1WBLn1	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

HCM Signalized Intersection Capacity Analysis

20: Rochester Rd. & EB Long Lake Rd.


Background
PM Peak Hour

												
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												

HCM Signalized Intersection Capacity Analysis

25: Rochester Rd. & WB Long Lake Rd.

Background
PM Peak Hour

												
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 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			120.0									
Intersection Capacity Utilization			90.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Background
PM Peak Hour



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						

HCM 6th TWSC
40: Site Drive & Long Lake Rd.

Background
PM Peak Hour

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	-	

HCM 6th TWSC
10: Rochester Rd. & Glaser Dr.

Future
AM Peak Hour

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	EBLn1WBLn1	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

HCM Signalized Intersection Capacity Analysis

20: Rochester Rd. & EB Long Lake Rd.













Future
AM Peak Hour

													
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								16.5	Sum of lost time (s)	
Intersection Capacity Utilization			93.3%								F	ICU Level of Service	
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

25: Rochester Rd. & WB Long Lake Rd.

Future
AM Peak Hour

												
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												

HCM Signalized Intersection Capacity Analysis

30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Future
AM Peak Hour



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						

HCM 6th TWSC
40: Site Drive & Long Lake Rd.

Future
AM Peak Hour

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
Stage 1	-	-	-	-	729
Stage 2	-	-	-	-	794
Critical Hdwy	-	-	4.14	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	-	-	2.22	-	3.52
Pot Cap-1 Maneuver	-	-	868	-	109
Stage 1	-	-	-	-	438
Stage 2	-	-	-	-	406
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	868	-	108
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	-

HCM 6th TWSC
10: Rochester Rd. & Glaser Dr.

Future
PM Peak Hour

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	EBLn1WBLn1	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

HCM Signalized Intersection Capacity Analysis

20: Rochester Rd. & EB Long Lake Rd.


Future
PM Peak Hour

												
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												

HCM Signalized Intersection Capacity Analysis

25: Rochester Rd. & WB Long Lake Rd.

Future
PM Peak Hour

												
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												

HCM Signalized Intersection Capacity Analysis

30: EB Long Lake Rd. & WB-to-EB X/O, W. of Rochester Rd

Future
PM Peak Hour



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						

HCM 6th TWSC
40: Site Drive & Long Lake Rd.

