PLANNING COMMISSION
MEETING AGENDA
REGULAR MEETING

500 W. Big Beaver
Troy, MI 48084
(248) 524-3364
www.troymi.gov
planning@troymi.gov

Donald Edmunds, Chair, Tom Krent, Vice Chair
Ollie Apahidean, Karen Crusse, Carlton M. Faison, Michael W. Hutson
Padma Kuppa, Philip Sanzica and John J. Tagle

November 1, 2016 **7:00 P.M.** **Council Chamber**

1. ROLL CALL

2. APPROVAL OF AGENDA

3. APPROVAL OF MINUTES – October 11, 2016

4. PUBLIC COMMENT – For Items Not on the Agenda

5. ZONING BOARD OF APPEALS (ZBA) REPORT

6. DOWNTOWN DEVELOPMENT AUTHORITY (DDA) REPORT

7. PLANNING AND ZONING REPORT

CONDITIONAL REZONING

8. PUBLIC HEARING - CONDITIONAL REZONING APPLICATION (File Number CR JPCR2016-003) – Proposed McClure Road Apartments, North of Big Beaver, West of Crooks, East side of McClure (3142, 3114, 3086 McClure), Section 20, From R-1B (One Family Residential) District to BB (Big Beaver) District

PRELIMINARY SITE PLAN REVIEW

9. PRELIMINARY SITE PLAN REVIEW (File Number SP JPLN2016-0028) – Proposed Troy Market Place (Additions), Southwest Corner of Big Beaver and Rochester, Section 27, Currently Zoned BB (Big Beaver) District

OTHER BUSINESS

10. PUBLIC COMMENT – Items on Current Agenda

11. PLANNING COMMISSION COMMENT

ADJOURN

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

Chair Edmunds called the Regular meeting of the Troy City Planning Commission to order at 7:00 p.m. on October 11, 2016 in the Council Board Room of the Troy City Hall.

1. ROLL CALL

Present:
Ollie Apahidean
Karen Crusse
Donald Edmunds
Carlton M. Faison
Michael W. Hutson
Tom Krent
Padma Kuppa
John J. Tagle

Absent:
Philip Sanzica

Also Present:
R. Brent Savidant, Planning Director
Ben Carlisle, Carlisle Wortman Associates
Julie Quinlan Dufrane, Assistant City Attorney
Claire Hao, Student Representative
Kathy L. Czarnecki, Recording Secretary

Student Representative Claire Hao was introduced and welcomed by all.

2. APPROVAL OF AGENDA

Resolution # PC-2016-10-062
Moved by: Tagle
Support by: Crusse

RESOLVED, To approve the Agenda as prepared.

Yes: All present (8)
Absent: Sanzica

MOTION CARRIED

3. APPROVAL OF MINUTES

Resolution # PC-2016-10-063
Moved by: Krent
Support by: Apahidean

RESOLVED, To approve the minutes of the September 27, 2016 Regular meeting as submitted.

Yes: Apahidean, Crusse, Edmunds, Krent, Hutson, Tagle
Abstain: Faison, Kuppa
Absent: Sanzica

MOTION CARRIED

4. PUBLIC COMMENT – Items not on the Agenda

There was no one present who wished to speak.

CONDITIONAL REZONING

5. PUBLIC HEARING - CONDITIONAL REZONING APPLICATION (File Number CR JPCR2016-002) – Proposed IHOP Restaurant and Retail, East side of Rochester, North of Big Beaver (1033 Urbancrest, 3130 Rochester, 3132-3142 Rochester), Section 23, From R-1E (One Family Residential) District to GB (General Business) District

Mr. Carlisle reviewed the Conditional Rezoning application. He specifically addressed parking and recommended to postpone the item so the applicant could address the parking concerns as well as minor concerns identified in his report dated October 6, 2016.

The applicant John Baker was present. Mr. Baker said he is in support of the recommendation to postpone and is anxious to address the number of elements and come back before the Board with a revised plan.

Chair Edmunds opened the Public Hearing.

- Gary Curtis, representative of Troy Masonic Center, 1032 Hartland, addressed parking as relates to the Masonic Center's parking lot.
- Julie Addison, 1137 Foxboro, addressed parking as relates to existing parking concerns at Rochester Commons.
- Jeff Perez, 1057 Urbancrest, addressed traffic, proposed fence and hours of operation.

Chair Edmunds closed the Public Hearing.

There was discussion on:
- Screening; fence along entire perimeter as well as landscaping.
- Traffic study not justified; application reviewed by City Traffic Engineer.
- Clarification between traffic study and parking study.
- Restaurant(s) hours of operation; not known at this time.
- Mitigation of negative impacts to surrounding properties; volume and location of drive-through restaurant speaker box, restaurant(s) hours of operation.

Resolution # PC-2016-10-064
Moved by: Krent
Seconded by: Faison

RESOLVED, That the Planning Commission hereby postpones this item to provide the applicant an opportunity to revise the application to address shortcomings identified in the report.

Yes: All present (8)
Absent: Sanzica

MOTION PASSED

PRELIMINARY SITE PLAN REVIEW

6. PRELIMINARY SITE PLAN REVIEW (File Number SP JPLN2016-0027) – Proposed Troy City Center (Fidelity Investments), Northeast Corner of Big Beaver and Crooks (888 W. Big Beaver), Section 21, Currently Zoned BB (Big Beaver) District

Mr. Carlisle gave a review on the Preliminary Site Plan application and the revised site plan received from the applicant today that was forwarded to Board members via email. He addressed proposed improvements, parking reconfiguration, existing site access, building elevation, building materials and building entrance. Mr. Carlisle said the application meets all Zoning Ordinance requirements.

Mr. Carlisle addressed future outlots on the entire site as relates to parking and circulation. He said a parking study would be a requirement for future outlots on the site.

Mr. Savidant said the revised Preliminary Site Plan was reviewed by the City Traffic Engineer and there were no concerns noted.

Present to represent the applicant were Project Architect Jason Krieger and David Vivio of O'Brien Construction.

There was discussion on:
- Conceptual plan for entire site; 6 outlots, apartment building, parking deck.
- Future outlots in relation to parking and circulation.
- Timetable and site location of Fidelity Investments outlot.
- Timetable of future outlots and entire project.
- Prospective tenants of future outlots.
- Cohesiveness of architecture throughout entire project.
- Building heights throughout entire project.

Resolution # PC-2016-10-065
Moved by: Krent
Support by: Tagle

RESOLVED, That Preliminary Site Plan Approval, pursuant to Article 8 of the Zoning Ordinance, as requested for the proposed Fidelity Investments office building, located on the northeast corner of Big Beaver and Crooks (888 W. Big Beaver), Section 21, within the BB (Big Beaver) District, be granted, subject to the following:

1. Provide dimensional measurements and calculations on the site plan, including open space and landscaping calculations.
2. Provide two (2) bicycle parking spaces.
3. Provide details of proposed dumpster enclosure.
4. Provide photometric plan.
5. Extend overhang along the entire length of the east façade all the way to the Big Beaver façade, to provide a guiding walkway to the front entrance from Big Beaver.
6. Redesign sidewalks as per Traffic Engineer comments.

Yes: All present (8)
Absent: Sanzica

MOTION PASSED

Members Hutson, Krent and Crusse commented on their affirmative votes as relates to the overall conceptual plan.

OTHER ITEMS

7. PUBLIC COMMENT – Items on Current Agenda

There was no one present who wished to speak.

8. PLANNING COMMISSION COMMENT

There were general Planning Commission comments.

Mr. Savidant asked members if they would be open to scheduling an additional meeting in November. He said November 17, 2016 would be a tentative meeting date.

The Regular meeting of the Planning Commission adjourned at 8:35 p.m.

Respectfully submitted,

_____
Donald Edmunds, Chair

Kathy L. Czarnecki, Recording Secretary

G:\Planning Commission Minutes\2016 PC Minutes\Draft\2016 10 11 Regular Meeting_Draft.doc

DATE: October 25, 2016

TO: Planning Commission

FROM: R. Brent Savidant, Planning Director

SUBJECT: PUBLIC HEARING - CONDITIONAL REZONING APPLICATION (File Number CR JPCR2016-003) – Proposed McClure Road Apartments, North of Big Beaver, West of Crooks, East side of McClure (3142, 3114, 3086 McClure), Section 20, From R-1B (One Family Residential) District to BB (Big Beaver) District

The applicant Sam Stafa seeks a conditional rezoning of the subject parcel from R-1B (One Family Residential) District to BB (Big Beaver) District. As part of the application, the applicant submitted a Preliminary Site Plan for a five-story, 140-room apartment building.

The site is within the Big Beaver classification in the City of Troy Master Plan.

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.

There will be a public hearing on this item at the November 1, 2016 Planning Commission Regular meeting.

Attachments:

1. Maps
2. Report prepared by Carlisle/Wortman Associates, Inc.
3. Excerpts of Planning Commission minutes (August 9, 2016, July 12, 2016)
4. Public Comment

G:\Conditional Rezoning\JPCR 2016-003 McClure Road Apartments Sec 20\PC Memo 11 01 2016.docx

PROPOSED RESOLUTION

CONDITIONAL REZONING APPLICATION (File Number CR JPCR2016-003) – Proposed McClure Road Apartments, North of Big Beaver, West of Crooks, East side of McClure (3142, 3114, 3086 McClure), Section 20, From R-1B (One Family Residential) District to BB (Big Beaver) District

Resolution # PC-2016-11-
Moved by:
Seconded by:

RESOLVED, That the Conditional Rezoning Request from R-1B (One Family Residential) district to BB (Big Beaver) district, which incorporates Preliminary Site Plan Approval, as per Section 16.04 of the City of Troy Zoning Ordinance, located north of Big Beaver, west of Crooks on the east side of McClure, within Section 20, being approximately 2.54 acres in size, be postponed to provide the applicant sufficient time to address issues identified in the October 25, 2016 report, including noted variances, incomplete application and parking deficiency.

Yes:
No:

MOTION PASSED / FAILED

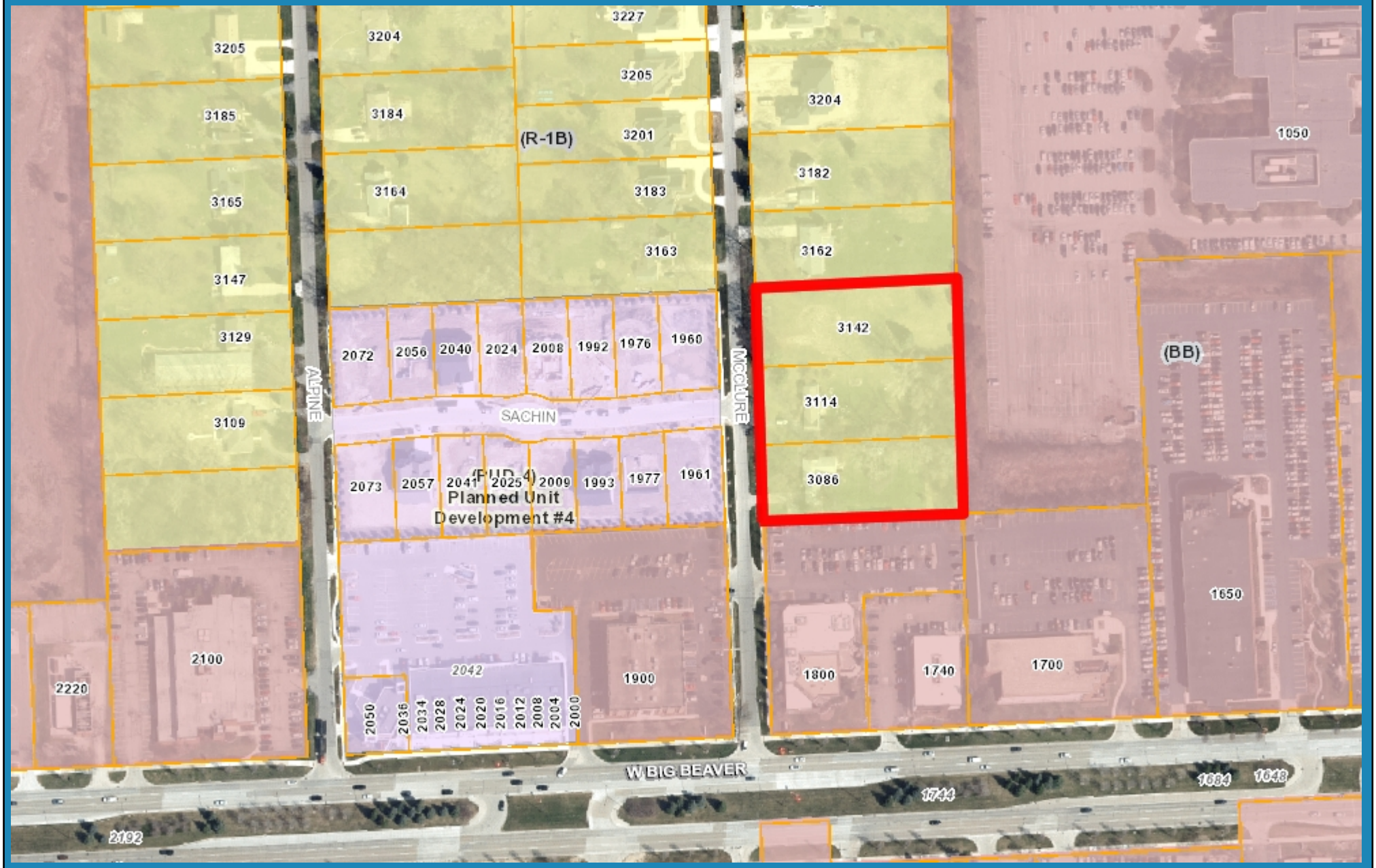
G:\Conditional Rezoning\JPCR 2016-003 McClure Road Apartments Sec 20\Proposed PC Resolution 2016 11 01.doc

City of Troy GIS Online

548 0 274 548 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.

City of Troy GIS Online



548 0 274 548 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.

605 S. Main Street, Ste. 1
Ann Arbor, MI 48104

(734) 662-2200
(734) 662-1935 Fax

Date: October 25, 2016

Conditional Rezoning and Preliminary Site Plan Review
For
City of Troy, Michigan

Applicant:	Sam Stafa
Project Name:	McClure Rd. Apartments
Plan Date:	October 10, 2016
Location:	East side of McClure, north of Big Beaver
Existing Zoning:	R1B, One Family Residential
Requested Zoning:	BB, Big Beaver Form Base Code
Action Requested:	Conditional Rezoning and Preliminary Site Plan Approval

SITE DESCRIPTION AND PROJECT STATUS

The applicant is requesting a conditional rezoning of the subject site encompassing three (3) parcels located on the east side of McClure Road, just north of Big Beaver. The three parcels are currently zoned R1-B, One Family Residential. The total development site acreage is 2.57 acres. The two southernmost lots are improved with a single-family home. The northernmost lot is vacant.

The applicant proposes to conditionally rezone the property from R1-B, One Family Residential to BB, Big Beaver Form-Base District to construct a 3 story to 5 story (62 feet), 140-unit apartment building. The building includes a mix of one and two bedroom units.

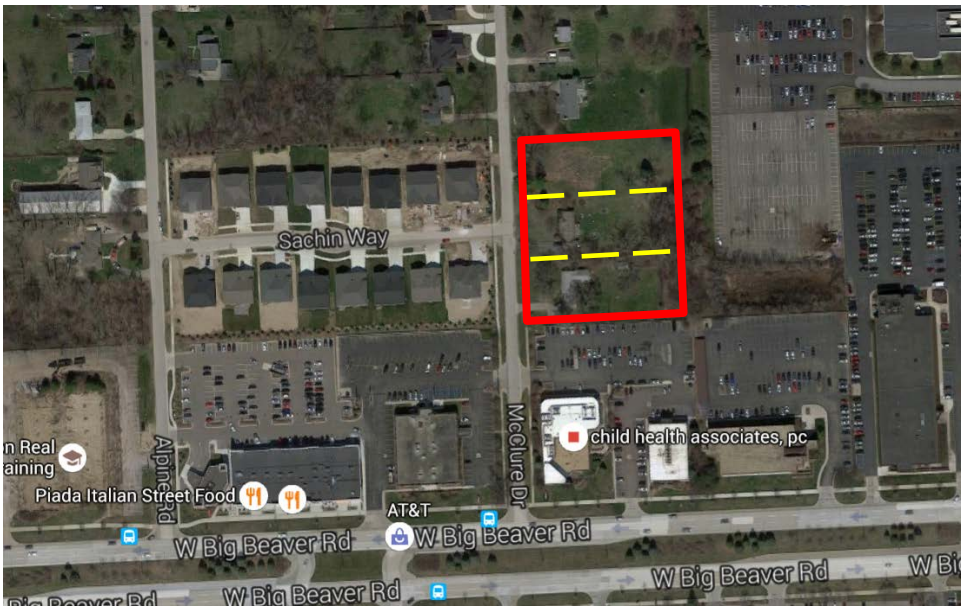
The building will be placed approximately 31-feet from McClure Drive, and setback approximately 131-feet from the northern property line. The site development includes 199 parking spaces: 96 under building, and 103 surface spaces. By ordinance the applicant is required to provide 280 spaces. The Planning Commission has the authority to grant a parking deviation to reduce the required parking if the

applicant is able to provide justification that the required number of spaces is not necessary, and the parking provided is sufficient to accommodate the development on a typical day.

Other site improvements include a water feature at the southwest corner of the site and decorative streetscaping along McClure Drive.

Location of Subject Property:

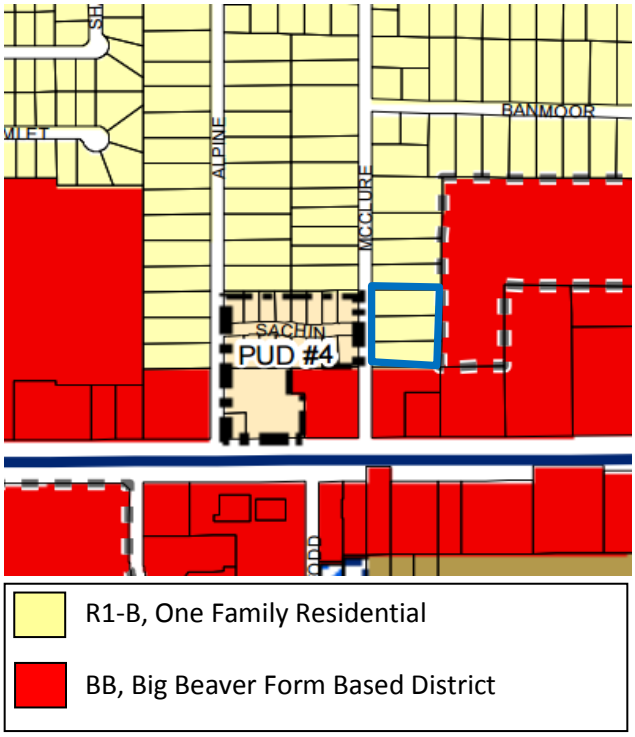
The property is located on the east side of McClure.



Surrounding Zoning:

A table summarizing zoning and uses of the adjacent properties is as follows:

Direction	Zoning	Use
North	R-1B, One-Family Residential	One Family Residential
South	BB, Big Beaver	Office
East	BB, Big Beaver (consent judgement)	Parking / Office
West	PUD	One Family Residential



CONDITIONAL REZONING PROCESS

The procedures for conditional rezoning are contained within Section 16.04 of the Zoning Ordinance. Conditional rezoning applications are processed in the same manner as traditional rezoning applications; however, the applicant voluntarily proposes specific conditions relating to the use and/or development of the land for which the conditional rezoning is requested. The applicant's offer of conditions can be made at the time the application for rezoning is filed or additional conditions can be made at a later time during the conditional rezoning process. A public hearing must be held by the Planning Commission before making a recommendation to the City Council on the proposed rezoning.

The applicant has offered the submitted site plan as a condition of rezoning approval. The applicant will need to submit a conditional rezoning agreement to the City, which will be reviewed by the City Attorney. As the conditional rezoning is directly tied to the site plan, the applicant is subsequently requesting preliminary site plan approval. If the Planning Commission recommends site plan, such approval is dependent upon the City Council granting the conditional rezoning.

Our review is split into two (2) sections: 1) Rezoning Analysis, and 2) Site Plan Review

Items to be Addressed: *Submit conditional rezoning agreement.*

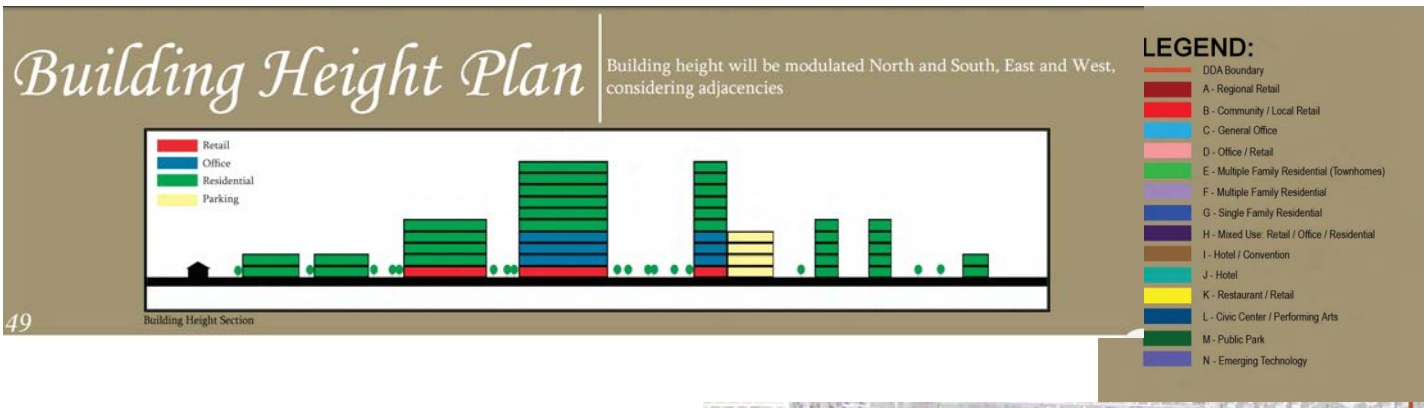
Rezoning Analysis

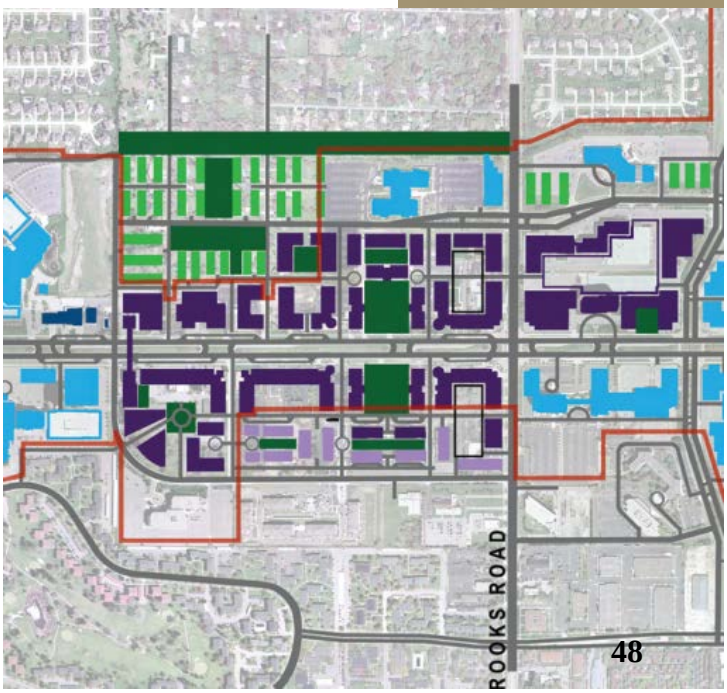
MASTER PLAN

The site is located within the area designated as Big Beaver in the Master Plan. The Big Beaver designation responds to the recommendations set forth in the Big Beaver Corridor Study, which promotes flexibility with land use relationships including higher density, vertically integrated mixed-use commercial, office, and residential towers. The Big Beaver Corridor Study and Master Plan promote redevelopment with a greater mix of land uses, particularly new residencies, but also encourages the use of prominent ground floor retail, restaurants, and cafes allowing visual interest and activity for visitors and residents.

Additional residential uses along and peripheral to Big Beaver promote the goals of the Big Beaver Corridor Study and Master Plan including transforming Big Beaver into a destination or "people place" characterized by round-the-clock activity and an exciting nightlife, promote redevelopment opportunities along the corridor, maintain and improve existing businesses along Big Beaver, and transform the corridor into a pedestrian-friendly environment.

The Big Beaver Corridor Study and Master Plan note a transition of intensity, both in height and use, from those parcels that directly front on Big Beaver and those that are adjacent to single-family residential and access onto perpendicular collector streets. The Study calls for variations in building height from the boulevard to the north and the south edges of the corridor. For example, a strategy of the Big Beaver Corridor study is to promote townhome development as a transition between higher intensity development along the corridor and adjacent single-family residential neighborhoods and the use of linear parks and landscape buffers as transitions.





Specifically, page 48 of the Big Beaver Corridor Study calls this site as a mixed use; retail/office/residential use. However, this is conceptual and one component of a long-term development strategy that includes multiple new buildings build both along and peripheral to the corridor.

Both the Master Plan and Zoning Ordinance make reference to the Big Beaver Corridor Study, prepared in 2006. The Study was commissioned by both the City and the DDA with the intent of transforming Big Beaver into a "World Class" boulevard.

The District Plan incorporated a much larger area than just properties with frontage directly on Big Beaver. The thinking behind this was that a larger land area was needed to transform the Corridor into a mixed use, higher density, walkable environment. It was also recognized that many of the properties that front on Big Beaver do not have sufficient depth to be developed in a manner envisioned by the Plan.

A key consideration in the District Plan was the Building Height Plan. In short, the Building Height Plan called for a transition in building height from properties adjacent to Big Beaver Road to properties interior from the roadway. In other words, higher buildings were envisioned directly on Big Beaver transitioning to lower buildings adjacent to neighborhoods.

While the range of building heights was from 10-12 stories down to 2-3 stories, the actual application of the Building Height Plan was intended to be taken in context. The Plan refers to such modulation in height, considering adjacent land uses.

The regulatory mechanism for implementing the Corridor Plan is the Zoning Ordinance, specifically the Big Beaver Form Based Code District. The current District boundaries are depicted on Map 5.04.1: Big Beaver District Regulating Plan. As is the case with many Zoning Districts, the boundaries are not necessarily coincident with those shown by the Big Beaver Corridor Plan. Modification of any District boundaries requires a rezoning based, in large part, on the consistency of the request with the Master Plan and any supporting Plans.

The Big Beaver Form Based Code is more specific about the relationship of height and use to adjacent properties. There are clear standards to be applied to address the specific issue regarding transition to adjacent properties that includes the following language found in Section 5.04.E.4:

4. *Transitional Features.*
    a. *Transitional features are architectural elements, site 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.*

In conclusion, the Big Beaver Corridor Plan anticipates a potential Zoning District which is more expansive than the current Big Beaver Form Based Code. However, in the application of the Code to any specific parcel or project, the language in the Ordinance is clear in the need to consider adjacent properties in regards to use, intensity and height.

CONDITIONAL REZONING STANDARDS

The Zoning Ordinance identifies five (5) findings that the Planning Commission should evaluate when considering a Conditional Rezoning petition (Section 16.04.C). A Conditional rezoning may only be approved upon a finding and determination that all of the following criteria are satisfied:

a) *The conditions, proposed development, and/or proposed use of the land are designed or proposed for public health, safety, and welfare purposes.*

b) *The conditions, proposed development and/or proposed use are not in material conflict with the Master Plan, or, if there is material conflict with the Master Plan, such conflict is due to one of the following:*
    I. *A change in City policy since the Master Plan was adopted.*
    II. *A change in conditions since the Master Plan was adopted.*
    III. *An error in the Master Plan*

c) *The conditions, proposed development and/or proposed use are in accordance with all terms and provisions of the zoning district to which the land is to be rezoned, except as otherwise allowed in the Conditional Rezoning Agreement.*

d) *Public services and facilities affected by a proposed development will be capable of accommodating service and facility loads caused by use of the development.*

e) The conditions, proposed development and/or proposed use shall insure compatibility with adjacent uses of land.

Due to outstanding site plan issues noted below, it is premature for us to offer a recommendation if the proposed development meets the conditional rezoning standards.

Site Plan Review

BUILDING ARRANGEMENT

The proposed building is U-shaped and oriented along the southern property line. The center of the U-shaped building includes a primary building entrance and a landscaping and patio area. The building setback along the northern property line, which is adjacent to single-family residential, is approximately 131 feet to the three-story portion of the building, and approximately 165 feet to the 5-story portion of the building. All at-grade parking is located along the northern portion of site based on the U-shaped building. Parking is located 10-feet from the northern property line.

Items to be addressed: *None*

AREA, WIDTH, HEIGHT, SETBACKS

Table 5.03.B.4, Building Form D of Section 5.03, Standards Applicable to All Districts of the Zoning Ordinance establishes the dimensional requirements for the BB, Big Beaver District. The requirements and proposed dimensions are as follows:

	Required	Provided	Compliance
Front (McClure.)	10 foot build-to-line	31.33 feet	Planning Commission can grant up to a 30-foot building placement. Applicant must move building at least 1.33 feet closer to McClure
Side (South)	N/A, building may be placed up to property line	30 feet	Complies
Side (north)	N/A, building may be placed up to property line	131	Complies
Rear (East)	40-foot minimum setback	30 feet	Does not comply
Building Height	Maximum 6 stories, 72 feet, Minimum 3 stories, 35 feet	3 to 5-stories, 62 feet	Complies
Lot Coverage (Building)	30%	30.71%	Does not comply

Minimum Open Space	15%	29.29%	Complies
Parking Location	Cannot be located in front yard	Approximately 6 spaces are located in front yard	Does not comply

Items to be addressed: *1). Applicant to move building no more than 30-feet from McClure; 2). Planning Commission to consider 30-foot building placement; 3). Applicant to meet 40-foot rear yard setback or seek a variance; 4). Applicant to reduce lot coverage to no more than 30% or seek a variance; and 5). Remove six spaces from front yard or seek a variance.*

PARKING

Section 13.06.G of the Zoning Ordinance requires:

	Required	Provided
Apartment: 2 spaces per unit	140 Units = 280 spaces	199 spaces (103 surface, and 96 under building)
Barrier Free	6	9
Bicycle Parking	2	0
Loading	0	0
Total	**280 automobile + 2 bicycle**	**199 spaces + 0 bicycle**

A total of one-hundred and ninety-nine (199) parking spaces are provided. The applicant is 81 spaces deficient of the required 280 spaces. The applicant in their traffic study notes that "*the proposed 199-space on-site parking supply will be adequate to meet resident parking requirements under most conditions. Giffels-Webster (preparer of study) recommends, however, that the applicant make a good faith effort to secure an easement in the under-utilized neighboring parking lot to the east, to be used as needed for guest and/or overflow parking."*

As set forth in Section 13.06.F, the Planning Commission may grant a parking deviation. Such deviation shall only be granted if the Planning Commission determines that a sufficient number of parking spaces is provided to accommodate the specific characteristics of the use in question. The applicant shall submit a parking study with adequate detail and information to assist the Planning Commission in determining the appropriateness of the request. The Planning Commission may attach conditions.

If there is insufficient parking on site, it is likely that apartment residents will find alternative parking locations on-street along McClure and Sachin. Insufficient parking on site will impact adjacent neighbors.

Items to be Addressed: *Submit a parking study with adequate detail and information to assist the Planning Commission in determining the appropriateness of the 81-parking space deviation request.*

SITE ACCESS AND CIRCULATION

<u>Vehicular access and Circulation</u>

The site is accessed via one (1) drive from McClure Road.

Pedestrian access and Walkways:

The applicant will install a five (5) foot concrete sidewalk on McClure Road. Internal concrete sidewalks/walkways are provided around the site to accommodate pedestrian access.

Items to be addressed: *None*

TRAFFIC STUDY

The applicant has submitted a traffic study for the project. According to the traffic study, the proposed 140 apartments will generate no more than 72 one-way trips in the AM peak hour and 95 one-way trips in the PM peak hour. Twenty to 25% of the trips are expected to travel to and from McClure road to the north site. As a result of the development, the expected increase in delay on McClure/Big Beaver intersection would 7 seconds and the typical queue backup would be two cars.

To reduce neighborhood traffic the applicant has suggested posting no right turns from the development from 7-9 a.m and 4-6 p.m and installation of speed humps on both McClure and Alpine.

The City Traffic Engineer and Traffic Consultant have reviewed the traffic report and note two comments outside of the noted parking deficiency. First, the on street parking on McClure directly perpendicular to Sachin should be removed. Secondly, a delay study for the peak periods for Banmoor and Muer intersections with Crooks should be provided.

Items to be addressed: *Address traffic comments noted by City Traffic Engineer and Traffic Consultant.*

LANDSCAPING

The applicant did not provide landscape calculations, or landscape species/height. The table below is based on our review but a complete landscape plan and calculations should be provided by the applicant.

	Required:	Provided:	Compliance:
(McClure) Street Trees: 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.	360 feet = 12 trees	12 trees	Complies
Site landscaping: A minimum of fifteen (15%) of the site area shall be comprised of landscape material. Up to twenty-five percent (25%) of the required landscape area may be brink, stone, pavers, or other public plaza	15%	Calculation not provided	Unknown

elements, but shall not include any parking area or required sidewalks.			
Interior Parking Lot Landscaping: 1 tree for every 8 parking spaces. Trees may be located adjacent to parking lot with planning commission approval.	103 exterior spaces = 13 trees	8 trees	Not in Compliance
Perimeter Parking Lot Landscaping: Parking lots that front on a public roadway shall be screened by a landscaped berm at least three (3) feet in height along the perimeter of the road right-of-way. Alternative landscape plantings or a solid wall that does not exceed three (3) feet in height may be approved, where it is found that space limitations or visibility for vehicular circulation prevent construction of a landscape berm.	Berm or solid wall with alternative landscape plantings	No screening indicated	Not in compliance
Landscape buffering: Required buffering between two differentiating land uses. Alternative 2, 3, or Wall required.	1 large evergreen every 10 feet or 1 narrow evergreen every 3 feet	Species and size not indicated so compliance could not be determined.	Unknown
Tree Mitigation	Mitigate required tree removal	It appears that the applicant is removing three (3) heritage trees	Confirm if trees are heritage trees. Mitigate as required.

Transformer / Trash Enclosure:

A trash area is located along the eastern edge of parking lot. A transformer is located to the southeast corner of the building. No screening is demonstrated around the proposed trash area or transformer.

***Items to be Addressed**: 1). Provide complete landscape plan with landscape calculations and heritage tree calculations; and 2). Indicate trash enclosure and transformer screening.*

PHOTOMETRICS

The applicant did not provide a complete photometric plan.

***Items to be Addressed:** Provide a complete photometric plan*

FLOOR PLAN AND ELEVATIONS

The applicant has submitted floor plans and elevations. The architecture provides architectural detail as well as changes in horizontal and vertical scaling, variations in material, pattern, and color, to provide ground story activation.

Items to be Addressed: *None*

DESIGN STANDARDS

The Big Beaver design standards provide the Planning Commission with direction when reviewing the proposed design features of this development.

Façade Variation.

The maximum linear length of an uninterrupted building façade facing public streets and/or parks shall be thirty (30) feet.

Pedestrian Access / Entrance.

a. *Primary Entrance: The primary building entrance shall be clearly identifiable and useable and located in the front façade parallel to the street.*

b. Pedestrian Connection. The pedestrian connection shall be fully paved and maintained surface not less than five (5) feet in width.

c. Additional Entrances. In addition to the primary façade facing front façade and/or the right-of-way, if a parking area is located in the rear or side yard, must also have a direct pedestrian access to the parking area that is of a level of materials quality and design emphasis at least equal to that of the primary entrance.

Ground Story Activation.

The first floor of any front façade facing a right-of-way shall be no less than fifty (50) percent windows and doors, and the minimum transparency for facades facing a side street, side yard, or parking area shall be no less than 30 percent of the façade. Transparency alternatives are permitted up to 80% of the 50% total along the front of buildings, and up to 100% of the sides of buildings. The minimum transparency requirement shall apply to all sides of a building that abut an open space, including a side yard, or public right-of-way. Transparency requirements shall not apply to sides which abut an alley.

Transitional Features

a. *Transitional features are architectural elements, site 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. 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.

Site Access and Parking

a. Required Parking. Off-street parking shall be provided in accordance with the standards set forth in Article 13, Site Design Standards.

b. Location.

I. When parking is located in a side yard (behind the front building line) but fronts on the required building line, no more than fifty (50) percent of the total site's linear feet along the required building line or one hundred (100) feet, whichever is less, shall be occupied by parking.

II. For a corner lot, shall be no more than fifty (50) percent of the site's cumulative linear feet along the required building lines or one hundred (100) feet, whichever is less, shall be occupied by parking. The building shall be located in the corner of the lot adjacent to the intersection.

III. For a double frontage lot or a lot that has frontage on three (3) streets, the cumulative total of all frontages occupied by parking shall be no more than sixty-five (65) percent of the total site's linear feet along a required building line or one hundred and twenty-five (125) feet, whichever is less.

IV. Where off-street parking is visible from a street, it should be screened in accordance with the standards set forth in Section 13.02.C.

Due to outstanding site plan issues noted, it is premature for us to offer a recommendation if the proposed development meets the Big Beaver zoning requirements.

Items to be Addressed: *Address site plan issue herein noted*

RECOMMENDATION

Due to outstanding site plan issues noted, it is premature for us to offer a recommendation if the proposed development meets the conditional rezoning standards. We recommend that the Planning Commission provide additional direction to the applicant and postpone action on the matter to allow the applicant to resubmit a preliminary site plan.

Sincerely,

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

The Lofts

3114 McClure Rd.
Troy, MI, 48084
United States of America

STATEMENT OF SELECTED DESIGN PROFESSIONAL

THESE CONSTRUCTION DOCUMENTS WERE PREPARED FOR COMPLIANCE WITH THE MICHIGAN CONSTRUCTION CODES IN EFFECT AT THE TIME OF PERMIT SUBMITTAL. ALL ENGINEERS, CONTRACTORS AND SUPPLIERS INVOLVED WITH THIS PROJECT SHALL COMPLY WITH THE SAME CODES ISSUED AND APPROVED CODE MODIFICATIONS AND/OR MUNICIPAL CONSTRUCTION BOARDS OF APPEALS RULINGS AND WHENEVER REQUIRED SHALL PROVIDE SHOP DRAWINGS AND SUBMITTALS CLEARLY DESCRIBING COMPLIANCE TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE FOR REVIEW AND APPROVAL.

REGISTERED DESIGN PROFESSIONAL IN CHARGE:
PETER STUHLREYER, A.I.A.
MICHIGAN IDENTIFICATION # 44668
DESIGNHAUS ARCHITECTURE

PROJECT TEAM

OWNER
TBD
ADDRESS
T:
F:
C:
CONTACT:

ARCHITECT
DESIGNHAUS ARCHITECTURE
301 WALNUT BLVD.
ROCHESTER, MI 48307
T: 248.601.4422
F: 248.453.5854
PROJECT MANAGER: JOE LATOZAS
PROJECT ARCHITECT:
PETER STUHLREYER, A.I.A

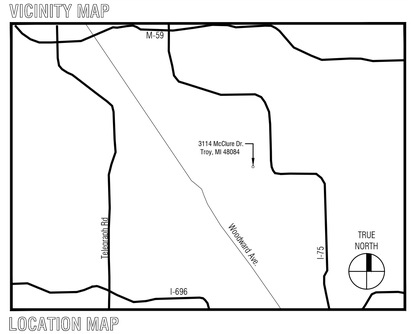
CIVIL ENGINEER
PEA
2430 Rochester Court, Suite 100
Troy, MI 48083
T: 248.689.9090
F: 248.689.1044
C: 248.821.4841
CONTACT: Jim Butler

MEP ENGINEER
TBD
ADRESS
T:
F:
C:
CONTACT:

STRUCTURAL ENGINEER
TBD
ADDRESS
T:
F:
C:
CONTACT:

CONTRACTOR
TBD
ADRESS
T:
F:
C:
CONTACT:

VICINITY MAP



LOCATION MAP

INDEX OF DRAWINGS

☐ SHEET ISSUED
⚠ REVISED
■ SHEET REISSUED

SHEET NO:	DRAWING NAME	Preliminary Design Review / 6.14.2016	Preliminary Discussion #2 / 7.21.2016
GENERAL			
G001	Title Sheet and Index	☐	☐
G002	Reference & Code Information	☐	
CIVIL			
TOPO	Boundary, Topographic, and Tree Inventory and Preservation Plan		☐
LANDSCAPE			
S100	Site Plan	☐	☐
S101	Site Details	☐	☐
S200	Preliminary Grading Plan	☐	☐
L100	Landscape Plan	☐	☐
S300	Preliminary Lighting Plan		☐
ARCHITECTURAL			
A100	Parking Level	☐	
A101	Entry Level	☐	
A102	Entry Level	☐	
A102	First Floor	☐	
A103	Second - Sixth Floors	☐	
A200	Elevations	☐	
A201	Elevations	☐	

DESIGNHAUS ARCHITECTURE EST 1998
301 WALNUT BOULEVARD
ROCHESTER, MI 48307
T: 248.601.4422 F: 248.453.5854
WWW.DESIGNHAUS.COM
INFO@DESIGNHAUS.COM

PEA

No.	Revision/Issue	Date
	----	----
	Preliminary Discussion #3	10.10.2016
	Preliminary Discussion #2	7.21.2016
	Preliminary Design Review	6.14.2016

The Lofts
3114 McClure Rd.
Troy, MI, 48084
United States of America

Title Sheet and Index

G001

016044

BENCHMARKS

SITE BM #5
(FROM PEA JOB #2004-198)
ARROW ON HYDRANT ON THE EAST SIDE OF McCLURE ROAD, ±200' NORTH OF BIG BEAVER ROAD.
ELEV. = 731.05

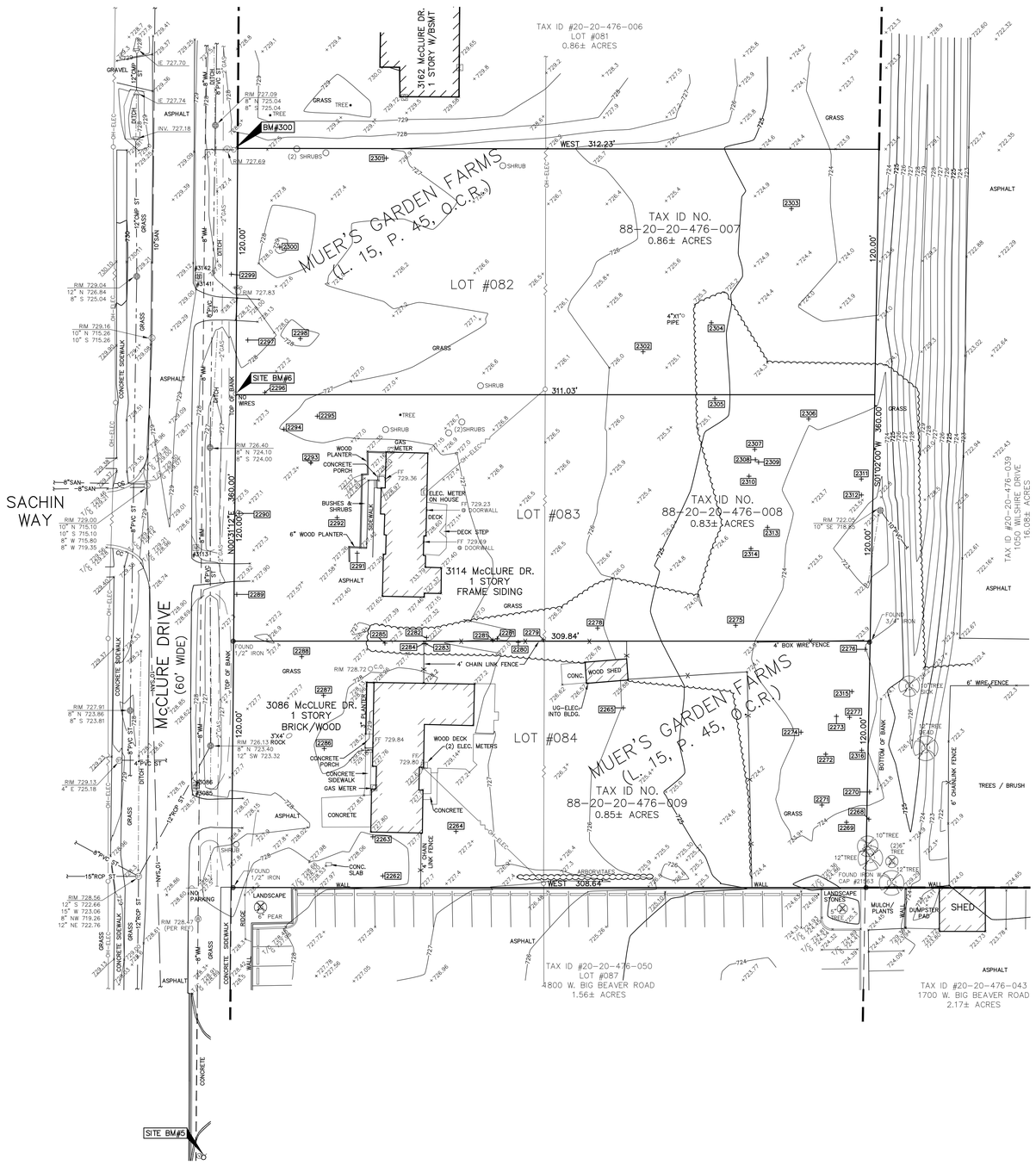
SITE BM #6
(FROM PEA JOB #2004-198)
GEAR PIN IN UTILITY POLE LOCATED ON THE EAST SIDE OF McCLURE DRIVE AT NORTHWEST CORNER OF HOUSE NO. 3114.
ELEV. = 728.67'

BM #300
A HYDRANT LOCATED ON THE EAST SIDE OF McCLURE DRIVE AT THE NE PROPERTY CORNER OF LOT NO. 082.
ELEV. = 729.79

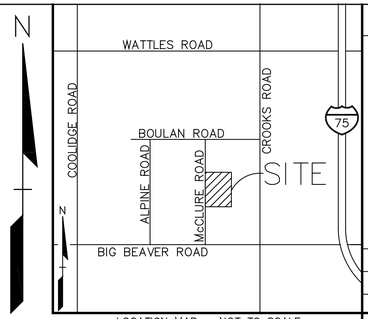
TAG NO.	CODE	DBH	COMMON NAME	LATIN NAME	COND.	NOTE
2262	EE	36	Siberian Elm	Ulmus pumila	GOOD	
2263	RC	7	Red Cedar	Juniperus virginiana	GOOD	x3
2264	EE	25	Siberian Elm	Ulmus pumila	GOOD	
2265	EE	24	Siberian Elm	Ulmus pumila	GOOD	
2266	BX	12	Box elder	Acer negundo	GOOD	
2267	BX	9	Box elder	Acer negundo	GOOD	
2268	BX	8	Box elder	Acer negundo	GOOD	
2269	BX	7	Box elder	Acer negundo	GOOD	
2270	RM	9	Red Maple	Acer rubrum	GOOD	
2271	E	11	American Elm	Ulmus americana	GOOD	
2272	MR	6	Red Mulberry	Morus rubra	GOOD	
2273	RM	15	Red Maple	Acer rubrum	GOOD	
2274	RM	8	Red Maple	Acer rubrum	GOOD	
2275	CT	30	Cottonwood	Populus deltoides	GOOD	x2
2276	CT	40	Cottonwood	Populus deltoides	GOOD	
2277	RM	6	Red Maple	Acer rubrum	GOOD	
2278	CT	34	Cottonwood	Populus deltoides	GOOD	
2279	RM	6	Red Maple	Acer rubrum	GOOD	x4
2280	RM	15	Red Maple	Acer rubrum	FAIR	
2281	RM	15	Red Maple	Acer rubrum	GOOD	x2
2282	BW	9	Black Walnut	Juglans nigra	GOOD	
2283	RM	12	Red Maple	Acer rubrum	GOOD	
2284	EE	8	Siberian Elm	Ulmus pumila	GOOD	
2285	EE	14	Siberian Elm	Ulmus pumila	GOOD	
2286	SM	34	Silver Maple	Acer saccharinum	GOOD	
2287	RM	28	Red Maple	Acer rubrum	GOOD	
2288	CA	8	Crab Apple	Malus caronaria	FAIR	x3
2289	RM	13	Red Maple	Acer rubrum	GOOD	x3
2290	RM	18	Red Maple	Acer rubrum	GOOD	
2291	MW	8	White Mulberry	Morus alba	GOOD	
2292	NM	15	Norway Maple	Acer platanoides	GOOD	
2293	NM	14	Norway Maple	Acer platanoides	FAIR	
2294	AP	7	Domestic Apple	Malus sylvestris	POOR	x7
2295	NS	12	Norway Spruce	Picea Abies	GOOD	
2296	RM	7	Red Maple	Acer rubrum	GOOD	x2
2297	WP	18	(Eastern) White Pine	Pinus strobus	GOOD	
2298	WP	16	(Eastern) White Pine	Pinus strobus	GOOD	
2299	NS	9	Norway Spruce	Picea Abies	GOOD	
2300	E	34	American Elm	Ulmus americana	GOOD	
2301	RM	9	Red Maple	Acer rubrum	GOOD	x3
2302	BC	12	Wild Black Cherry	Prunus serotina	POOR	x3
2303	BP	19	Bradford Pear	Pyrus calleryanna	GOOD	
2304	BS	14	Blue Spruce	Picea pungens	GOOD	
2305	CT	35	Cottonwood	Populus deltoides	GOOD	
2306	EE	13	Siberian Elm	Ulmus pumila	GOOD	
2307	EE	9	Siberian Elm	Ulmus pumila	GOOD	
2308	EE	9	Siberian Elm	Ulmus pumila	GOOD	
2309	EE	6	Siberian Elm	Ulmus pumila	GOOD	
2310	EE	11	Siberian Elm	Ulmus pumila	GOOD	
2311	BX	8	Box elder	Acer negundo	GOOD	
2312	BW	10	Black Walnut	Juglans nigra	GOOD	
2313	EE	7	Siberian Elm	Ulmus pumila	GOOD	
2314	E	7	American Elm	Ulmus americana	GOOD	
2315	E	7	American Elm	Ulmus americana	GOOD	
2316	PN	6	Pin Cherry	Prunus pennsylvanica	GOOD	x3

NOTE:
DUE TO CONDITION, LOCATION, QUALITY, TYPE, OR EXTENDED LIFE EXPECTANCY, ALL TREES TO BE REMOVED FROM SITE.