Future
PM Peak Hour

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

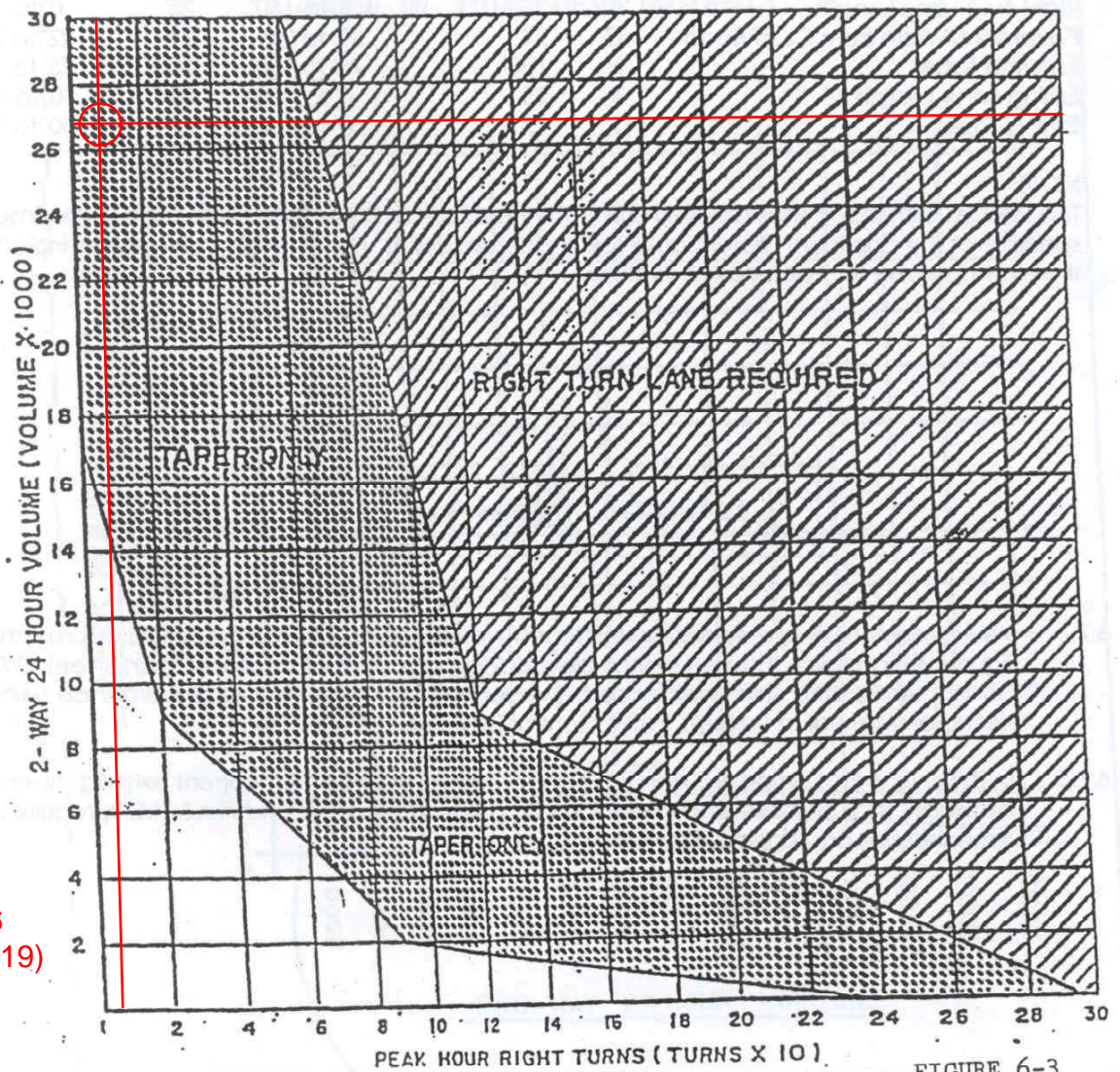


FIGURE 6-3

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).

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](#)

CAUTION: This email did not originate from within the City of Troy. Do not click links or open attachments unless you recognize the sender and know the content is safe.

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



ITEM #9

DATE: December 7, 2022

TO: Planning Commission

FROM: R. Brent Savidant, Community Development Director

SUBJECT: POTENTIAL PLANNED UNIT DEVELOPMENT (PUD) APPLICATION – Concept Plan discussion, East of Livernois, North of Square Lake (PIN 88-20-03-301-088, 88-20-03-301-025, -024, -023), Section 35, Currently Zoned NN (Neighborhood Node “Q”) and R-1B (One Family Residential) Districts.

The owner of the subject parcel, GFA, is interested in developing a mixed use (residential only) PUD on the site. Planning Department was provided a conceptual site plan describing the potential project.

The site is 5.48 acres in area. Three single family homes presently sit on the property. A PUD would provide the applicant with some flexibility with potential project uses moving forward. The attached memo summarizes the project.

The Planning Commission reviewed a concept at the July 26, 2022 Regular meeting and provided feedback. The applicant revised the concept based on Planning Commission feedback and requested another opportunity to present to the board.

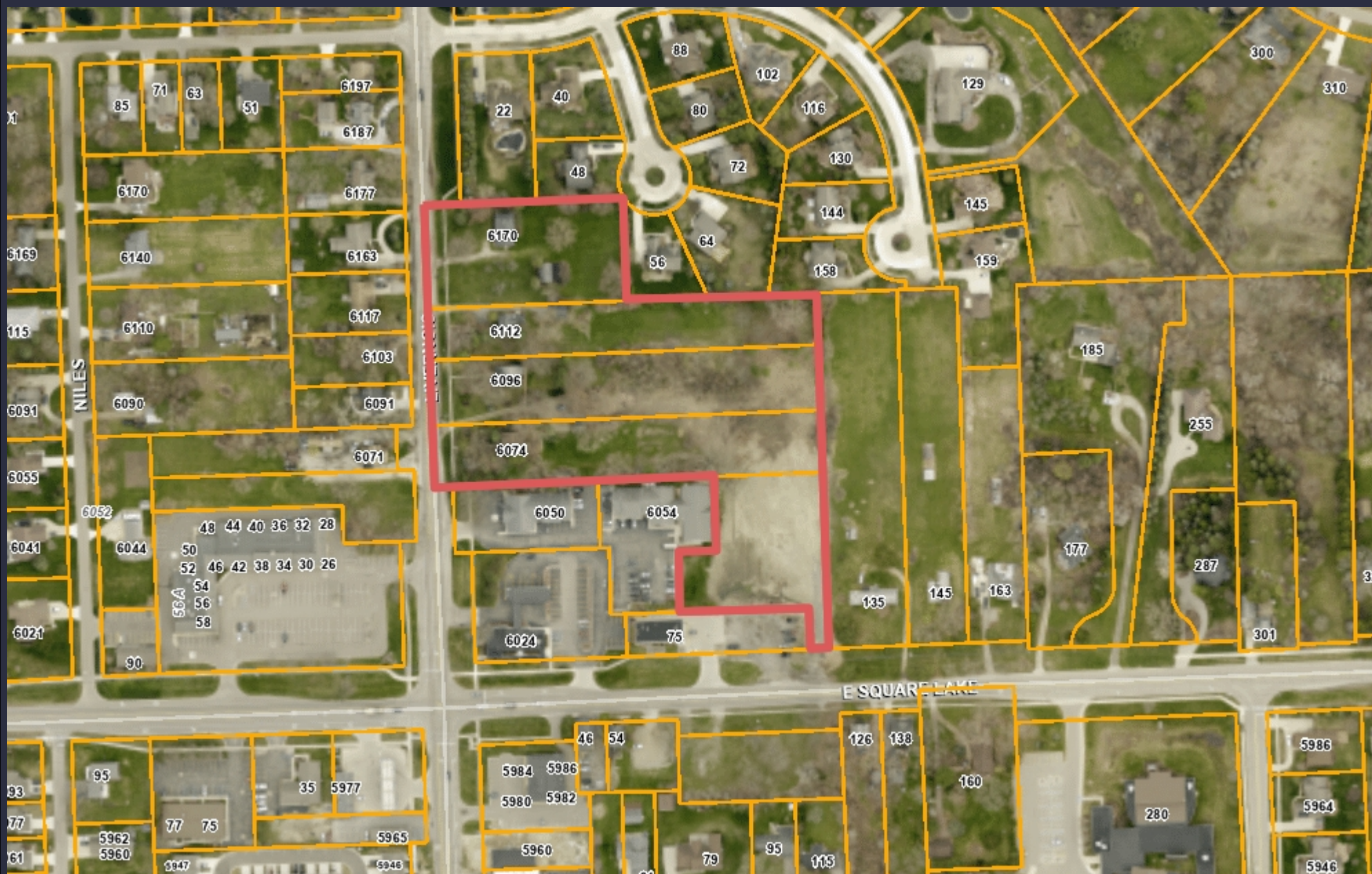
A formal application has not been submitted. The applicant seeks input and direction from the Planning Commission on this matter, prior to moving forward. Formal action is not required.

Please be prepared to discuss this item at the December 13, 2022 Regular meeting.

Attachments:

1. Maps
2. Minutes from July 26, 2022 Planning Commission Regular meeting.
3. Memo from Carlisle/Wortman Associates, Inc.
4. Miscellaneous information provided by applicant

G:\PUDs\Potential Project\GFA Livernois & Square Lake\GFA Square Lake Concept 12-13-22.docx



595 0 297 595Feet



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.



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.