REPLACEMENT TREES WILL BE INSTALLED AS NECESSARY IN ALL POSSIBLE LANDSCAPED AREAS



GRAPHIC SCALE
−30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.



LOCATION MAP – NOT TO SCALE

LEGEND

IRON FOUND
IRON SET
NAIL FOUND
NAIL & CAP SET
BRASS PLUG SET
MONUMENT FOUND
MONUMENT SET
SEC. CORNER FOUND
R RECORDED
M MEASURED
C CALCULATED

EXISTING
ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
UNDERGROUND CABLE TV, CATV PEDESTAL
TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
GAS MAIN, VALVE & GAS LINE MARKER
WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
SANITARY SEWER, CLEANOUT & MANHOLE
STORM SEWER, CLEANOUT & MANHOLE
COMBINED SEWER & MANHOLE
SQUARE, ROUND & BEEHIVE CATCH BASIN
CULVERT
POST INDICATOR VALVE
WATER VALVE BOX,HYDRANT VALVE BOX, SERVICE SHUTOFF
MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
UNIDENTIFIED STRUCTURE
× 816.06 SPOT ELEVATION
EDGE OF WATER
DITCH
670 CONTOUR LINE
FENCE
GUARD RAIL
TREE LINE
TREE TAG
STREET LIGHT
SIGN
CONC. CONCRETE
ASPH. ASPHALT
GRAVEL GRAVEL SHOULDER
WETLAND

REFERENCE DRAWINGS

WATER MAIN	CITY OF TROY GIS MAP, DATED MAY 27, 20176
SANITARY SEWER	CITY OF TROY GIS MAP, DATED MAY 27, 20176
STORM SEWER	CITY OF TROY GIS MAP, DATED MAY 27, 20176
GAS	CONSUMERS ENERGY QUARTER SECTION MAP 02-6-20-4, DATED 09-10-15
FLOODPLAIN	FEMA F.I.R.M. 26125C0533F, DATED SEPTEMBER 29, 2006.
ELECTRIC	HAVE NOT RECEIVED INFORMATION AS OF 06-09-2016
TELEPHONE	HAVE NOT RECEIVED INFORMATION AS OF 06-09-2016
CABLE	HAVE NOT RECEIVED INFORMATION AS OF 06-09-2016
SURVEYS	PEA TOPOGRAPHIC SURVEY, S:\PROJECTS\2008\2008066\DWG\TOPOBASE.DWG
	PEA TOPOGRAPHIC SURVEY S:\PROJECTS\2008\2008066\DWG\TOPO-9-23-08.DWG
	PEA TOPOGRAPHIC SURVEY S:\PROJECTS\2008\2008066\DWG\PHASE II-08066-TOPOBASE.DWG

SURVEYORS COMMENTS:
- Have not been provided with a Title Commitment.
- Title Commitment could show easements and other encumbrances on subject parcel.

LEGAL DESCRIPTION

Parcel ID No. 88-20-20-476-007
T2N, R11E, SEC 20 MUER'S GARDEN FARMS LOT 84

Parcel ID No. 88-20-20-476-008
T2N, R11E, SEC 20 MUER'S GARDEN FARMS LOT 83

Parcel ID No. 88-20-20-476-009
T2N, R11E, SEC 20 MUER'S GARDEN FARMS LOT 82

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0533F, DATED SEPTEMBER 29, 2006.

No.	BY	CHK	DESCRIPTION	DATE

REVISIONS

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

THIS DRAWING AND DESIGN ARE THE PROPERTY OF PEA, INC. THEY ARE SUBMITTED ON THE CONDITION THAT THEY ARE NOT TO BE DISCLOSED, REPRODUCED, OR COPIED, IN WHOLE OR IN PART, OR USED FOR FURNISHING INFORMATION TO OTHERS, WITHOUT THE PRIOR WRITTEN CONSENT OF PEA, INC. ALL COMMON LAW RIGHTS OF COPYRIGHT AND OTHERWISE ARE HEREBY SPECIFICALLY RESERVED. © 2015 PEA, INC.

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811
Know what's below Call before you dig
MISS DIG System, Inc.
1-800-482-7171 (TOLL FREE) www.missdig.net

PEA, Inc.
2430 Rochester Ct. Ste 100
Troy, MI 48083-1872
t: 248.689.9090
f: 248.689.1044
www.peainc.com

DESIGNHAUS ARCHITECTURE
301 WALNUT BLVD.
ROCHESTER, MICHIGAN 48307

TOPOGRAPHIC SURVEY
McCLURE LUXURY APARTMENTS
PART OF THE SOUTHEAST 1/4 OF SECTION 20, T2N, R11E
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

DES.	DN.	LKP	SUR.	JCW	P.M.	JPB

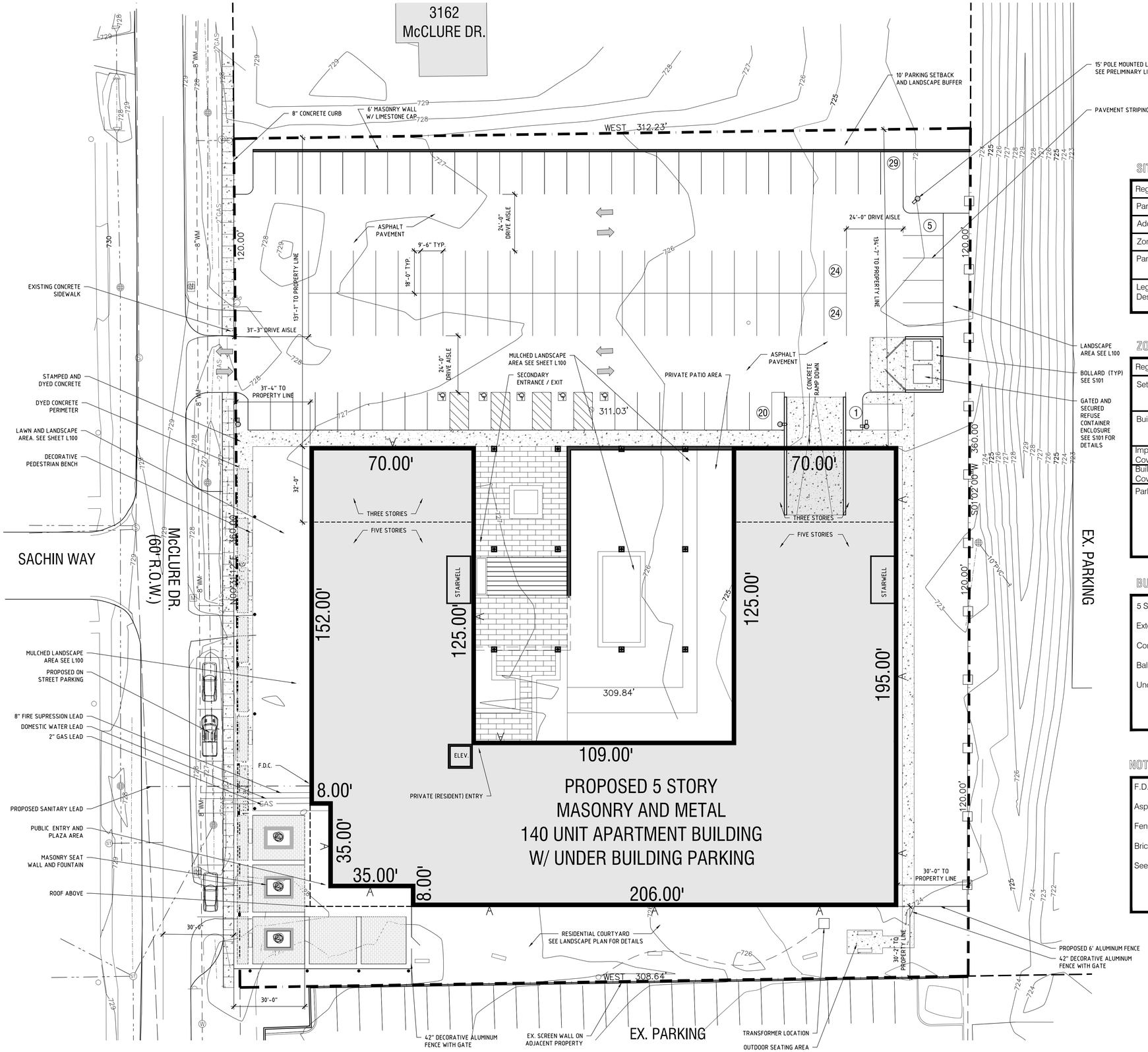
Z:\Architecture\ALL OTHER JOBS\08066 - McClure St. Muer Farm\Drawings\Civil\08135-TOPOBASE.dwg

ORIGINAL ISSUE DATE: JUNE 9, 2016

PEA JOB NO. 2016-135

SCALE: 1" = 30'

DRAWING NUMBER: TOPO



1 Site Plan
SCALE: 1"=20'

NORTH

DESIGNHAUS ARCHITECTOR EST 1998
301 WALNUT BOULEVARD
ROCHESTER, MI 48307
T: 248.601.4422 F: 248.453.5854
WWW.DESIGNHAUS.COM
INFO@DESIGNHAUS.COM

SITE DATA

Regulation	Information
Parcel I.D. (s)	20-20-476-007 / 008 / 009
Address	3142 / 3114 / 3086 McClure Dr.
Zoning	BB - Big Beaver District
Parcel Area	+/- 111,715 Sq. Ft. (2.57 Acres)
Legal Description	See Attachment w/ Application

ZONING SCHEDULE OF REGULATIONS

Regulation	Required	Provided
Setbacks	Front: 30' Sides:30' Rear: 30'	Front: 31.33' Sides: N-131.08' / S- 30' Rear: 30'
Building Height	Maximum: 50' (when NOT adjacent to residential) 40' (when adjacent to residential)	n/a
Impervious Coverage	Maximum: 75%	68.13%
Building Coverage	Maximum: 40%	30.71%
Parking		103 Surface Spaces 96 Under Building Spaces 199 Spaces total (Including 9 handicap accessible spaces)

BUILDING DATA

5 Story Apartment Building

Exterior patio space units available

Community Courtyard/Greenspace

Balcony Units Available

Underground Parking - see S101 detail

NOTES

F.D.C. per city standards.

Asphalt pavement throughout. 6" concrete curb & gutter. 4" concrete sidewalks

Fencing to be 6' in height. See S101 for details

Brick veneer on dumpster to match building. See S101 detail

See Lighting Plan for fixture locations. All lighting to have shielded light source

No.	Revision/Issue	Date
	----	----
	Preliminary Discussion #3	10.10.2016
	Preliminary Discussion #2	7.21.2016
	Preliminary Design Review	6.14.2016

The Lofts
3114 McClure Rd.
Troy, MI, 48084
United States of America

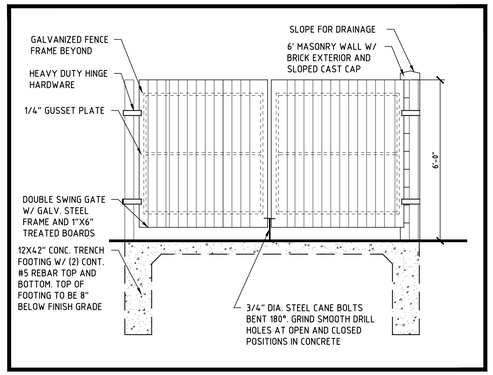
Site Plan

S100

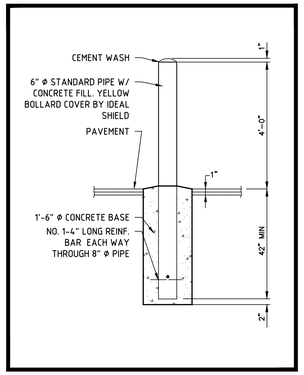
016044

S100 Site Plan.dwg
10/10/2016
Francesca

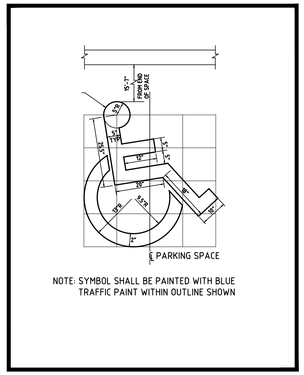
DUMPSTER ENCLOSURE DETAIL



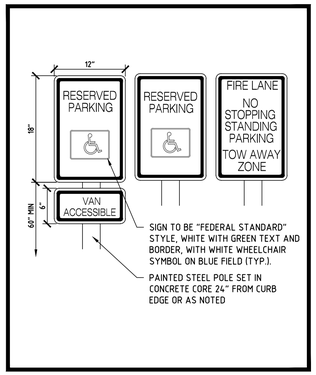
BOLLARD DETAIL



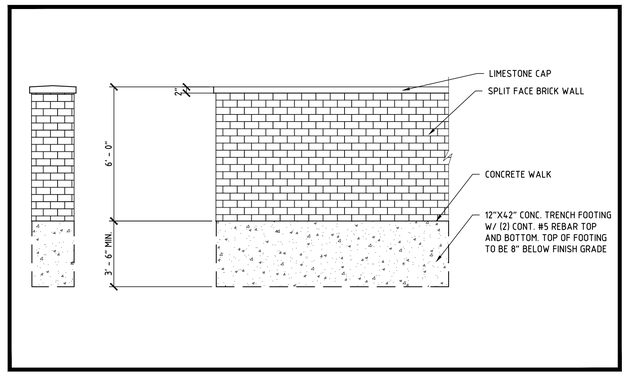
PARKING SPACE PAINT DETAIL



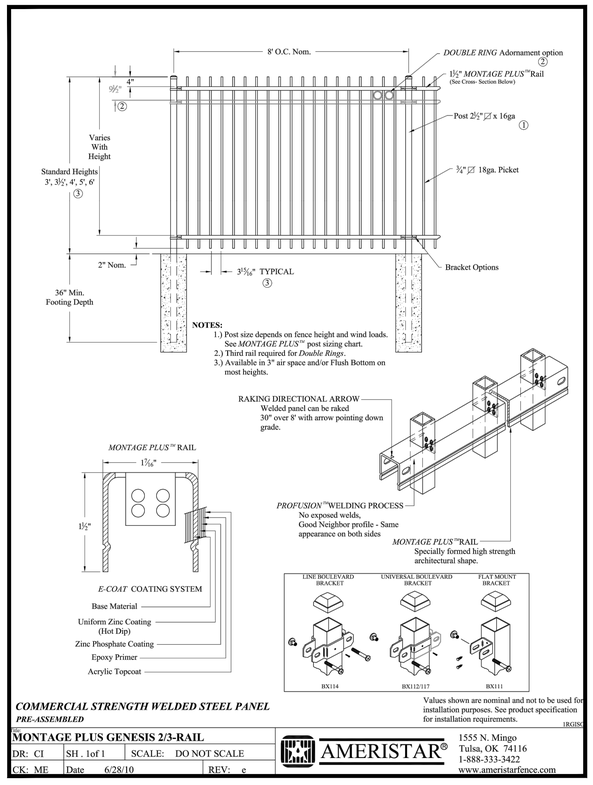
HANDICAP SIGN DETAIL

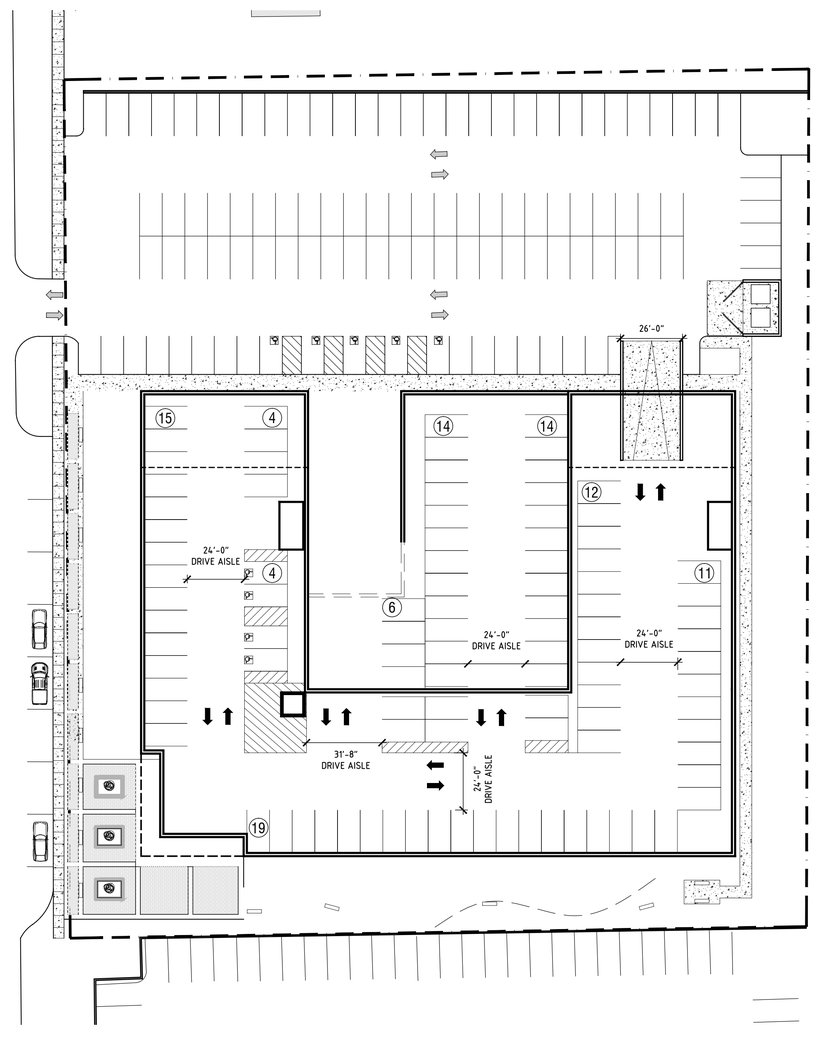


MASONRY WALL DETAIL



FENCE DETAIL





1 Site Parking Detail

SCALE: 1"=30'

NORTH

DESIGNHAUS ARCHITECTOR EST 1998

301 WALNUT BOULEVARD
ROCHESTER, MI 48307

T: 248.601.4422 F: 248.453.5854

WWW.DESIGNHAUS.COM
INFO@DESIGNHAUS.COM

No.	Revision/Issue	Date
	----	----
	Preliminary Discussion #3	10.10.2016
	Preliminary Discussion #2	7.21.2016
	Preliminary Design Review	6.14.2016

The Lofts
3114 McClure Rd.
Troy, MI, 48084
United States of America

Site Details

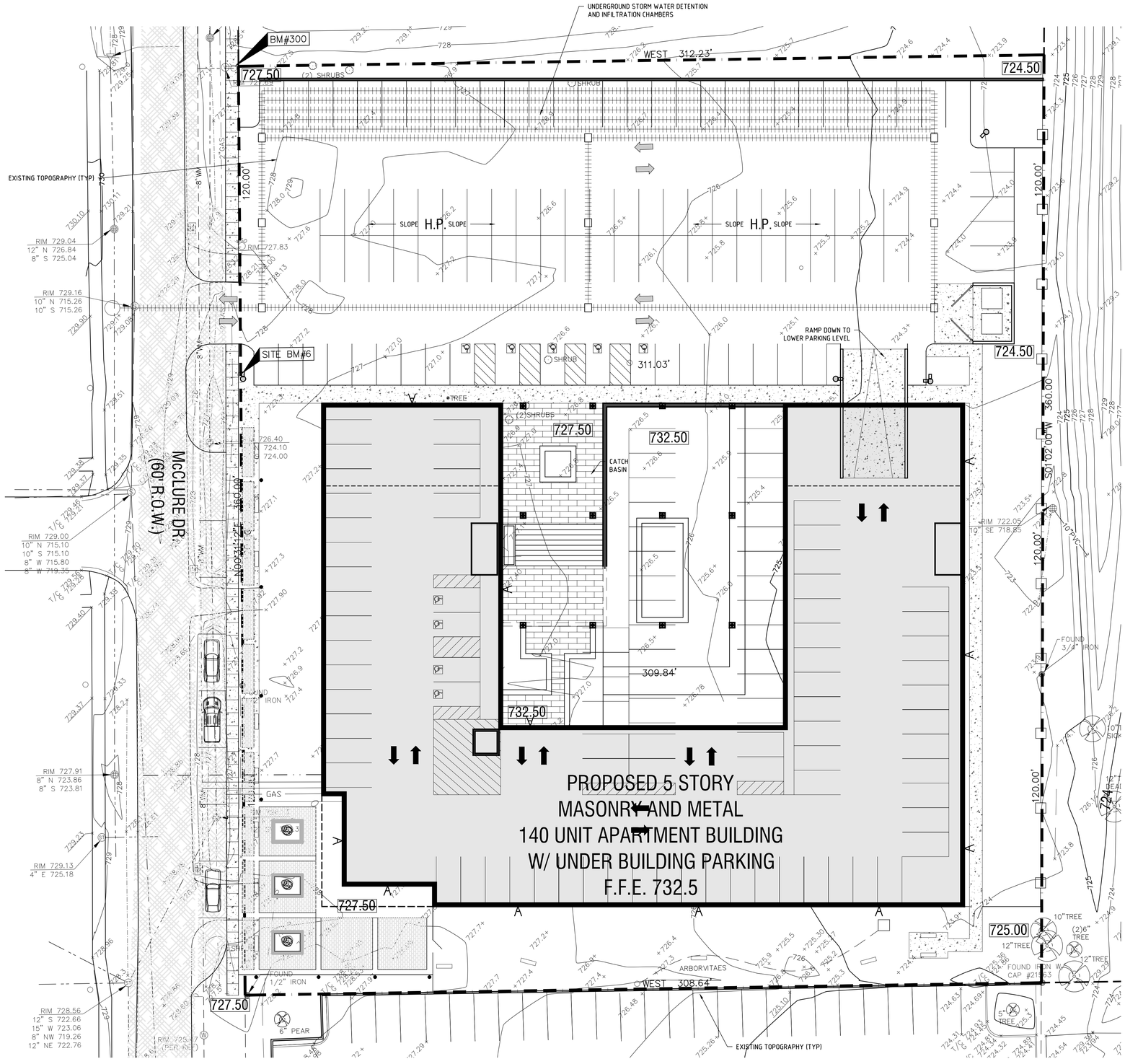
S101

016044

S101 Site Details.dwg

10/10/2016

Francesca



1 Preliminary Grading Plan

SCALE: 1"=20'

NORTH

DESIGNHAUS ARCHITECTOR EST 1998

301 WALNUT BOULEVARD
ROCHESTER, MI 48307

T: 248.601.4422 F: 248.453.5854

WWW.DESIGNHAUS.COM
INFO@DESIGNHAUS.COM

No.	Revision/Issue	Date
	----	----
	Preliminary Discussion #3	10.10.2016
	Preliminary Discussion #2	7.21.2016
	Preliminary Design Review	6.14.2016

The Lofts
3114 McClure Rd.
Troy, MI, 48084
United States of America

Preliminary Grading Plan

S200

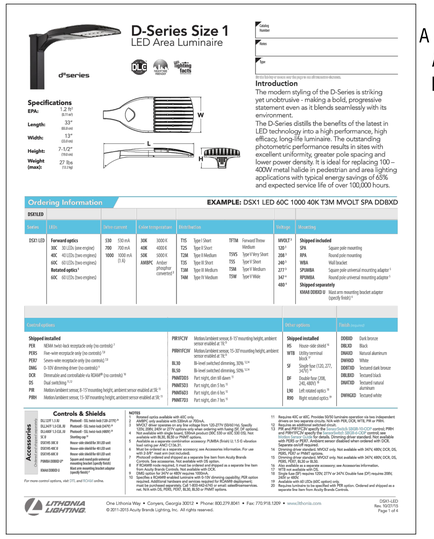
016044

S200 Preliminary Grading Plan.dwg

10/10/2016

Francesca

A - 15' POLE MOUNTED L.E.D. AREA LIGHT SHIELDED TO PREVENT OFF SITE GLARE



D-Series Size 1
LED Area Luminaire

d^series

Specifications
EPA: 1.2 ft² (0.11 m²)
Length: 33" (83.8 cm)
Width: 13" (33.0 cm)
Height: 7-1/2" (19.0 cm)
Weight (max): 27 lbs (12.2 kg)

Catalog Number
Notes
Type

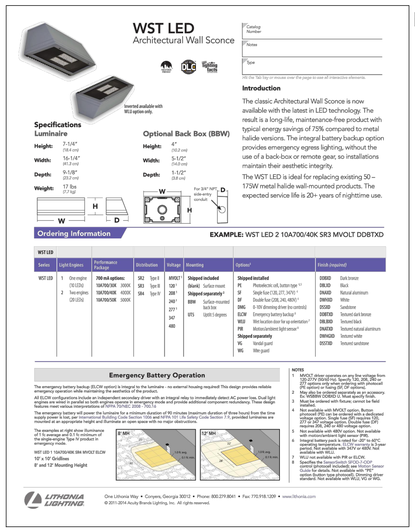
Introduction
The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.
The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing 100 – 400W metal halide in pedestrian and area lighting applications with typical energy savings of 60% and expected service life of over 100,000 hours.

Ordering Information — EXAMPLE: DSX1 LED 60C 1000 40K T3M MVOLT SPA DDBXD

Accessories: Control & Shields

LITHONIA LIGHTING — One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com
© 2011-2015 Acuity Brands Lighting, Inc. All rights reserved. DSX1 LED Rev. 10/27/15 Page 1 of 4

B - 10' WALL MOUNTED LIGHT. LIGHT SOURCE SHIELDED



WST LED
Architectural Wall Sconce

Specifications
Luminaire
Height: 7-1/4" (18.4 cm)
Width: 16-1/4" (41.3 cm)
Depth: 9-1/8" (23.2 cm)
Weight: 17 lbs (7.7 kg)

Optional Back Box (BBW)
Height: 4" (10.2 cm)
Width: 5-1/2" (14.0 cm)
Depth: 3-1/2" (8.9 cm)

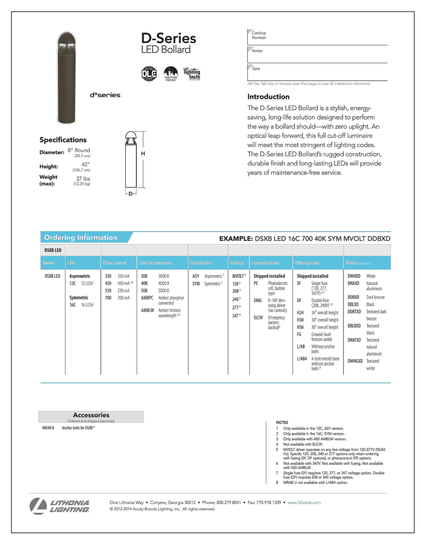
Introduction
The classic Architectural Wall Sconce is now available with the latest in LED technology. The result is a long-life, maintenance-free product with typical energy savings of 75% compared to metal halide versions. The integral battery backup option provides emergency egress lighting, without the use of a back-box or remote gear, so installations maintain their aesthetic integrity.
The WST LED is ideal for replacing existing 50 – 175W metal halide wall-mounted products. The expected service life is 20+ years of nighttime use.

Ordering Information — EXAMPLE: WST LED 2 10A700/40K SR3 MVOLT DDBTXD

Emergency Battery Operation

LITHONIA LIGHTING — One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com
© 2011-2014 Acuity Brands Lighting, Inc. All rights reserved.

C - L.E.D. BOLLARD WALK LIGHT



D-Series
LED Bollard

d^series

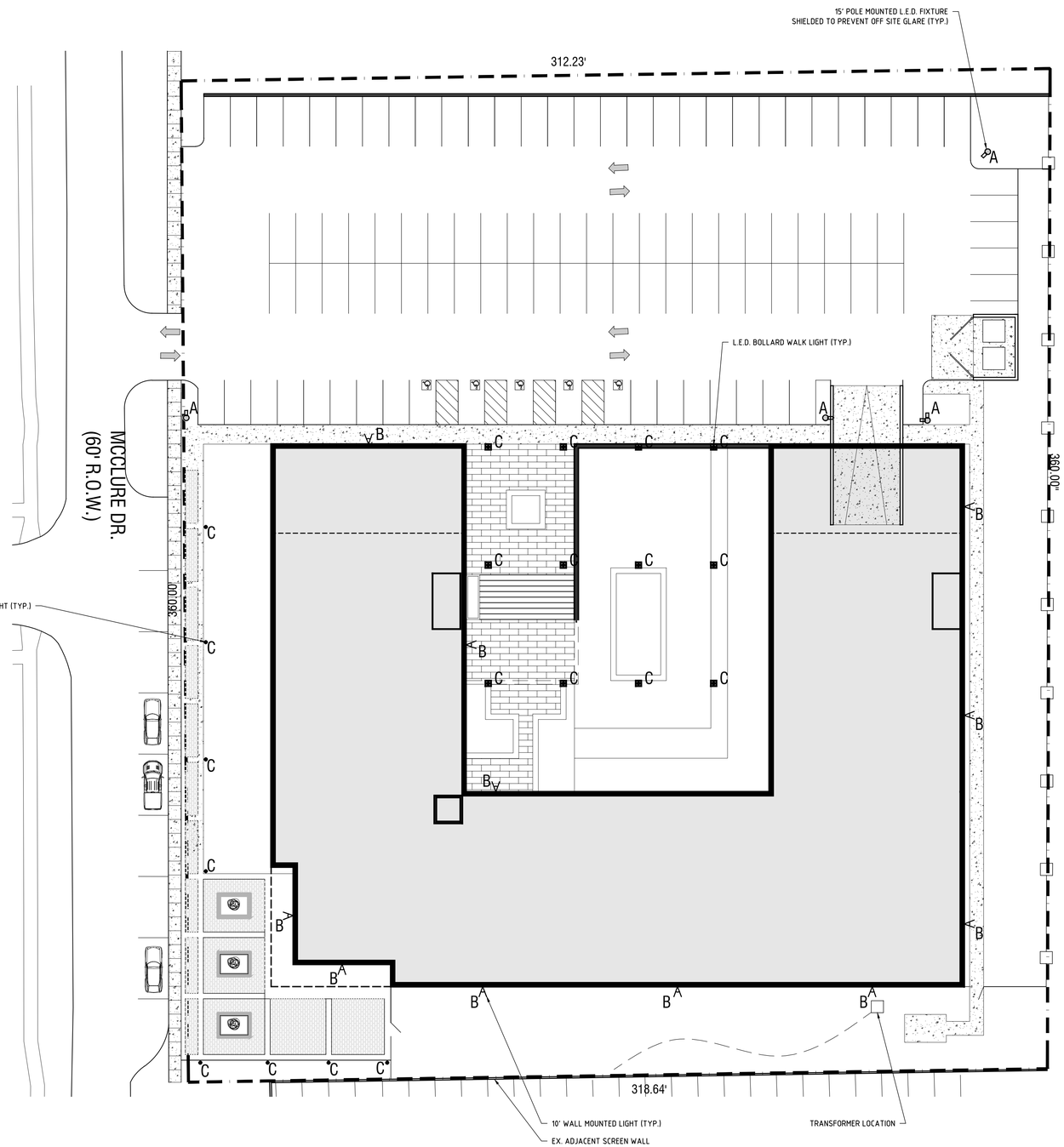
Specifications
Diameter: 8" Round (20.3 cm)
Height: 42" (106.7 cm)
Weight (max): 27 lbs (12.25 kg)

Introduction
The D-Series LED Bollard is a stylish, energy-saving, long-life solution designed to perform the way a bollard should—with zero uplight. An optical leap forward, this full cut-off luminaire will meet the most stringent of lighting codes. The D-Series LED Bollard's rugged construction, durable finish and long-lasting LEDs will provide years of maintenance-free service.

Ordering Information — EXAMPLE: DSXB LED 16C 700 40K SYM MVOLT DDBXD

Accessories

LITHONIA LIGHTING — One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com
© 2012-2014 Acuity Brands Lighting, Inc. All rights reserved.



1 Preliminary Exterior Lighting Plan
1" = 20'

NORTH

DESIGNHAUS ARCHITECTOR EST 1998
301 WALNUT BOULEVARD
ROCHESTER, MI 48307
T: 248.601.4422 F: 248.453.5854
WWW.DESIGNHAUS.COM
INFO@DESIGNHAUS.COM

No.	Revision /Issue	Date
	----	----
	Preliminary Discussion #3	10.10.2016
	Preliminary Discussion #2	7.21.2016
	Preliminary Design Review	6.14.2016

The Lofts
3114 McClure Rd.
Troy, MI, 48084
United States of America

Preliminary Lighting Plan

S300 016044

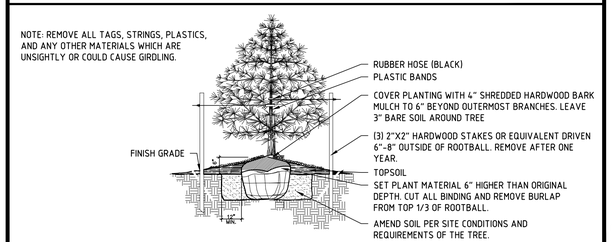
S300 Preliminary Lighting Plan.dwg
10/10/2016
Francesca

GENERAL NOTES FOR LANDSCAPE DEVELOPMENT

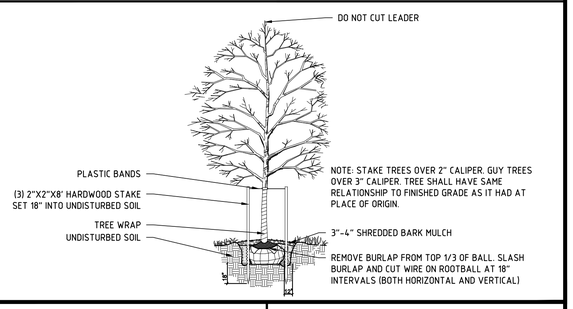
1. LANDSCAPE CONTRACTOR SHALL VISIT THE SITE, INSPECT EXISTING SITE CONDITIONS AND REVIEW PROPOSED PLANTING AND RELATED WORK. IN CASE OF DISCREPANCY BETWEEN PLAN AND PLANT LIST, PLAN SHALL GOVERN QUANTITIES. CONTACT LANDSCAPE ARCHITECT WITH ANY CONCERNS.
2. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ON SITE UTILITIES PRIOR TO BEGINNING CONSTRUCTION ON HIS/HER PHASE OF WORK. ELECTRIC, GAS, TELEPHONE, CABLE TELEVISION MAY BE LOCATED BY CALLING MISS DIG. 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 OWNERS 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 TREES TO HAVE CLAY OR CLAY LOAM BALLS, TREES WITH SAND BALLS WILL BE REJECTED.
9. 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.
10. CONCERNING GROUND COVER, ALL PLANTING BEDS SHALL RECEIVE 3" SHREDDED HARDWOOD BARK MULCH, SEE SPECIFICATIONS. ALL OTHER DISTURBED AREAS SHALL BE SODDED.
11. LANDSCAPING SHALL BE MAINTAINED IN A GOOD CONDITION TO PRESENT A HEALTHY, NEAT, AND ORDERLY APPEARANCE FREE FROM REFUSE AND DEBRIS. ALL UNHEALTHY AND DEAD MATERIAL SHALL BE REPLACED WITHIN ONE (1) YEAR OF THE NEXT APPROPRIATE PLANTING PERIOD.
12. OWNER TO ESTABLISH MAINTENANCE PROGRAM TO ENSURE GROUNDS AND LANDSCAPING TO REMAIN HEALTHY AND WELL GROOMED.
13. RECOMMENDED PLANTING DATES ARE MARCH 1ST TO MAY 15TH FOR ALL MATERIALS, AND OCTOBER 15TH TO DECEMBER 15TH FOR DECIDUOUS MATERIALS. PLANTINGS OUTSIDE THESE DATES SHALL HAVE PRIOR APPROVAL OF THE LANDSCAPE ARCHITECT.
14. UNDERGROUND IRRIGATION SYSTEM TO BE DESIGNED AND INSTALLED BY CONTRACTOR.
15. TURF GRASS TO BE COMMON TO OAKLAND COUNTY, MI.

PLANTING DETAILS

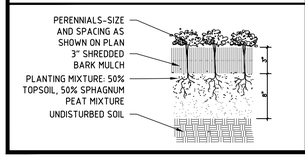
EVERGREEN TREES



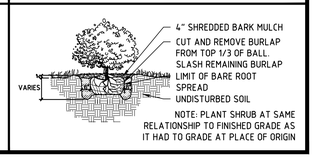
DECIDUOUS TREES

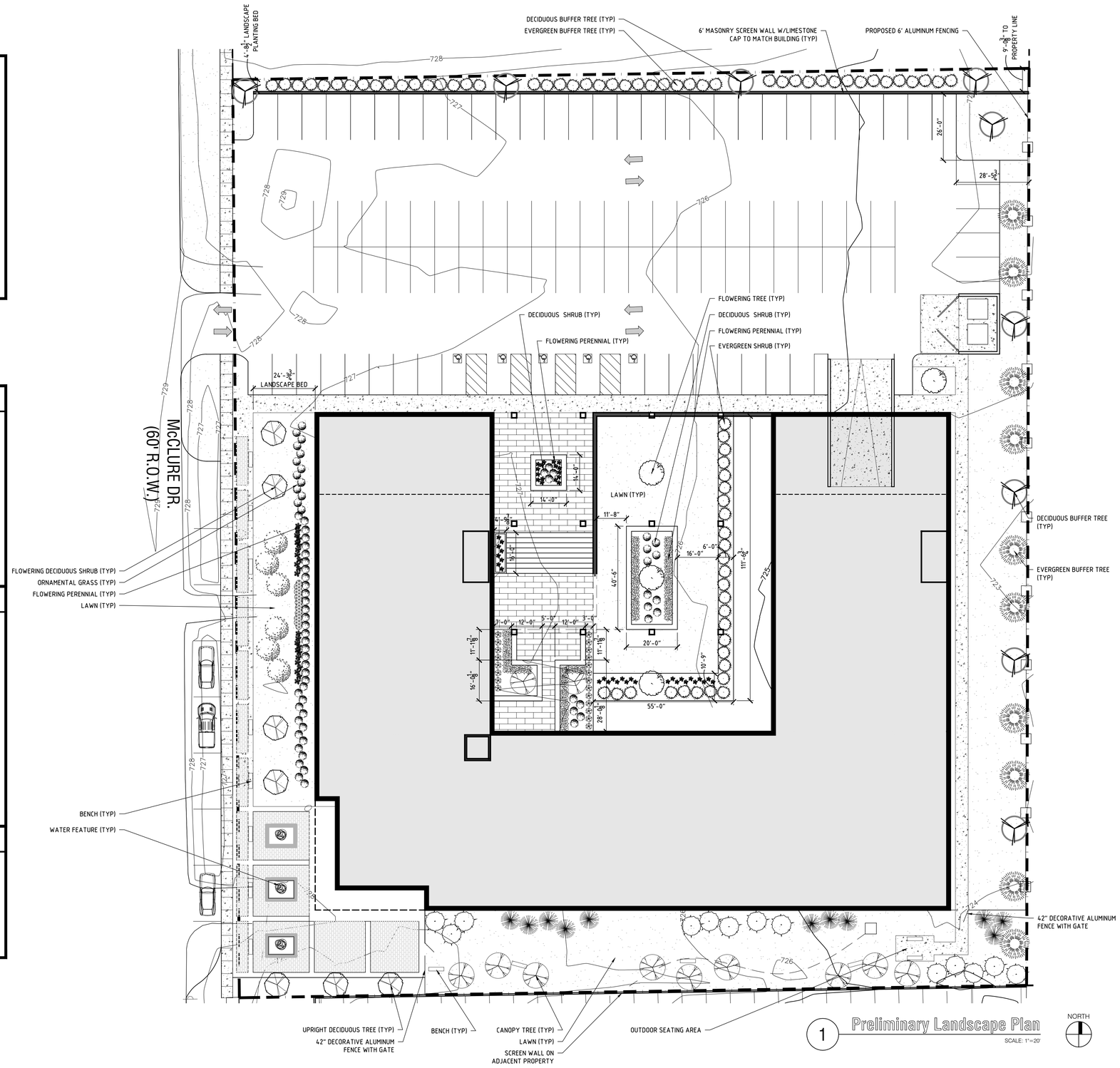


PERENNIALS



SHRUBS





1 Preliminary Landscape Plan
SCALE: 1"=20'

DESIGNHAUS ARCHITECTOR EST 1998
301 WALNUT BOULEVARD
ROCHESTER, MI 48307
T: 248.601.4422 F: 248.453.5854
WWW.DESIGNHAUS.COM
INFO@DESIGNHAUS.COM

No.	Revision/Issue	Date
	----	----
	Preliminary Discussion #3	10.10.2016
	Preliminary Discussion #2	7.21.2016
	Preliminary Design Review	6.14.2016

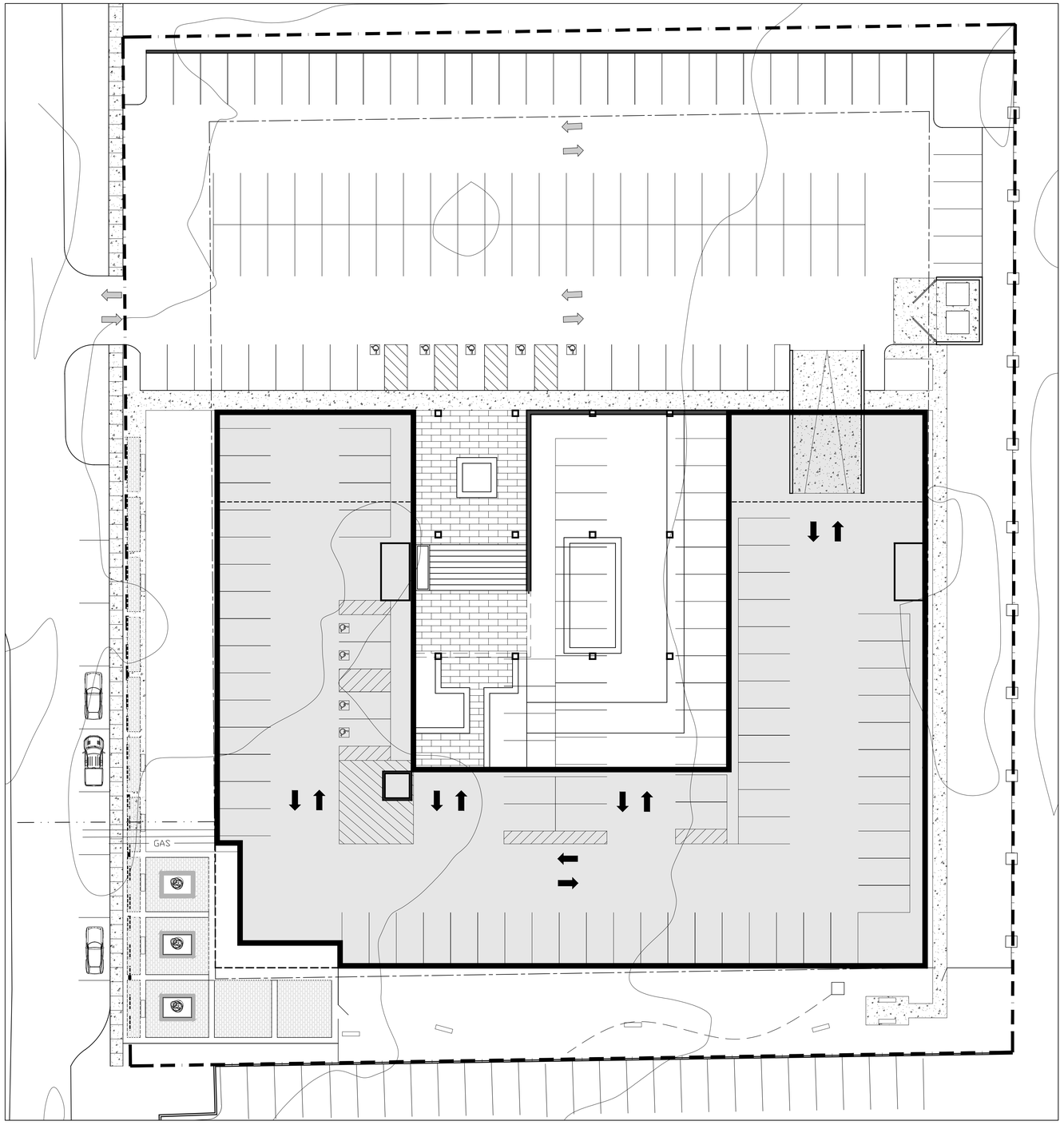
The Lofts
3114 McClure Rd.
Troy, MI, 48084
United States of America