OTHER ITEMS

6. **POTENTIAL PLANNED UNIT DEVELOPMENT (PUD) APPLICATION** – Concept Plan Discussion, East of Livernois, North of Square Lake (PIN 88-20-03-301-088, 88-20-03-301-025, -024, -023), Section 35, Currently Zoned NN (Neighborhood Node “Q”) and R-1B (One Family Residential) Districts

Mr. Carlisle presented a brief background of the Planned Unit Development application. He addressed the mixed zoning and the 14-unit attached townhome development that was granted approval in 2018. Mr. Carlisle said the applicant is seeking to amend the previously approved plan to incorporate four additional parcels into an overall development of the site. Mr. Carlisle said the concept plan is only for discussion and no action would be taken this evening. He said it is too early in the process to determine data with respect to Zoning Ordinance requirements.

Mr. Carlisle read revised language recently drafted by the Master Plan Neighborhood Node Steering Committee for Neighborhood Node “Q” that relates to primary uses and character of the neighborhood node.

Applicant Gary Abitheira addressed his vision of incorporating the additional parcels with the townhome development and shared his thoughts on various placements of the PUD housing types to blend with the townhomes.

There was discussion, some comments related to:

- Previously approved development; housing types, timing and validity of approval, currently in engineering process.
- Existing homes; historical in nature, not listed in Historic Preservation Chapter.
- Neighborhood Node “Q” toured by Planning Commission and City Council.
- Public benefit; preservation of two existing homes, housing types offered.
- Intent of PUD development; provide flexibility from Zoning Ordinance regulations to allow a more creative and negotiable product.
- Board members expressed opposition to 3-story tall buildings.
- Applicant encouraged to:
 - Create more green space.
 - Retain “old Troy” feel of neighborhood.
 - Create a community feel, a village.
 - Create a different and unique development.
 - Let element of historical homes shine on their own.



Carlisle | Wortman
ASSOCIATES, INC.

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

To: Troy Planning Commission
Brent Savidant, Community Development Director

From: Ben Carlisle, AICP

Date: December 6, 2022

RE: GFA Square Lake Concept Review

A concept plan has submitted a Planned Unit Development (PUD) for adjacent to the northeast corner of the intersection of Square Lake and Livernois. The concept plan includes a total of forty-eight (48) units with a mix of housing types. Additional amenities include preservation of two existing homes on site, homes with first floor master, stormwater management, and small play area. The part of this site that is zoned FB, Form-Based was approved for a fourteen (14) unit attached townhome project. See section below for more information. This project has been expanded to include four parcels currently zoned R-1B.



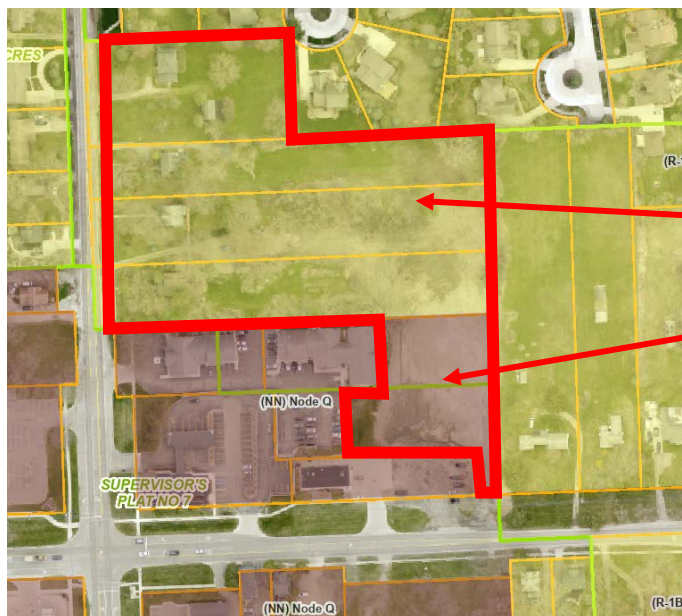
Housing Types

As noted, the project proposes a mix of housing types:

Type	Number	Notes
Preservation of Existing Single-Family Homes	2	Existing homes on site
Single Family Ranch Homes	4	First Floor Master
Two-Story Attached (first floor Master)	9	First Floor Master
Two-Story Attached Townhome	27	
Two-Story Duplexes	6	
Total	48	

Zoning

The site includes a mix of Form-based zoning and R-1B. The preservation of the single-family homes, the inclusion of the new homes, and the mix of other housing products require this site to be developed as a Planned Unit Development.



Four parcels added to the development

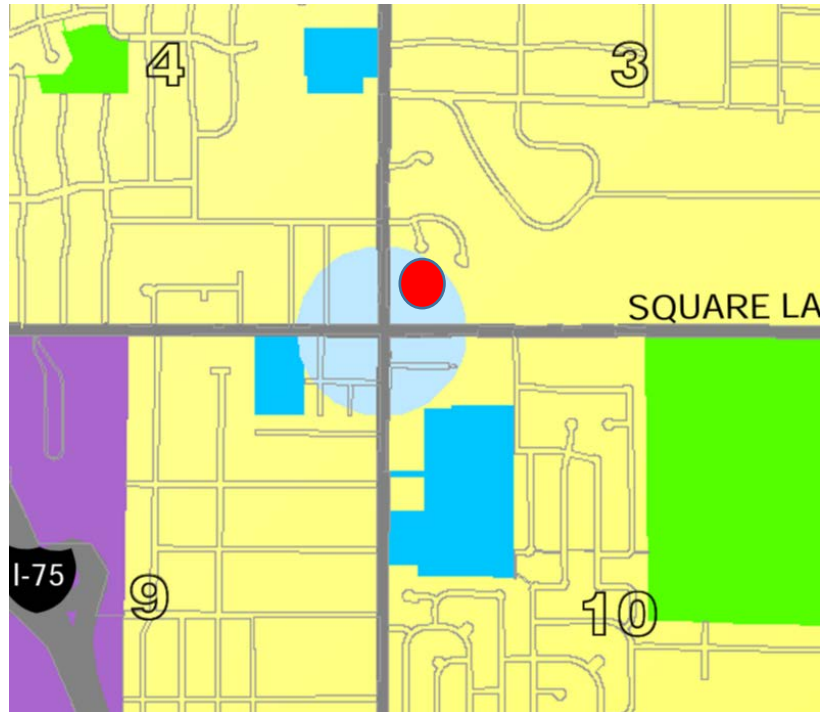
Part of site approved for fourteen (14) unit attached townhome project.

Master Plan

The site is designated as Neighborhood Node on the future land use plan. The Neighborhood Node master plan designation is not parcel specific, but rather shown as a concentric circle approximately within a 1,000 foot radius of the intersection.

Elements of neighborhood node include:

- Neighborhood Nodes are the concentrated, commercial and mixed-use centers situated at major intersections of Troy thoroughfares.
- Development will be denser and taller than the surrounding area, encouraging visual prominence to signal a gathering space.
- Nodes should be generally confined to a 1,000 foot radius from a major intersection.
- The nodes provide uses and spaces that attract and welcome neighborhood residents.
- Buildings should be separated from the right-of-way line by a landscaped greenbelt, one lane of off-street parking or a pedestrian walk, or a combination of these.
- Primary parking areas will be located within rear or interior side yards.
- Off-street parking should be screened from the public right-of-way by a knee wall or low decorative fence with a hedge of plantings.
- Walks will connect adjacent developments and the public sidewalks.
- Well-defined crosswalks with timed signalization will permit safe crossings.
- Flexible use of space allowing modest outdoor gathering spaces, such as plazas, will be encouraged.
- Buildings should be between two and three stories, although one-story structures accommodating gas stations or other special situations may be permitted.
- One-story buildings should have a minimum exterior height of sixteen feet.
- A ground level story should have a minimum height of twelve feet from finished floor to finished ceiling.
- Facades facing major thoroughfares will be treated as fronts and should have a minimum of half transparent glass and special architectural design treatments.
- Fenestration (the arrangement of windows and doors) should be highlighted through the use of awnings, overhangs or trim detailing.