Landscape Plan

L100

016044

L100 Landscape Plan.dwg
10/10/2016
Francesca



1 Existing Tree Inventory and Preservation Plan

1" = 20'

NORTH

Existing Tree inventory

TAG	SIZE	COMMON NAME	DISPOSITION
101	8"	RED MAPLE	TO REMAIN
102	8"	RED MAPLE	"
103	8"	RED MAPLE	"
104	16"	SILVER MAPLE	TO BE REMOVED
105	10"	CEDAR	"
106	6"	FIR	"
107	16"	FIR	"
108	17"	FIR	"
109	16"	SPRUCE	"
110	17"	SPRUCE	"
112	15"	PINE	"
113	14"	SPRUCE	"
114	10"	CEDAR	"
115	16"	ELM	"
116	18"	MAPLE	"
117	16"	ELM	"
118	17"	ELM	"

DESIGNHAUS ARCHITECTOR EST 1998

301 WALNUT BOULEVARD
ROCHESTER, MI 48307

T: 248.601.4422 F: 248.453.5854

WWW.DESIGNHAUS.COM
INFO@DESIGNHAUS.COM

No.	Revision/Issue	Date
	----	----
	Preliminary Discussion #3	10.10.2016
	Preliminary Discussion #2	7.21.2016
	Preliminary Design Review	6.14.2016

The Lofts
3114 McClure Rd.
Troy, MI, 48084
United States of America

Preliminary Tree Inventory

L101

016044

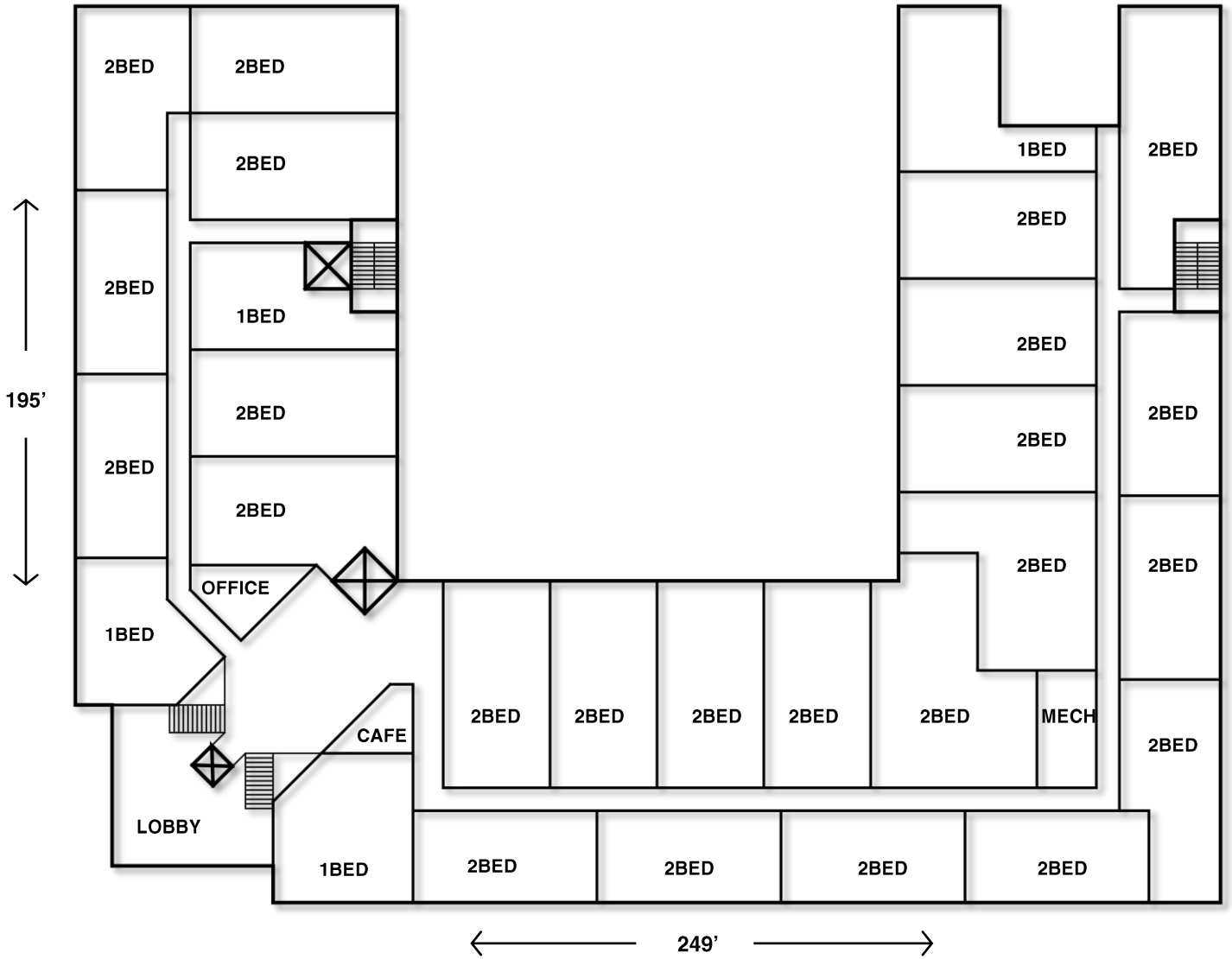
L101 Preliminary Tree Inventory.dwg
10/10/2016
Dell User

Preliminary Design Package
for **McClure Dr. Luxury Apartments** in Troy, MI

DESIGNHAUS ARCHITECTURE EST 1998

September 12th, 2016
301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

McClure Dr. Luxury Apartments
1st Floor Plan

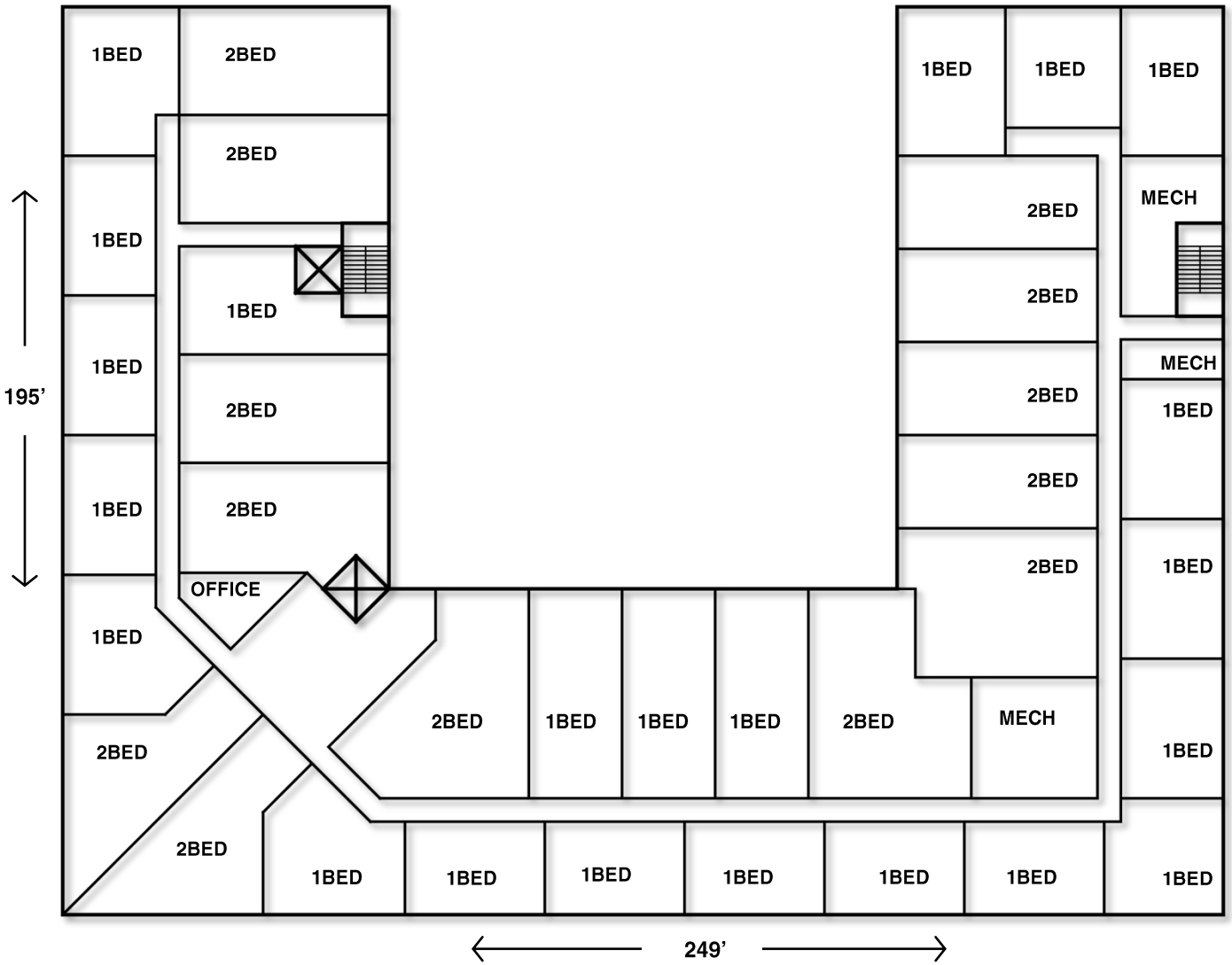


September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

McClure Dr. Luxury Apartments
2nd Floor Plan

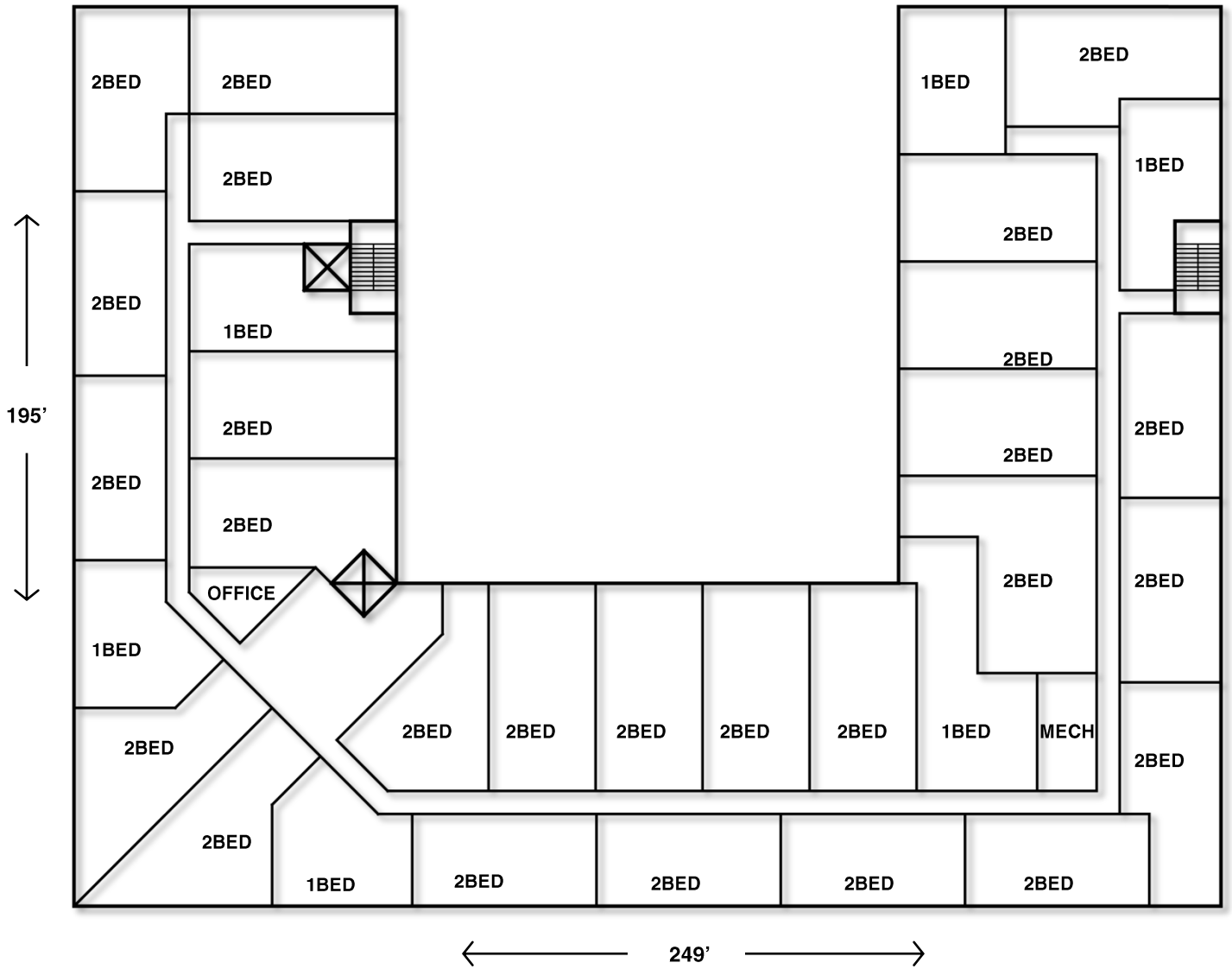


September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

McClure Dr. Luxury Apartments
3rd Floor Plan

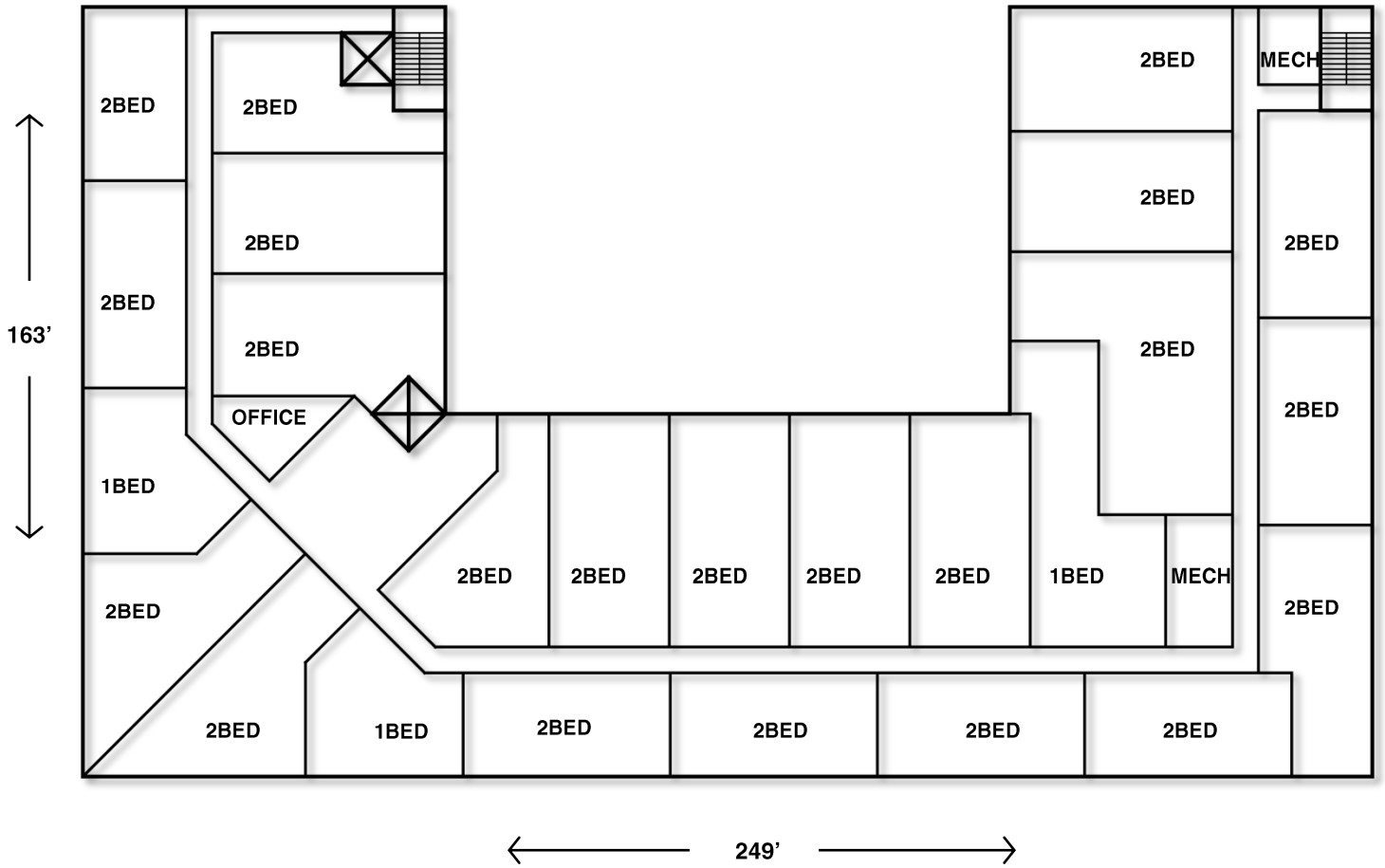


September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

McClure Dr. Luxury Apartments
4th & 5th Floor Plan



September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

VENIRS

McClure Dr. Luxury Apartments
Illustration

September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

McClure Dr. Luxury Apartments
Illustration

September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

McClure Dr. Luxury Apartments
West Elevation

September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

McClure Dr. Luxury Apartments
South Elevation

September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

McClure Dr. Luxury Apartments
East Elevation

September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

McClure Dr. Luxury Apartments
North Elevation

September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

McClure Dr. Luxury Apartments
Elevations

September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

McClure Dr. Luxury Apartments
Southbound on McClure Rd.

McClure Dr. Luxury Apartments
Eastbound on Big Beaver

McClure Dr. Luxury Apartments
Eastbound on Sachin Way

September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

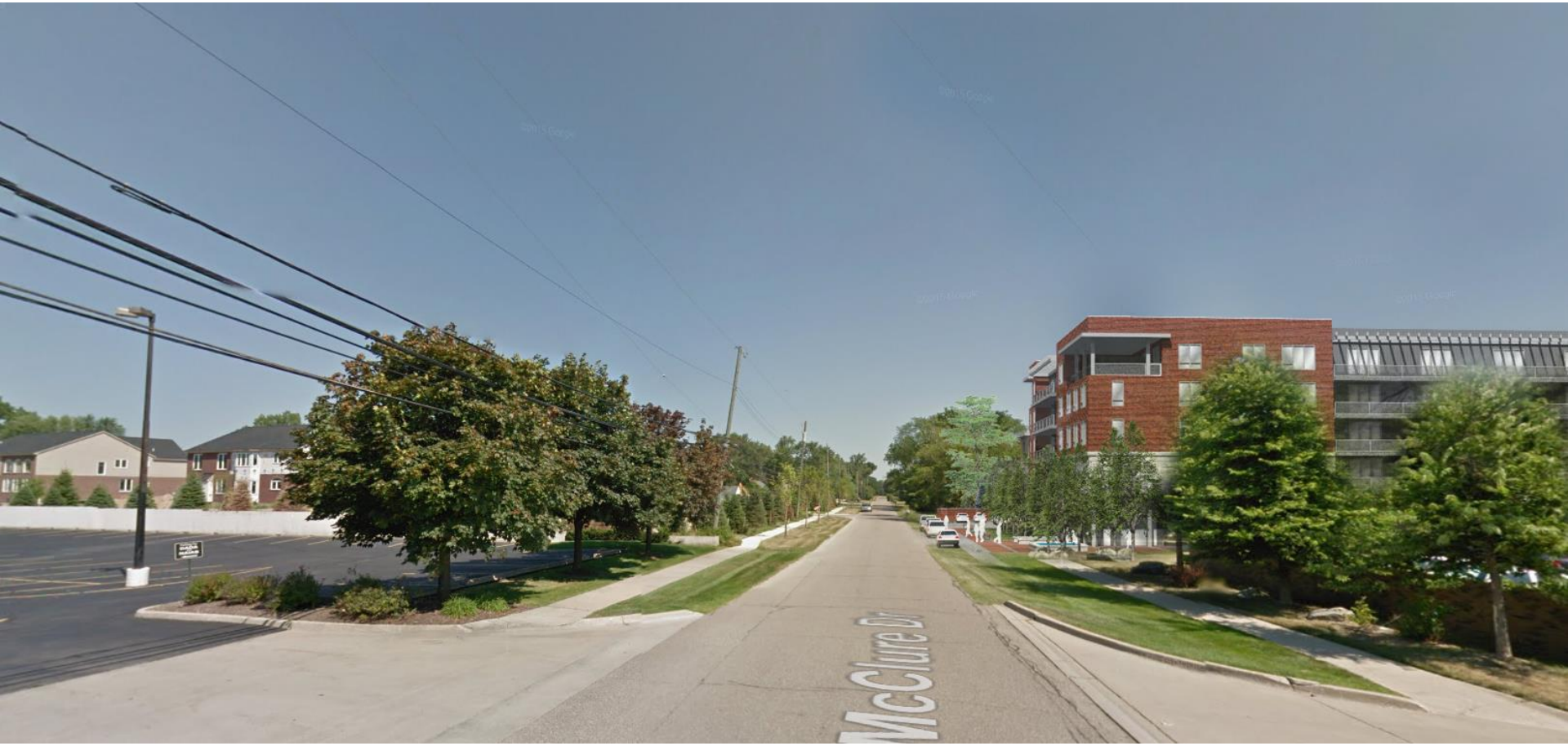
McClure Dr. Luxury Apartments
From Residential Rear Property Line

September 12th, 2016

301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

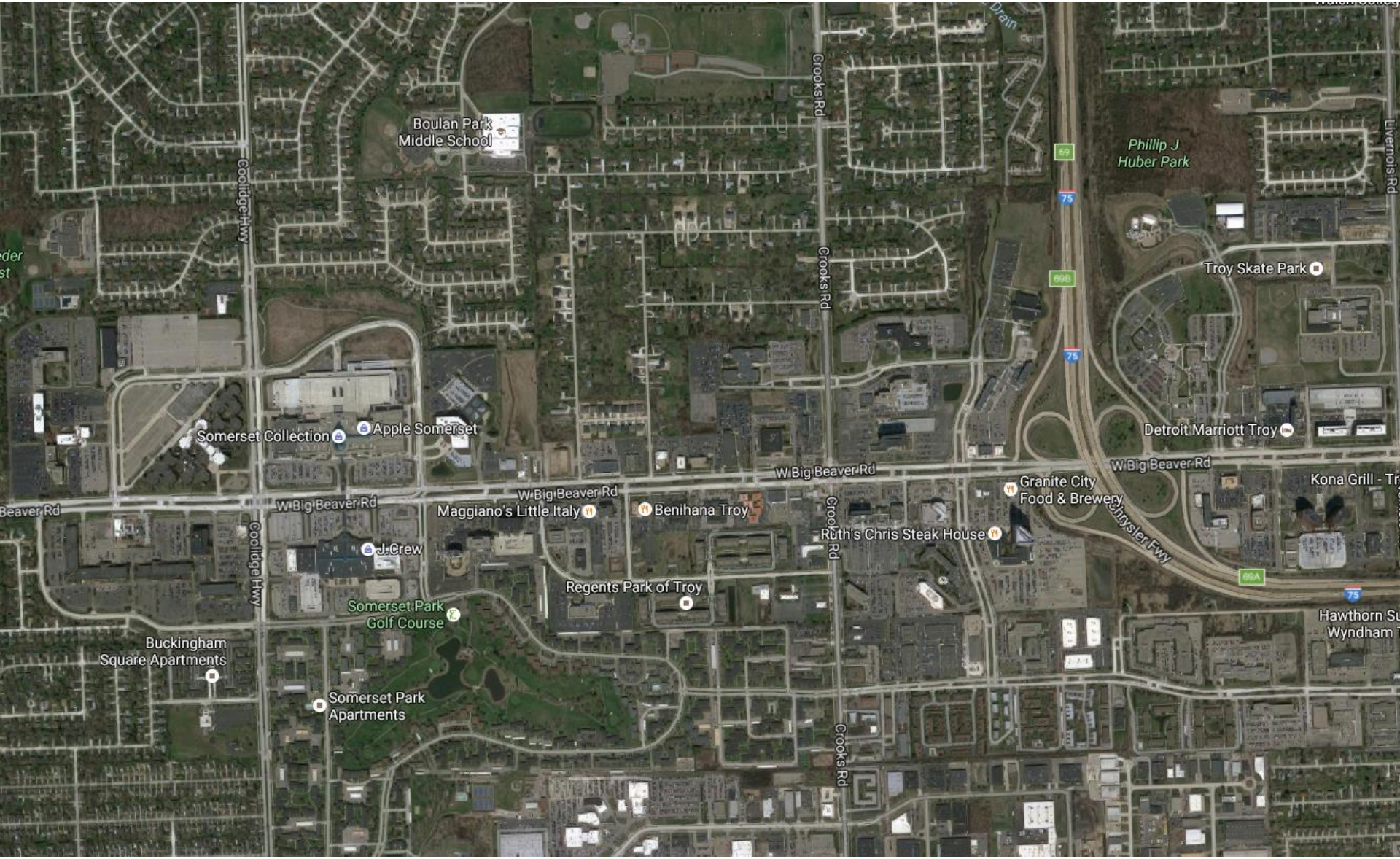
McClure Dr. Luxury Apartments
Northbound on McClure Rd.



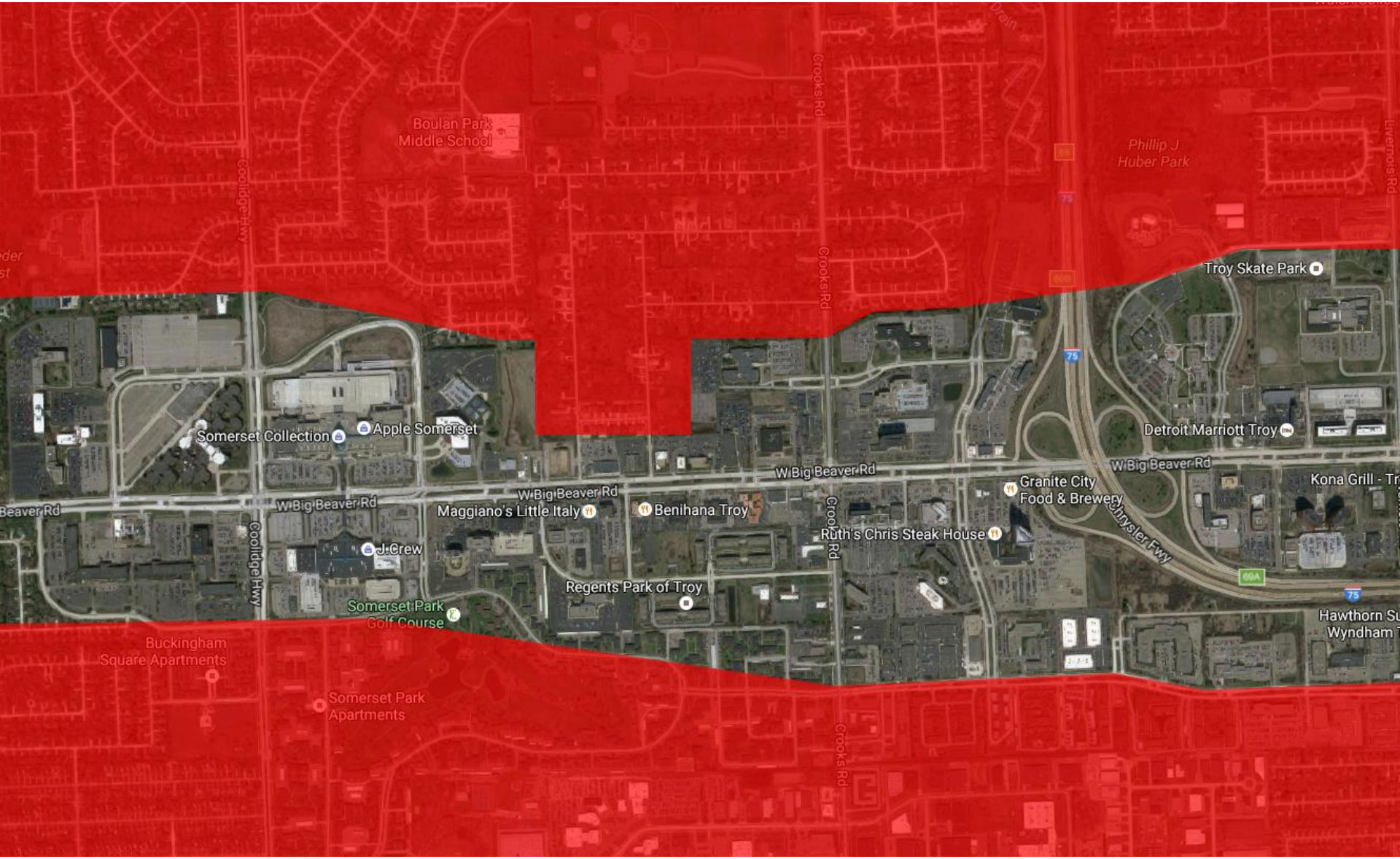
September 12th, 2016
301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

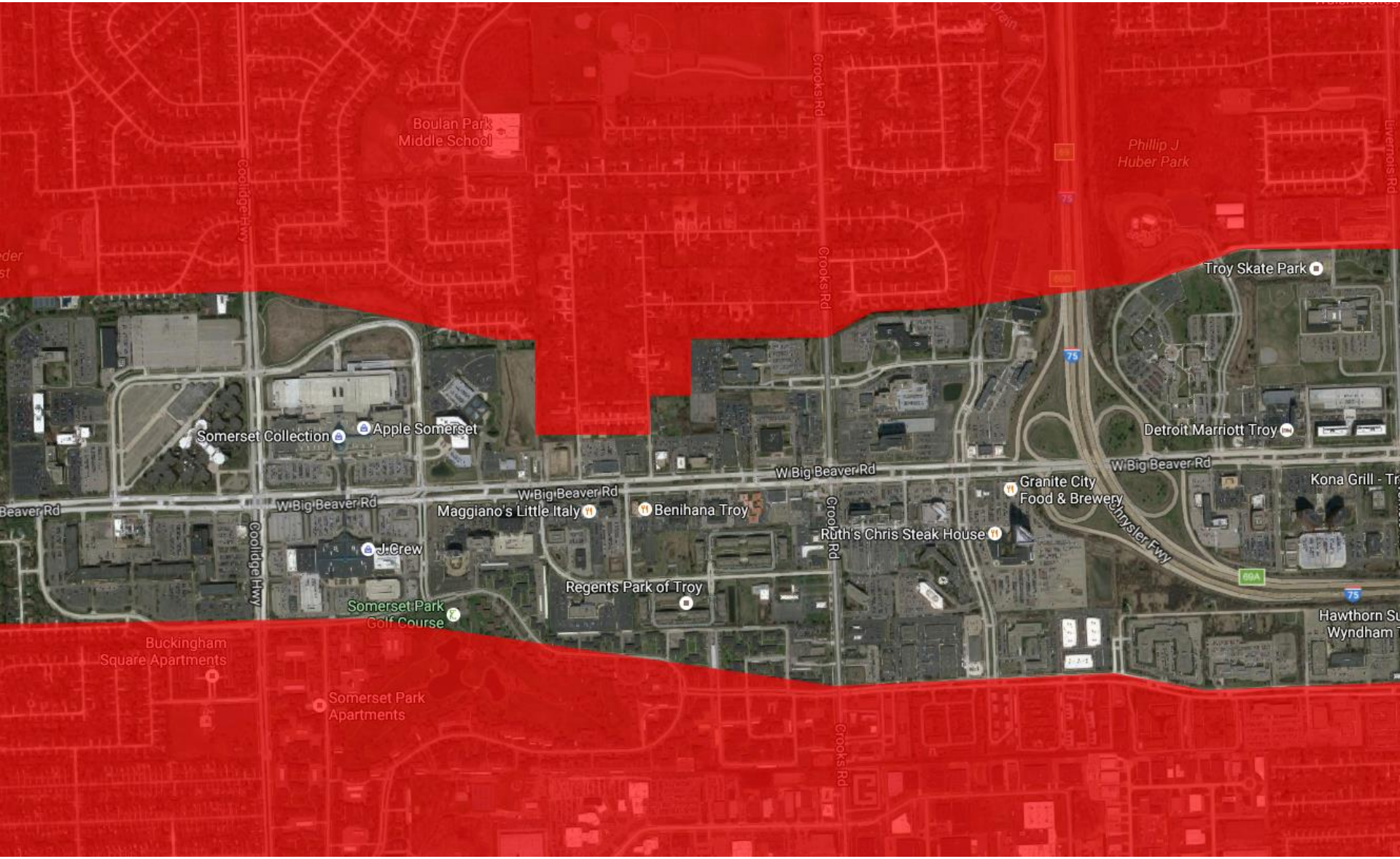
McClure Dr. Luxury Apartments



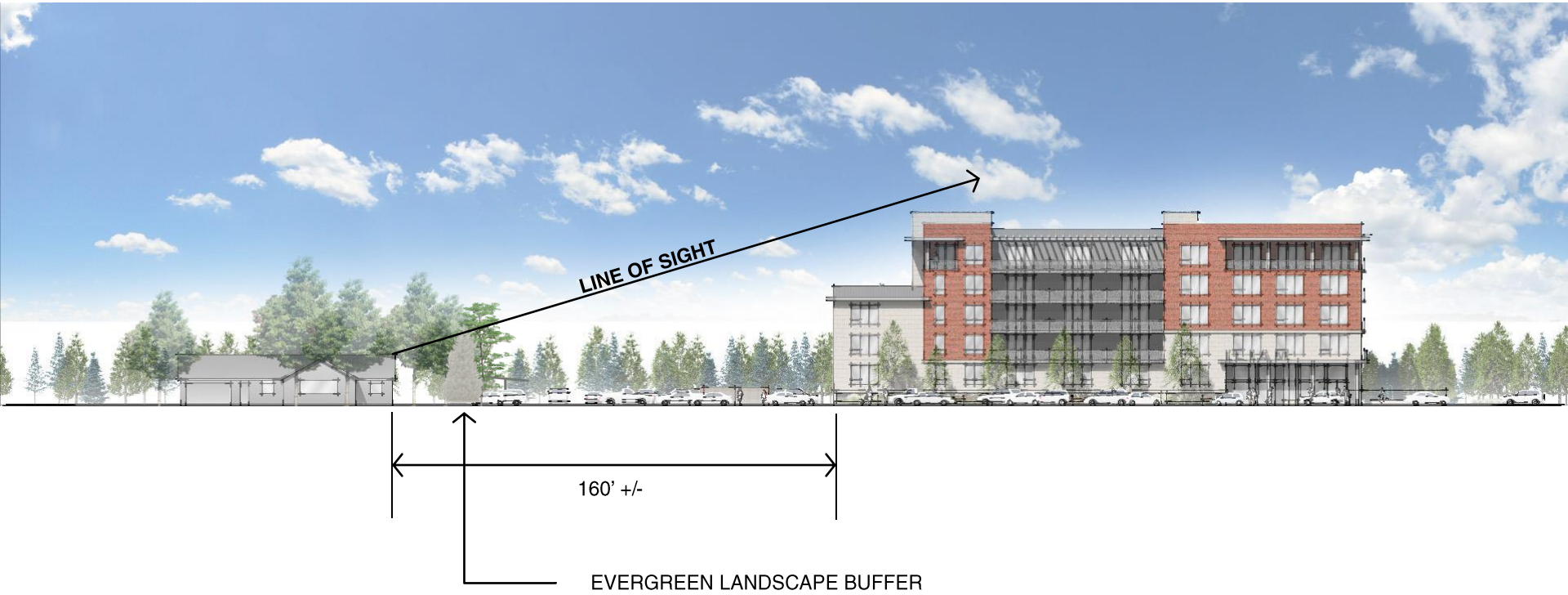
McClure Dr. Luxury Apartments



McClure Dr. Luxury Apartments



McClure Dr. Luxury Apartments



September 12th, 2016

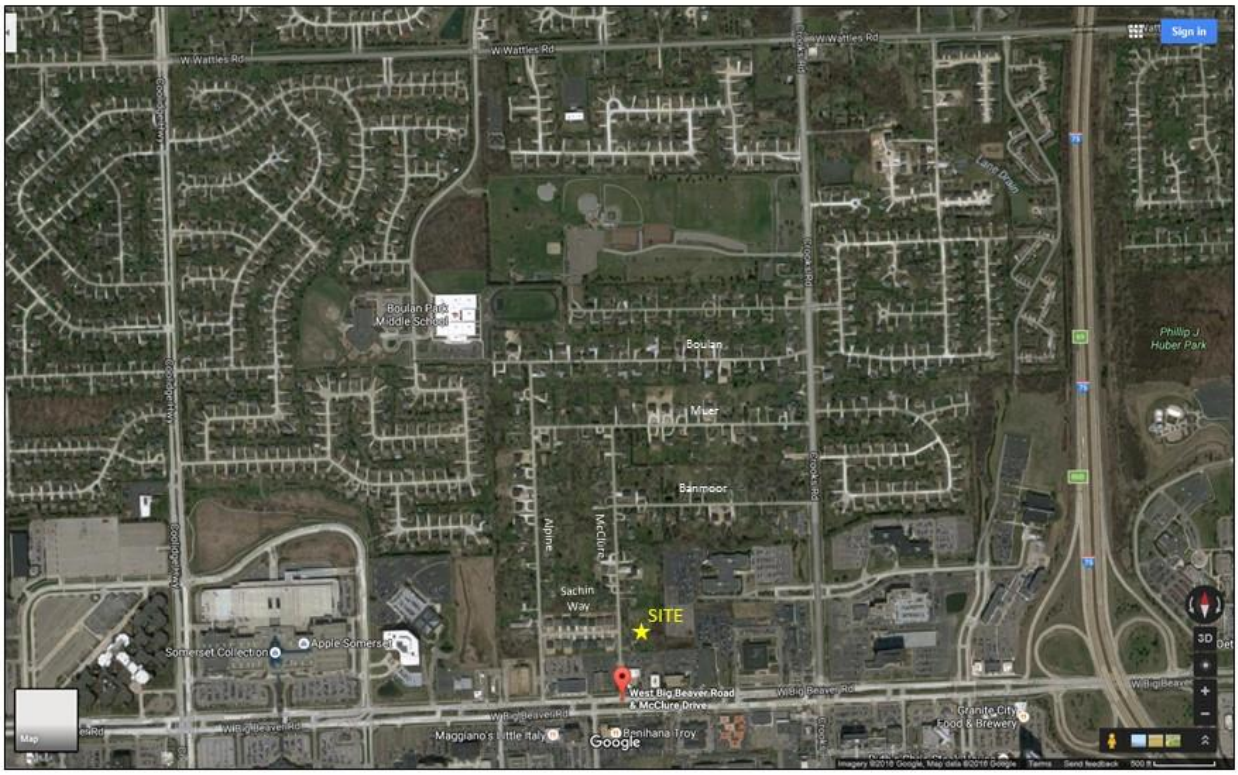
301 Walnut Blvd | Rochester, Michigan | 48307 | p 248 601 4422 | www.designhaus.com

DESIGNHAUS ARCHITECTURE EST 1998

McClulre Dr. Luxury Apartments
Context Views

TRAFFIC AND PARKING STUDY FOR PROPOSED
McCLURE ROAD APARTMENTS

TROY, MI



Prepared for
TOLLE BROOKE LLC
Troy, MI

By
GIFFELS WEBSTER
Washington, MI

October 2016

CONTENTS

EXECUTIVE SUMMARY ii

INTRODUCTION 1

EXISTING CONDITIONS 1
- Land Uses 1
- Roadway Network 1
- Traffic Volumes 5

FUTURE CONDITIONS 10
- Land Uses 10
- Roadway Network 10
- Background Traffic 10
- Trip Generation 14
- Trip Distribution and Assignment 14

IMPACT ANALYSES 19
- Method and Criteria 19
- Level of Service Results 19
- Queuing Predictions for Minor Approaches 23

NEIGHBORHOOD CUT-THROUGH TRAFFIC 24
- Method 24
- Results 24
- Potential Traffic Calming 26

PARKING REQUIREMENT 26
- Literature Survey 26
- Analysis 26

CONCLUSIONS AND RECOMMENDATIONS 27

APPENDICES
- A: Resume of Preparer
- B: Traffic Counts
- C: Background Traffic
- D: Impact Analyses
- E: Cut-Through Traffic
- F: Parking Ratios

TRAFFIC AND PARKING STUDY FOR PROPOSED McCLURE ROAD APARTMENTS
TROY, MI

EXECUTIVE SUMMARY

This study examines the potential traffic impacts and parking requirements of a 140-unit, upscale apartment building proposed for the east side of McClure, immediately north of two office buildings fronting on Big Beaver. The proposed 199 on-site parking spaces are proposed to be served by a single access drive on McClure a short distance north of Sachin Way. Full occupancy is assumed to first occur in the year 2019.

Both the surrounding residents and the City of Troy are also concerned about the "cut-through" traffic thought to exist between Crooks Road and westbound Big Beaver. At the request of the City, the developer (Tolle Brooke LLC) retained Giffels Webster (GW) to assess this issue and its potential mitigation, as well as the traffic impacts and parking requirements of the proposed apartments.

This report documents the traffic and parking study by reviewing existing conditions; the potential conditions in 2019 in the hypothetical absence of proposed development; the expected conditions in 2019 with both background growth and the development fully occupied; the cut-through traffic issue; and the apartments' practical parking requirement (less than that specified by ordinance).

The study's key conclusions and recommendations are as follows:

- The 140 proposed upscale apartments can be expected to generate no more than 72 one-way vehicle trips in the AM peak hour (58 exiting and 14 entering) and 95 one-way vehicle trips in the PM peak hour (62 entering and 33 exiting).

- Twenty to 25 percent of the new trips can be expected to travel to and from Crooks via the neighborhood streets north of the site. The largest single movement of such traffic would be 14 vehicles exiting the site onto NB McClure in the AM peak hour, some using Banmoor to reach Crooks and some using Muer. Although this new local traffic will be residential in nature, existing residents may call for such new traffic to be minimized; one potential way of doing so – at least for outbound traffic – would be to post the exiting side of the site access drive for no right turns, 7-9 a.m. and 4-6 p.m. Inbound site traffic from the north could be minimized by posting no right turns along SB Crooks at Muer and Banmoor; see the discussion below relative to the mitigation of existing cut-through traffic.

- Assuming that the other 75-80% of site traffic exits via McClure's intersection with WB Big Beaver, the average delay on SB McClure would increase by about 7 sec in both peak hours; however, the associated level of service would likely remain an acceptable D (the level already reached in the PM peak hour with background traffic growth alone).

- Associated with the preceding increase in traffic on the McClure approach to Big Beaver would be slightly longer queues of vehicles waiting to turn right. During the busiest three

minutes of the peak hour, the typical queue of one vehicle can be expected to increase to two vehicles. Such backups occur only briefly, however, and may be overstated by the traffic model since that model does not account for the gaps in WB traffic created by the upstream traffic signal at Crooks.

- Existing neighborhood cut-through traffic was found to be relatively minor in terms of absolute volume. The largest single movement of such traffic were the ten vehicles cutting through to Big Beaver in the AM peak hour, five from Muer/Crooks and five from Banmoor/Crooks. The City might want to consider posting turn restrictions to address neighborhood concerns in this regard, however. Potential signage would prohibit right turns SB from Crooks onto both Muer and Banmoor, 7-9 a.m. and 4-6 p.m.

- Although not quantified in the study, it appears that neighborhood traffic speeds may be a more consequential issue than the volume of cut-through traffic. The City would be well-advised to consider traffic calming measures aimed primarily at speed reduction. In particular, consideration might be given to the installation of a pair of speed humps (*not* bumps) on McClure, one hump on or near the site's north property line and the other hump on or near the site's south property line. For equal treatment, and to guard against traffic diverting from McClure, another pair of humps could be installed at comparable locations on Alpine.

- The proposed 199-space on-site parking supply will be adequate to meet resident parking requirements under most conditions. GW recommends, however, that the applicant make a good-faith effort to secure an easement in the under-utilized neighboring parking lot to the east, to be used as needed for guest and/or overflow parking. If such an easement is acquired, permission should also be sought for providing a well-lighted, all-weather pedestrian path between that lot and the subject site.

TRAFFIC AND PARKING STUDY FOR PROPOSED McCLURE ROAD APARTMENTS – TROY, MI

INTRODUCTION

This study examines the potential traffic impacts and parking requirements of a 140-unit, upscale apartment building proposed for the east side of McClure, immediately north of two office buildings fronting on Big Beaver (Figures 1-3). The proposed 199 on-site parking spaces are proposed to be served by a single access drive on McClure about 70 feet north of Sachin Way (center-to-center). In this study, full occupancy is assumed to first occur in the year 2019.

Both the surrounding residents and the City of Troy are also concerned about the "cut-through" traffic thought to exist between Crooks Road and westbound Big Beaver. At the request of the City, the developer (Tolle Brooke LLC) retained Giffels Webster (GW) to assess this issue and its potential mitigation, as well as the traffic impacts and parking requirements of the proposed apartments.

This report documents the traffic and parking study by reviewing existing conditions; the potential conditions in 2019 in the hypothetical absence of proposed development; the expected conditions in 2019 with both background growth and the development fully occupied; the cut-through traffic issue; and the apartments' practical parking requirement (less than that specified by ordinance).

EXISTING CONDITIONS

Land Uses

As can be seen in Figure 3, the subject site is in a transition area between relatively high-density commercial uses along Big Beaver and the relatively low-density single-family neighborhood to the north. The latter area includes a broad mix of older and newer homes, with evidence that many of the homes are of relatively recent construction. The site itself would occupy three existing lots, with the southerly two now occupied by single-family homes and the northerly one still vacant.

Roadway Network

McClure Road and the other local streets in the study area are 25-mph paved streets, ranging in width from 20-22 feet and generally uncurbed, under the jurisdiction of the City of Troy. Sachin Way, connecting McClure and Alpine a short distance north of Big Beaver, is a 27-ft-wide curbed street with stop signs at each end.

Big Beaver Road is a 45-mph, six-lane divided arterial under the jurisdiction of the Road Commission for Oakland County (RCOC). Left turns are accommodated at directional crossovers served by deceleration lanes (Figure 3). Both McClure and Alpine are controlled by stop signs and flare out a bit – to an approach lane approximately 15 feet in width – where they intersect Big Beaver.

Crooks Road is a 45-mph, five-lane undivided arterial, also under the jurisdiction of RCOC. Banmoor and Muer are controlled by stop signs where they intersect Crooks.

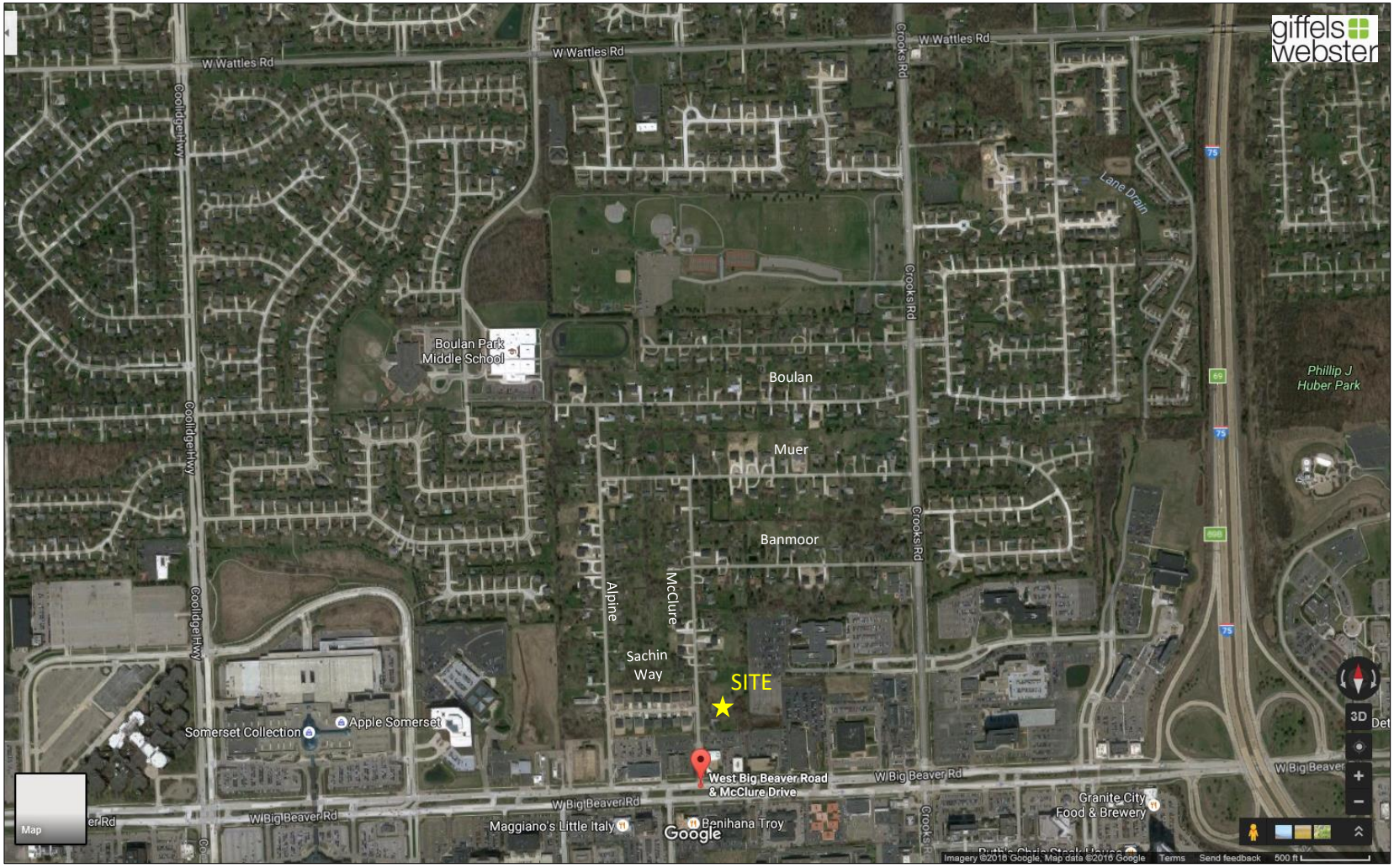
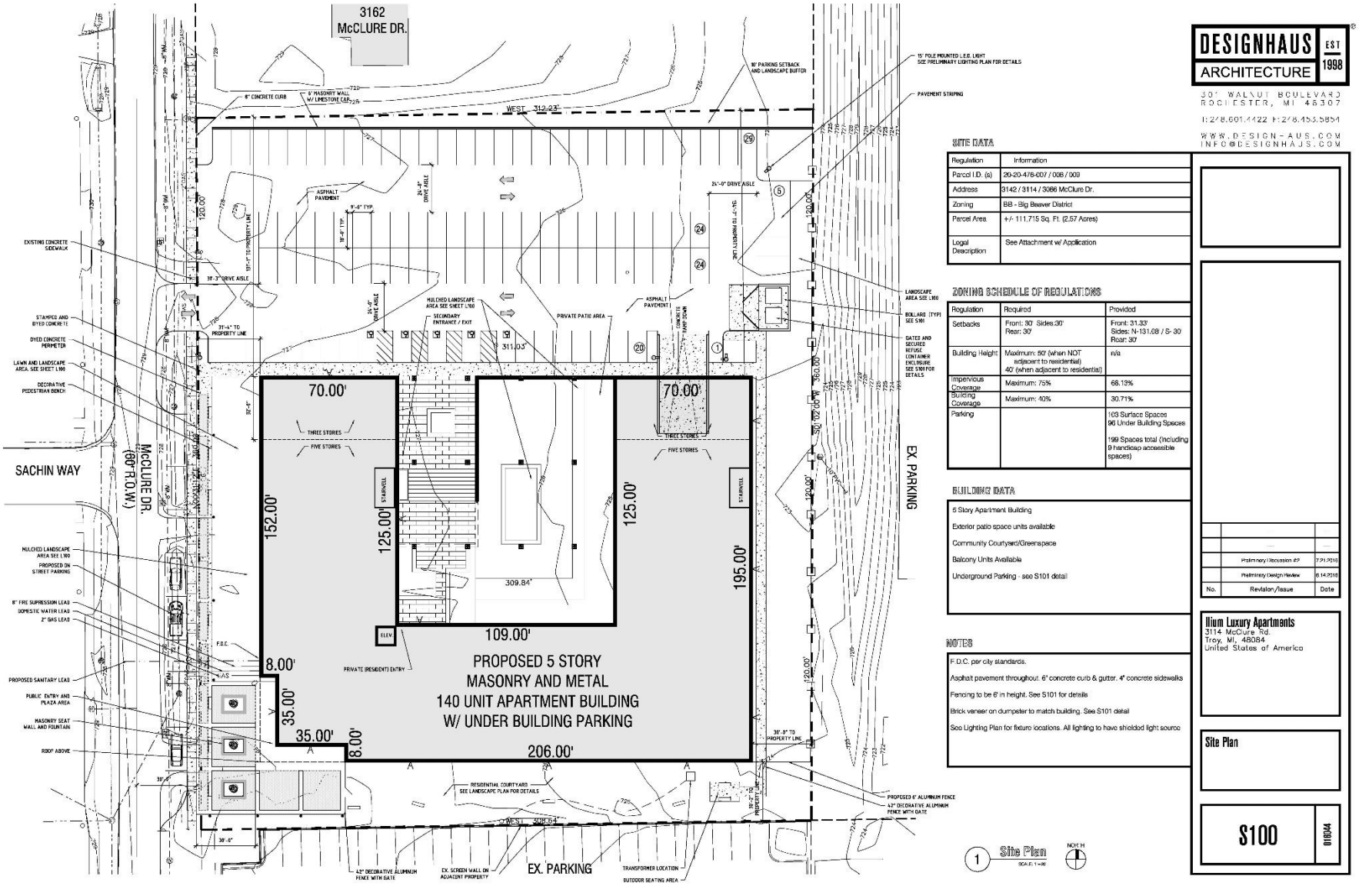


Figure 1. Vicinity Aerial



DESIGNHAUS ARCHITECTURE EST 1998

301 WALNUT BOULEVARD
ROCHESTER, MI 48307
P:248.601.4422 F:248.455.5854
WWW.DESIGN-HAUS.COM
INFO@DESIGNHAUS.COM

SITE DATA

Regulation	Information
Parcel I.D. (s)	20-20-476-007 / 008 / 009
Address	3142 / 3114 / 3086 McClure Dr.
Zoning	BB - Big Beaver District
Parcel Area	+/- 111,715 Sq. Ft. (2.57 Acres)
Legal Description	See Attachment w/ Application

ZONING SCHEDULE OF REGULATIONS

Regulation	Required	Provided
Setbacks	Front: 30' Sides:30' Rear: 30'	Front: 31.33' Sides: N-131.08 / S- 30' Rear: 30'
Building Height	Maximum: 50' (when NOT adjacent to residential) 40' (when adjacent to residential)	n/a
Impervious Coverage	Maximum: 75%	68.19%
Building Coverage	Maximum: 40%	30.71%
Parking		103 Surface Spaces 96 Under Building Spaces 199 Spaces total (including 9 handicap accessible spaces)

BUILDING DATA

5 Story Apartment Building

Exterior patio space units available

Community Courtyard/Greenspace

Balcony Units Available

Underground Parking - see S101 detail

NOTES

F.D.C. per city standards.

Asphalt pavement throughout. 6" concrete curb & gutter. 4" concrete sidewalks

Fencing to be 6' in height. See S101 for details

Brick veneer on dumpster to match building. See S101 detail

See Lighting Plan for fixture locations. All lighting to have shielded light source

No.	Revision/Issue	Date
	Preliminary Discussion #2	7.21.2016
	Preliminary Design Review	6.14.2016

Ilium Luxury Apartments
3114 McClure Rd.
Troy, MI, 48084
United States of America

Site Plan

S100

016034

Figure 2. Proposed Site Plan

Figure 3. Intersections and Potential Cut-Through Traffic Routes Evaluated

Traffic Volumes

The website of the Southeast Michigan Council of Governments (SEMCOG) was first searched for past traffic volumes along Big Beaver between Crooks and Coolidge. Selected results of this search are presented in appendix Tables B-1 through B-4. No clear trends are revealed by these data. Note in Table B-1 that the daily volumes eastbound in 2015 were supposedly less than in most past years of record, even relative to 2003 (three years before Kmart vacated its headquarters at Big Beaver and Coolidge). On the other hand, the daily volumes westbound (Table B-2) supposedly dipped sharply in 2007 and rose sharply in 2015. It is possible that the volumes were not consistently recorded at the same point between the two major crossroads; the effects of the crossovers on the mainline volumes can be quite significant.

The current volumes in the AM and PM peak commuting periods were determined at most study area intersections by Traffic Data Collection (TDC) of Washington Township, using an MDOT-accepted video recording system known as Miovision. The intersections counted by TDC included Big Beaver/McClure, Big Beaver/Alpine, Crooks/Banmoor, and Crooks/Muer. These counts were done twice: on August 23, 2016 – before school resumed for the fall – and on September 14, 2016 – after school had resumed and summer vacations had ended. The TDC count data are tabulated in the second part of Appendix B.

The minor intersections of McClure/Sachin and Alpine/Sachin were counted manually by Giffels Webster staff in the AM and PM peak periods of September 13, 2016. The GW count data are tabulated in the third part of Appendix B.

Table 1 shows that the peak-hour volumes on Big Beaver at McClure were actually 5% *lower* in September than in August. On Crooks at Muer, on the other hand, the September volumes were 4% *higher* than in August. When the data for all four major intersections are pooled, the overall difference between the September and August volumes is an insignificant 1% or less. The balance of the analyses in this study utilize the September counts, since they reflect somewhat higher volumes on the local streets involved.

The September 2016 peak-hour traffic volumes evaluated in this study are illustrated in Figures 4-6. The corresponding TDC volumes for August are summarized in appendix Figures B-5 through B-7.

Also shown in Figures 4-6 (via yellow arrows) are the movements of concern relative to potential cut-through traffic. Volumes shown in yellow numbers were determined by tabulating the corresponding number of license plates, *not all of which were necessarily associated with cut-through vehicles;* those shown in black were counted directly (in the conventional manner) by TDC or GW personnel.

In Figure 4, note that the volume on the westbound Big Beaver approach to McClure is split between that using the deceleration lane for the downstream WB-to-EB crossover and that continuing past the crossover. This reflects the fact that entry delays from McClure depend primarily on the gaps available in the first three through lanes, as well as the fact that *Highway Capacity Manual* methodology used in modeling this type of intersection is limited to three through lanes.

Table 1. Comparison of September 2016 to August 2016 Traffic Volumes

Date	Peak Hour	Big Beaver/McClure		Big Beaver/Alpine		Crooks/Banmoor		Crooks/Muer		Grand Total
		WB	SB	WB	SB	NB+SB	EB	NB+SB	EB	
8/23/2016	AM	1715	25	1531	17	2656	8	2626	22	8600
		1740		1548		2664		2648		
	PM	2018	29	1984	33	2926	33	2941	38	10002
		2047		2017		2959		2979		
9/14/2016	AM	1614	41	1473	67	2686	8	2735	26	8650
		1655		1540		2694		2761		
	PM	1907	29	1851	47	3060	31	3059	39	10023
		1936		1898		3091		3098		
Sep/Aug	AM	0.95		0.99		1.01		1.04		1.01
	PM	0.95		0.94		1.04		1.04		1.00

Figure 4. Current Peak-Hour Volumes along McClure Drive Near Big Beaver Road

Figure 5. Current Peak-Hour Volumes along Alpine Road Near Big Beaver Road

Figure 6. Current Peak-Hour Volumes along Crooks Road

FUTURE CONDITIONS

Land Uses

In forecasting future background traffic, it is important to anticipate the additional traffic likely to be generated by nearby developments that have been approved but are not yet built and/or occupied. Two such developments identified in this study, shown in appendix Figures C-1 and C-2, are as follows:

- The 27,280-s.f. office building at 1900 West Big Beaver, on the northwest corner of Big Beaver and McClure, has a 5,000-s.f. vacancy that is leased but not yet occupied. When this vacant space occupies this November, it is reasonable to expect the traffic using the site's access drive on McClure to increase by about 37%.

- The 9,823-s.f., 272-seat Eddie V's Prime Seafood Restaurant, now under construction on the northwest corner of Big Beaver and Alpine, should be open for business this year.

Roadway Network

There are no known plans for near-term improvements to roadways within the study area.

Background Traffic

Future background volumes represent the traffic activity likely to be present upon site build-out, but in its hypothetical absence. Customarily, the levels of service afforded these volumes are predicted in order to have a proper basis for assessing the marginal impacts of adding site development traffic.

Background traffic growth is generally attributable to increases in regional economic activity as well as to future nearby land developments. Traffic volumes on major roads in relatively mature areas – such as Big Beaver and Crooks in Troy – rarely grow at sustained rates of more than 1-2% per year. Given the previously cited historic data for Big Beaver, this study assumed that economic growth alone will result in a 5% traffic volume increase on both Big Beaver and Crooks over the proposed development's projected three-year build-out (equivalent to a compounded annual growth rate of 1.6%). Zero background traffic growth was assumed for the local streets evaluated. Appendix Figures C-3 through C-5 show the current peak-hour volumes adjusted per these assumptions.

The additional peak-hour traffic expected for the other two nearby developments (cited above) are shown on Figures C-1 and C-2.

Finally, Figures 7-9 illustrate the future total background peak-hour volumes, accounting for both general growth and the other two nearby developments. These figures add the volumes forecasted in Figures C-1 and C-2 to the corresponding volumes shown in Figures C-3, C-4, and C-5.

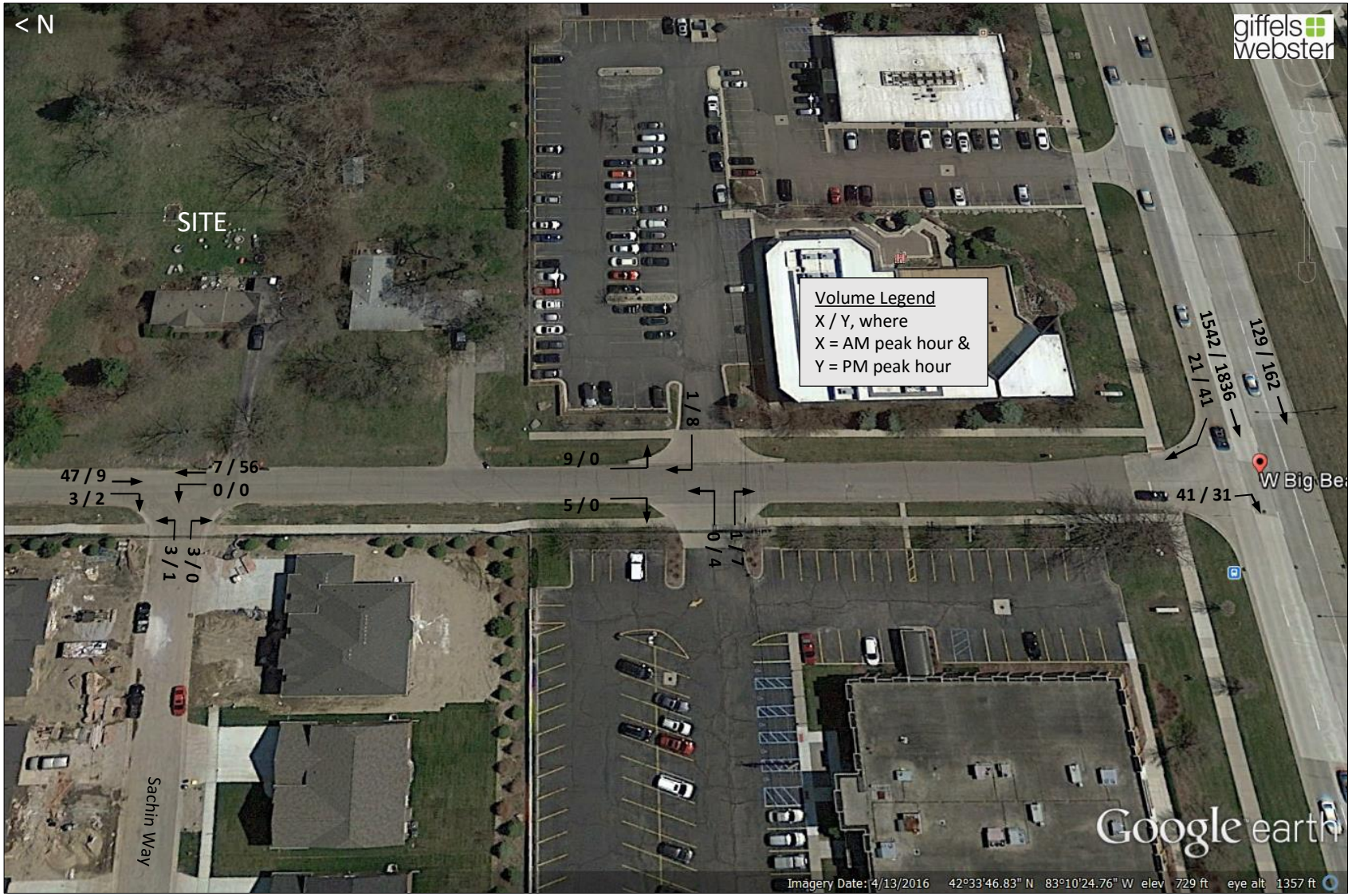


Figure 7. Future Background Peak-Hour Volumes along McClure Drive Near Big Beaver Road

Figure 8. Future Background Peak-Hour Volumes along Alpine Road Near Big Beaver Road

Figure 9. Future Background Peak-Hour Volumes along Crooks Road

Trip Generation

Site-generated traffic was forecasted in this study using the data and application guidelines most recently recommended by the Institute of Transportation Engineers (ITE). At the request of the City's traffic consultant, ITE trip generation rates for the most general category of apartments were applied. GW believes that the forecast shown in Table 2 is conservatively high, as it does not reflect the lower amount of peak-hour travel typically associated with the expected demographics of the apartment residents (i.e., single occupants, senior citizens, etc.).

Table 2. Trip Generation Forecast[1]

Land Use	ITE Use #	No. of D.U.	Weekday Trips	AM Peak-Hour Trips			PM Peak-Hour Trips		
				In	Out	Total	In	Out	Total
Apartment	220	140	972	14	58	72	62	33	95

[1] Forecast based on rate data and methodology recommended by Institute of Transportation Engineers in its *Trip Generation Manual – 9th Edition* (2012). A "trip" is a one-directional vehicular movement into or out of the site.

Trip Distribution and Assignment

Existing area traffic patterns suggest that it would be reasonable to expect 20-30% of the new apartment-generated trips to use McClure north of the site. As indicated in Table 3, this study assumes 25% in the AM peak hour and 20% in the PM peak hour.

Table 3. Trip Distribution and Assignment[1]

To/From	AM Peak Hour				PM Peak Hour			
	In		Out		In		Out	
	%	No.	%	No.	%	No.	%	No.
North	25	4	25	14	20	12	20	7
South	75	10	75	44	80	50	80	26
Total	100	14	100	58	100	62	100	33

[1] Trip distribution to/from the north in the AM peak hour based, in part, on the 30% of current Sachin Way traffic observed to/from the north that hour, via McClure and Alpine combined; this percent is assumed to decrease to 25% in the future due to increased volumes on both the major and minor streets, and the impact of those volumes on minor-street delays. In the PM peak hour, the percentage is assumed to be even less - 20% - due to the fact that Banmoor approach delays are already signficantly greater that hour than they are in the AM peak hour.

Figure 10 (below) shows the forecasted peak-hour site traffic assigned to key intersections within the study area. The combined totals of future background traffic and future site traffic are illustrated in Figures 11, 12, and 13 for the McClure, Alpine, and Crooks sub-areas, respectively.

Figure 10. Site-Generated Traffic

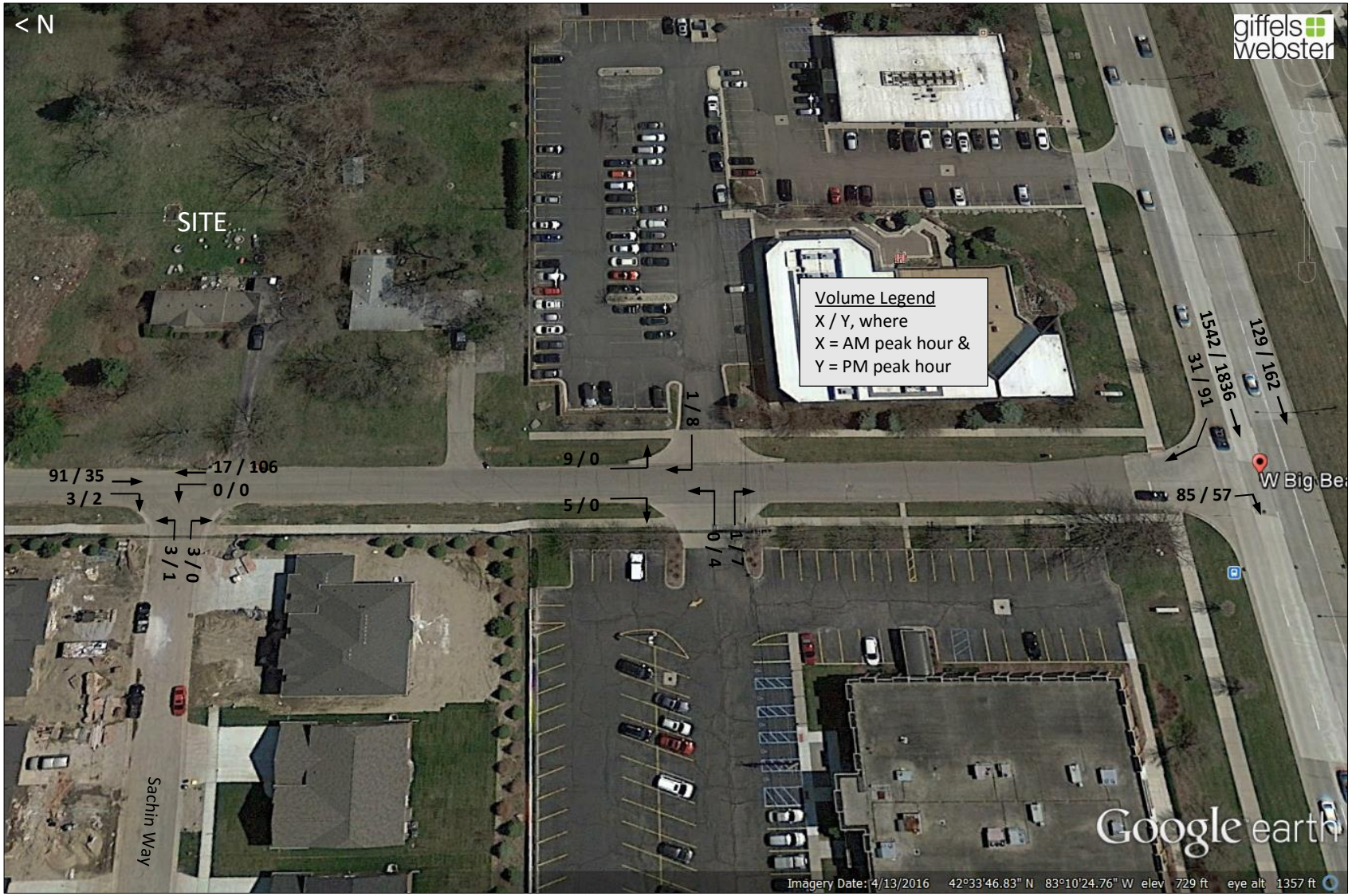


Figure 11. Future Total Peak-Hour Volumes along McClure Drive Near Big Beaver Road

Figure 12. Future Total Peak-Hour Volumes along Alpine Road Near Big Beaver Road

Figure 13. Future Total Peak-Hour Volumes along Crooks Road

IMPACT ANALYSES

Method and Criteria

Intersection capacity analyses were conducted using the *Synchro 9 Light* computerized traffic model, based on methodologies contained in the Transportation Research Board's *Highway Capacity Manual.* The primary objective of such analyses is to determine the *level of service,* a qualitative measure of the "ease" of traffic flow based on vehicular delay. Analytical models are used to estimate the average control delay for specific vehicular (through or turning) movements – and in the case of all-way stop-controlled and signalized intersections – each approach and the overall intersection as well. The models account for lane configuration, grade (if any), type of traffic control, traffic volume and composition, and other traffic flow parameters.

Level of service (LOS) is expressed on a letter grading scale, with A being the highest level and F being the lowest level. Achieving an overall intersection and/or approach LOS of D or better is the normal objective in an urban or suburban area; however, LOS of E or worse may be unavoidable for some turning movements onto heavily traveled roads, especially when those movements are controlled by stop signs as opposed to signals.

Table 4 defines LOS, in terms of average control delay per vehicle, for signalized intersections and unsignalized intersections, respectively.

Table 4. Level of Service Criteria

Level of Service	Control Delay per Vehicle (sec)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Level of Service Results

Detailed *Synchro* printouts appear in Appendix D. The evaluations represented by these printouts determined how well various intersections and driveways are or can be expected to operate under current, future background, and future total (background-plus-site) traffic volumes – all under the assumption that there would be no changes in existing intersection design or traffic controls. Model-predicted average delays and levels of service are summarized in Tables 5-11 (below), followed by a list of key related findings. Queuing results are discussed in the following sub-section.

Table 5. Levels of Service at McClure and WB Big Beaver

Approach	Movement	AM Peak Hour			PM Peak Hour		
		Volume (veh)	Avg. Delay (sec/veh)	LOS	Volume (veh)	Avg. Delay (sec/veh)	LOS
Current Traffic							
SB	R	41	23.0	C	29	24.8	C
Future Background Traffic							
SB	R	41	24.6	C	31	28.3	D
Future Total (Background + Site) Traffic							
SB	R	85	31.5	D	57	34.8	D

Table 6. Levels of Service at McClure and Sachin

Approach	Movement	AM Peak Hour			PM Peak Hour		
		Volume (veh)	Avg. Delay (sec/veh)	LOS	Volume (veh)	Avg. Delay (sec/veh)	LOS
Current Traffic							
EB	L + R	6	8.8	A	1	9.1	A
NB	L	0	-	-	0	-	-
Future Background Traffic							
EB	L + R	6	8.8	A	1	9.1	A
NB	L	0	-	-	0	-	-
Future Total (Background + Site) Traffic							
EB	L + R	6	9.1	A	1	9.6	A
NB	L	0	-	-	0	-	-

Table 7. Levels of Service at McClure and Site Driveway[1]

Approach	Movement	AM Peak Hour			PM Peak Hour		
		Volume (veh)	Avg. Delay (sec/veh)	LOS	Volume (veh)	Avg. Delay (sec/veh)	LOS
Future Total (Background + Site) Traffic							
WB	L + R	58	9.2	A	33	9.5	A
SB	L	4	7.3	A	12	7.5	A

[1] See diagram in Appendix D for the peak-hour traffic assignments at this location.

Table 8. Levels of Service at Alpine and WB Big Beaver

Approach	Movement	AM Peak Hour			PM Peak Hour		
		Volume (veh)	Avg. Delay (sec/veh)	LOS	Volume (veh)	Avg. Delay (sec/veh)	LOS
Current Traffic							
SB	R	67	24.6	C	47	29.8	D
Future Background Traffic							
SB	R	68	26.8	D	49	34.6	D
Future Total (Background + Site) Traffic							
SB	R	68	28.0	D	49	35.6	E

Table 9. Levels of Service at Alpine and Sachin

Approach	Movement	AM Peak Hour			PM Peak Hour		
		Volume (veh)	Avg. Delay (sec/veh)	LOS	Volume (veh)	Avg. Delay (sec/veh)	LOS
Current Traffic							
WB	L + R	11	8.9	A	1	8.8	A
SB	L	3	7.2	A	0	-	-
Future Background Traffic							
WB	L + R	11	8.9	A	1	8.8	A
SB	L	3	7.2	A	0	-	-
Future Total (Background + Site) Traffic							
WB	L + R	11	8.9	A	1	8.8	A
SB	L	3	7.2	A	0	-	-

Table 10. Levels of Service at Crooks and Banmoor

Approach	Movement	AM Peak Hour			PM Peak Hour		
		Volume (veh)	Avg. Delay (sec/veh)	LOS	Volume (veh)	Avg. Delay (sec/veh)	LOS
Current Traffic							
EB	L + R	8	64.7	F	31	190.7	F
NB	L	3	15.7	C	10	11.9	B
Future Background Traffic							
EB	L + R	8	77.9	F	31	248.7	F
NB	L	3	16.6	C	10	12.3	B
Future Total (Background + Site) Traffic							
EB	L + R	16	184.6	F	35	323.1	F
NB	L	3	16.6	C	10	12.4	B

Table 11. Levels of Service at Crooks and Muer

Approach	Movement	AM Peak Hour			PM Peak Hour		
		Volume (veh)	Avg. Delay (sec/veh)	LOS	Volume (veh)	Avg. Delay (sec/veh)	LOS
Current Traffic							
EB	L + R	26	272.0	F	39	246.3	F
NB	L	3	16.0	C	4	11.9	B
Future Background Traffic							
EB	L + R	26	372.2	F	39	342.9	F
NB	L	3	17.0	C	4	12.3	B
Future Total (Background + Site) Traffic							
EB	L + R	32	499.6	F	42	390.6	F
NB	L	3	17.0	C	4	12.4	B

- Adding the forecasted apartment traffic to the McClure approach to Big Beaver (Table 5) is expected to increase the average southbound right-turn delay by about 7 sec, but should not result in associated levels of service (LOS) less than D – a reasonably good grade for entering a highway as busy as Big Beaver. *Since the modeling did not reflect gaps in the WB traffic flow due to the upstream signal at Crooks, the actual delays exiting McClure are likely somewhat less than shown in Table 5.*

- The LOS at McClure and Sachin (Table 6) will remain A under all conditions evaluated.

- The LOS at McClure and the site access drive (Table 7) will be A in both peak hours.

- Adding the forecasted apartment traffic to the WB Big Beaver approach to Alpine (Table 8) will increase the SB delays on Alpine by only about 1 sec. Even that small an amount would, however, change the PM level of service from a D to a (still acceptable) E.

- The LOS at Alpine and Sachin (Table 9) will remain A under all conditions evaluated.

- The LOS on the EB Banmoor and EB Muer approaches to Crooks (Tables 10-11) are and will remain F for all current and future conditions evaluated. The Synchro-predicted delay increases due to the maximum forecasted apartment traffic range from 0.8-2.1 minutes per vehicle. However, *it is important to recognize that all of the delays listed in Tables 10-11 overstate reality, since the model does not account for the "two-stage" exiting left turns typically made in such situations (where, in this case, left-turning drivers use a gap in the SB flow to take intermediate refuge in the two-way left-turn lane, after which they use a gap in the NB flow to complete their entry to that flow).*

Queuing Predictions for Minor Approaches

The Synchro model also predicts the 95th-percentile queue for certain movements. This is the number of backed-up vehicles expected during the busiest three minutes of the peak hour. The model uses a continuous mathematical function and therefore predicts queues in fractional vehicles; the values below can be rounded to the nearest whole vehicle for reaching generalized conclusions.

Table 12. Synchro-Predicted 95th-Percentile Queues (in vehicles)[1]

Approach	Traffic Scenario	Peak Hour	
		AM	PM
SB McClure at Big Beaver	Current	0.6	0.7
	Future Background	0.7	0.9
	Future Total	1.8	1.7
SB Alpine at Big Beaver	Current	1.2	1.4
	Future Background	1.4	1.7
	Future Total	1.5	1.7
EB Banmoor at Crooks	Current	0.6	3.2
	Future Background	0.7	3.6
	Future Total	2.0	4.4
EB Muer at Crooks	Current	3.8	3.9
	Future Background	4.2	4.4
	Future Total	5.1	4.8

[1] The values shown for the Banmoor and Muer approaches to Crooks are likely never reached in the field, due to the propensity of drivers in such situations to reduce their delays by conducting two-stage left turns to the center lane of the five-lane crossroad.

The most significant finding revealed by Table 12 is that the forecasted apartment traffic can be expected to increase the 95th-percentile queues on the SB McClure approach to Big Beaver by about one vehicle (more precisely, by 1.1 vehicles in the AM peak hour and 0.8 vehicle in the PM peak hour). However, having a side-street backup as long as two vehicles during less than three minutes of the busiest hour is not all that unusual along a road as busy as Big Beaver, and should therefore be considered acceptable.

The predicted queuing on the EB Banmoor and Muer approaches to Crooks are likely exaggerated significantly – for the footnoted reason – but in any case, they generally reveal increases of about one vehicle or less due to the possible addition of apartment traffic.

NEIGHBORHOOD CUT-THROUGH TRAFFIC

Method

Certain potential cut-through traffic movements were identified for study, as indicated earlier by the yellow arrows in Figures 4-6. Table 13 summarizes the movements evaluated.

Table 13. Types of Neighborhood Cut-Through Traffic Evaluated

Starting Location	WB & SB				NB & EB	
	Ending Location					
	McClure & Big Beaver	McClure & businesses	Alpine & Big Beaver	Alpine & businesses	Banmoor & Crooks	Muer & Crooks
Muer & Crooks	X	X	X	X		
Banmoor & Crooks	X	X				
McClure & businesses					X	X
Alpine & businesses						X

GW observers recorded, in five-minute intervals, the last 3-4 characters of each passing license plate. A very small number of plates could not be read, and a dash was recorded in such instances so as to develop an accurate traffic count (at least on the day in which plates were noted). The total volumes for the movements of interest were shown earlier as yellow numbers in Figures 4-6. It is important to recognize that only some of the vehicles making these movements represented cut-through traffic. *Cut-through traffic was defined as consisting of those vehicles entering the neighborhood in the either the same 5-minute interval as they exited, or within 10 minutes prior.*

Results

The number of cut-through vehicles identified, of the types defined in Table 13, are tabulated by 15-minute interval within the two-hour AM and PM peak periods in appendix Tables E-1 and E-2, respectively. The results for the two corresponding peak hours are shown in Table 14 (below). Key findings include:

- In the AM peak hour, a total of ten Crooks Road vehicles cut entirely through the neighborhood to Big Beaver at McClure, half entering at Muer and half entering at Banmoor. That same hour, a total of five Crooks Road vehicles cut entirely through the neighborhood to Big Beaver at Alpine after entering at Muer (those potentially entering at Boulan were not determined).

Table 14. Peak-Hour Volumes of Cut-Through Traffic

Starting Location	WB & SB				NB & EB	
	Ending Location					
	McClure & Big Beaver	McClure & businesses	Alpine & Big Beaver	Alpine & businesses	Banmoor & Crooks	Muer & Crooks
8:00-9:00 a.m. Peak Hour						
Muer & Crooks	5	3	5	1		
Banmoor & Crooks	5	2				
McClure & businesses					0	1
Alpine & businesses						0
Totals	10	5	5	1	0	1
4:45-5:45 p.m. Peak Hour						
Muer & Crooks	1	0	0	0		
Banmoor & Crooks	5	0				
McClure & businesses					3	4
Alpine & businesses						1
Totals	6	0	0	0	3	5

- In the PM peak hour, a total of six Crooks Road vehicles cut entirely through the neighborhood to Big Beaver at McClure, five entering at Banmoor and only one entering at Muer. That same hour, *no* vehicles cut-through from Crooks to Alpine.

- Vehicles cutting through the neighborhood to the sampled businesses fronting on Big Beaver were fewer in number. The use of SB McClure for arriving vehicles was limited to five vehicles in the AM peak hour and *no* vehicles in the PM peak hour, and the use of SB Alpine for arriving vehicles was limited to one vehicle in the AM peak hour and *no* vehicles in the PM peak hour.

- Vehicles cutting through the neighborhood to Crooks Road from the sampled businesses on Big Beaver consisted of one vehicle in the AM peak hour and a total of eight vehicles in the PM peak hour (of the latter, three exited via Banmoor and five exited via Muer).

Based on the above, it appears reasonable to conclude that the observed neighborhood cut-through traffic is relatively minor in terms of absolute volume, at least in a conventional traffic engineering sense. However, such traffic may be more noticeable to residents – and therefore seem larger in quantity – due to the relatively high speeds seen along McClure and Alpine, at least near Big Beaver. Although these speeds were not sampled in this study, whether for SB vehicles generally or cut-through vehicles in particular, the GW license plate observers stationed at the commercial drives developed the impression that vehicle speeds approaching Big Beaver were generally excessive.

Potential Traffic Calming

GW is familiar with a wide range of potential traffic calming measures, and staff has experience with implementing as well as recommending such treatments. If high volumes of cut-through traffic were actually observed in this case, meaningful countermeasures would be relatively limited in number. The most effective such countermeasure – which this study is certainly *not* recommending – would be the conversion of both McClure and Alpine to cul-de-sacs, effectively disallowing regular through traffic, on McClure immediately south of Banmoor and on Alpine immediately south of Muer. The two required turnarounds could "kiss" the existing intersections, using mountable curbs and a gate to facilitate through movements by authorized emergency vehicles.

Since the volumes of cut-through traffic are relatively minor in an absolute sense, however, and since the prevailing speeds appear to be excessive, it would make more sense to consider measures to reduce speeds. Accordingly, GW recommends that the City consider installing a pair of well-marked, well-signed speed humps (*not* bumps) on both McClure and Alpine in the general vicinity of Sachin Way. Appropriate locations on McClure would be at or near the north and south property lines of the subject site. Similar locations on Alpine would also appear to be appropriate.

PARKING REQUIREMENT

Literature Survey

Parking ratios for multi-family housing were determined for several locations besides the City of Troy. Summarized in appendix Table F-1, the sampled ratios cover not only a broad geographic range, but also alternative units of measure; specifically, they indicate the number of parking spaces per dwelling unit or bedroom, either required by ordinance or already provided at a sampling of built developments; the number of spaces needed to accommodate the average number of vehicles owned per dwelling unit; and the number of occupied spaces seen during periods of peak demand.

Analysis

Table 15 shows how selected parking ratios from the literature survey can be used to support the adequacy of a 193-space parking requirement. Providing six additional spaces, as the latest site plan does, theoretically provides a small surplus. If concerns remain regarding the adequacy of the proposed parking supply, consideration could be given to seeking a parking easement in the neighboring under-utilized industrial parking lot to the east; if the applicant is successful in this regard, the site plan should be revised to provide an improved walking path between that lot and the subject site.

Table 15. Support for a 193-Space Parking Requirement[1]

Basis of Calculation	Calculation	Result
Other zoning ordinances:		
Boulder, CO & Grants Pass, OR	[1 BR @ 1/du x 69 du] + [2 BR @ 1.5/du x 71 du] = [69+106=]	175
Cumberland, MD	[1 BR @ 1.25/du x 69 du] + [2 BR @ 1.5/du x 71 du] = [86+106=]	193
Eau Claire, WI	1/bedroom x 211 bedrooms	211
	Average	193
Parking supply:		
ITE average at 3 suburban sites	0.9/bedroom x 211 bedrooms	190
ITE average at 44 total sites	1.4/du x 140 du	196
	Average	193
Vehicle ownership:		
Research Notes, for Midwest	[1 BR @ 1.1/du x 69 du] + [2 BR @ 1.6/du x 71 du] = [76+114=]	190
ITE average at suburban sites	1.4/du x 140 du	196
	Average	193
Eno Foundation suggestions:		
Elderly housing	0.7/du x 50 du = 35 spaces	
One bedroom	1.5/du x 45 du = 68 spaces Total	193
Two bedroom	2.0/du x 45 du = 90 spaces	
High single-occupancy scenario:		
Single-occupancy units	1.0/du x 87 du = 87 spaces	
Double-occupancy units	2.0/du x 53 du = 106 spaces Total	193

[1] See appendix Table F-1 for a synthesis of parking ratios found in the literature.

CONCLUSIONS AND RECOMMENDATIONS

- The 140 proposed upscale apartments can be expected to generate no more than 72 one-way vehicle trips in the AM peak hour (58 exiting and 14 entering) and 95 one-way vehicle trips in the PM peak hour (62 entering and 33 exiting).

- Twenty to 25 percent of the new trips can be expected to travel to and from Crooks via the neighborhood streets north of the site. The largest single movement of such traffic would be 14 vehicles exiting the site onto NB McClure in the AM peak hour, some using Banmoor to reach Crooks and some using Muer. Although this new local traffic will be residential in nature, existing residents may call for such new traffic to be minimized; one potential way of doing so – at least for outbound traffic – would be to post the exiting side of the site access drive for no right turns, 7-9 a.m. and 4-6 p.m. Inbound site traffic from the north could be minimized by posting no right turns along SB Crooks at Muer and Banmoor; see the discussion below relative to the mitigation of existing cut-through traffic.

- Assuming that the other 75-80% of site traffic exits via McClure's intersection with WB Big Beaver, the average delay on SB McClure would increase by about 7 sec in both peak hours; however, the associated level of service would likely remain an acceptable D (the level already reached in the PM peak hour with background traffic growth alone).

- Associated with the preceding increase in traffic on the McClure approach to Big Beaver would be slightly longer queues of vehicles waiting to turn right. During the busiest three minutes of the peak hour, the typical queue of one vehicle can be expected to increase to two vehicles. Such backups occur only briefly, however, and may be overstated by the traffic model since that model does not account for the gaps in WB traffic created by the upstream traffic signal at Crooks.

- Existing neighborhood cut-through traffic was found to be relatively minor in terms of absolute volume. The largest single movement of such traffic were the ten vehicles cutting through to Big Beaver in the AM peak hour, five from Muer/Crooks and five from Banmoor/Crooks. The City might want to consider posting turn restrictions to address neighborhood concerns in this regard, however. Potential signage would prohibit right turns SB from Crooks onto both Muer and Banmoor, 7-9 a.m. and 4-6 p.m.

- Although not quantified in the study, it appears that neighborhood traffic speeds may be a more consequential issue than the volume of cut-through traffic. The City would be well-advised to consider traffic calming measures aimed primarily at speed reduction. In particular, consideration might be given to the installation of a pair of speed humps (*not* bumps) on McClure, one hump on or near the site's north property line and the other hump on or near the site's south property line. For equal treatment, and to guard against traffic diverting from McClure, another pair of humps could be installed at comparable locations on Alpine.

- The proposed 199-space on-site parking supply should be adequate to meet resident parking requirements under most conditions. GW recommends, however, that the applicant make a good-faith effort to secure an easement in the under-utilized neighboring parking lot to the east, to be used as needed for guest and/or overflow parking. If such an easement is acquired, permission should also be sought for providing a well-lighted, all-weather pedestrian path between that lot and the subject site.

APPENDIX A:

RESUME OF PREPARER

WILLIAM A. STIMPSON, P.E.

Senior Traffic Engineer

PROFESSIONAL EXPERIENCE

Two degrees in civil engineering and 46 years of experience in transportation and traffic engineering, specializing in traffic safety and site planning. Traffic safety work has included driver performance research, facility safety auditing, and crash litigation support. Site planning work has included plan development and review, traffic impact analysis, and access management. Has also dealt with parking, ridesharing and bicycling incentives, and freight transportation. Registered Professional Engineer in Michigan since 1980 and expert witness since 1987. Practical experience as a countywide Traffic Engineering Supervisor, 1991-93.

1998 to Present GIFFELS WEBSTER (formerly Clearzoning/Birchler Arroyo Associates) – Washington, Michigan
Senior Traffic Engineer

Mr. Stimpson has performed traffic reviews of hundreds of site plans; prepared shared parking studies, thoroughfare plans, crash data studies, corridor safety evaluations, and access management studies; conducted and reviewed numerous traffic impact studies; and completed signal warrant evaluations and cut-through traffic studies for both public and private clients. He has also investigated individual traffic crashes relative to alleged highway-tort, premises, and/or personal liability, and has provided expert testimony as needed. Mr. Stimpson:

- Is a skilled site plan reviewer, providing valuable advice to municipalities and private developers. His comprehensive traffic review of a site plan can dramatically improve on-site circulation, access to and from the public road network, and pedestrian safety. He is also an expert in shared parking analysis, offering the ability to reduce unnecessary impervious surface area and increase site efficiency.
- Has provided traffic engineering, parking, and safety consulting services to several Michigan communities, including the cities of Novi, Rochester, Woodhaven, and Lathrup Village; townships of Shelby, Grand Blanc, and Lenox; and villages of Bingham Farms and Mattawan.
- Formulated a new comprehensive policy for traffic impact studies (subsequently adopted by several client communities); reviews such studies for our municipal clients; and prepares such studies for our private clients.
- Developed access management plans for Southfield Road in Lathrup Village; Van Dyke Avenue in Shelby Township; M-24 in Lapeer County; Novi Road in Novi; and Allen and West Roads in Woodhaven.
- Consults nationally in crash litigation matters. Has deposition and trial experience in both civil and criminal cases. Court-accepted expert witness in traffic engineering and crash causation analysis.