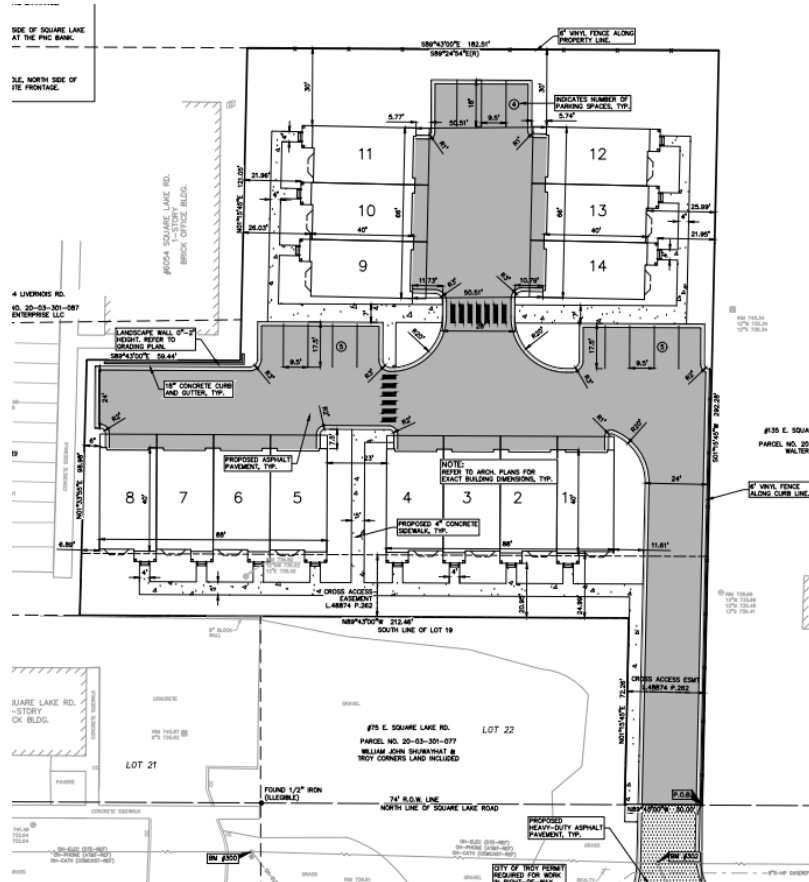


- Lighting will be carefully managed so as not to encroach on adjacent residential areas.

Please note that Planning Commission is considering amendments to the Master Plan section for neighborhood node, including modifying many of these elements.

Approved Plan

As noted the following 14-unit townhome development was approved in 2018.



2018 approved 14-unit site plan

Concept Plan

The Concept Plan was first reviewed by the Planning Commission in July. Discussion included:

- Previously approved development, housing types, timing and validity of approval, currently in engineering process
- Existing homes; historical in nature, and listed in Historic Preservation Chapter
- Neighborhood Node “Q” toured by Planning Commission and City Council
- Public benefit, preservation of two existing homes, housing types offered
- Intent of PUD development, provide flexibility from Zoning Ordinance regulations to allow a more creative and negotiable product
- Planning Commission members expressed opposition to 3-story tall buildings
- Applicant was encouraged to:
 - Create more green space
 - Retain “old Troy” feel of neighborhood
 - Create a community feel, a village
 - Create a different and unique development
 - Let element of historical homes shine on their own

The applicant has submitted a revised concept plan. Significant changes to the plan include:

- Reduced height of all units to not exceed two-stories
- Reduced number of units by 3
- Added duplex unit type
- Added internal park



July 2022 Plan



December 2022 Plan

GFA Square Lake

PUD Standards

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.

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.

Details:

The concept plan is very conceptual. Details such as architectural quality, elevations, material selection, building height, and onsite amenities are very important and will be reviewed in detail if this project moves forward.

Questions for the Planning Commission Consideration

1. Has the revised plan addressed the concerns of the Planning Commission?
2. Is the proposed plan consistent with the Master Plan?
3. Does the Planning Commission support the proposed mix of housing types? Are there additionally types or changes in types that the Planning Commission thinks should be considered?
4. Is the proposed plan consistent with the PUD standards?
5. Are there site plan changes that the applicant should consider?
6. Are there other considerations that should be discussed with the applicant?

I look forward to discussing this plan at your December meeting.

Sincerely,



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







1013