1995 to 1998 WILLIAM A. STIMPSON, P.E. – Rochester, Michigan
Self-Employed Consultant

- Served as primary author of traffic safety manual for statewide use, under direction of the Southeast Michigan Council of Governments and sponsorship of Michigan's Office of Highway Safety Planning.
- Consulted nationally in crash litigation involving alleged personal and highway tort liability. Investigated crashes involving grade crossings, curves, trucks, pedestrians, and poor weather.
- Conducted and evaluated several traffic impact studies.

1993 to 1995 A/E GROUP, INC. – McLean, Virginia, Program Manager,
Federal Highway Administration Geometric Design Lab

- Set up and managed national lab to coordinate development of Interactive Highway Safety Design Model, a suite of CAD-interactive software for visualizing and assessing the safety of prospective highway designs.
- Edited research reports, set up studies on curve speeds and roadway design consistency, evaluated research proposals for driver performance model, and wrote paper on vehicle dynamics modeling.
- Organized and chaired national workshop on accident analysis methods. Also reviewed 250 police accident reports in search of causal factors.

1991 to 1993 ADA COUNTY HIGHWAY DISTRICT – Boise, Idaho
Traffic Engineering Supervisor

- Evaluated warrants for – and specified design and placement of – new signs, signals, and markings on ACHD's 1,500 miles of city streets and county roads.
- Oversaw design, construction, and/or operation of traffic signals at 260 intersections.
- Conceived and directed special traffic engineering and safety studies.
- Participated in conceptual planning and public-meeting review of all capital improvements.
- Evaluated traffic safety of all construction plans for intersections, roadways, and bridges.
- Approved traffic control plans for all significant road-related construction and maintenance.
- Evaluated traffic impacts of proposed land developments, and specified needed roadway and traffic control improvements.
- Analyzed traffic planning issues, such as downtown circulation and parking, new route and intersection alternatives, and regional pathways.

1987 to 1991 WILLIAM A. STIMPSON, P.E. – Rochester Hills, Michigan
Self-Employed Consultant

- As Ford Motor Company's Proving Ground Safety Consultant in 1990, reviewed all aspects of driving safety at the company's four domestic proving grounds. Recommended new traffic control devices and numerous roadside safety improvements.
- Consulted in accident litigation, investigating crashes involving a construction zone, winter conditions, grade crossings, intersection sight distance, curves, and obstacle visibility. Also analyzed mass crash data, looking for evidence of vehicle design and operational problems.
- Established relationship between driver age and frequency of vehicle rollover crashes.
- Conducted several traffic impact studies and developed site plans for two shopping centers.

1979 to 1986 GENERAL MOTORS RESEARCH LABORATORIES – Warren, Michigan,
Senior Research Engineer

- Researched crash causation, traffic signal coordination, in-vehicle navigation, and freight transportation.
- Used mass accident data to determine heavy-truck accident involvement trends, and to detect statistically different safety effects of alternative automobile bumper standards.
- Demonstrated through in-traffic measurements that re-timing and coordinating a network of vehicle-actuated traffic signals can reduce fuel use by as much as 15%.
- Established, for users of an in-vehicle navigation system, a relationship between excess travel and road network familiarity.
- Helped develop concept initially referred to as a "cooperative highway," where in-vehicle navigation, cellular communications, and computerized traffic control might improve travel efficiency and safety (a precursor to Intelligent Transportation Systems, or ITS).
- Developed analytic procedure for trading off receiving dock inventory and unloading costs.
- Helped develop, test, and implement a new production scheduling method proven to reduce finished vehicle logistics costs by as much a $1 million per year per assembly plant.

1974 to 1979 ALAN M. VOORHEES & ASSOCIATES – McLean, Virginia
Associate Engineer

- Managed and participated in studies of driver response to traffic control devices under various roadway design and environmental conditions; heavy truck safety; traffic operations; and parking.
- Directed development of accident-probability model based on traffic performance, and used model to evaluate alternative road delineation systems. Research led to new national standard for broken-line striping.
- Directed study of driver response to alternative durations of the yellow traffic signal.
- Assisted in comprehensive research study leading to national policy for right-turn-on-red.
- Evaluated benefits and costs of methods for alleviating adverse aerodynamic effects of large trucks.
- Compiled and analyzed data on 600 downgrade truck accidents.
- Directed comprehensive study of fringe parking lots for carpoolers at 150 lots in four states.

- Estimated cost-effectiveness of area-wide express bus service.
- Contributed to development of U.S. Capitol Hill Master Plan.
- Evaluated traffic circulation, traffic impact, parking, and signal timing optimization.

1972 to 1974 NATIONAL MILITARY COMMAND SYSTEM SUPPORT CENTER – The Pentagon, Transportation Analyst

- Worked as a junior Army officer in the NMCSSC, an arm of the Defense Communications Agency providing systems analysis support to the Organization of the Joint Chiefs of Staff.
- Developed multi-modal transportation data bases for foreign theaters of operation.
- Consulted with senior officers of OJCS on intra-theater strategic mobility modeling needs, and directed revisions to a large multi-modal transportation simulation model.

1970 to 1971 TEXAS TRANSPORTATION INSTITUTE, Texas A&M University, College Station, Texas, Research Assistant

- Researched Highway Visual Communications Systems within TTI's Driving Environment Program.
- Synthesized findings of diagnostic field studies of driver behavior and performance, and used findings to recommend improved roadway design and traffic control practices.
- With a research psychologist, co-authored detailed "Driver Expectancy Checklist" for roadway design (condensed checklist later published by American Association of State Highway Officials, nka as AASHTO).
- Helped conduct daytime and nighttime sign legibility tests.

EDUCATION

B.S.E. Civil Engineering, University of Michigan
Dean's Honor List, College of Engineering; top 1/3 of civil engineering graduating class

M.Eng. Civil Engineering, Texas A&M University
Top 10% of graduating class; Elected to Chi Epsilon, 1970, and Phi Kappa Phi, 1972

U.S. Army Transportation School – Diploma, Transportation Officer Basic Course
Familiarization with all transportation modes; top 10% of graduating class

PROFESSIONAL REGISTRATION AND AFFILIATIONS

REGISTRATION
Professional Engineer (P.E.) – State of Michigan, No. 27420 (since 1980)

AFFILIATIONS
Institute of Transportation Engineers, Fellow (since 1994) & Life Member (effective January 2013)
Transportation Research Board, Committee on Operational Effects of Geometrics

PUBLICATIONS AND NON-PROPRIETARY MAJOR REPORTS

1. "Crash-Data-Assisted Safety Evaluation of 12 Intersections in City of Novi." Prepared for City of Novi, Jun 2012.

2. "Identification of High-Crash Intersections in the City of Novi, 2006-2010." Prepared for City of Novi, Jan 2012.

3. "Aguirre v. Delta Sonic." Prepared for Packer Engineering, Inc. & Delta Sonic Car Wash Systems, Inc., Mar 2010.

4. "Evaluation of Cronin / Greene Motorcycle Crash at Intersection of Western Avenue and 63rd Street in City of Chicago." Prepared for Packer Engineering, Inc. & City of Chicago, Dec 2009.

5. "An Evaluation of Golf Cart Utilization for Burnham Harbor Security Patrols." Prepared for Packer Engineering, Inc. & Hector Espitia, Esq., Nov 2009.

6. "An Evaluation of Driver, Vehicle, and Roadway Causal Factors in the Matter of Kachel v. Hetrick, et al. v. PennDOT." Prepared in association with Engineering Analysis Associates, Inc., Jul 2000.

7. "Bridge Management Data for Southeast Michigan." Prepared for Southeast Michigan Council of Governments by William A. Stimpson, P.E., Jun 1996.

8. "SEMCOG Traffic Safety Manual – First Edition." Prepared for Southeast Michigan Council of Governments by William A. Stimpson, P.E., Feb 1996.

9. Workshop on Development of the Interactive Highway Safety Design Model (IHSDM) Accident Analysis Module," co-authored with D.W. Harwood, K.M. Bauer, and J. M. Mason. Prepared for Federal Highway Administration (FHWA) by Midwest Research Institute, Nov 1995.

10. "Influence of Vehicle Dynamics on Geometric Design," co-authored with J.A. Reagan. Presented at the Transportation Research Board's (First) International Symposium on Highway Design Practices, Boston, Massachusetts, Aug 1995.

11. "Technical Summary: Horizontal Alignment Design Consistency for Rural Two-Lane Highways (Publication No. FHWA-RD-94-034, Jan 1995)." Pub. No. FHWA-RD-130. Prepared for FHWA by A/E Group, Inc., Jan 1995.

12. "The Special Intersection Study: A Public/Private Partnership to Expand System Capacity in Concert with Land Development Needs." Presented at Annual Meeting of the Intermountain Section of the Institute of Transportation Engineers, Jackson Hole, Wyoming, May 1993.

13. "Rollover Accident Frequency and Driver Age." Unpublished paper, Jun 1987.

14. "Co-ordinating Vehicle-Actuated Traffic Signals to Reduce Vehicular Fuel Consumption," co-authored by G.M. Takasaki. Traffic Engineering & Control, Vol. 23, No. 10, Oct 1982.

15. "The Influence of the Time Duration of Yellow Traffic Signals on Driver Response," co-authored by P.L. Zador and P. J. Tarnoff. ITE Journal, Nov 1980.

16. "Corridor Parking Facilities for Carpoolers," co-authored with J. W. Flora and J. R. Wroble. Final Report on Contract DOT-FH-11-9463. Prepared for FHWA by Alan M. Voorhees & Associates, Jun 1980.

17. "Methodologies for Evaluating TSM Actions in Bombay." Working paper prepared for municipality of Bombay, India, under World Bank-sponsored study conducted by Alan M. Voorhees & Associates, Apr 1979.

18. "Downgrade Truck Accidents and Their Prevention," co-authored by D.T. Gallagher. Prepared for Systems Technology, Inc. & Federal Highway Administration by Alan M. Voorhees & Associates, Jan 1979.

19. "Impact of Park-and-Ride and Express Bus Improvements." Chapter C of Transportation System Management: an Assessment of Impacts. Prepared for Urban Mass Transportation Administration under contract UMTA-VA-06-0047 by Alan M. Voorhees & Associates, Nov 1978.

20. "A Cost-Effectiveness Evaluation of Devices for Reducing the Adverse Aerodynamic Effects of Large Trucks," co-authored by S.R. Shapiro. Prepared for Systems Technology, Inc. & Federal Highway Administration by Alan M. Voorhees & Associates, Aug 1978.

21. "The Traffic Safety Effectiveness of Selected Delineation Treatments Applied to Two-Lane Rural Highways." Winner of Honorable Mention in Past Presidents' Award competition, Institute of Transportation Engineers, Aug 1978.

22. "Study of the Effectiveness of Lane Markings for Traffic Safety," co-authored with M.L. Altman. Prepared for Illinois Department of Transportation by Alan M. Voorhees & Associates, Apr 1978.

23. "Field Evaluation of Selected Delineation Treatments on Two-Lane Rural Highways," co-authored by H.W. McGee, W.K. Kittelson, and R.H. Ruddy. Report Nos. FHWA-RD-77-118, 119. Prepared for Federal Highway Administration by Alan M. Voorhees & Associates, Oct 1977.

24. "Predicting the Traffic Safety Effects of Alternative Roadway Delineation Treatments," co-authored by W.K. Kittelson. AMV Tech Notes, Alan. M. Voorhees & Associates, Mar 1977.

25. "Methods for Field Evaluation of Roadway Delineation Treatments," co-authored by W.K. Kittelson and W.D. Berg. Transportation Research Record 630, 1977.

26. "Right-Turn-On-Red," Vols. I and II, co-authored with H.W. McGee, J. Cohen, G.F. King, and R.F. Morris. Report Nos. FHWA-RD-76-89, 90. Prepared for Federal Highway Administration by Alan M. Voorhees & Associates, May 1976.

27. "The Effects of Larger Trucks on Highway Operations and Design," co-authored with C.R. Keller. AMV Tech Notes, Alan M. Voorhees & Associates, Sep 1975.

28. "Data Base Development for the Transportation Requirements and Capabilities Simulator Model (TRACS)." National Military Command System Support Center, Nov 1974.

29. "TRACS: A Computer Model of Intra-theater Strategic Mobility," co-authored by B.D. Nussbaum. Presented at 44th National Meeting of Operations Research Society of America, San Diego, California, Nov 1973.

30. "Three Schemes for Improved Line-Haul Bus Rapid Transit." Traffic Engineering, Feb 1973.

31. "Driver Expectancy Checklist – A Design Review Tool," co-authored by N.C. Ellis. Prepared by Texas Transportation Institute and published by American Association of State Highway Officials, 1972.

32. "A New Warning Sign." TexITE, Vol. XVIII, No. 1, Sep 1971.

33. "A Critical Review of Climbing Lane Design Practices," co-authored by J.C. Glennon. Highway Research Record 371, 1971.

34. "Highway Engineering Tips." Prepared for Multi-State Policy Committee of Project HPR-2(108), Diagnostic Studies of Highway Visual Communication Systems. Prepared by Texas Transportation Institute, 1970.

OTHER HONORS

- Honorable Mention, Institute of Transportation Engineers Past Presidents' Award, 1978
- Defense Communications Agency Certificate of Achievement, 1974

MILITARY SERVICE

- 2LT, US Army Reserve, 1970-1973, and 1LT, US Army Reserve, 1973-1976
- Active duty in the Pentagon, 1972-1974 (see Experience section, above)

SELECTED SHORT COURSES

- SIMSCRIPT II.5 computer simulation language
- Computerized control of traffic signals
- Applied multivariate analysis (Princeton University)
- Highway Capacity Software 2000
- Roundabout design, operation, and analysis (M. Wallwork)
- Access Management Guidebook – Train the Trainer (MDOT)
- Syncho 6 / SimTraffic software
- Designing Pedestrian Facilities for Accessibility

Last updated: July 2016

APPENDIX C:

BACKGROUND TRAFFIC

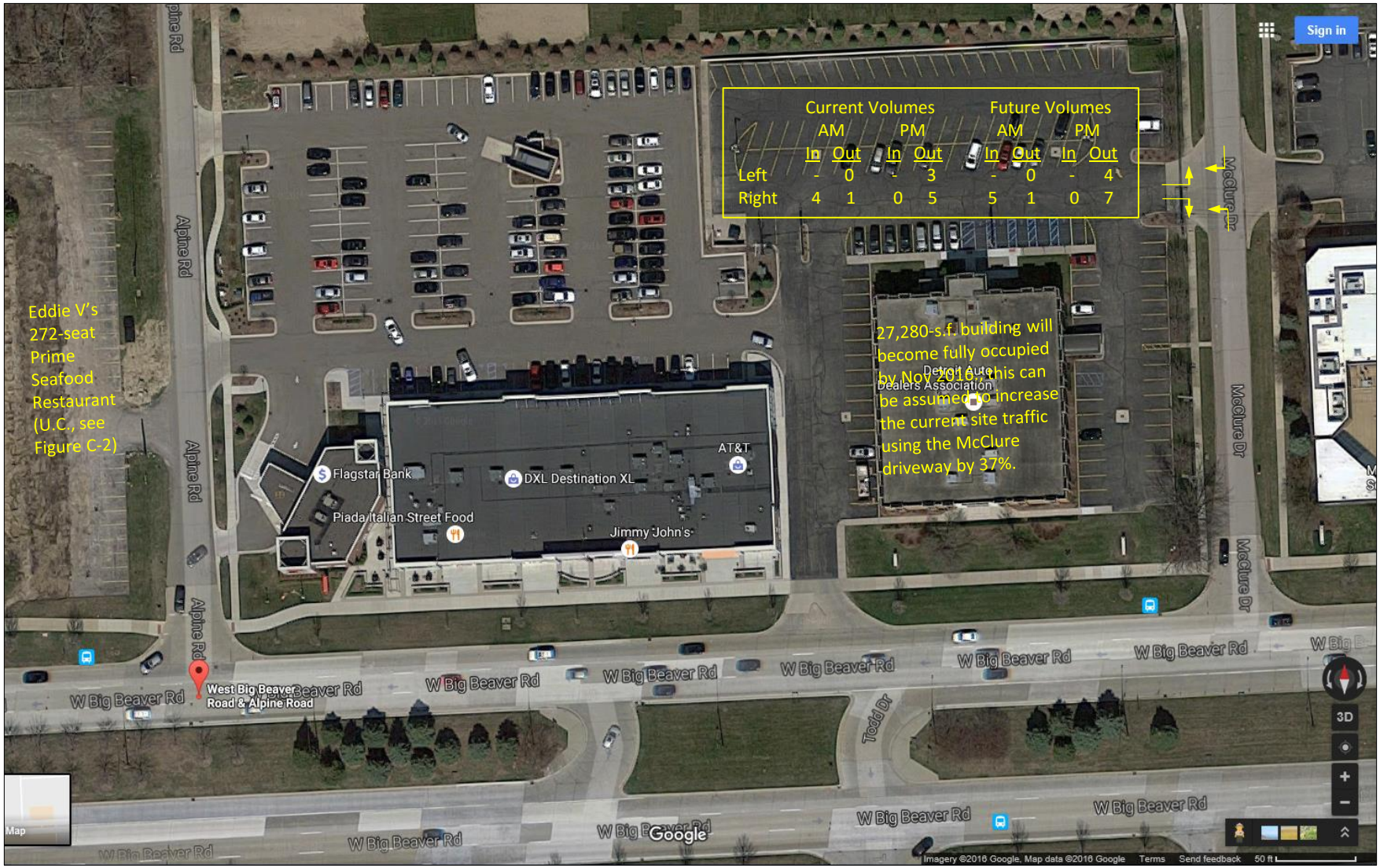
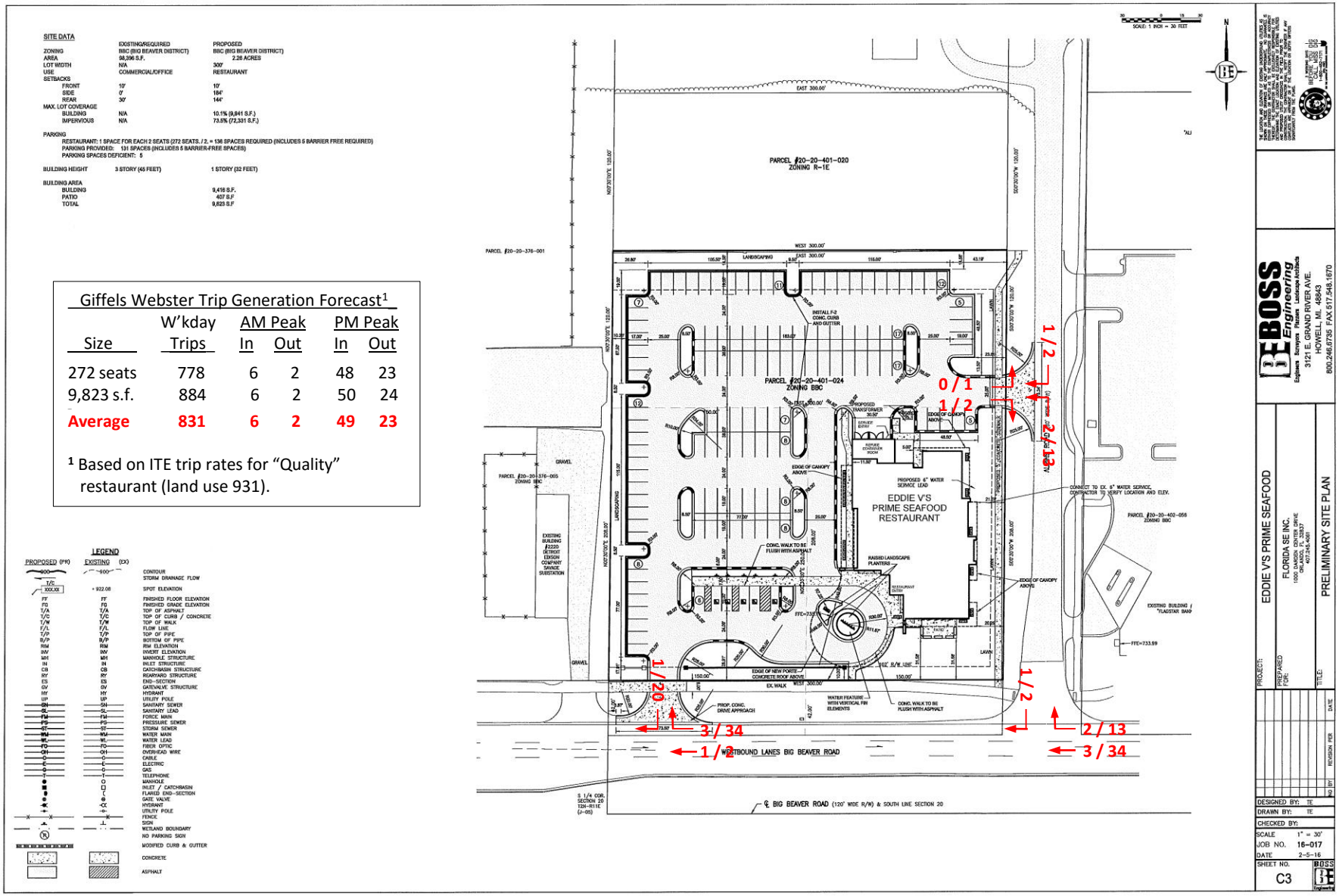


Figure C-1. Developments Contributing to Future Background Traffic



Giffels Webster Trip Generation Forecast[1]

Size	W'kday Trips	AM Peak In	AM Peak Out	PM Peak In	PM Peak Out
272 seats	778	6	2	48	23
9,823 s.f.	884	6	2	50	24
Average	**831**	**6**	**2**	**49**	**23**

[1] Based on ITE trip rates for "Quality" restaurant (land use 931).

Figure C-2. Eddie V's Prime Seafood Restaurant – Under Construction at Big Beaver and Alpine

Figure C-3. Current Through Volumes on Big Beaver at McClure Increased by 5% to Reflect General Economic Growth

Figure C-4. Current Through Volumes on Big Beaver at Alpine Increased by 5% to Reflect General Economic Growth

Figure C-5. Current Through Volumes along Crooks Increased by 5% to Reflect General Economic Growth

APPENDIX B:

TRAFFIC COUNTS

SEMCOG DATA

ROAD COMMISSION for OAKLAND COUNTY

TCDS Help Refresh MS2

Transportation Data Management System

Home | TSMS | TCLS | TTDS | PMS | PMDS | RSMS | NMDS | PMMS | WOTS | RTTV

Login | Locate | Locate All | Email This

Auto-Locate OFF

List View | All DIRs

Record 3 of 28 Goto Record go

Location ID	2496	MPO ID	3167
Type	LINK	HPMS ID	
On NHS		On HPMS	
LRS ID		LRS Loc Pt.	
SF Group	01	Route Type	
AF Group		Route	
GF Group			
Class Dist Grp			
WIM Group			
Fnct'l Class	-	Milepost	
Located On	BIG BEAVER		
Loc On Alias			
From Road	COOLIDGE		
To Road	CROOKS		

From PR	From MP	To PR	To MP	Bgn PT	End PT	Length
607204	1	607204	2.005	63044957	63044804	

More Detail

STATION DATA

Directions: EB

AADT

	Year	AADT	DHV-30	K %	D %	PA	BC	Src
	2015	16,080						
	2011	14,984						
	2009	18,370						
	2007	17,610						
	2003	17,160						

|<< < > >>| 1-5 of 7

Travel Demand Model

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

VOLUME COUNT

	Date	Int	Total
	Wed 8/19/2015	60	18,502
	Mon 5/2/2011	60	15,406
	Mon 8/24/2009	60	19,931
	Mon 10/1/2007	60	18,621
	Mon 6/23/2003	60	19,190
	Wed 12/16/1998	60	30,133
	Wed 4/30/1997	60	27,361

VOLUME TREND

Year	Annual Growth
2015	2%
2011	-10%
2009	2%
2007	1%
2003	-10%
1998	15%

Figure B-1. Daily Traffic Volumes on EB Big Beaver between Coolidge and Crooks

ROAD COMMISSION for OAKLAND COUNTY

TCDS Help Refresh MS2

Transportation Data Management System

Home | TSMS | TCLS | TTDS | PMS | PMDS | RSMS | NMDS | PMMS | WOTS | RTTV

Login | Locate | Locate All | Email This

Auto-Locate OFF

List View | All DIRs

Record 4 of 28 Goto Record go

Location ID	2497	MPO ID	3209
Type	LINK	HPMS ID	
On NHS		On HPMS	
LRS ID		LRS Loc Pt.	
SF Group	01	Route Type	
AF Group		Route	
GF Group			
Class Dist Grp			
WIM Group			
Fnct'l Class	-	Milepost	
Located On	BIG BEAVER		
Loc On Alias			
From Road	COOLIDGE		
To Road	CROOKS		

From PR	From MP	To PR	To MP	Bgn PT	End PT	Length
4408243	0.48	4408243	1.483	63044924	63044750	

More Detail

STATION DATA

Directions: WB

AADT

	Year	AADT	DHV-30	K %	D %	PA	BC	Src
	2015	26,330						
	2011	20,992						
	2009	20,710						
	2007	14,830						
	2003	24,410						

|<< < > >>| 1-5 of 7

Travel Demand Model

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

VOLUME COUNT

	Date	Int	Total
	Wed 8/19/2015	60	30,308
	Wed 5/4/2011	60	22,909
	Tue 8/25/2009	60	22,912
	Tue 10/2/2007	60	15,924
	Tue 6/24/2003	60	27,819
	Wed 12/16/1998	60	31,538
	Wed 4/30/1997	60	26,818

VOLUME TREND

Year	Annual Growth
2015	6%
2011	1%
2009	18%
2007	-12%
2003	-4%
1998	23%

Figure B-2. Daily Traffic Volumes on WB Big Beaver between Crooks and Coolidge

SEMCOG

TCDS Help Refresh MS2

Transportation Data Management System

Home | TSMS | TCLS | TTDS | PMS | PMDS | RSMS | NMDS | PMMS | WOTS | RTTV

Back | Login | Locate | Locate All

Auto-Locate OFF

Volume Count Report

LOCATION INFO	
Location ID	2497
Type	LINK
Fnct'l Class	-
Located On	BIG BEAVER
From Road	COOLIDGE
To Road	CROOKS
Direction	WB
Community	Troy
MPO ID	3209
HPMS ID	
Agency	Oakland County

COUNT DATA INFO	
Count Status	Accepted
Start Date	Wed 8/19/2015
End Date	Thu 8/20/2015
Start Time	11:00:00 AM
End Time	11:00:00 AM
Direction	
Notes	
Count Source	FO357_____
Weather	
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube

K_{PM} = 2,468/30,308 = 0.0814

INTERVAL:60-MIN	
Time	Hourly Count
0:00-1:00	128
1:00-2:00	46
2:00-3:00	44
3:00-4:00	24
4:00-5:00	101
5:00-6:00	325
6:00-7:00	804
7:00-8:00	1,580
8:00-9:00	2,196
9:00-10:00	1,849
10:00-11:00	1,793
11:00-12:00	2,132
12:00-13:00	2,512
13:00-14:00	2,214
14:00-15:00	1,908
15:00-16:00	1,995
16:00-17:00	2,225
17:00-18:00	2,468
18:00-19:00	2,016
19:00-20:00	1,591
20:00-21:00	1,176
21:00-22:00	639
22:00-23:00	367
23:00-24:00	175
Total	30,308
AADT	
AM Peak	08:00-09:00 2,196
PM Peak	12:00-13:00 2,512

Figure B-3. Hourly Volumes on WB Big Beaver between Crooks and Coolidge – August 19, 2015

SEMCOG

TCDS Help Refresh MS2

Transportation Data Management System

Home | TSMS | TCLS | TTDS | PMS | PMDS | RSMS | NMDS | PMMS | WOTS | RTTV

Back | Login | Locate | Locate All

Auto-Locate OFF

Volume Count Report

LOCATION INFO	
Location ID	2497
Type	LINK
Fnct'l Class	-
Located On	BIG BEAVER
From Road	COOLIDGE
To Road	CROOKS
Direction	WB
Community	Troy
MPO ID	3209
HPMS ID	
Agency	Oakland County

COUNT DATA INFO	
Count Status	Accepted
Start Date	Tue 8/25/2009
End Date	Wed 8/26/2009
Start Time	11:00:00 AM
End Time	11:00:00 AM
Direction	
Notes	
Count Source	FO356_____
Weather	
Study	
Speed Limit	
Description	
Sensor Type	

K_{PM} = 1,950/22,912 = 0.0851 >

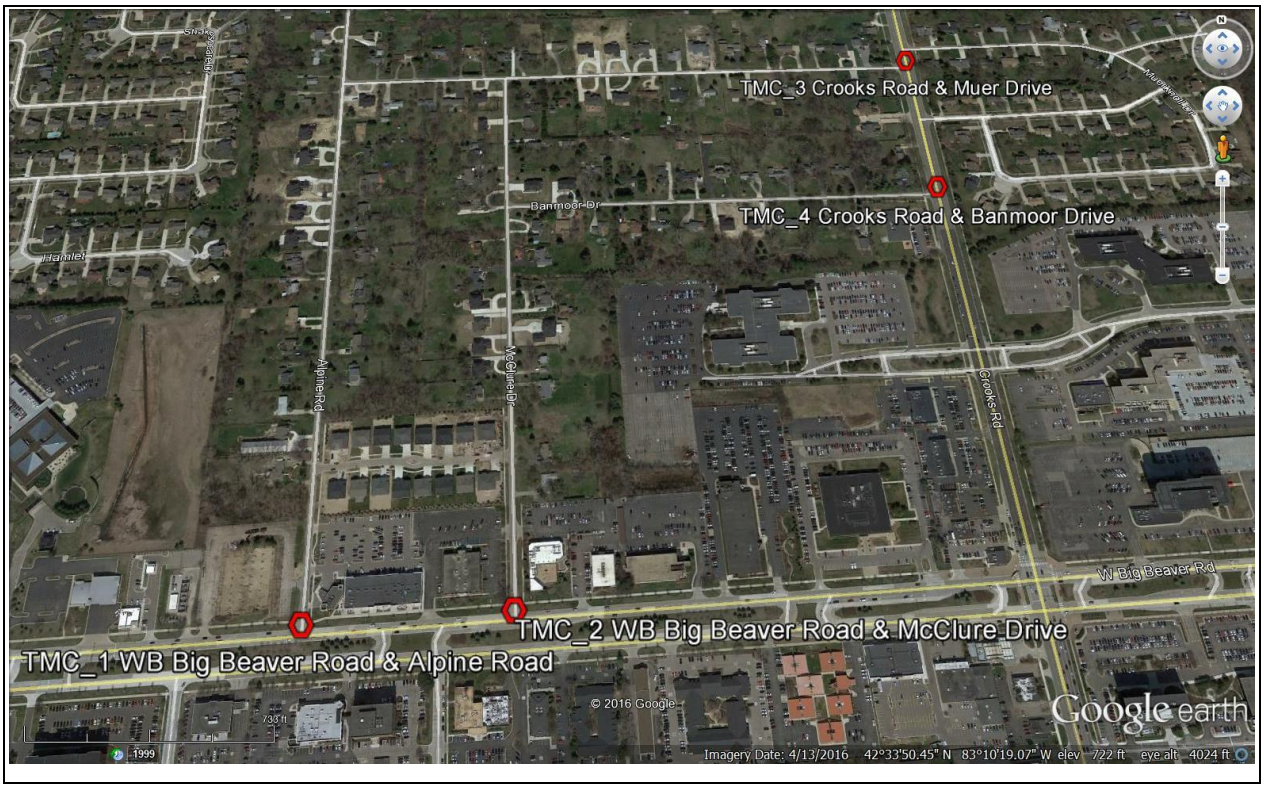
INTERVAL:60-MIN	
Time	Hourly Count
0:00-1:00	95
1:00-2:00	45
2:00-3:00	45
3:00-4:00	23
4:00-5:00	51
5:00-6:00	165
6:00-7:00	618
7:00-8:00	1,218
8:00-9:00	1,750
9:00-10:00	1,416
10:00-11:00	1,237
11:00-12:00	1,574
12:00-13:00	1,690
13:00-14:00	1,606
14:00-15:00	1,363
15:00-16:00	1,555
16:00-17:00	1,741
17:00-18:00	1,950
18:00-19:00	1,575
19:00-20:00	1,179
20:00-21:00	852
21:00-22:00	581
22:00-23:00	378
23:00-24:00	205
Total	22,912
AADT	
AM Peak	08:00-09:00 1,750
PM Peak	17:00-18:00 1,950

Figure B-4. Hourly Volumes on WB Big Beaver between Crooks and Coolidge – August 25, 2009

TDC COUNTS

TRAFFIC DATA COLLECTION
7504 Sawgrass Drive
Washington, Michigan 48094
Phone: 586 786-5407
Fax: 248 650-1184

Traffic Counts for City of Troy
Traffic Study
Oakland County, Michigan



Traffic Count Location Map

(4 - 4 Hour Turning Movement Count Locations Highlighted In Red)

OF AUGUST 23, 2016

TDC
Traffic Data Collection
www.tdccounts.com
7504 Sawgrass Drive.
Washington, MI. 48094
Phone: 589 786-5407
Fax: 248 650-1184
Cell: 248 342-3933

August 26, 2016

William A. Stimpson, P.E.
Senior Project Engineer
Giffels Webster
6303 26 Mile Road, Suite 100
Washington, MI 48094
(586) 781-8905 Direct
(248) 997-0845 Cell
wstimpson@giffelswebster.com

RE: Traffic Counts for City of Troy Traffic Study
Oakland County, Michigan

Bill:

Enclosed are the traffic reports for the four (4) - 4 hour video classification intersection turning movement counts conducted by Traffic Data Collection, LLC for the above project. Traffic studies were conducted last Tuesday, August 23, 2016 from 7:00-9:00 AM morning & 400 PM to 6:00 PM afternoon peak hours.

The following thru movements were recorded for the inside crossover lane for WB Big Beaver Road @ McClure Drive:

7:00-7:15AM (16)	8:00-8:15AM (19)	4:00-4:15PM (34)	5:00-5:15PM (45)
7:15-7:30AM (18)	8:15-8:30AM (41)	4:15-4:30PM (39)	5:15-5:30PM (39)
7:30-7:45AM (17)	8:30-8:45AM (35)	4:30-4:45PM (36)	5:30-5:45PM (39)
7:45-8:00AM (29)	8:45-9:00AM (46)	4:45-5:00PM (36)	5:45-6:00 PM (31)

Traffic reports have been processed into 15 & 60 minute aggregate summaries with peak hours and exported into Universal Traffic Data Format (UTDF). Turning movement counts were recorded and logged with Miovision video scout cameras and video files can be provided upon request. Please contact me at (248) 342-3933 if you have any questions regarding this information, or if I can provide you with any additional processing of the electronic count data to assist you with completion of your project.

Traffic Data Collection
www.tdccounts.com
7504 Sawgrass Drive.
Washington, MI. 48094
Phone: 589 786-5407
Fax: 248 650-1184
Cell: 248 342-3933

Thank you for using our traffic services.

Marc G. Matich
Principal
MGM/dmm
Attachments: Reports

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 24L

File Name : TMC_2 BigBeaver & McClure_8-23-16
Site Code : TMC_2
Start Date : 8/23/2016
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds

	McClure Drive Southbound					WB Big Beaver Road Westbound					NA Northbound					WB Big Beaver Road Eastbound					
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	0	0	1	2	0	208	0	0	208	0	0	0	0	0	0	0	0	0	0	210
07:15 AM	1	0	0	0	1	0	275	0	0	275	0	0	0	0	0	0	0	0	0	0	276
07:30 AM	5	0	0	0	5	3	330	0	0	333	0	0	0	0	0	0	0	0	0	0	338
07:45 AM	2	0	0	1	3	3	355	0	0	358	0	0	0	0	0	0	0	0	0	0	361
Total	9	0	0	2	11	6	1168	0	0	1174	0	0	0	0	0	0	0	0	0	0	1185
08:00 AM	4	0	0	2	6	6	341	0	0	347	0	0	0	0	0	0	0	0	0	0	353
08:15 AM	11	0	0	0	11	8	371	0	0	379	0	0	0	0	0	0	0	0	0	0	390
08:30 AM	4	0	0	1	5	10	444	0	0	454	0	0	0	0	0	0	0	0	0	0	459
08:45 AM	6	0	0	0	6	10	525	0	0	535	0	0	0	0	0	0	0	0	0	0	541
Total	25	0	0	3	28	34	1681	0	0	1715	0	0	0	0	0	0	0	0	0	0	1743
**** BREAK ****																					
04:00 PM	16	0	0	1	17	13	403	0	0	416	0	0	0	0	0	0	0	0	0	0	433
04:15 PM	9	0	0	0	9	13	387	0	0	400	0	0	0	0	0	0	0	0	0	0	409
04:30 PM	9	0	0	0	9	8	405	0	0	413	0	0	0	0	0	0	0	0	0	0	422
04:45 PM	13	0	0	1	14	4	414	0	0	418	0	0	0	0	0	0	0	0	0	0	432
Total	47	0	0	2	49	38	1609	0	0	1647	0	0	0	0	0	0	0	0	0	0	1696
05:00 PM	13	0	0	0	13	19	507	0	0	526	0	0	0	0	0	0	0	0	0	0	539
05:15 PM	10	0	0	0	10	13	499	0	0	512	0	0	0	0	0	0	0	0	0	0	522
05:30 PM	1	0	0	0	1	15	470	0	0	485	0	0	0	0	0	0	0	0	0	0	486
05:45 PM	5	0	0	0	5	6	489	0	0	495	0	0	0	0	0	0	0	0	0	0	500
Total	29	0	0	0	29	53	1965	0	0	2018	0	0	0	0	0	0	0	0	0	0	2047
Grand Total	110	0	0	7	117	131	6423	0	0	6554	0	0	0	0	0	0	0	0	0	0	6671
Apprch %	94	0	0	6		2	98	0	0		0	0	0	0		0	0	0	0		
Total %	1.6	0	0	0.1	1.8	2	96.3	0	0	98.2	0	0	0	0	0	0	0	0	0	0	
Pass Cars	108	0	0	0	108	131	6357	0	0	6488	0	0	0	0	0	0	0	0	0	0	6596
% Pass Cars	98.2	0	0	0	92.3	100	99	0	0	99	0	0	0	0	0	0	0	0	0	0	98.9
Single Units	2	0	0	0	2	0	64	0	0	64	0	0	0	0	0	0	0	0	0	0	66
% Single Units	1.8	0	0	0	1.7	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Heavy Trucks	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
% Peds	0	0	0	100	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1

Comments: 4 Hour video intersection turning movement traffic study conducted during typical weekday (Tuesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours. Non-signalized "T" intersection, VCU video camera was located within SW intersection quadrant.

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

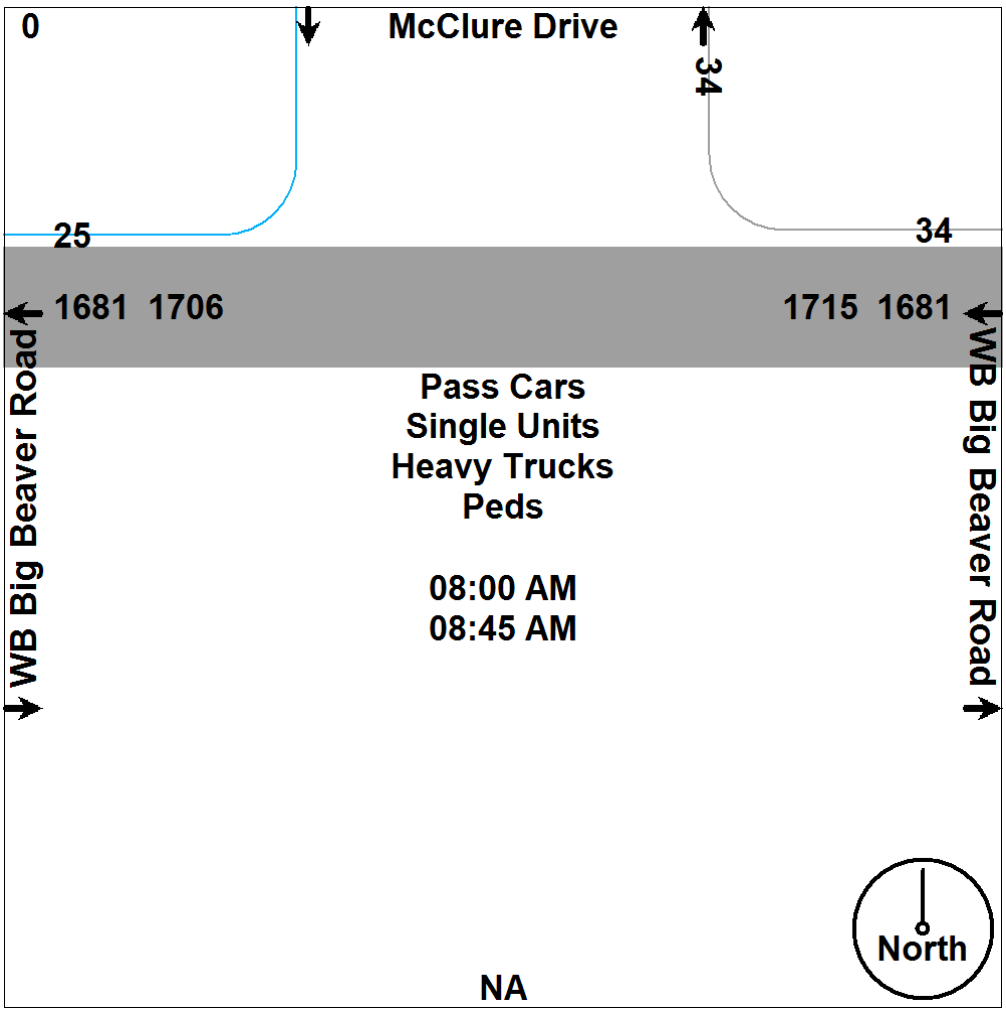
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 24L

File Name : TMC_2 BigBeaver & McClure_8-23-16
Site Code : TMC_2
Start Date : 8/23/2016
Page No : 3

	McClure Drive Southbound				WB Big Beaver Road Westbound				NA Northbound				WB Big Beaver Road Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	4	0	0	4	6	341	0	347	0	0	0	0	0	0	0	0	351
08:15 AM	**11**	0	0	**11**	8	371	0	379	0	0	0	0	0	0	0	0	390
08:30 AM	4	0	0	4	**10**	444	0	454	0	0	0	0	0	0	0	0	458
08:45 AM	6	0	0	6	10	**525**	0	**535**	0	0	0	0	0	0	0	0	**541**
Total Volume	25	0	0	25	34	1681	0	1715	0	0	0	0	0	0	0	0	1740
% App. Total	100	0	0		2	98	0		0	0	0		0	0	0		
PHF	.568	.000	.000	.568	.850	.800	.000	.801	.000	.000	.000	.000	.000	.000	.000	.000	.804
Pass Cars	25	0	0	25	34	1658	0	1692	0	0	0	0	0	0	0	0	1717
% Pass Cars	100	0	0	100	100	98.6	0	98.7	0	0	0	0	0	0	0	0	98.7
Single Units	0	0	0	0	0	23	0	23	0	0	0	0	0	0	0	0	23
% Single Units	0	0	0	0	0	1.4	0	1.3	0	0	0	0	0	0	0	0	1.3
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

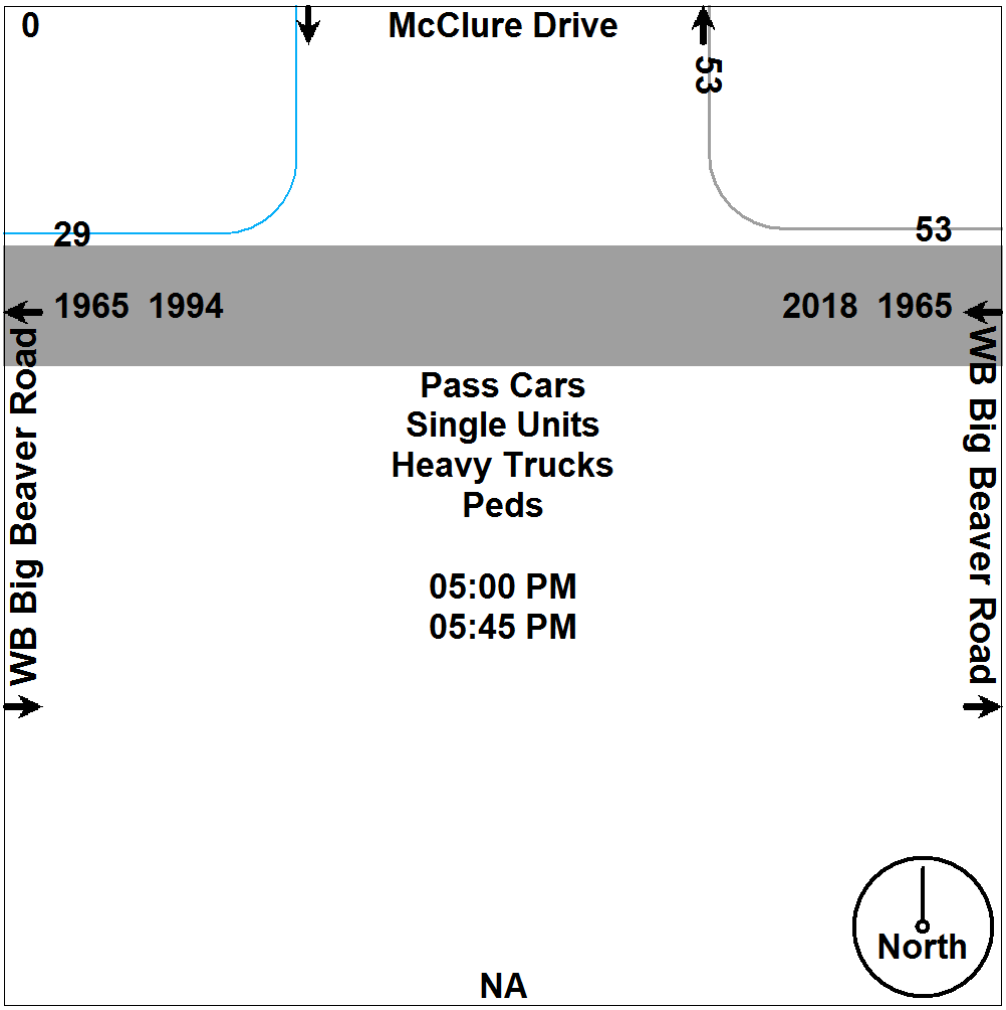
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 24L

File Name : TMC_2 BigBeaver & McClure_8-23-16
Site Code : TMC_2
Start Date : 8/23/2016
Page No : 4

	McClure Drive Southbound				WB Big Beaver Road Westbound				NA Northbound				WB Big Beaver Road Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**13**	0	0	**13**	**19**	**507**	0	**526**	0	0	0	0	0	0	0	0	**539**
05:15 PM	10	0	0	10	13	499	0	512	0	0	0	0	0	0	0	0	522
05:30 PM	1	0	0	1	15	470	0	485	0	0	0	0	0	0	0	0	486
05:45 PM	5	0	0	5	6	489	0	495	0	0	0	0	0	0	0	0	500
Total Volume	29	0	0	29	53	1965	0	2018	0	0	0	0	0	0	0	0	2047
% App. Total	100	0	0		2.6	97.4	0		0	0	0		0	0	0		
PHF	.558	.000	.000	.558	.697	.969	.000	.959	.000	.000	.000	.000	.000	.000	.000	.000	.949
Pass Cars	28	0	0	28	53	1955	0	2008	0	0	0	0	0	0	0	0	2036
% Pass Cars	96.6	0	0	96.6	100	99.5	0	99.5	0	0	0	0	0	0	0	0	99.5
Single Units	1	0	0	1	0	10	0	10	0	0	0	0	0	0	0	0	11
% Single Units	3.4	0	0	3.4	0	0.5	0	0.5	0	0	0	0	0	0	0	0	0.5
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 24L

File Name : TMC_2 BigBeaver & McClure_8-23-16
Site Code : TMC_2
Start Date : 8/23/2016
Page No : 5

Aerial Photo

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 3DQ

File Name : TMC_1 BigBeaver & Alpine_8-23-16
Site Code : TMC_1
Start Date : 8/23/2016
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds

	Alpine Road Southbound					WB Big Beaver Road Westbound					NA Northbound					WB Big Beaver Road Eastbound					
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	6	0	0	0	6	2	192	0	0	194	0	0	0	0	0	0	0	0	0	0	200
07:15 AM	4	0	0	0	4	2	283	0	0	285	0	0	0	0	0	0	0	0	0	0	289
07:30 AM	3	0	0	0	3	3	285	0	0	288	0	0	0	0	0	0	0	0	0	0	291
07:45 AM	9	0	0	0	9	1	354	0	0	355	0	0	0	0	0	0	0	0	0	0	364
Total	22	0	0	0	22	8	1114	0	0	1122	0	0	0	0	0	0	0	0	0	0	1144
08:00 AM	7	0	0	1	8	1	302	0	0	303	0	0	0	0	0	0	0	0	0	0	311
08:15 AM	6	0	0	0	6	5	349	0	0	354	0	0	0	0	0	0	0	0	0	0	360
08:30 AM	3	0	0	1	4	10	405	0	0	415	0	0	0	0	0	0	0	0	0	0	419
08:45 AM	1	0	0	0	1	10	449	0	0	459	0	0	0	0	0	0	0	0	0	0	460
Total	17	0	0	2	19	26	1505	0	0	1531	0	0	0	0	0	0	0	0	0	0	1550
**** BREAK ****																					
04:00 PM	14	0	0	1	15	12	415	0	0	427	0	0	0	0	0	0	0	0	0	0	442
04:15 PM	9	0	0	0	9	12	345	0	0	357	0	0	0	0	0	0	0	0	0	0	366
04:30 PM	10	0	0	0	10	9	451	0	0	460	0	0	0	0	0	0	0	0	0	0	470
04:45 PM	10	0	0	0	10	15	373	0	0	388	0	0	0	0	0	0	0	0	0	0	398
Total	43	0	0	1	44	48	1584	0	0	1632	0	0	0	0	0	0	0	0	0	0	1676
05:00 PM	7	0	0	1	8	12	527	0	0	539	0	0	0	0	0	0	0	0	1	1	548
05:15 PM	6	0	0	1	7	7	478	0	0	485	0	0	0	0	0	0	0	0	0	0	492
05:30 PM	9	0	0	0	9	14	474	0	0	488	0	0	0	0	0	0	0	0	0	0	497
05:45 PM	11	0	0	1	12	8	464	0	0	472	0	0	0	0	0	0	0	0	0	0	484
Total	33	0	0	3	36	41	1943	0	0	1984	0	0	0	0	0	0	0	0	1	1	2021
Grand Total	115	0	0	6	121	123	6146	0	0	6269	0	0	0	0	0	0	0	0	1	1	6391
Apprch %	95	0	0	5		2	98	0	0		0	0	0	0		0	0	0	100		
Total %	1.8	0	0	0.1	1.9	1.9	96.2	0	0	98.1	0	0	0	0	0	0	0	0	0	0	
Pass Cars	109	0	0	0	109	122	6085	0	0	6207	0	0	0	0	0	0	0	0	0	0	6316
% Pass Cars	94.8	0	0	0	90.1	99.2	99	0	0	99	0	0	0	0	0	0	0	0	0	0	98.8
Single Units	6	0	0	0	6	1	57	0	0	58	0	0	0	0	0	0	0	0	0	0	64
% Single Units	5.2	0	0	0	5	0.8	0.9	0	0	0.9	0	0	0	0	0	0	0	0	0	0	1
Heavy Trucks	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	4
% Heavy Trucks	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1
Peds	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	7
% Peds	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0.1

Comments: 4 Hour video intersection turning movement traffic study conducted during typical weekday (Tuesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours. Non-signalized "T" intersection. VCU video camera was located within NE intersection quadrant.

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

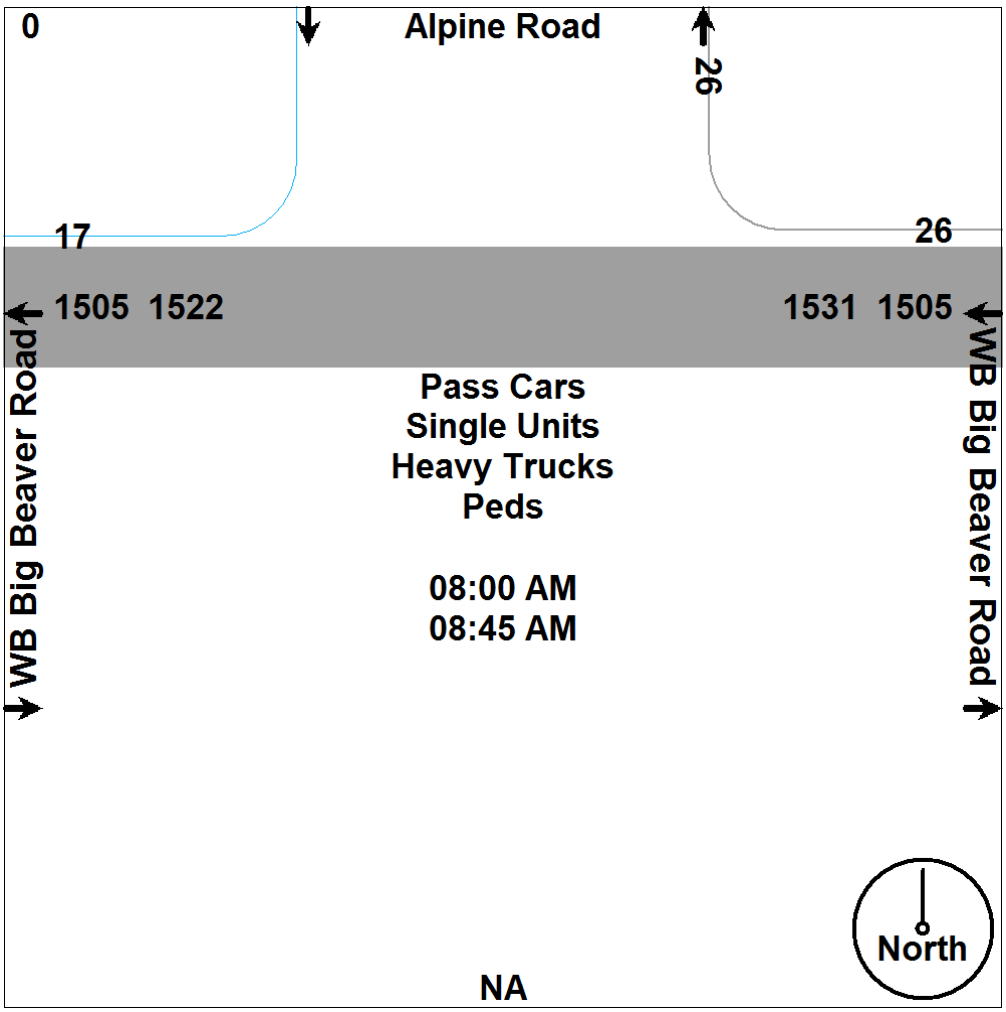
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 3DQ

File Name : TMC_1 BigBeaver & Alpine_8-23-16
Site Code : TMC_1
Start Date : 8/23/2016
Page No : 3

	Alpine Road Southbound				WB Big Beaver Road Westbound				NA Northbound				WB Big Beaver Road Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	**7**	0	0	**7**	1	302	0	303	0	0	0	0	0	0	0	0	310
08:15 AM	6	0	0	6	5	349	0	354	0	0	0	0	0	0	0	0	360
08:30 AM	3	0	0	3	**10**	405	0	415	0	0	0	0	0	0	0	0	418
08:45 AM	1	0	0	1	10	**449**	0	**459**	0	0	0	0	0	0	0	0	**460**
Total Volume	17	0	0	17	26	1505	0	1531	0	0	0	0	0	0	0	0	1548
% App. Total	100	0	0		1.7	98.3	0		0	0	0		0	0	0		
PHF	.607	.000	.000	.607	.650	.838	.000	.834	.000	.000	.000	.000	.000	.000	.000	.000	.841
Pass Cars	14	0	0	14	25	1486	0	1511	0	0	0	0	0	0	0	0	1525
% Pass Cars	82.4	0	0	82.4	96.2	98.7	0	98.7	0	0	0	0	0	0	0	0	98.5
Single Units	3	0	0	3	1	18	0	19	0	0	0	0	0	0	0	0	22
% Single Units	17.6	0	0	17.6	3.8	1.2	0	1.2	0	0	0	0	0	0	0	0	1.4
Heavy Trucks	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% Heavy Trucks	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0.1
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

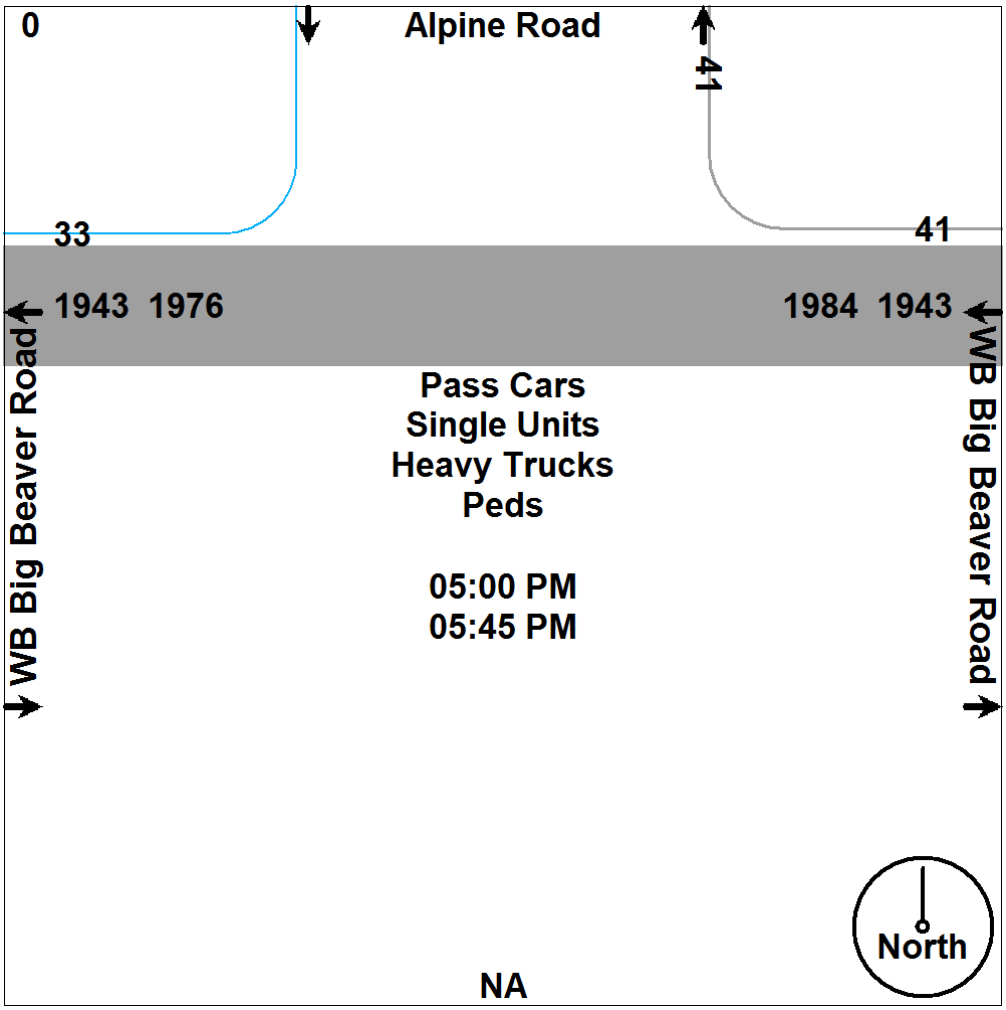
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 3DQ

File Name : TMC_1 BigBeaver & Alpine_8-23-16
Site Code : TMC_1
Start Date : 8/23/2016
Page No : 4

	Alpine Road Southbound				WB Big Beaver Road Westbound				NA Northbound				WB Big Beaver Road Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	7	0	0	7	12	**527**	0	**539**	0	0	0	0	0	0	0	0	**546**
05:15 PM	6	0	0	6	7	478	0	485	0	0	0	0	0	0	0	0	491
05:30 PM	9	0	0	9	**14**	474	0	488	0	0	0	0	0	0	0	0	497
05:45 PM	**11**	0	0	**11**	8	464	0	472	0	0	0	0	0	0	0	0	483
Total Volume	33	0	0	33	41	1943	0	1984	0	0	0	0	0	0	0	0	2017
% App. Total	100	0	0		2.1	97.9	0		0	0	0		0	0	0		
PHF	.750	.000	.000	.750	.732	.922	.000	.920	.000	.000	.000	.000	.000	.000	.000	.000	.924
Pass Cars	33	0	0	33	41	1932	0	1973	0	0	0	0	0	0	0	0	2006
% Pass Cars	100	0	0	100	100	99.4	0	99.4	0	0	0	0	0	0	0	0	99.5
Single Units	0	0	0	0	0	11	0	11	0	0	0	0	0	0	0	0	11
% Single Units	0	0	0	0	0	0.6	0	0.6	0	0	0	0	0	0	0	0	0.5
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 3DQ

File Name : TMC_1 BigBeaver & Alpine_8-23-16
Site Code : TMC_1
Start Date : 8/23/2016
Page No : 5

Aerial Photo

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 34N

File Name : TMC_4 Crooks & Banmoor_8-23-16
Site Code : TMC_4
Start Date : 8/23/2016
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds

	Crooks Road Southbound					NA Westbound					Crooks Road Northbound					Banmoor Drive Eastbound					
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	259	0	0	259	0	0	0	0	0	0	126	0	0	126	0	0	0	1	1	386
07:15 AM	1	321	0	0	322	0	0	0	0	0	0	179	1	0	180	0	0	0	0	0	502
07:30 AM	3	393	0	0	396	0	0	0	0	0	0	205	3	0	208	3	0	2	0	5	609
07:45 AM	2	389	0	0	391	0	0	0	0	0	0	259	0	0	259	1	0	1	0	2	652
Total	6	1362	0	0	1368	0	0	0	0	0	0	769	4	0	773	4	0	3	1	8	2149
08:00 AM	2	421	0	0	423	0	0	0	0	0	0	234	2	0	236	2	0	0	1	3	662
08:15 AM	2	440	0	0	442	0	0	0	0	0	0	262	1	0	263	2	0	1	1	4	709
08:30 AM	2	421	0	0	423	0	0	0	0	0	0	217	2	0	219	1	0	0	1	2	644
08:45 AM	5	404	0	0	409	0	0	0	0	0	0	204	3	0	207	5	0	0	0	5	621
Total	11	1686	0	0	1697	0	0	0	0	0	0	917	8	0	925	10	0	1	3	14	2636
**** BREAK ****																					
04:00 PM	2	208	0	0	210	0	0	0	0	0	0	378	1	0	379	0	0	2	1	3	592
04:15 PM	1	251	0	0	252	0	0	0	0	0	0	386	2	0	388	2	0	2	0	4	644
04:30 PM	2	266	0	0	268	0	0	0	0	0	0	418	2	0	420	0	0	5	0	5	693
04:45 PM	4	295	0	0	299	0	0	0	0	0	0	420	2	0	422	5	0	2	0	7	728
Total	9	1020	0	0	1029	0	0	0	0	0	0	1602	7	0	1609	7	0	11	1	19	2657
05:00 PM	4	324	0	0	328	0	0	0	0	0	0	483	5	0	488	5	0	8	0	13	829
05:15 PM	2	273	0	0	275	0	0	0	0	0	0	423	3	0	426	3	0	5	0	8	709
05:30 PM	0	280	0	0	280	0	0	0	0	0	0	394	1	0	395	2	0	6	0	8	683
05:45 PM	4	292	0	0	296	0	0	0	0	0	0	355	4	0	359	3	0	3	0	6	661
Total	10	1169	0	0	1179	0	0	0	0	0	0	1655	13	0	1668	13	0	22	0	35	2882
Grand Total	36	5237	0	0	5273	0	0	0	0	0	0	4943	32	0	4975	34	0	37	5	76	10324
Apprch %	0.7	99.3	0	0		0	0	0	0		0	99.4	0.6	0		44.7	0	48.7	6.6		
Total %	0.3	50.7	0	0	51.1	0	0	0	0	0	0	47.9	0.3	0	48.2	0.3	0	0.4	0	0.7	
Pass Cars	35	5185	0	0	5220	0	0	0	0	0	0	4893	31	0	4924	34	0	37	0	71	10215
% Pass Cars	97.2	99	0	0	99	0	0	0	0	0	0	99	96.9	0	99	100	0	100	0	93.4	98.9
Single Units	1	42	0	0	43	0	0	0	0	0	0	35	1	0	36	0	0	0	0	0	79
% Single Units	2.8	0.8	0	0	0.8	0	0	0	0	0	0	0.7	3.1	0	0.7	0	0	0	0	0	0.8
Heavy Trucks	0	10	0	0	10	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	25
% Heavy Trucks	0	0.2	0	0	0.2	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.2
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	5
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	6.6	0

Comments: 4 Hour video intersection turning movement traffic study conducted during typical weekday (Tuesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours. Non-signalized "T" intersection. VCU video camera was located within SW intersection quadrant.

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

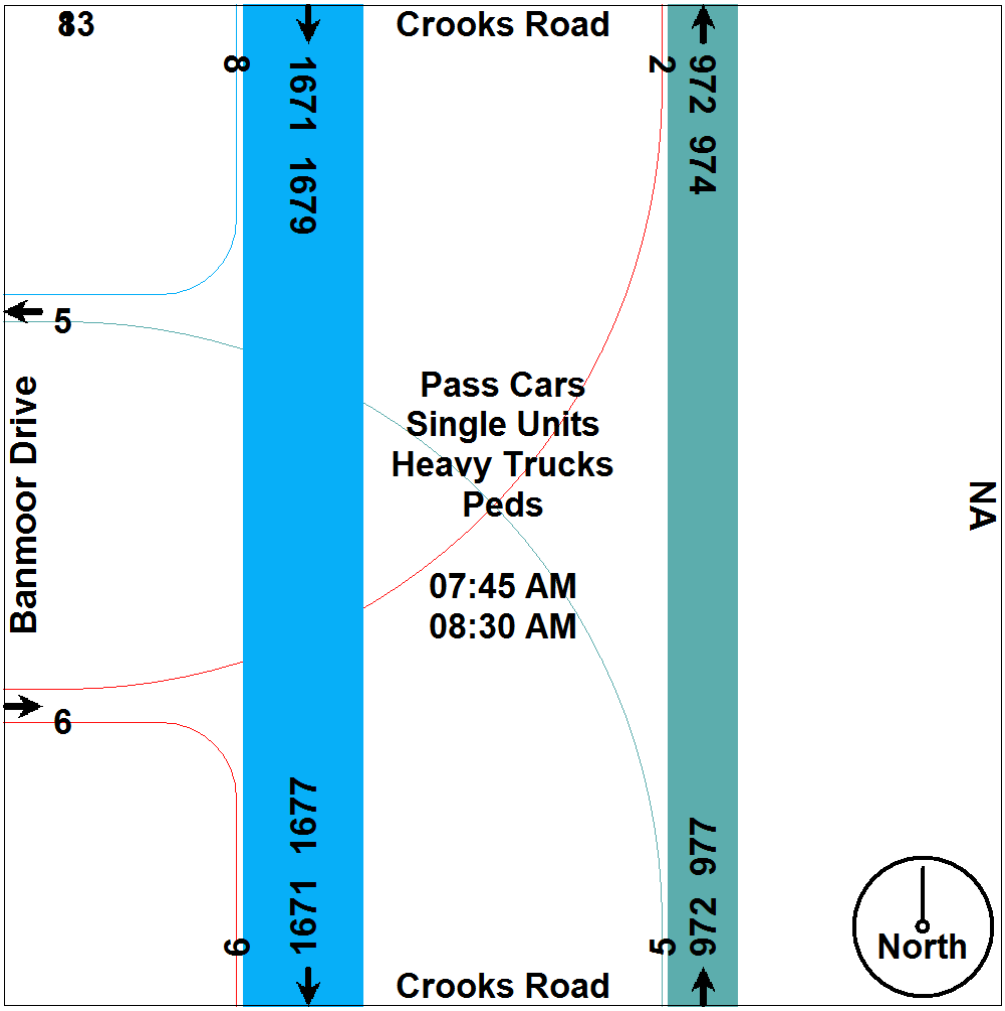
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 34N

File Name : TMC_4 Crooks & Banmoor_8-23-16
Site Code : TMC_4
Start Date : 8/23/2016
Page No : 3

	Crooks Road Southbound				NA Westbound				Crooks Road Northbound				Banmoor Drive Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**2**	389	0	391	0	0	0	0	0	259	0	259	1	0	**1**	2	652
08:00 AM	2	421	0	423	0	0	0	0	0	234	**2**	236	**2**	0	0	2	661
08:15 AM	2	**440**	0	**442**	0	0	0	0	0	**262**	1	**263**	2	0	1	**3**	**708**
08:30 AM	2	421	0	423	0	0	0	0	0	217	2	219	1	0	0	1	643
Total Volume	8	1671	0	1679	0	0	0	0	0	972	5	977	6	0	2	8	2664
% App. Total	0.5	99.5	0		0	0	0		0	99.5	0.5		75	0	25		
PHF	1.00	.949	.000	.950	.000	.000	.000	.000	.000	.927	.625	.929	.750	.000	.500	.667	.941
Pass Cars	8	1657	0	1665	0	0	0	0	0	959	4	963	6	0	2	8	2636
% Pass Cars	100	99.2	0	99.2	0	0	0	0	0	98.7	80.0	98.6	100	0	100	100	98.9
Single Units	0	11	0	11	0	0	0	0	0	8	1	9	0	0	0	0	20
% Single Units	0	0.7	0	0.7	0	0	0	0	0	0.8	20.0	0.9	0	0	0	0	0.8
Heavy Trucks	0	3	0	3	0	0	0	0	0	5	0	5	0	0	0	0	8
% Heavy Trucks	0	0.2	0	0.2	0	0	0	0	0	0.5	0	0.5	0	0	0	0	0.3
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

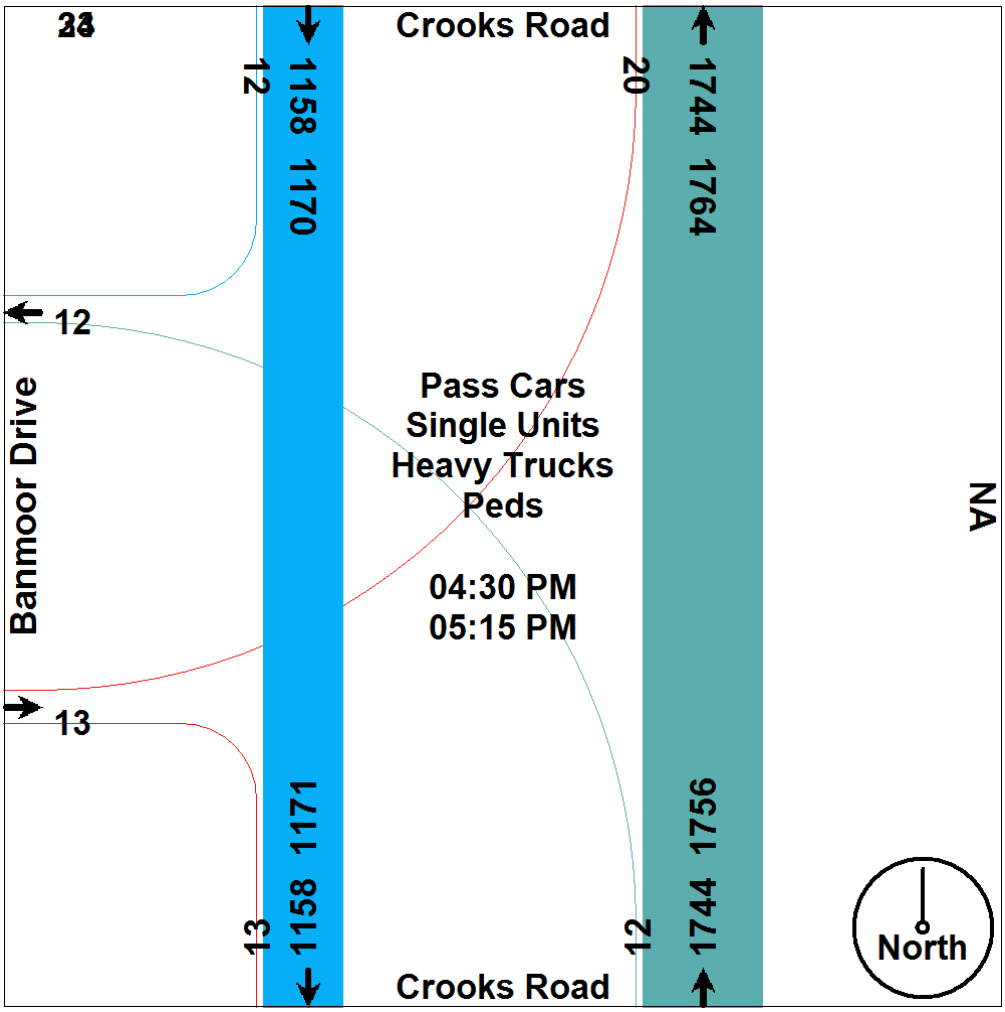
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 34N

File Name : TMC_4 Crooks & Banmoor_8-23-16
Site Code : TMC_4
Start Date : 8/23/2016
Page No : 4

	Crooks Road Southbound				NA Westbound				Crooks Road Northbound				Banmoor Drive Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	2	266	0	268	0	0	0	0	0	418	2	420	0	0	5	5	693
04:45 PM	**4**	295	0	299	0	0	0	0	0	420	2	422	**5**	0	2	7	728
05:00 PM	4	**324**	0	**328**	0	0	0	0	0	**483**	**5**	**488**	5	0	**8**	**13**	**829**
05:15 PM	2	273	0	275	0	0	0	0	0	423	3	426	3	0	5	8	709
Total Volume	12	1158	0	1170	0	0	0	0	0	1744	12	1756	13	0	20	33	2959
% App. Total	1	99	0		0	0	0		0	99.3	0.7		39.4	0	60.6		
PHF	.750	.894	.000	.892	.000	.000	.000	.000	.000	.903	.600	.900	.650	.000	.625	.635	.892
Pass Cars	11	1148	0	1159	0	0	0	0	0	1733	12	1745	13	0	20	33	2937
% Pass Cars	91.7	99.1	0	99.1	0	0	0	0	0	99.4	100	99.4	100	0	100	100	99.3
Single Units	1	10	0	11	0	0	0	0	0	8	0	8	0	0	0	0	19
% Single Units	8.3	0.9	0	0.9	0	0	0	0	0	0.5	0	0.5	0	0	0	0	0.6
Heavy Trucks	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0.2	0	0.2	0	0	0	0	0.1
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

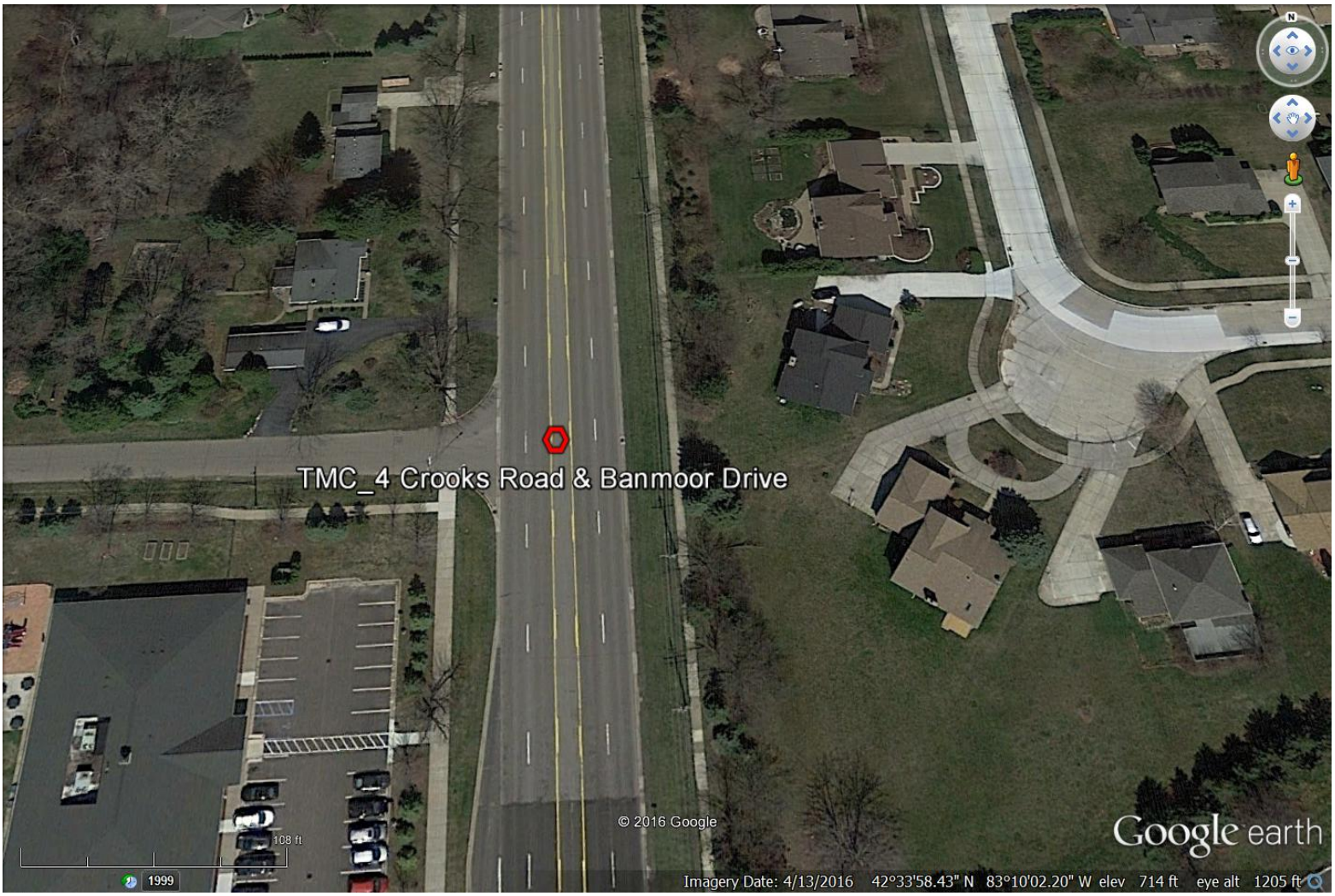
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 34N

File Name : TMC_4 Crooks & Banmoor_8-23-16
Site Code : TMC_4
Start Date : 8/23/2016
Page No : 5

Aerial Photo



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 3CU

File Name : TMC_3 Crooks & Muer_8-23-16
Site Code : TMC_3
Start Date : 8/23/2016
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds

	Crooks Road Southbound					NA Westbound					Crooks Road Northbound					Muer Drive Eastbound					
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	260	0	0	260	0	0	0	0	0	0	125	1	0	126	0	0	0	0	0	386
07:15 AM	1	326	0	0	327	0	0	0	0	0	0	182	0	0	182	1	0	0	0	1	510
07:30 AM	0	387	0	0	387	0	0	0	0	0	0	207	0	0	207	5	0	2	0	7	601
07:45 AM	1	351	0	0	352	0	0	0	0	0	0	264	1	0	265	2	0	0	0	2	619
Total	2	1324	0	0	1326	0	0	0	0	0	0	778	2	0	780	8	0	2	0	10	2116
08:00 AM	1	421	0	0	422	0	0	0	0	0	0	228	0	0	228	3	0	5	0	8	658
08:15 AM	3	442	0	0	445	0	0	0	0	0	0	263	2	0	265	0	0	3	0	3	713
08:30 AM	3	415	0	0	418	0	0	0	0	0	0	222	0	0	222	0	0	2	0	2	642
08:45 AM	6	411	0	0	417	0	0	0	0	0	0	209	0	0	209	2	0	7	0	9	635
Total	13	1689	0	0	1702	0	0	0	0	0	0	922	2	0	924	5	0	17	0	22	2648
**** BREAK ****																					
04:00 PM	3	218	0	0	221	0	0	0	0	0	0	387	0	0	387	1	0	6	0	7	615
04:15 PM	1	244	0	0	245	0	0	0	0	0	0	381	1	0	382	0	0	8	0	8	635
04:30 PM	2	270	0	0	272	0	0	0	0	0	0	427	2	0	429	1	0	7	0	8	709
04:45 PM	1	300	0	0	301	0	0	0	0	0	0	419	0	0	419	1	0	6	0	7	727
Total	7	1032	0	0	1039	0	0	0	0	0	0	1614	3	0	1617	3	0	27	0	30	2686
05:00 PM	4	321	0	0	325	0	0	0	0	0	0	488	2	0	490	0	0	10	0	10	825
05:15 PM	1	278	0	0	279	0	0	0	0	0	0	426	0	0	426	0	0	13	0	13	718
05:30 PM	2	281	0	0	283	0	0	0	0	0	0	400	2	0	402	0	0	6	0	6	691
05:45 PM	3	299	0	0	302	0	0	0	0	0	0	348	1	0	349	1	0	1	0	2	653
Total	10	1179	0	0	1189	0	0	0	0	0	0	1662	5	0	1667	1	0	30	0	31	2887
Grand Total	32	5224	0	0	5256	0	0	0	0	0	0	4976	12	0	4988	17	0	76	0	93	10337
Apprch %	0.6	99.4	0	0		0	0	0	0		0	99.8	0.2	0		18.3	0	81.7	0		
Total %	0.3	50.5	0	0	50.8	0	0	0	0	0	0	48.1	0.1	0	48.3	0.2	0	0.7	0	0.9	
Pass Cars	30	5173	0	0	5203	0	0	0	0	0	0	4924	11	0	4935	17	0	76	0	93	10231
% Pass Cars	93.8	99	0	0	99	0	0	0	0	0	0	99	91.7	0	98.9	100	0	100	0	100	99
Single Units	2	41	0	0	43	0	0	0	0	0	0	36	1	0	37	0	0	0	0	0	80
% Single Units	6.2	0.8	0	0	0.8	0	0	0	0	0	0	0.7	8.3	0	0.7	0	0	0	0	0	0.8
Heavy Trucks	0	10	0	0	10	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	26
% Heavy Trucks	0	0.2	0	0	0.2	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.3
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments: 4 Hour video intersection turning movement traffic study conducted during typical weekday (Tuesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours. Non-signalized "T" intersection. VCU video camera was located within SW intersection quadrant.

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

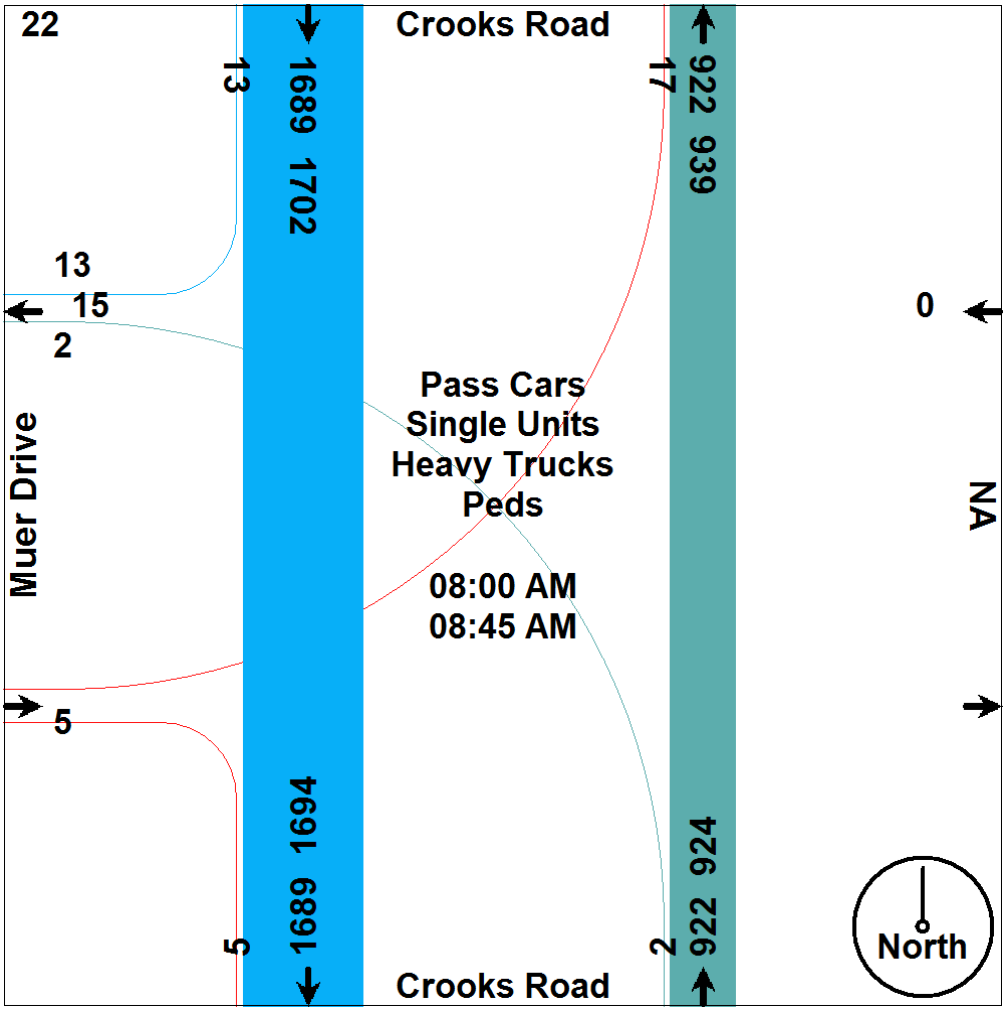
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 3CU

File Name : TMC_3 Crooks & Muer_8-23-16
Site Code : TMC_3
Start Date : 8/23/2016
Page No : 3

	Crooks Road Southbound				NA Westbound				Crooks Road Northbound				Muer Drive Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	421	0	422	0	0	0	0	0	228	0	228	**3**	0	5	8	658
08:15 AM	3	**442**	0	**445**	0	0	0	0	0	**263**	**2**	**265**	0	0	3	3	**713**
08:30 AM	3	415	0	418	0	0	0	0	0	222	0	222	0	0	2	2	642
08:45 AM	**6**	411	0	417	0	0	0	0	0	209	0	209	2	0	**7**	**9**	635
Total Volume	13	1689	0	1702	0	0	0	0	0	922	2	924	5	0	17	22	2648
% App. Total	0.8	99.2	0		0	0	0		0	99.8	0.2		22.7	0	77.3		
PHF	.542	.955	.000	.956	.000	.000	.000	.000	.000	.876	.250	.872	.417	.000	.607	.611	.928
Pass Cars	12	1672	0	1684	0	0	0	0	0	907	2	909	5	0	17	22	2615
% Pass Cars	92.3	99.0	0	98.9	0	0	0	0	0	98.4	100	98.4	100	0	100	100	98.8
Single Units	1	12	0	13	0	0	0	0	0	12	0	12	0	0	0	0	25
% Single Units	7.7	0.7	0	0.8	0	0	0	0	0	1.3	0	1.3	0	0	0	0	0.9
Heavy Trucks	0	5	0	5	0	0	0	0	0	3	0	3	0	0	0	0	8
% Heavy Trucks	0	0.3	0	0.3	0	0	0	0	0	0.3	0	0.3	0	0	0	0	0.3
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

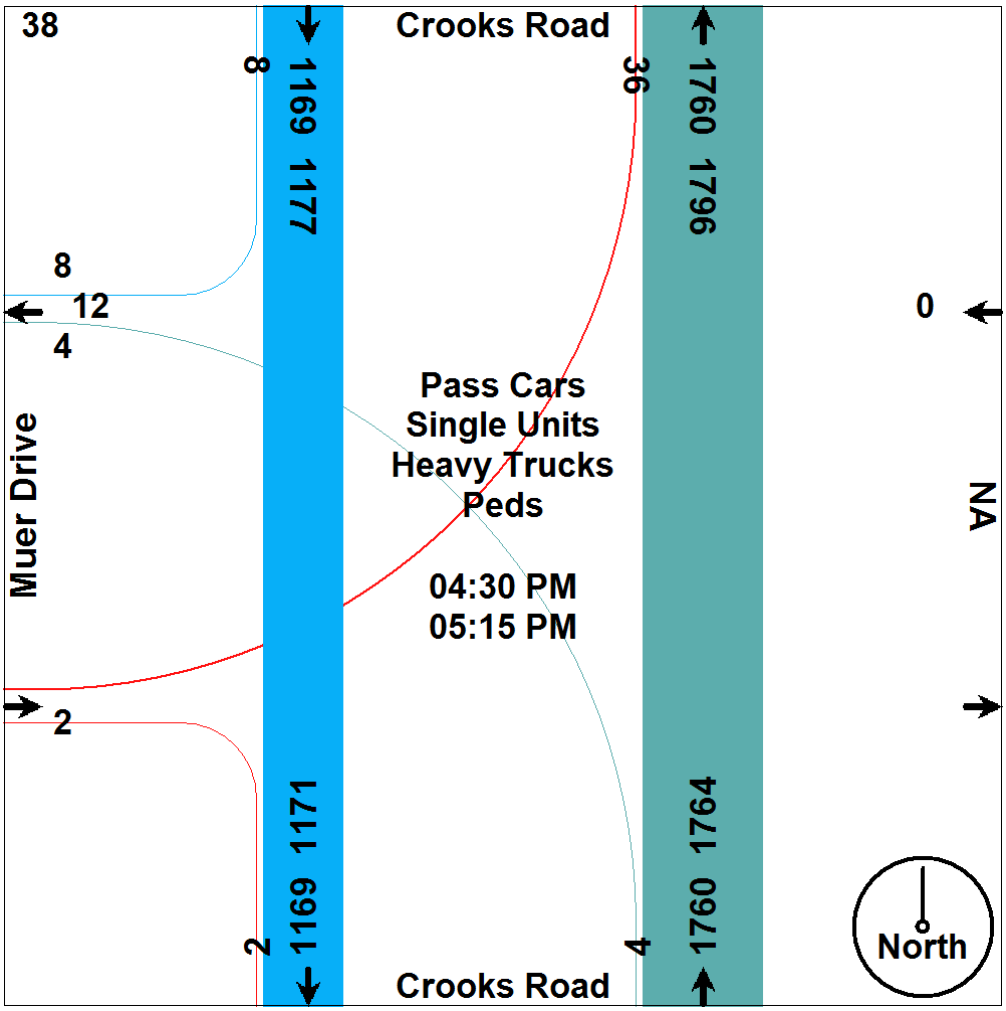
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 3CU

File Name : TMC_3 Crooks & Muer_8-23-16
Site Code : TMC_3
Start Date : 8/23/2016
Page No : 4

	Crooks Road Southbound				NA Westbound				Crooks Road Northbound				Muer Drive Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	2	270	0	272	0	0	0	0	0	427	**2**	429	**1**	0	7	8	709
04:45 PM	1	300	0	301	0	0	0	0	0	419	0	419	1	0	6	7	727
05:00 PM	**4**	**321**	0	**325**	0	0	0	0	0	**488**	2	**490**	0	0	10	10	**825**
05:15 PM	1	278	0	279	0	0	0	0	0	426	0	426	0	0	**13**	**13**	718
Total Volume	8	1169	0	1177	0	0	0	0	0	1760	4	1764	2	0	36	38	2979
% App. Total	0.7	99.3	0		0	0	0		0	99.8	0.2		5.3	0	94.7		
PHF	.500	.910	.000	.905	.000	.000	.000	.000	.000	.902	.500	.900	.500	.000	.692	.731	.903
Pass Cars	8	1158	0	1166	0	0	0	0	0	1751	4	1755	2	0	36	38	2959
% Pass Cars	100	99.1	0	99.1	0	0	0	0	0	99.5	100	99.5	100	0	100	100	99.3
Single Units	0	10	0	10	0	0	0	0	0	6	0	6	0	0	0	0	16
% Single Units	0	0.9	0	0.8	0	0	0	0	0	0.3	0	0.3	0	0	0	0	0.5
Heavy Trucks	0	1	0	1	0	0	0	0	0	3	0	3	0	0	0	0	4
% Heavy Trucks	0	0.1	0	0.1	0	0	0	0	0	0.2	0	0.2	0	0	0	0	0.1
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Clear Dry Deg's 80's
Count By: Miovision Video VCU 3CU

File Name : TMC_3 Crooks & Muer_8-23-16
Site Code : TMC_3
Start Date : 8/23/2016
Page No : 5

Aerial Photo

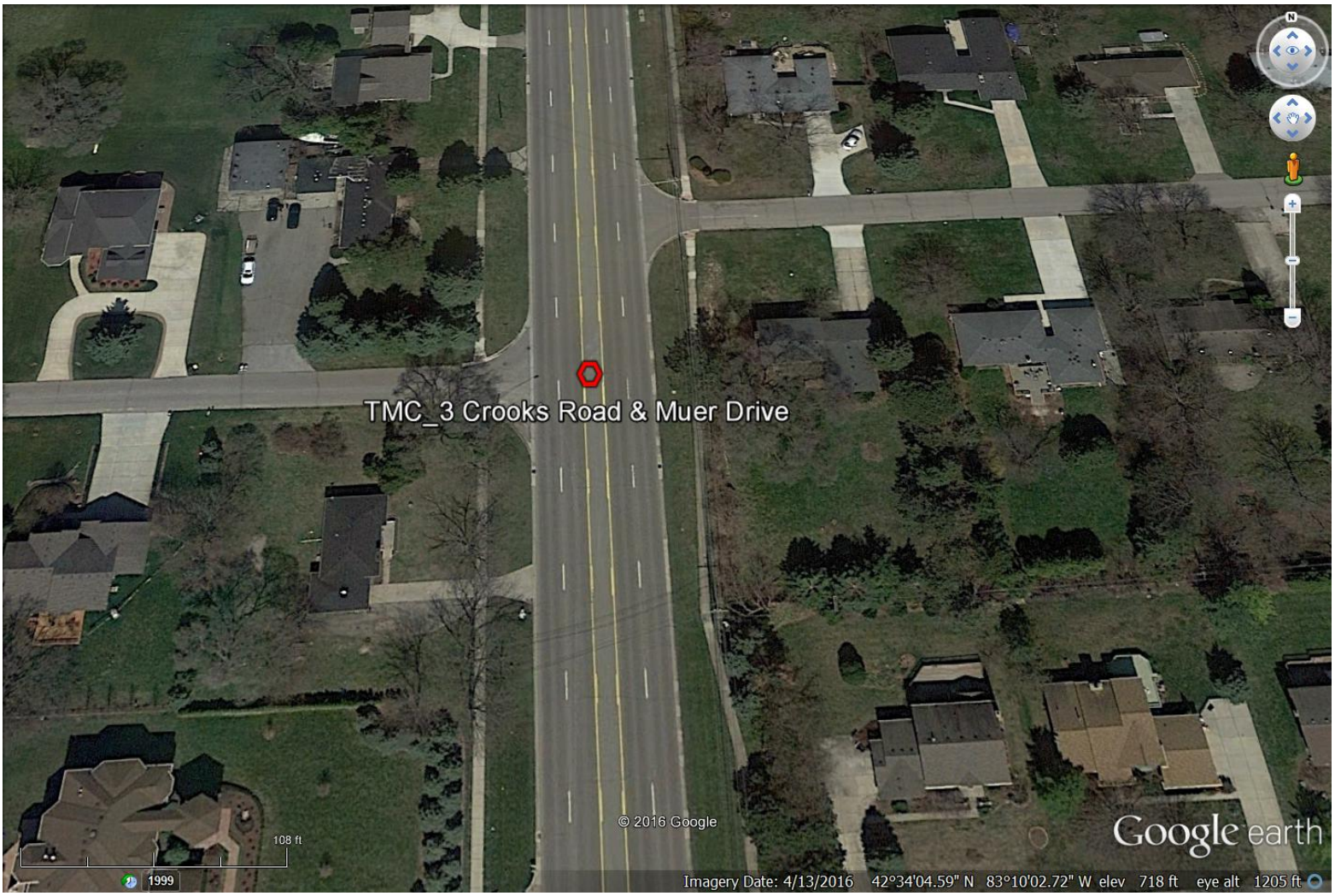


Figure B-5. Peak-Hour Volumes at Big Beaver and McClure in August 2016

Figure B-6. Peak-Hour Volumes at Big Beaver and Alpine in August 2016

Figure B-7. Peak-Hour Volumes at Crooks/Banmoor and Crooks/Muer, in August 2016

OF SEPTEMBER 14, 2016

TDC
Traffic Data Collection
www.tdccounts.com
7504 Sawgrass Drive.
Washington, MI. 48094
Phone: 589 786-5407
Fax: 248 650-1184
Cell: 248 342-3933

September 17, 2016

William A. Stimpson, P.E.
Senior Traffic Engineer
Giffels Webster
6303 26 Mile Road, Suite 100
Washington, MI 48094
(586) 781-8950 Direct
(248) 997-0845 Cell
wstimpson@giffelswebster.com

RE: Traffic Counts for City of Troy Traffic Study
Oakland County, Michigan

Bill:

Enclosed are the follow up traffic reports for the four (4) - 4 hour video classification intersection turning movement counts conducted by Traffic Data Collection, LLC for the above project. Traffic studies were conducted last Wednesday, September 14, 2016 from 7:00-9:00 AM morning & 400 PM to 6:00 PM afternoon peak hours while school was in session.

The following thru movements were recorded for the inside crossover lane for WB Big Beaver Road @ McClure Drive on 9/14/16:

7:00-7:15AM (11)	8:00-8:15AM (37)	4:00-4:15PM (36)	5:00-5:15PM (54)
7:15-7:30AM (24)	8:15-8:30AM (20)	4:15-4:30PM (25)	5:15-5:30PM (37)
7:30-7:45AM (27)	8:30-8:45AM (34)	4:30-4:45PM (44)	5:30-5:45PM (30)
7:45-8:00AM (29)	8:45-9:00AM (38)	4:45-5:00PM (27)	5:45-6:00 PM (26)

Traffic reports have been processed into 15 & 60 minute aggregate summaries with peak hours and exported into Universal Traffic Data Format (UTDF). Turning movement counts were recorded and logged with Miovision video scout cameras and video files can be provided upon request. Please contact me at (248) 342-3933 if you have any questions regarding this information, or if I can provide you with any additional processing of the electronic count data to assist you with completion of your project.

Traffic Data Collection
www.tdccounts.com
7504 Sawgrass Drive.
Washington, MI. 48094
Phone: 589 786-5407
Fax: 248 650-1184
Cell: 248 342-3933

Thank you for using our traffic services.

Marc G. Matich
Principal
MGM/dmm
Attachments: Reports

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 3EP

File Name : TMC_2 BigBeaver & McClure_9-14-16
Site Code : TMC_2
Start Date : 9/14/2016
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds

	McClure Drive Southbound					WB Big Beaver Road Westbound					NA Northbound					WB Big Beaver Road Eastbound					
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	2	0	0	0	2	0	223	0	0	223	0	0	0	0	0	0	0	0	0	0	225
07:15 AM	3	0	0	0	3	4	305	0	0	309	0	0	0	0	0	0	0	0	0	0	312
07:30 AM	4	0	0	0	4	3	303	0	0	306	0	0	0	0	0	0	0	0	0	0	310
07:45 AM	12	0	0	0	12	4	380	0	0	384	0	0	0	0	0	0	0	0	0	0	396
Total	21	0	0	0	21	11	1211	0	0	1222	0	0	0	0	0	0	0	0	0	0	1243
08:00 AM	11	0	0	0	11	2	384	0	0	386	0	0	0	0	0	0	0	0	0	0	397
08:15 AM	9	0	0	0	9	6	362	0	0	368	0	0	0	0	0	0	0	0	0	0	377
08:30 AM	11	0	0	1	12	5	367	0	0	372	0	0	0	0	0	0	0	0	0	0	384
08:45 AM	10	0	0	0	10	8	480	0	0	488	0	0	0	0	0	0	0	0	0	0	498
Total	41	0	0	1	42	21	1593	0	0	1614	0	0	0	0	0	0	0	0	0	0	1656
**** BREAK ****																					
04:00 PM	8	0	0	1	9	10	390	0	0	400	0	0	0	0	0	0	0	0	0	0	409
04:15 PM	3	0	0	0	3	4	407	0	0	411	0	0	0	0	0	0	0	0	0	0	414
04:30 PM	7	0	0	0	7	11	471	0	0	482	0	0	0	0	0	0	0	0	0	0	489
04:45 PM	7	0	0	0	7	9	437	0	0	446	0	0	0	0	0	0	0	0	0	0	453
Total	25	0	0	1	26	34	1705	0	0	1739	0	0	0	0	0	0	0	0	0	0	1765
05:00 PM	11	0	0	1	12	14	502	0	0	516	0	0	0	0	0	0	0	0	0	0	528
05:15 PM	4	0	0	0	4	7	456	0	0	463	0	0	0	0	0	0	0	0	0	0	467
05:30 PM	4	0	0	0	4	7	451	0	0	458	0	0	0	0	0	0	0	0	0	0	462
05:45 PM	7	0	0	1	8	7	452	0	0	459	0	0	0	0	0	0	0	0	0	0	467
Total	26	0	0	2	28	35	1861	0	0	1896	0	0	0	0	0	0	0	0	0	0	1924
Grand Total	113	0	0	4	117	101	6370	0	0	6471	0	0	0	0	0	0	0	0	0	0	6588
Apprch %	96.6	0	0	3.4		1.6	98.4	0	0		0	0	0	0		0	0	0	0		
Total %	1.7	0	0	0.1	1.8	1.5	96.7	0	0	98.2	0	0	0	0	0	0	0	0	0	0	
Pass Cars	112	0	0	0	112	99	6283	0	0	6382	0	0	0	0	0	0	0	0	0	0	6494
% Pass Cars	99.1	0	0	0	95.7	98	98.6	0	0	98.6	0	0	0	0	0	0	0	0	0	0	98.6
Single Units	1	0	0	0	1	2	73	0	0	75	0	0	0	0	0	0	0	0	0	0	76
% Single Units	0.9	0	0	0	0.9	2	1.1	0	0	1.2	0	0	0	0	0	0	0	0	0	0	1.2
Heavy Trucks	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	0	0	0	0	0	14
% Heavy Trucks	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0.2
Peds	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
% Peds	0	0	0	100	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1

Comments: 4 Hour video intersection turning movement traffic study conducted during typical weekday (Wednesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was in session. Non-signalized intersection. VCU video camera was located within SE intersection quadrant.

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

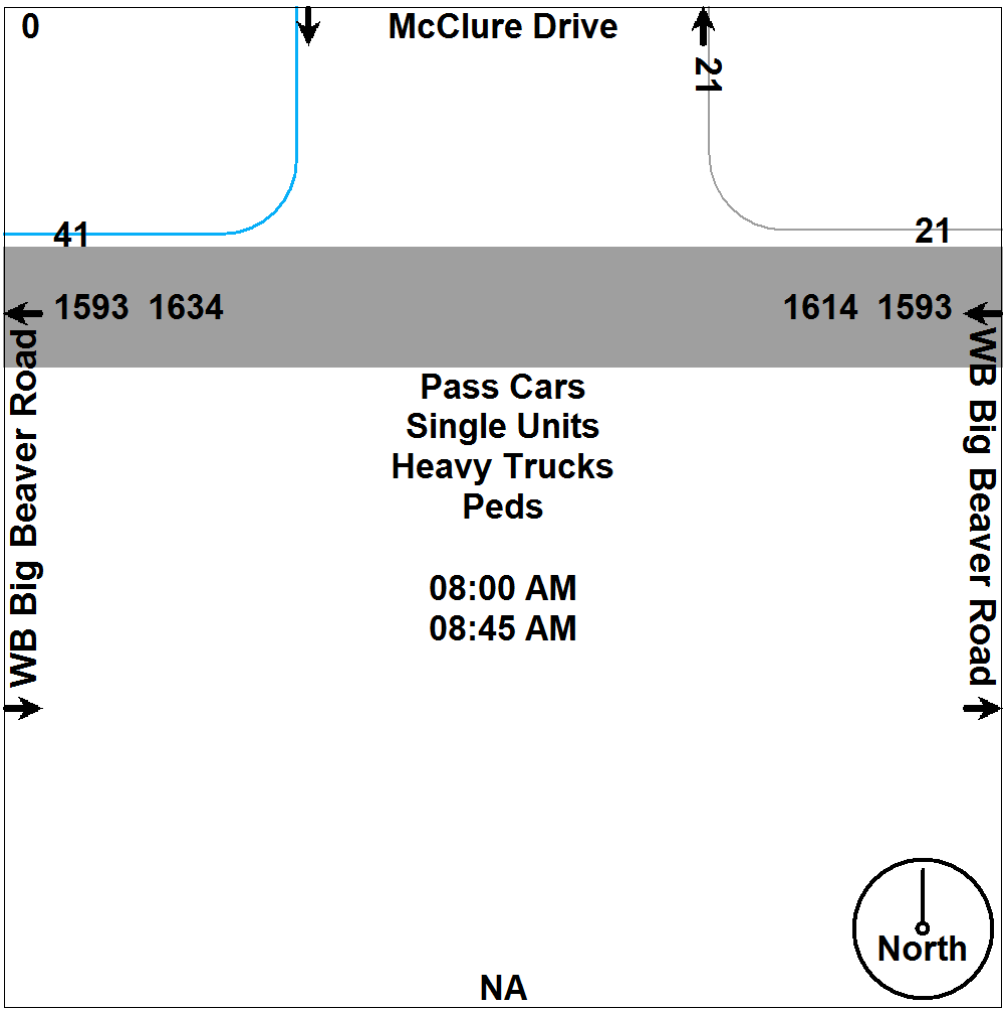
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 3EP

File Name : TMC_2 BigBeaver & McClure_9-14-16
Site Code : TMC_2
Start Date : 9/14/2016
Page No : 3

	McClure Drive Southbound				WB Big Beaver Road Westbound				NA Northbound				WB Big Beaver Road Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	**11**	0	0	**11**	2	384	0	386	0	0	0	0	0	0	0	0	397
08:15 AM	9	0	0	9	6	362	0	368	0	0	0	0	0	0	0	0	377
08:30 AM	11	0	0	11	5	367	0	372	0	0	0	0	0	0	0	0	383
08:45 AM	10	0	0	10	**8**	**480**	0	**488**	0	0	0	0	0	0	0	0	**498**
Total Volume	41	0	0	41	21	1593	0	1614	0	0	0	0	0	0	0	0	1655
% App. Total	100	0	0		1.3	98.7	0		0	0	0		0	0	0		
PHF	.932	.000	.000	.932	.656	.830	.000	.827	.000	.000	.000	.000	.000	.000	.000	.000	.831
Pass Cars	41	0	0	41	21	1563	0	1584	0	0	0	0	0	0	0	0	1625
% Pass Cars	100	0	0	100	100	98.1	0	98.1	0	0	0	0	0	0	0	0	98.2
Single Units	0	0	0	0	0	27	0	27	0	0	0	0	0	0	0	0	27
% Single Units	0	0	0	0	0	1.7	0	1.7	0	0	0	0	0	0	0	0	1.6
Heavy Trucks	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	3
% Heavy Trucks	0	0	0	0	0	0.2	0	0.2	0	0	0	0	0	0	0	0	0.2
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

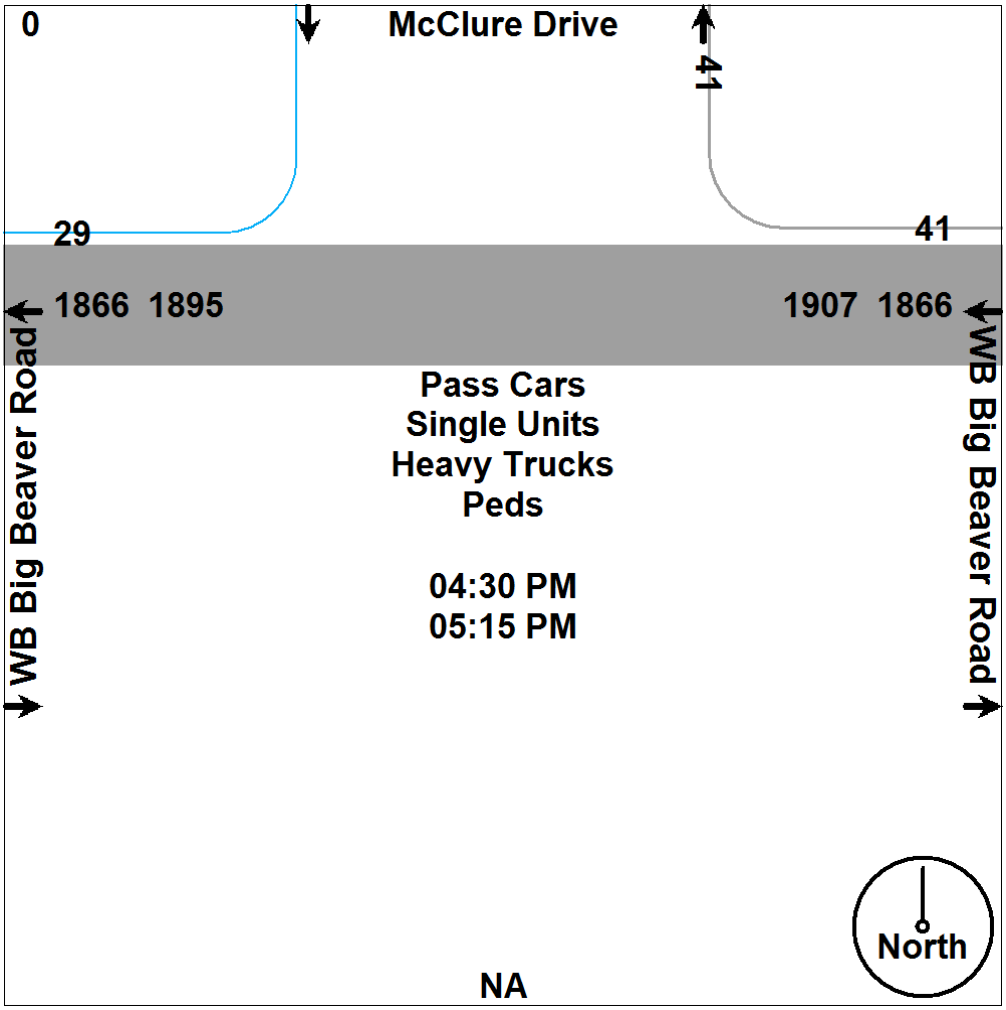
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 3EP

File Name : TMC_2 BigBeaver & McClure_9-14-16
Site Code : TMC_2
Start Date : 9/14/2016
Page No : 4

	McClure Drive Southbound				WB Big Beaver Road Westbound				NA Northbound				WB Big Beaver Road Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	7	0	0	7	11	471	0	482	0	0	0	0	0	0	0	0	489
04:45 PM	7	0	0	7	9	437	0	446	0	0	0	0	0	0	0	0	453
05:00 PM	**11**	0	0	**11**	**14**	**502**	0	**516**	0	0	0	0	0	0	0	0	**527**
05:15 PM	4	0	0	4	7	456	0	463	0	0	0	0	0	0	0	0	467
Total Volume	29	0	0	29	41	1866	0	1907	0	0	0	0	0	0	0	0	1936
% App. Total	100	0	0		2.1	97.9	0		0	0	0		0	0	0		
PHF	.659	.000	.000	.659	.732	.929	.000	.924	.000	.000	.000	.000	.000	.000	.000	.000	.918
Pass Cars	28	0	0	28	40	1849	0	1889	0	0	0	0	0	0	0	0	1917
% Pass Cars	96.6	0	0	96.6	97.6	99.1	0	99.1	0	0	0	0	0	0	0	0	99.0
Single Units	1	0	0	1	1	16	0	17	0	0	0	0	0	0	0	0	18
% Single Units	3.4	0	0	3.4	2.4	0.9	0	0.9	0	0	0	0	0	0	0	0	0.9
Heavy Trucks	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% Heavy Trucks	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0.1
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 4BT

File Name : TMC_1 BigBeaver & Alpine_9-14-16
Site Code : TMC_1
Start Date : 9/14/2016
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds

	Alpine Road Southbound					WB Big Beaver Road Westbound					NA Northbound					WB Big Beaver Road Eastbound					
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	2	0	0	0	2	3	199	0	0	202	0	0	0	0	0	0	0	0	0	0	204
07:15 AM	4	0	0	0	4	1	297	0	0	298	0	0	0	0	0	0	0	0	0	0	302
07:30 AM	8	0	0	0	8	3	258	0	0	261	0	0	0	0	0	0	0	0	0	0	269
07:45 AM	6	0	0	0	6	4	371	0	0	375	0	0	0	0	0	0	0	0	0	0	381
Total	20	0	0	0	20	11	1125	0	0	1136	0	0	0	0	0	0	0	0	0	0	1156
08:00 AM	18	0	0	0	18	0	345	0	0	345	0	0	0	0	0	0	0	0	0	0	363
08:15 AM	18	0	0	0	18	4	321	0	0	325	0	0	0	0	0	0	0	0	0	0	343
08:30 AM	11	0	0	0	11	4	377	0	0	381	0	0	0	0	0	0	0	0	0	0	392
08:45 AM	20	0	0	0	20	10	412	0	0	422	0	0	0	0	0	0	0	0	0	0	442
Total	67	0	0	0	67	18	1455	0	0	1473	0	0	0	0	0	0	0	0	0	0	1540
**** BREAK ****																					
04:00 PM	8	0	0	2	10	15	388	0	0	403	0	0	0	0	0	0	0	0	0	0	413
04:15 PM	9	0	0	0	9	7	413	0	0	420	0	0	0	0	0	0	0	0	0	0	429
04:30 PM	4	0	0	0	4	11	410	0	0	421	0	0	0	0	0	0	0	0	0	0	425
04:45 PM	10	0	0	1	11	13	436	0	0	449	0	0	0	0	0	0	0	0	1	1	461
Total	31	0	0	3	34	46	1647	0	0	1693	0	0	0	0	0	0	0	0	1	1	1728
05:00 PM	16	0	0	0	16	15	472	0	0	487	0	0	0	0	0	0	0	0	0	0	503
05:15 PM	8	0	0	0	8	14	466	0	0	480	0	0	0	0	0	0	0	0	0	0	488
05:30 PM	18	0	0	0	18	11	403	0	0	414	0	0	0	0	0	0	0	0	0	0	432
05:45 PM	5	0	0	0	5	8	462	0	0	470	0	0	0	0	0	0	0	0	0	0	475
Total	47	0	0	0	47	48	1803	0	0	1851	0	0	0	0	0	0	0	0	0	0	1898
Grand Total	165	0	0	3	168	123	6030	0	0	6153	0	0	0	0	0	0	0	0	1	1	6322
Apprch %	98.2	0	0	1.8		2	98	0	0		0	0	0	0		0	0	0	100		
Total %	2.6	0	0	0	2.7	1.9	95.4	0	0	97.3	0	0	0	0	0	0	0	0	0	0	
Pass Cars	161	0	0	0	161	121	5953	0	0	6074	0	0	0	0	0	0	0	0	0	0	6235
% Pass Cars	97.6	0	0	0	95.8	98.4	98.7	0	0	98.7	0	0	0	0	0	0	0	0	0	0	98.6
Single Units	3	0	0	0	3	1	65	0	0	66	0	0	0	0	0	0	0	0	0	0	69
% Single Units	1.8	0	0	0	1.8	0.8	1.1	0	0	1.1	0	0	0	0	0	0	0	0	0	0	1.1
Heavy Trucks	1	0	0	0	1	1	12	0	0	13	0	0	0	0	0	0	0	0	0	0	14
% Heavy Trucks	0.6	0	0	0	0.6	0.8	0.2	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0.2
Peds	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4
% Peds	0	0	0	100	1.8	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0.1

Comments: 4 Hour video intersection turning movement traffic study conducted during typical weekday (Wednesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was in session. Non-signalized intersection. VCU video camera was located within NE intersection quadrant.

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

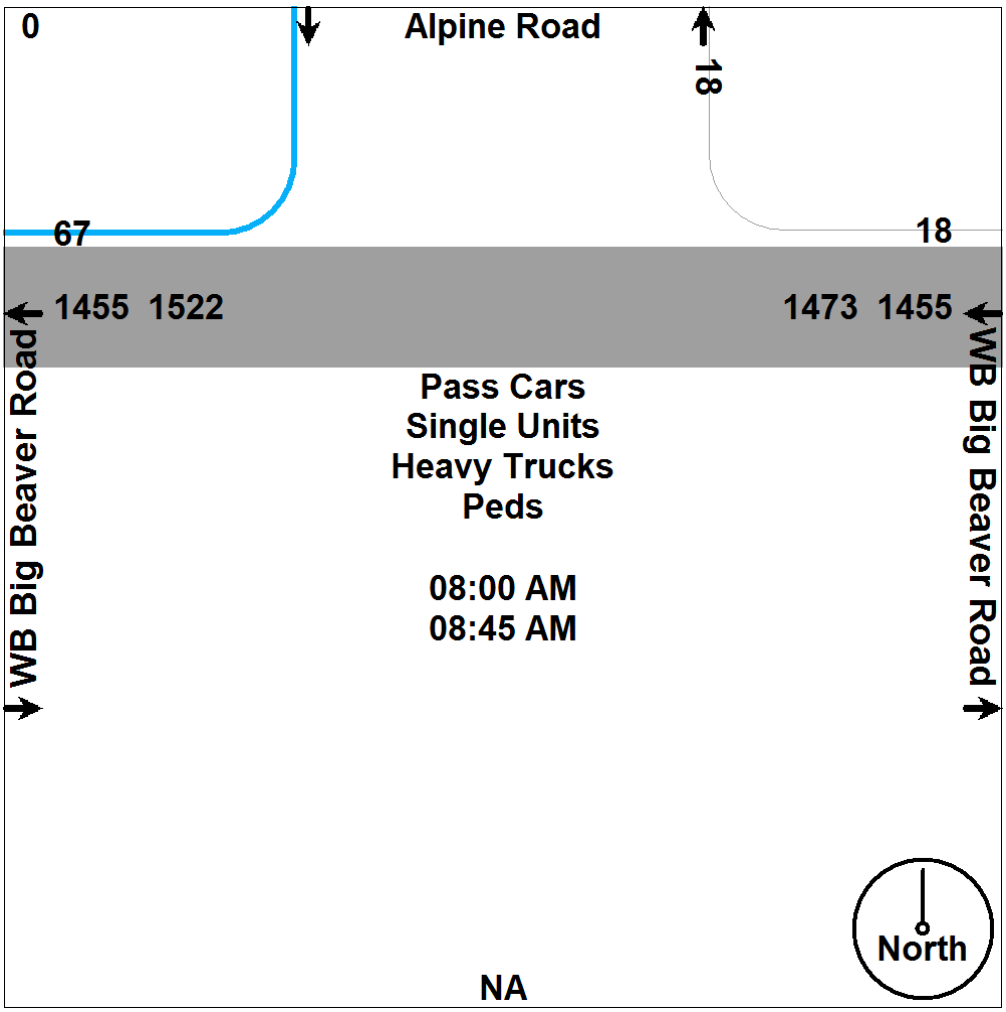
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 4BT

File Name : TMC_1 BigBeaver & Alpine_9-14-16
Site Code : TMC_1
Start Date : 9/14/2016
Page No : 3

	Alpine Road Southbound				WB Big Beaver Road Westbound				NA Northbound				WB Big Beaver Road Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	18	0	0	18	0	345	0	345	0	0	0	0	0	0	0	0	363
08:15 AM	18	0	0	18	4	321	0	325	0	0	0	0	0	0	0	0	343
08:30 AM	11	0	0	11	4	377	0	381	0	0	0	0	0	0	0	0	392
08:45 AM	**20**	0	0	**20**	**10**	**412**	0	**422**	0	0	0	0	0	0	0	0	**442**
Total Volume	67	0	0	67	18	1455	0	1473	0	0	0	0	0	0	0	0	1540
% App. Total	100	0	0		1.2	98.8	0		0	0	0		0	0	0		
PHF	.838	.000	.000	.838	.450	.883	.000	.873	.000	.000	.000	.000	.000	.000	.000	.000	.871
Pass Cars	66	0	0	66	17	1428	0	1445	0	0	0	0	0	0	0	0	1511
% Pass Cars	98.5	0	0	98.5	94.4	98.1	0	98.1	0	0	0	0	0	0	0	0	98.1
Single Units	1	0	0	1	1	26	0	27	0	0	0	0	0	0	0	0	28
% Single Units	1.5	0	0	1.5	5.6	1.8	0	1.8	0	0	0	0	0	0	0	0	1.8
Heavy Trucks	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% Heavy Trucks	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0.1
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

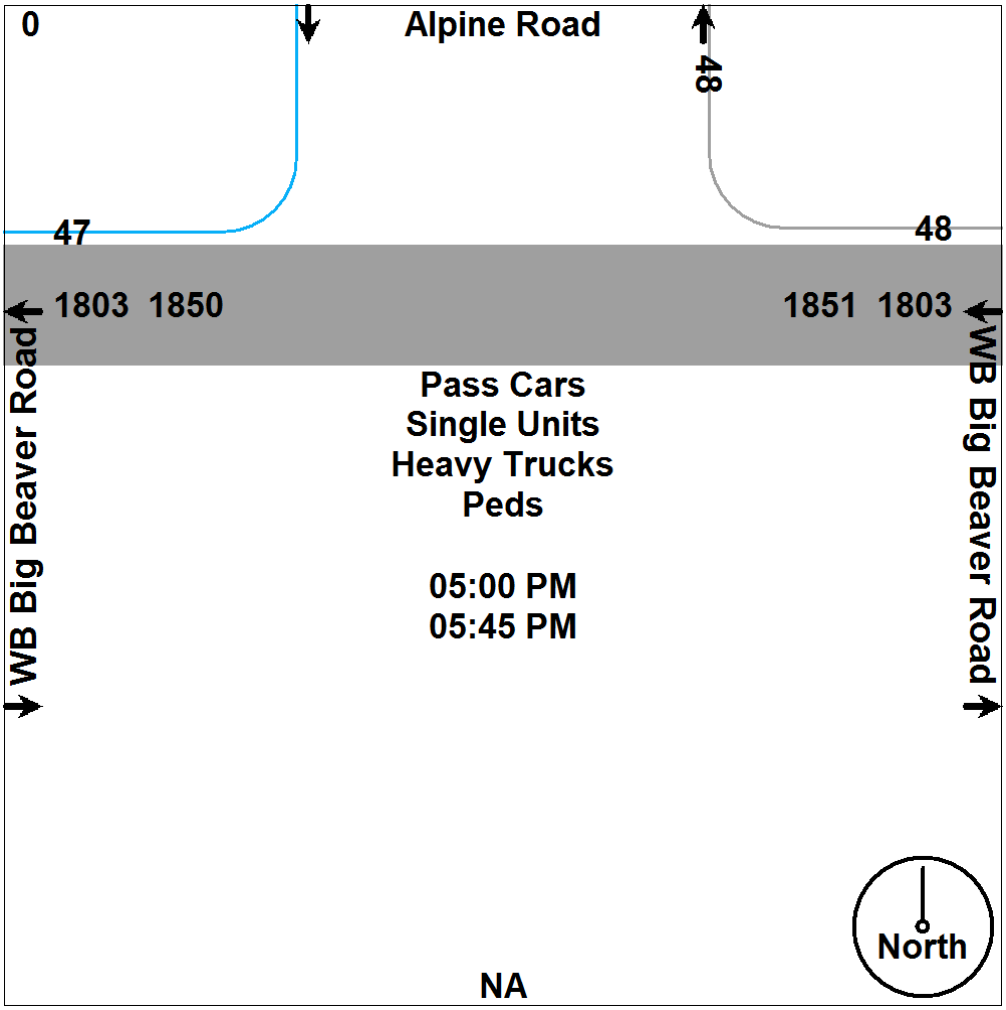
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 4BT

File Name : TMC_1 BigBeaver & Alpine_9-14-16
Site Code : TMC_1
Start Date : 9/14/2016
Page No : 4

	Alpine Road Southbound				WB Big Beaver Road Westbound				NA Northbound				WB Big Beaver Road Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	16	0	0	16	**15**	**472**	0	**487**	0	0	0	0	0	0	0	0	**503**
05:15 PM	8	0	0	8	14	466	0	480	0	0	0	0	0	0	0	0	488
05:30 PM	**18**	0	0	**18**	11	403	0	414	0	0	0	0	0	0	0	0	432
05:45 PM	5	0	0	5	8	462	0	470	0	0	0	0	0	0	0	0	475
Total Volume	47	0	0	47	48	1803	0	1851	0	0	0	0	0	0	0	0	1898
% App. Total	100	0	0		2.6	97.4	0		0	0	0		0	0	0		
PHF	.653	.000	.000	.653	.800	.955	.000	.950	.000	.000	.000	.000	.000	.000	.000	.000	.943
Pass Cars	47	0	0	47	48	1789	0	1837	0	0	0	0	0	0	0	0	1884
% Pass Cars	100	0	0	100	100	99.2	0	99.2	0	0	0	0	0	0	0	0	99.3
Single Units	0	0	0	0	0	13	0	13	0	0	0	0	0	0	0	0	13
% Single Units	0	0	0	0	0	0.7	0	0.7	0	0	0	0	0	0	0	0	0.7
Heavy Trucks	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% Heavy Trucks	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0.1
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 3CU

File Name : TMC_4 Crooks & Banmoor_9-14-16
Site Code : TMC_4
Start Date : 9/14/2016
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds

	Crooks Road Southbound					NA Westbound					Crooks Road Northbound					Banmoor Drive Eastbound					
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	295	0	0	296	0	0	0	0	0	0	132	0	0	132	2	0	1	0	3	431
07:15 AM	2	396	0	0	398	0	0	0	0	0	0	164	0	0	164	0	0	1	0	1	563
07:30 AM	2	381	0	0	383	0	0	0	0	0	0	217	0	0	217	0	0	1	1	2	602
07:45 AM	2	422	0	0	424	0	0	0	0	0	0	224	1	0	225	0	0	1	0	1	650
Total	7	1494	0	0	1501	0	0	0	0	0	0	737	1	0	738	2	0	4	1	7	2246
08:00 AM	1	443	0	0	444	0	0	0	0	0	0	246	1	0	247	0	0	1	0	1	692
08:15 AM	3	430	0	0	433	0	0	0	0	0	0	246	1	0	247	3	0	0	0	3	683
08:30 AM	3	429	0	0	432	0	0	0	0	0	0	234	0	0	234	2	0	1	0	3	669
08:45 AM	4	369	0	0	373	0	0	0	0	0	0	203	1	0	204	4	0	3	0	7	584
Total	11	1671	0	0	1682	0	0	0	0	0	0	929	3	0	932	9	0	5	0	14	2628
**** BREAK ****																					
04:00 PM	1	218	0	0	219	0	0	0	0	0	0	436	1	0	437	1	0	2	0	3	659
04:15 PM	1	256	0	0	257	0	0	0	0	0	0	410	4	0	414	2	0	2	0	4	675
04:30 PM	3	257	0	0	260	0	0	0	0	0	0	474	1	0	475	2	0	5	0	7	742
04:45 PM	1	300	0	0	301	0	0	0	0	0	0	433	3	0	436	4	0	5	0	9	746
Total	6	1031	0	0	1037	0	0	0	0	0	0	1753	9	0	1762	9	0	14	0	23	2822
05:00 PM	1	318	0	0	319	0	0	0	0	0	0	465	1	0	466	3	0	6	0	9	794
05:15 PM	3	304	0	0	307	0	0	0	0	0	0	469	3	0	472	4	0	6	0	10	789
05:30 PM	1	321	0	0	322	0	0	0	0	0	0	434	3	0	437	1	0	2	0	3	762
05:45 PM	2	229	0	0	231	0	0	0	0	0	0	365	0	0	365	2	0	4	0	6	602
Total	7	1172	0	0	1179	0	0	0	0	0	0	1733	7	0	1740	10	0	18	0	28	2947
Grand Total	31	5368	0	0	5399	0	0	0	0	0	0	5152	20	0	5172	30	0	41	1	72	10643
Apprch %	0.6	99.4	0	0		0	0	0	0		0	99.6	0.4	0		41.7	0	56.9	1.4		
Total %	0.3	50.4	0	0	50.7	0	0	0	0	0	0	48.4	0.2	0	48.6	0.3	0	0.4	0	0.7	
Pass Cars	30	5294	0	0	5324	0	0	0	0	0	0	5087	20	0	5107	30	0	40	0	70	10501
% Pass Cars	96.8	98.6	0	0	98.6	0	0	0	0	0	0	98.7	100	0	98.7	100	0	97.6	0	97.2	98.7
Single Units	1	62	0	0	63	0	0	0	0	0	0	47	0	0	47	0	0	1	0	1	111
% Single Units	3.2	1.2	0	0	1.2	0	0	0	0	0	0	0.9	0	0	0.9	0	0	2.4	0	1.4	1
Heavy Trucks	0	12	0	0	12	0	0	0	0	0	0	18	0	0	18	0	0	0	0	0	30
% Heavy Trucks	0	0.2	0	0	0.2	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.3
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	1.4	0

Comments: 4 Hour video intersection turning movement traffic study conducted during typical weekday (Wednesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was in session. Non-signalized intersection. VCU video camera was located within SW intersection quadrant.

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

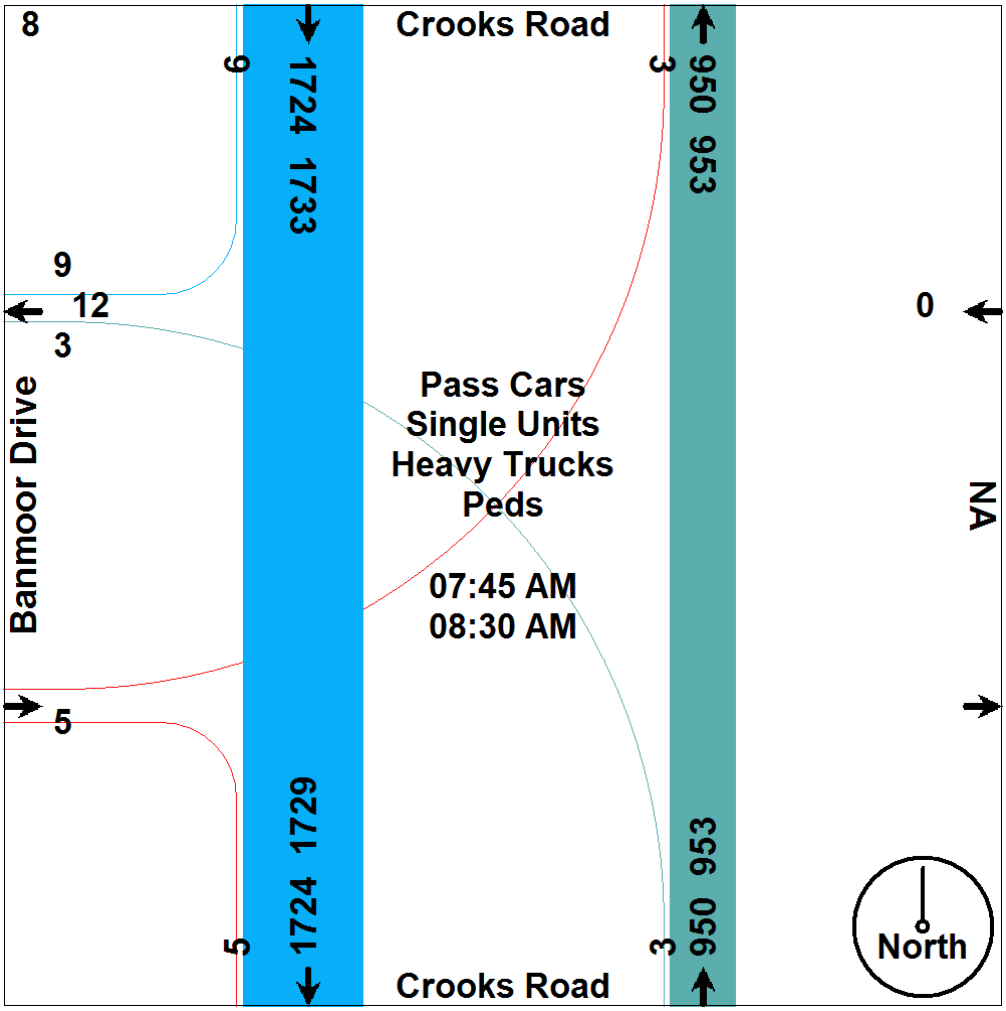
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 3CU

File Name : TMC_4 Crooks & Banmoor_9-14-16
Site Code : TMC_4
Start Date : 9/14/2016
Page No : 3

	Crooks Road Southbound				NA Westbound				Crooks Road Northbound				Banmoor Drive Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	2	422	0	424	0	0	0	0	0	224	**1**	225	0	0	**1**	1	650
08:00 AM	1	**443**	0	**444**	0	0	0	0	0	**246**	1	**247**	0	0	1	1	**692**
08:15 AM	**3**	430	0	433	0	0	0	0	0	246	1	247	**3**	0	0	**3**	683
08:30 AM	3	429	0	432	0	0	0	0	0	234	0	234	2	0	1	3	669
Total Volume	9	1724	0	1733	0	0	0	0	0	950	3	953	5	0	3	8	2694
% App. Total	0.5	99.5	0		0	0	0		0	99.7	0.3		62.5	0	37.5		
PHF	.750	.973	.000	.976	.000	.000	.000	.000	.000	.965	.750	.965	.417	.000	.750	.667	.973
Pass Cars	9	1705	0	1714	0	0	0	0	0	927	3	930	5	0	3	8	2652
% Pass Cars	100	98.9	0	98.9	0	0	0	0	0	97.6	100	97.6	100	0	100	100	98.4
Single Units	0	18	0	18	0	0	0	0	0	17	0	17	0	0	0	0	35
% Single Units	0	1.0	0	1.0	0	0	0	0	0	1.8	0	1.8	0	0	0	0	1.3
Heavy Trucks	0	1	0	1	0	0	0	0	0	6	0	6	0	0	0	0	7
% Heavy Trucks	0	0.1	0	0.1	0	0	0	0	0	0.6	0	0.6	0	0	0	0	0.3
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

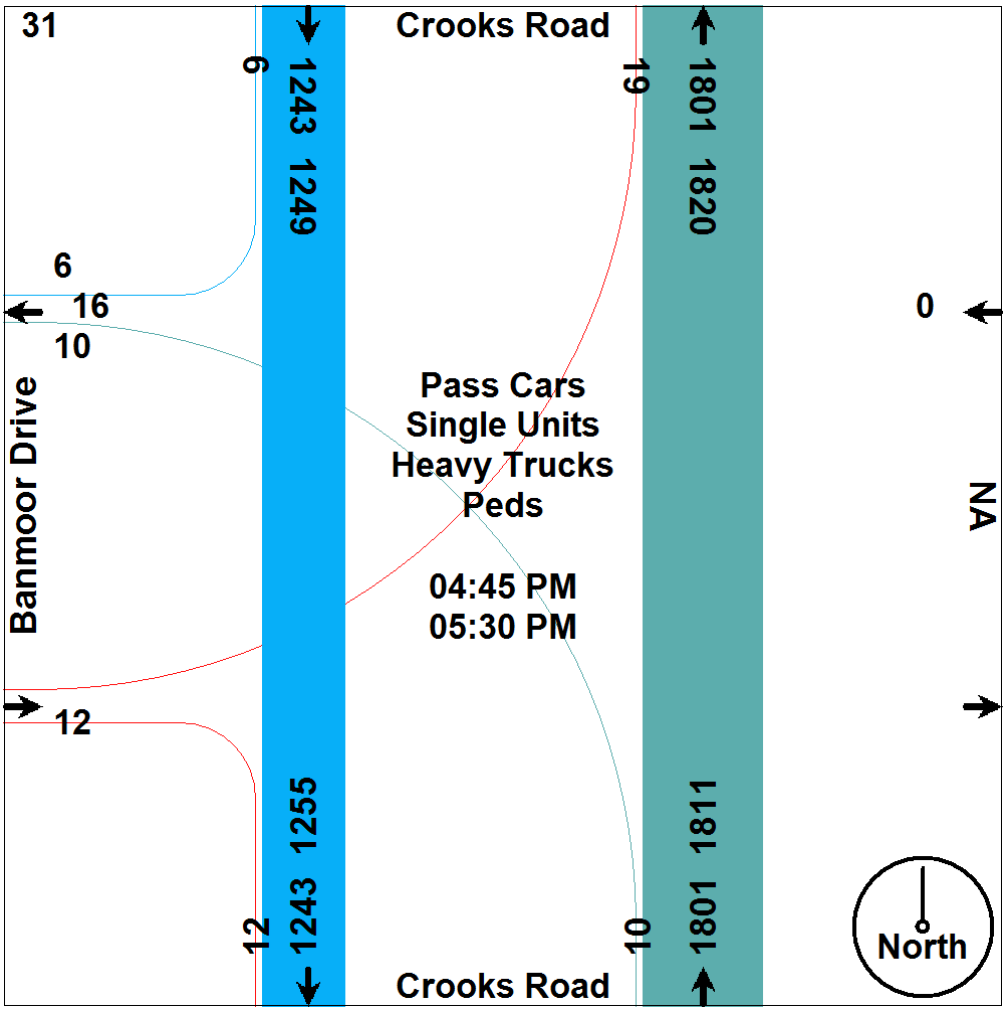
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 3CU

File Name : TMC_4 Crooks & Banmoor_9-14-16
Site Code : TMC_4
Start Date : 9/14/2016
Page No : 4

	Crooks Road Southbound				NA Westbound				Crooks Road Northbound				Banmoor Drive Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	1	300	0	301	0	0	0	0	0	433	**3**	436	**4**	0	5	9	746
05:00 PM	1	318	0	319	0	0	0	0	0	465	1	466	3	0	**6**	9	**794**
05:15 PM	**3**	304	0	307	0	0	0	0	0	**469**	3	**472**	4	0	6	**10**	789
05:30 PM	1	**321**	0	**322**	0	0	0	0	0	434	3	437	1	0	2	3	762
Total Volume	6	1243	0	1249	0	0	0	0	0	1801	10	1811	12	0	19	31	3091
% App. Total	0.5	99.5	0		0	0	0		0	99.4	0.6		38.7	0	61.3		
PHF	.500	.968	.000	.970	.000	.000	.000	.000	.000	.960	.833	.959	.750	.000	.792	.775	.973
Pass Cars	5	1229	0	1234	0	0	0	0	0	1794	10	1804	12	0	19	31	3069
% Pass Cars	83.3	98.9	0	98.8	0	0	0	0	0	99.6	100	99.6	100	0	100	100	99.3
Single Units	1	11	0	12	0	0	0	0	0	6	0	6	0	0	0	0	18
% Single Units	16.7	0.9	0	1.0	0	0	0	0	0	0.3	0	0.3	0	0	0	0	0.6
Heavy Trucks	0	3	0	3	0	0	0	0	0	1	0	1	0	0	0	0	4
% Heavy Trucks	0	0.2	0	0.2	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0.1
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 34O

File Name : TMC_3 Crooks & Muer_9-14-16
Site Code : TMC_3
Start Date : 9/14/2016
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds

	Crooks Road Southbound					NA Westbound					Crooks Road Northbound					Muer Drive Eastbound					
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	293	0	0	293	0	0	0	0	0	0	136	1	0	137	1	0	2	0	3	433
07:15 AM	1	393	0	0	394	0	0	0	0	0	0	157	0	0	157	2	0	3	0	5	556
07:30 AM	6	381	0	0	387	0	0	0	0	0	0	224	3	0	227	1	0	6	0	7	621
07:45 AM	13	449	0	0	462	0	0	0	0	0	0	232	0	0	232	3	0	2	0	5	699
Total	20	1516	0	0	1536	0	0	0	0	0	0	749	4	0	753	7	0	13	0	20	2309
08:00 AM	7	414	0	0	421	0	0	0	0	0	0	246	2	0	248	2	0	6	0	8	677
08:15 AM	11	427	0	0	438	0	0	0	0	0	0	248	0	0	248	3	0	7	0	10	696
08:30 AM	12	436	0	0	448	0	0	0	0	0	0	237	1	0	238	0	0	3	0	3	689
08:45 AM	12	352	0	0	364	0	0	0	0	0	0	198	3	0	201	3	0	2	0	5	570
Total	42	1629	0	0	1671	0	0	0	0	0	0	929	6	0	935	8	0	18	0	26	2632
**** BREAK ****																					
04:00 PM	1	219	0	0	220	0	0	0	0	0	0	437	3	0	440	1	0	10	0	11	671
04:15 PM	1	258	0	0	259	0	0	0	0	0	0	395	5	0	400	1	0	6	0	7	666
04:30 PM	3	257	0	0	260	0	0	0	0	0	0	494	1	0	495	2	0	7	0	9	764
04:45 PM	3	296	0	0	299	0	0	0	0	0	0	418	2	0	420	4	0	7	0	11	730
Total	8	1030	0	0	1038	0	0	0	0	0	0	1744	11	0	1755	8	0	30	0	38	2831
05:00 PM	1	318	0	0	319	0	0	0	0	0	0	470	1	0	471	1	0	9	0	10	800
05:15 PM	3	310	0	0	313	0	0	0	0	0	0	468	1	0	469	3	0	4	0	7	789
05:30 PM	9	321	0	0	330	0	0	0	0	0	0	438	0	0	438	3	0	8	0	11	779
05:45 PM	1	226	0	0	227	0	0	0	0	0	0	357	2	0	359	0	0	2	0	2	588
Total	14	1175	0	0	1189	0	0	0	0	0	0	1733	4	0	1737	7	0	23	0	30	2956
Grand Total	84	5350	0	0	5434	0	0	0	0	0	0	5155	25	0	5180	30	0	84	0	114	10728
Apprch %	1.5	98.5	0	0		0	0	0	0		0	99.5	0.5	0		26.3	0	73.7	0		
Total %	0.8	49.9	0	0	50.7	0	0	0	0	0	0	48.1	0.2	0	48.3	0.3	0	0.8	0	1.1	
Pass Cars	84	5270	0	0	5354	0	0	0	0	0	0	5080	25	0	5105	27	0	83	0	110	10569
% Pass Cars	100	98.5	0	0	98.5	0	0	0	0	0	0	98.5	100	0	98.6	90	0	98.8	0	96.5	98.5
Single Units	0	70	0	0	70	0	0	0	0	0	0	56	0	0	56	3	0	1	0	4	130
% Single Units	0	1.3	0	0	1.3	0	0	0	0	0	0	1.1	0	0	1.1	10	0	1.2	0	3.5	1.2
Heavy Trucks	0	10	0	0	10	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	29
% Heavy Trucks	0	0.2	0	0	0.2	0	0	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0.3
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments: 4 Hour video intersection turning movement traffic study conducted during typical weekday (Wednesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was in session. Non-signalized intersection. VCU video camera was located within SW intersection quadrant.

Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

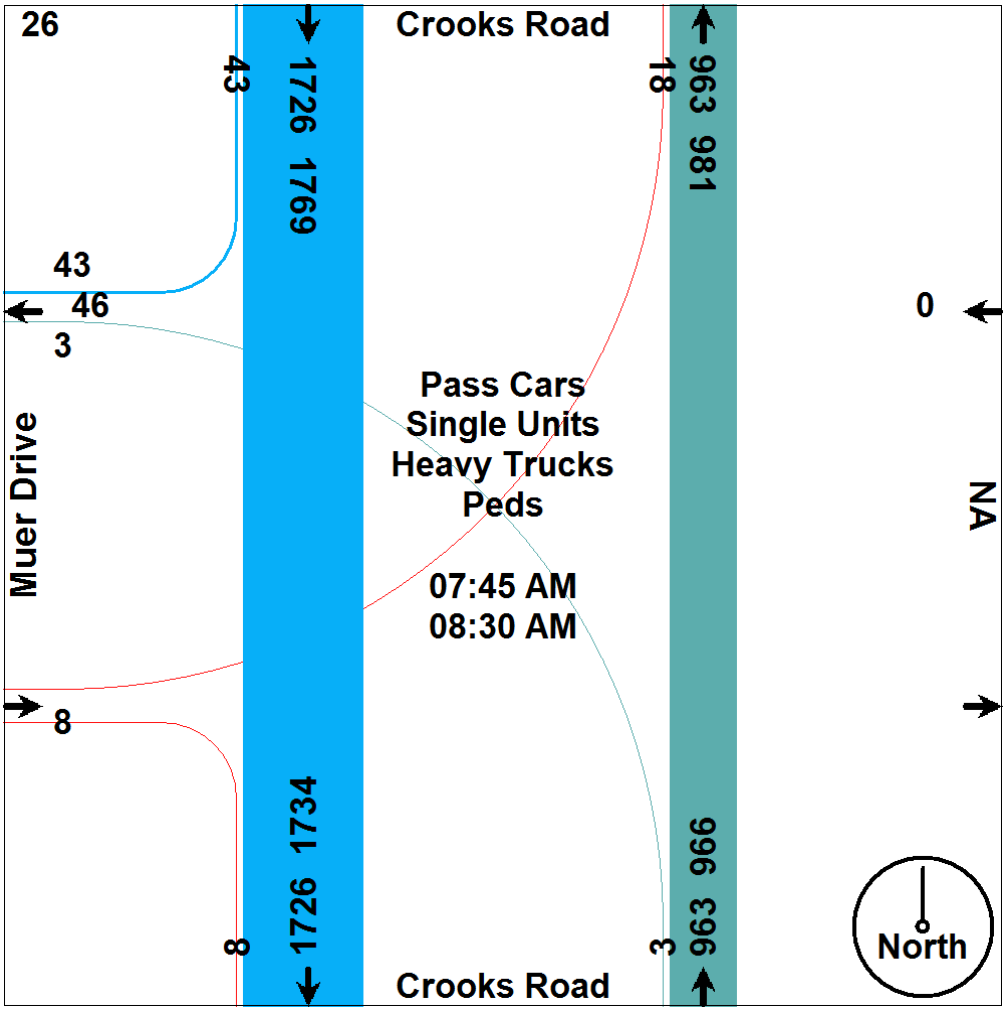
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 34O

File Name : TMC_3 Crooks & Muer_9-14-16
Site Code : TMC_3
Start Date : 9/14/2016
Page No : 3

	Crooks Road Southbound				NA Westbound				Crooks Road Northbound				Muer Drive Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**13**	**449**	0	**462**	0	0	0	0	0	232	0	232	**3**	0	2	5	**699**
08:00 AM	7	414	0	421	0	0	0	0	0	246	**2**	**248**	2	0	6	8	677
08:15 AM	11	427	0	438	0	0	0	0	0	**248**	0	248	3	0	**7**	**10**	696
08:30 AM	12	436	0	448	0	0	0	0	0	237	1	238	0	0	3	3	689
Total Volume	43	1726	0	1769	0	0	0	0	0	963	3	966	8	0	18	26	2761
% App. Total	2.4	97.6	0		0	0	0		0	99.7	0.3		30.8	0	69.2		
PHF	.827	.961	.000	.957	.000	.000	.000	.000	.000	.971	.375	.974	.667	.000	.643	.650	.987
Pass Cars	43	1704	0	1747	0	0	0	0	0	938	3	941	5	0	18	23	2711
% Pass Cars	100	98.7	0	98.8	0	0	0	0	0	97.4	100	97.4	62.5	0	100	88.5	98.2
Single Units	0	19	0	19	0	0	0	0	0	19	0	19	3	0	0	3	41
% Single Units	0	1.1	0	1.1	0	0	0	0	0	2.0	0	2.0	37.5	0	0	11.5	1.5
Heavy Trucks	0	3	0	3	0	0	0	0	0	6	0	6	0	0	0	0	9
% Heavy Trucks	0	0.2	0	0.2	0	0	0	0	0	0.6	0	0.6	0	0	0	0	0.3
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

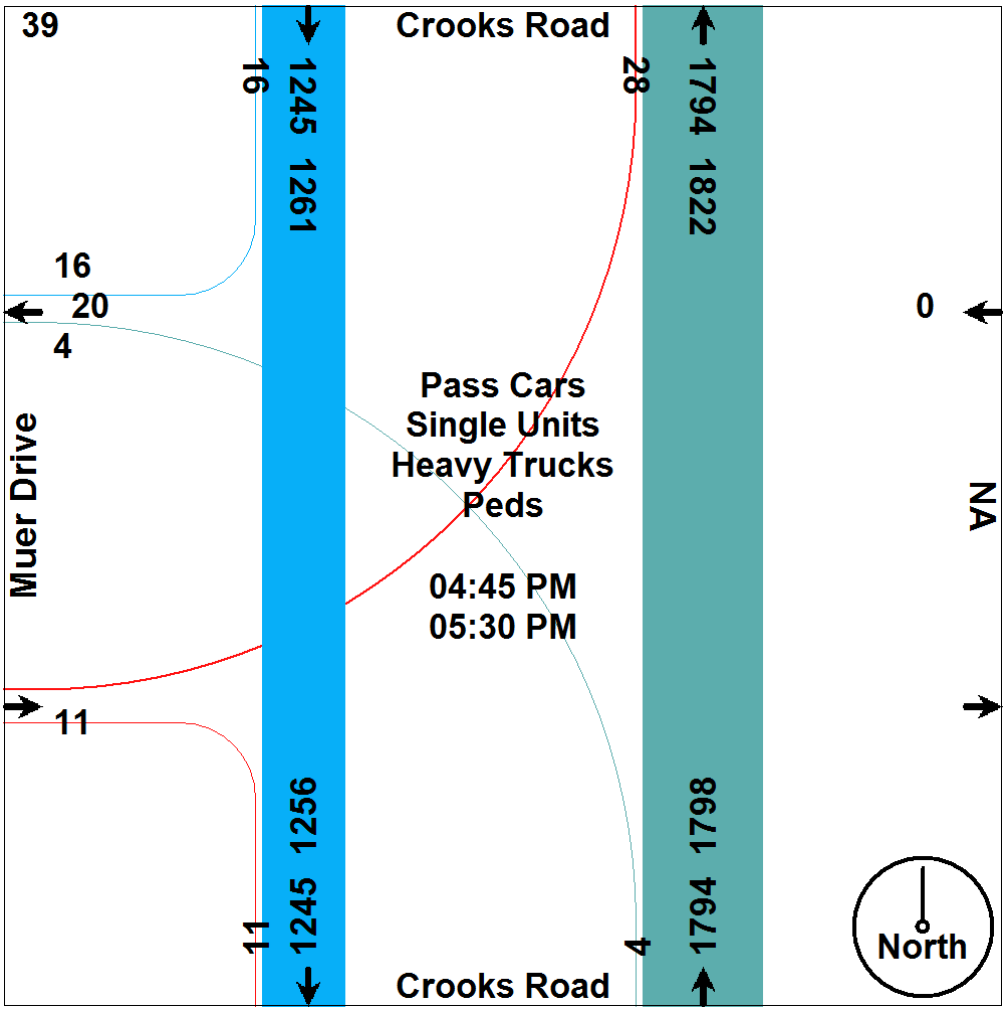
Traffic Study Performed For:

Giffels Webster

Project: City of Troy Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather: Rain AM/Pt.Cldy. PM Deg's 80's
Count By: Miovision Video VCU 34O

File Name : TMC_3 Crooks & Muer_9-14-16
Site Code : TMC_3
Start Date : 9/14/2016
Page No : 4

	Crooks Road Southbound				NA Westbound				Crooks Road Northbound				Muer Drive Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	3	296	0	299	0	0	0	0	0	418	**2**	420	**4**	0	7	**11**	730
05:00 PM	1	318	0	319	0	0	0	0	0	**470**	1	**471**	1	0	**9**	10	**800**
05:15 PM	3	310	0	313	0	0	0	0	0	468	1	469	3	0	4	7	789
05:30 PM	**9**	**321**	0	**330**	0	0	0	0	0	438	0	438	3	0	8	11	779
Total Volume	16	1245	0	1261	0	0	0	0	0	1794	4	1798	11	0	28	39	3098
% App. Total	1.3	98.7	0		0	0	0		0	99.8	0.2		28.2	0	71.8		
PHF	.444	.970	.000	.955	.000	.000	.000	.000	.000	.954	.500	.954	.688	.000	.778	.886	.968
Pass Cars	16	1230	0	1246	0	0	0	0	0	1783	4	1787	11	0	28	39	3072
% Pass Cars	100	98.8	0	98.8	0	0	0	0	0	99.4	100	99.4	100	0	100	100	99.2
Single Units	0	13	0	13	0	0	0	0	0	9	0	9	0	0	0	0	22
% Single Units	0	1.0	0	1.0	0	0	0	0	0	0.5	0	0.5	0	0	0	0	0.7
Heavy Trucks	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
% Heavy Trucks	0	0.2	0	0.2	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0.1
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



GW COUNTS

McCLURE ROAD APARTMENTS TRAFFIC IMPACT STUDY
AM Turning-Movement Count for Intersection of McClure and Sachin
Tuesday, September 13, 2016

Cumulative Turning-Movement Counts

15 Minutes Ending	EB Sachin		NB McClure		SB McClure		Total
	LT	RT	LT	TH	TH	RT	
7:15	1	1	0	0	6	2	10
7:30	1	1	0	0	8	2	12
7:45	2	1	0	0	12	4	19
8:00	2	1	0	1	21	4	29
8:15	3	2	0	2	32	4	43
8:30	4	3	0	4	39	4	54
8:45	4	4	0	7	49	6	70
9:00	5	4	0	8	67	7	91

Turning-Movement Counts by 15-Minute Interval

15 Minutes Ending	EB Sachin		NB McClure		SB McClure		Total
	LT	RT	LT	TH	TH	RT	
7:15	1	1	0	0	6	2	10
7:30	0	0	0	0	2	0	2
7:45	1	0	0	0	4	2	7
8:00	0	0	0	1	9	0	10
8:15	1	1	0	1	11	0	14
8:30	1	1	0	2	7	0	11
8:45	0	1	0	3	10	2	16
9:00	1	0	0	1	18	1	21
TOTAL	5	4	0	8	67	7	91

Hourly Total

Hour Beginning	EB Sachin		NB McClure		SB McClure		Total
	LT	RT	LT	TH	TH	RT	
7:00	2	1	0	1	21	4	29
7:15	2	1	0	2	26	2	33
7:30	3	2	0	4	31	2	42
7:45	2	3	0	7	37	2	51
8:00	3	3	0	7	46	3	62

AM Peak Hour[1]

Hour Beginning	EB Sachin		NB McClure		SB McClure		Total
	LT	RT	LT	TH	TH	RT	
8:00	**3**	**3**	**0**	**7**	**46**	**3**	**62**
PHF (Peak-Hour Factor)	0.75	0.75	-	0.58	0.64	0.38	0.74
	0.75		0.58		0.64		

[1] 8:00-9:00 also determined (by TDC) to be the peak hour for McClure and Big Beaver.

McCLURE ROAD APARTMENTS TRAFFIC IMPACT STUDY
PM Turning-Movement Count for Intersection of McClure and Sachin
Tuesday, September 13, 2016

Cumulative Turning-Movement Counts

15 Minutes Ending	EB Sachin		NB McClure		SB McClure		Total
	LT	RT	LT	TH	TH	RT	
4:15	0	0	0	7	0	0	7
4:30	1	2	0	15	1	2	21
4:45	2	2	0	23	1	3	31
5:00	3	2	0	30	6	4	45
5:15	3	2	0	54	7	5	71
5:30	3	2	0	64	8	5	82
5:45	3	2	0	78	10	5	98
6:00	3	2	0	83	11	5	104

Turning-Movement Counts by 15-Minute Interval

15 Minutes Ending	EB Sachin		NB McClure		SB McClure		Total
	LT	RT	LT	TH	TH	RT	
4:15	0	0	0	7	0	0	7
4:30	1	2	0	8	1	2	14
4:45	1	0	0	8	0	1	10
5:00	1	0	0	7	5	1	14
5:15	0	0	0	24	1	1	26
5:30	0	0	0	10	1	0	11
5:45	0	0	0	14	2	0	16
6:00	0	0	0	5	1	0	6
TOTAL	3	2	0	83	11	5	104

Hourly Total

Hour Beginning	EB Sachin		NB McClure		SB McClure		Total
	LT	RT	LT	TH	TH	RT	
4:00	3	2	0	30	6	4	45
4:15	3	2	0	47	7	5	64
4:30	2	0	0	49	7	3	61
4:45	1	0	0	55	9	2	67
5:00	0	0	0	53	5	1	59

PM Peak Hour[1]

Hour Beginning	EB Sachin		NB McClure		SB McClure		Total
	LT	RT	LT	TH	TH	RT	
4:45	**1**	**0**	**0**	**55**	**9**	**2**	**67**
PHF (Peak-Hour Factor)	0.25	-	-	0.57	0.45	0.50	0.64
	0.25		0.57		0.46		

[1] TDC determined the peak hour (in September) at McClure and Big Beaver to be 4:30-5:30.

McCLURE ROAD APARTMENTS TRAFFIC IMPACT STUDY
AM Turning-Movement Count for Intersection of Alpine and Sachin
Tuesday, September 13, 2016

Cumulative Turning-Movement Counts

15 Minutes Ending	WB Sachin		NB Alpine		SB Alpine		Total
	LT	RT	TH	RT	LT	TH	
7:15	0	0	1	0	0	1	2
7:30	0	0	1	0	0	6	7
7:45	0	3	2	0	0	10	15
8:00	2	3	3	0	1	21	30
8:15	4	3	4	0	1	35	47
8:30	8	5	4	0	1	52	70
8:45	9	5	6	1	3	65	89
9:00	10	5	6	1	3	75	100

Turning-Movement Counts by 15-Minute Interval

15 Minutes Ending	WB Sachin		NB Alpine		SB Alpine		Total
	LT	RT	TH	RT	LT	TH	
7:15	0	0	1	0	0	1	2
7:30	0	0	0	0	0	5	5
7:45	0	3	1	0	0	4	8
8:00	2	0	1	0	1	11	15
8:15	2	0	1	0	0	14	17
8:30	4	2	0	0	0	17	23
8:45	1	0	2	1	2	13	19
9:00	1	0	0	0	0	10	11
TOTAL	10	5	6	1	3	75	100

Hourly Total

Hour Beginning	WB Sachin		NB Alpine		SB Alpine		Total
	LT	RT	TH	RT	LT	TH	
7:00	2	3	3	0	1	21	30
7:15	4	3	3	0	1	34	45
7:30	8	5	3	0	1	46	63
7:45	9	2	4	1	3	55	74
8:00	8	2	3	1	2	54	70

AM Peak Hour[1]

Hour Beginning	WB Sachin		NB Alpine		SB Alpine		Total
	LT	RT	TH	RT	LT	TH	
7:45	**9**	**2**	**4**	**1**	**3**	**55**	**74**
PHF (Peak-Hour Factor)	0.56	0.25	0.50	0.25	0.38	0.81	0.80
	0.46		0.42		0.85		

[1] TDC determined the peak hour at Alpine and Big Beaver to be 8:00-9:00.

McCLURE ROAD APARTMENTS TRAFFIC IMPACT STUDY
PM Turning-Movement Count for Intersection of Alpine and Sachin
Tuesday, September 13, 2016

Cumulative Turning-Movement Counts

15 Minutes Ending	WB Sachin		NB Alpine		SB Alpine		Total
	LT	RT	TH	RT	LT	TH	
4:15	0	0	7	0	0	5	12
4:30	0	0	9	1	0	5	15
4:45	0	0	11	2	0	8	21
5:00	0	0	16	2	0	9	27
5:15	0	0	28	3	0	12	43
5:30	0	0	36	4	0	13	53
5:45	1	0	40	5	0	14	60
6:00	1	0	44	5	1	15	66

Turning-Movement Counts by 15-Minute Interval

15 Minutes Ending	WB Sachin		NB Alpine		SB Alpine		Total
	LT	RT	TH	RT	LT	TH	
4:15	0	0	7	0	0	5	12
4:30	0	0	2	1	0	0	3
4:45	0	0	2	1	0	3	6
5:00	0	0	5	0	0	1	6
5:15	0	0	12	1	0	3	16
5:30	0	0	8	1	0	1	10
5:45	1	0	4	1	0	1	7
6:00	0	0	4	0	1	1	6
TOTAL	1	0	44	5	1	15	66

Hourly Total

Hour Beginning	WB Sachin		NB Alpine		SB Alpine		Total
	LT	RT	TH	RT	LT	TH	
4:00	0	0	16	2	0	9	27
4:15	0	0	21	3	0	7	31
4:30	0	0	27	3	0	8	38
4:45	1	0	29	3	0	6	39
5:00	1	0	28	3	1	6	39

PM Peak Hour[1]

Hour Beginning	WB Sachin		NB Alpine		SB Alpine		Total
	LT	RT	TH	RT	LT	TH	
4:45	**1**	**0**	**29**	**3**	**0**	**6**	**39**
PHF (Peak-Hour Factor)	0.25	-	0.60	0.75	-	0.50	0.61
	0.25		0.62		0.50		

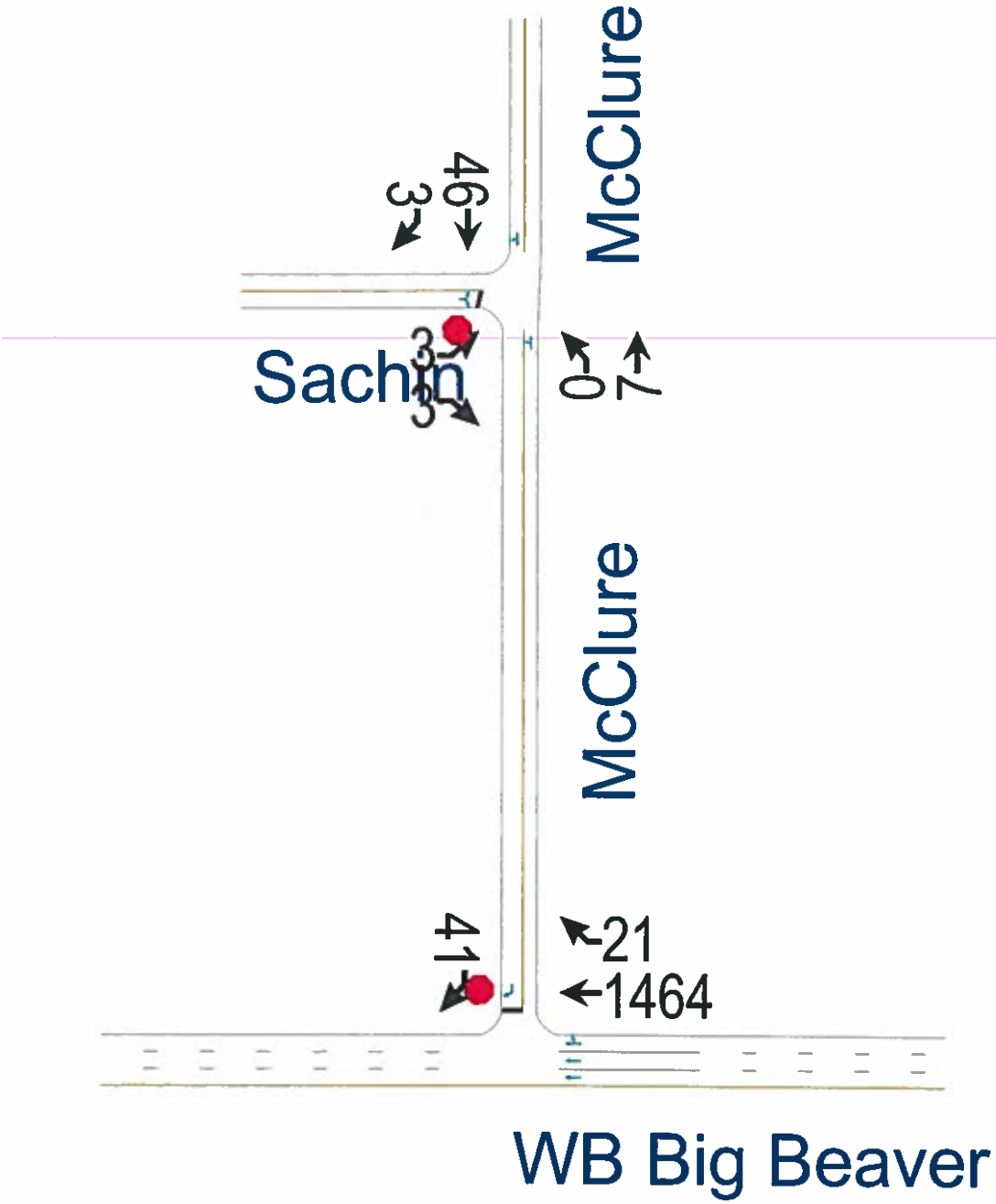
[1] TDC determined the peak hour at Alpine and Big Beaver to be 5:00-6:00.

APPENDIX D:

IMPACT ANALYSES

McClure
Current AM Peak Hour

WB Deceleration Lane
Hypothetically Removed



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑↑↱			↱
Traffic Vol, veh/h	0	0	1464	21	0	41
Future Vol, veh/h	0	0	1464	21	0	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	83	83	92	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1764	25	0	44

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	895
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	244
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	244
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	23
HCM LOS		C

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	244
HCM Lane V/C Ratio	-	-	0.181
HCM Control Delay (s)	-	-	23
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	0.6

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	3	0	7	46	3
Future Vol, veh/h	3	3	0	7	46	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	92	60	64	64
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	0	12	72	5

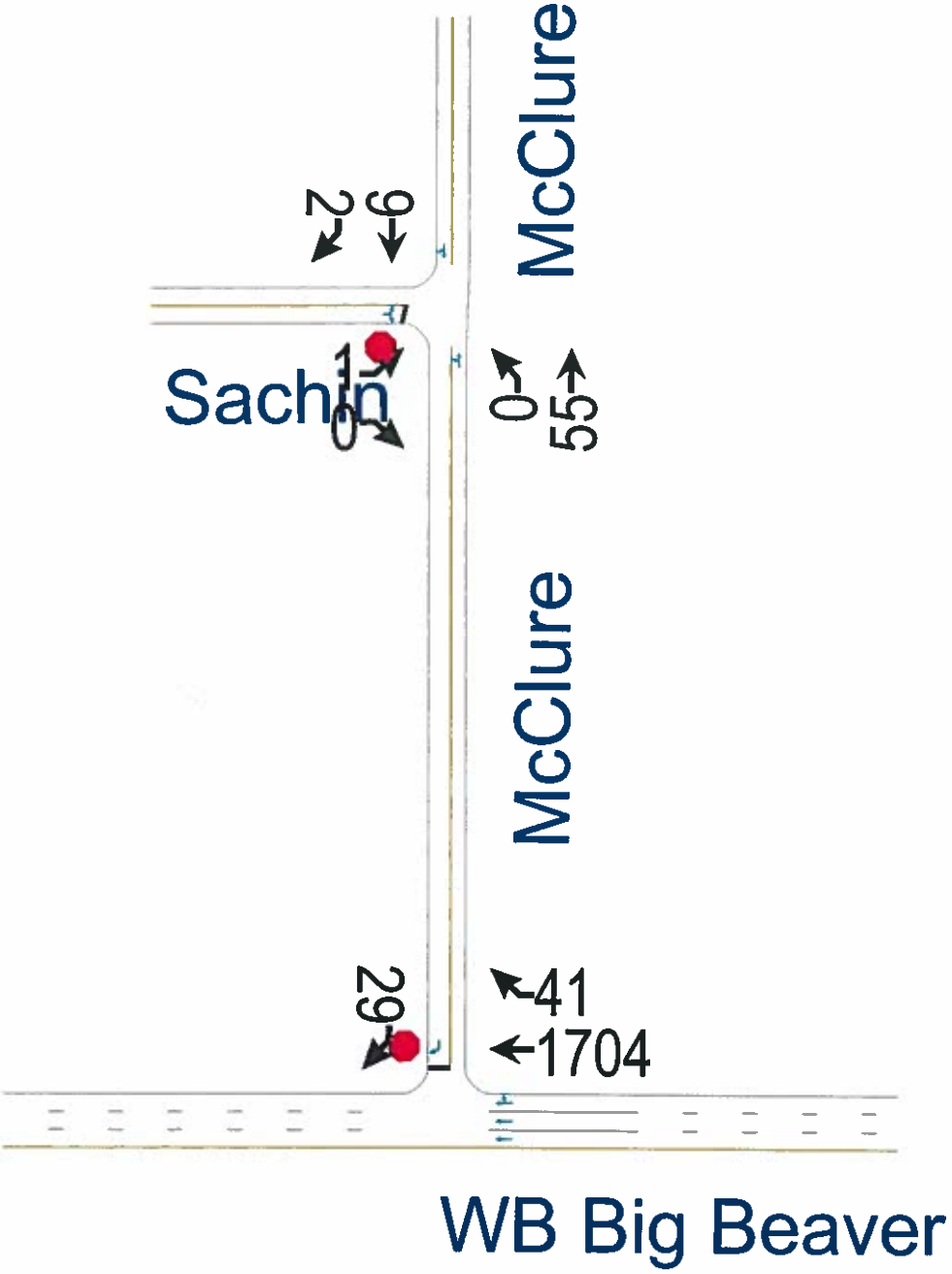
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	86	74	77	0	-	0
Stage 1	74	-	-	-	-	-
Stage 2	12	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	915	988	1522	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	1011	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	915	988	1522	-	-	-
Mov Cap-2 Maneuver	915	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	1011	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1522	-	950	-	-
HCM Lane V/C Ratio	-	-	0.008	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

McClure
Current PM Peak Hour

WB Deceleration Lane
Hypothetically Removed



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	1704	41	0	29
Future Vol, veh/h	0	0	1704	41	0	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	66
Heavy Vehicles, %	2	2	1	1	2	2
Mvmt Flow	0	0	1852	45	0	44

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	948
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	225
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	225
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	24.8
HCM LOS		C

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	225
HCM Lane V/C Ratio	-	-	0.195
HCM Control Delay (s)	-	-	24.8
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	0.7

Intersection	
Int Delay, s/veh	0.1

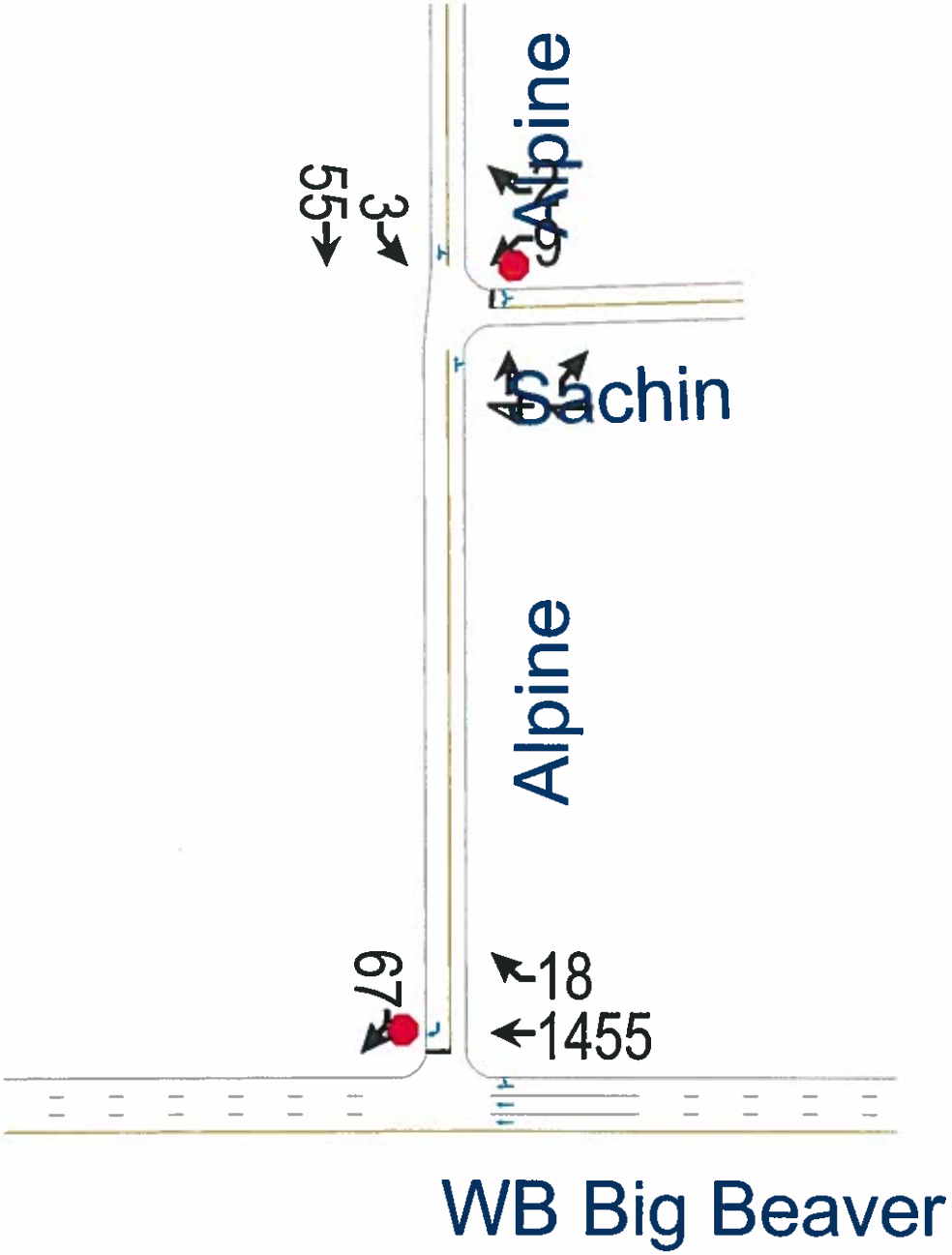
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	55	9	2
Future Vol, veh/h	1	0	0	55	9	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	60	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	0	0	92	15	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	109	17	18	0	-	0
Stage 1	17	-	-	-	-	-
Stage 2	92	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	888	1062	1599	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	932	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	888	1062	1599	-	-	-
Mov Cap-2 Maneuver	888	-	-	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1599	-	888	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Alpine
Current AM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑↑↱			↱
Traffic Vol, veh/h	0	0	1455	18	0	67
Future Vol, veh/h	0	0	1455	18	0	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	87	87	92	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1672	21	0	80

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	847
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	262
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	262
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	24.6
HCM LOS		C

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	262
HCM Lane V/C Ratio	-	-	0.304
HCM Control Delay (s)	-	-	24.6
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	1.2

Intersection	
Int Delay, s/veh	2

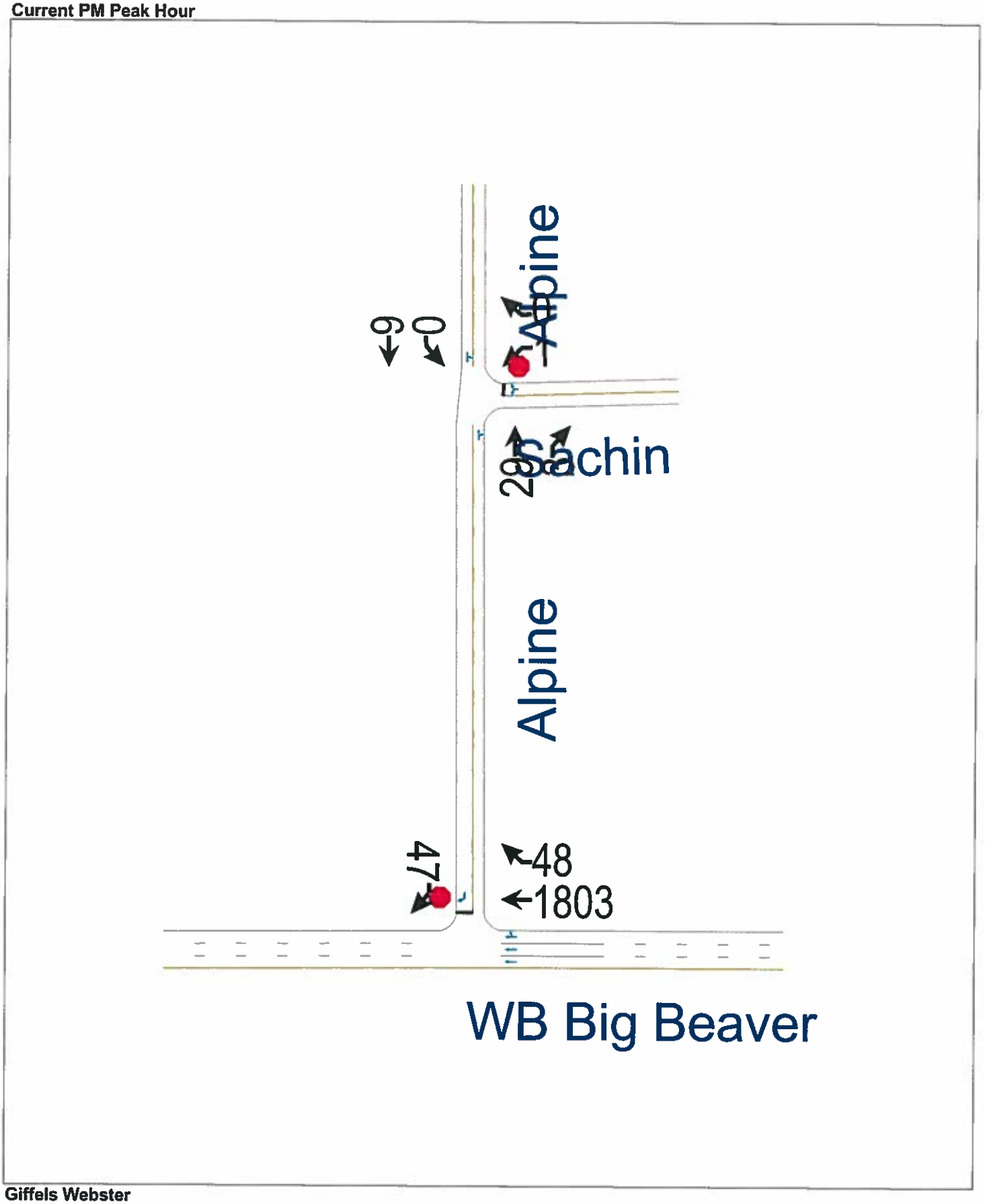
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	2	4	1	3	55
Future Vol, veh/h	9	2	4	1	3	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	60	60	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	3	7	2	4	65

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	80	8	0	0	8	0
Stage 1	8	-	-	-	-	-
Stage 2	72	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	922	1074	-	-	1612	-
Stage 1	1015	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	919	1074	-	-	1612	-
Mov Cap-2 Maneuver	919	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	948	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	944	1612	-
HCM Lane V/C Ratio	-	-	0.019	0.002	-
HCM Control Delay (s)	-	-	8.9	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Alpine
Current PM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	1803	48	0	47
Future Vol, veh/h	0	0	1803	48	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	92	65
Heavy Vehicles, %	2	2	1	1	2	2
Mvmt Flow	0	0	1898	51	0	72

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	974
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	216
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	216
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	29.8
HCM LOS		D

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	216
HCM Lane V/C Ratio	-	-	0.335
HCM Control Delay (s)	-	-	29.8
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.4

Intersection	
Int Delay, s/veh	0.2

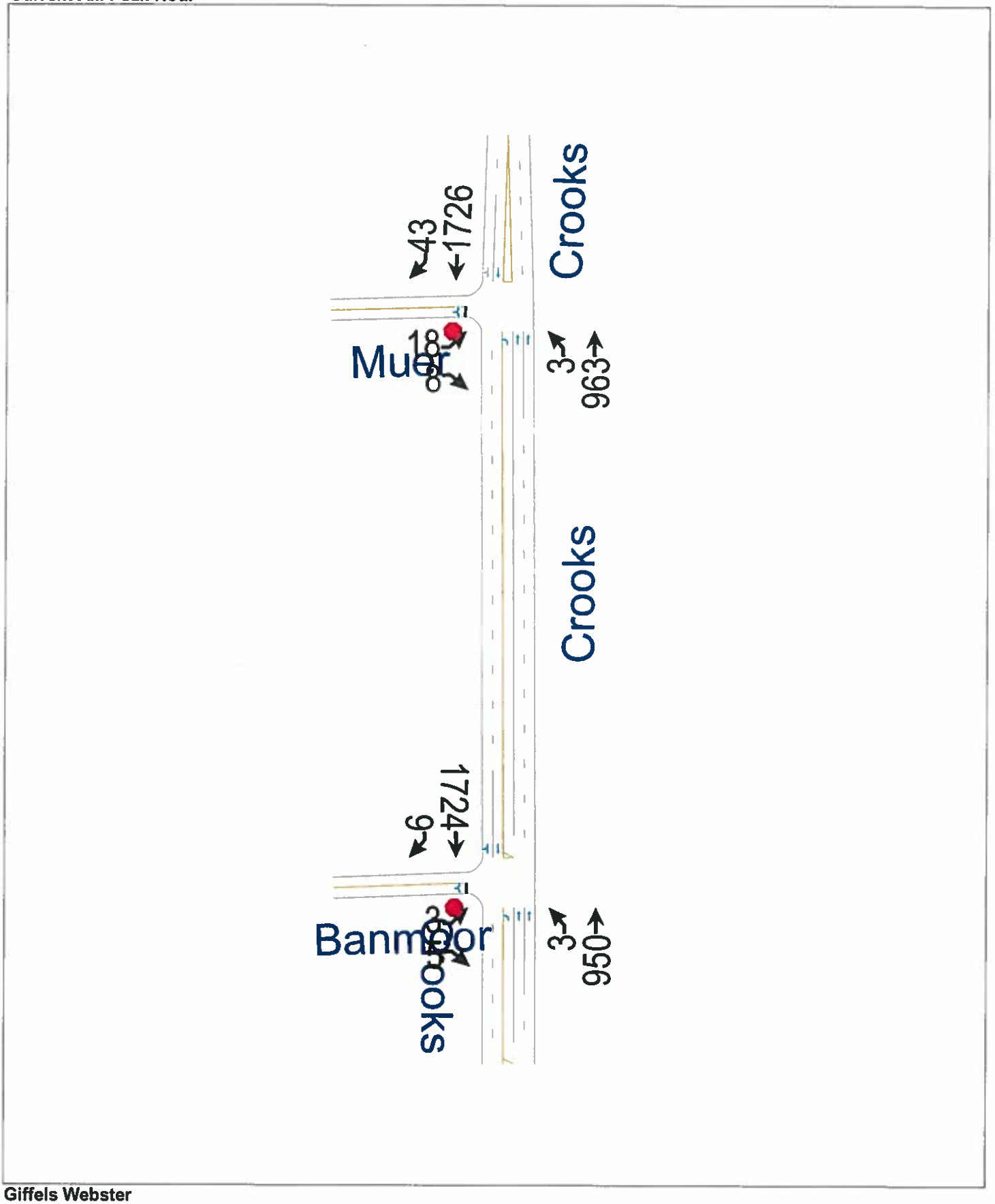
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	29	3	0	6
Future Vol, veh/h	1	0	29	3	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	62	62	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	0	47	5	0	10

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	59	49	0	0	52	0
Stage 1	49	-	-	-	-	-
Stage 2	10	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	948	1020	-	-	1554	-
Stage 1	973	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	948	1020	-	-	1554	-
Mov Cap-2 Maneuver	948	-	-	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	1013	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	948	1554	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	-	-	8.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Crooks
Current AM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	5	3	950	1724	9
Future Vol, veh/h	3	5	3	950	1724	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	67	67	95	95	95	95
Heavy Vehicles, %	0	0	0	2	1	0
Mvmt Flow	4	7	3	1000	1815	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2325	912	1824	0	-	0
Stage 1	1819	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	32	280	340	-	-	-
Stage 1	117	-	-	-	-	-
Stage 2	576	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	32	280	340	-	-	-
Mov Cap-2 Maneuver	32	-	-	-	-	-
Stage 1	117	-	-	-	-	-
Stage 2	571	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	64.7	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	340	-	72	-	-
HCM Lane V/C Ratio	0.009	-	0.166	-	-
HCM Control Delay (s)	15.7	-	64.7	-	-
HCM Lane LOS	C	-	F	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection	
Int Delay, s/veh	3.7

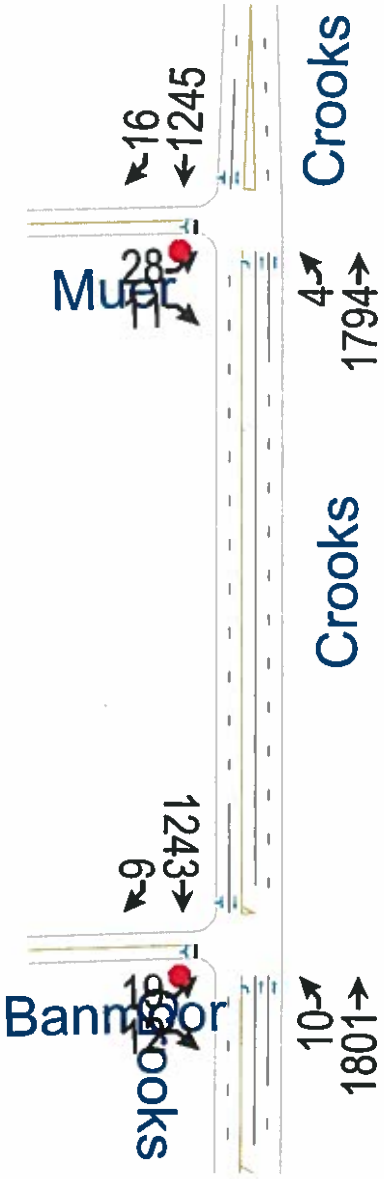
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	8	3	963	1726	43
Future Vol, veh/h	18	8	3	963	1726	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	660	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	65	65	95	95	95	95
Heavy Vehicles, %	0	38	0	3	1	0
Mvmt Flow	28	12	3	1014	1817	45

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2352	931	1862	0	-	0
Stage 1	1839	-	-	-	-	-
Stage 2	513	-	-	-	-	-
Critical Hdwy	6.8	7.66	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.68	2.2	-	-	-
Pot Cap-1 Maneuver	31	209	329	-	-	-
Stage 1	114	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	31	209	329	-	-	-
Mov Cap-2 Maneuver	31	-	-	-	-	-
Stage 1	114	-	-	-	-	-
Stage 2	567	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	272	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	329	-	42	-	-
HCM Lane V/C Ratio	0.01	-	0.952	-	-
HCM Control Delay (s)	16	-	272	-	-
HCM Lane LOS	C	-	F	-	-
HCM 95th %tile Q(veh)	0	-	3.8	-	-

Crooks
Current PM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	12	10	1801	1243	6
Future Vol, veh/h	19	12	10	1801	1243	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	95	95	95	95
Heavy Vehicles, %	0	0	0	1	1	17
Mvmt Flow	24	15	11	1896	1308	6

Major/Minor	Minor2		Majpr1		Major2	
Conflicting Flow All	2281	657	1315	0	-	0
Stage 1	1312	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	34	412	533	-	-	-
Stage 1	220	-	-	-	-	-
Stage 2	333	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	33	412	533	-	-	-
Mov Cap-2 Maneuver	33	-	-	-	-	-
Stage 1	220	-	-	-	-	-
Stage 2	326	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	190.9	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	533	-	51	-	-
HCM Lane V/C Ratio	0.02	-	0.779	-	-
HCM Control Delay (s)	11.9	-	190.9	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.1	-	3.2	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	11	4	1794	1245	16
Future Vol, veh/h	28	11	4	1794	1245	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	660	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	95	95	95	95
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	31	12	4	1888	1311	17

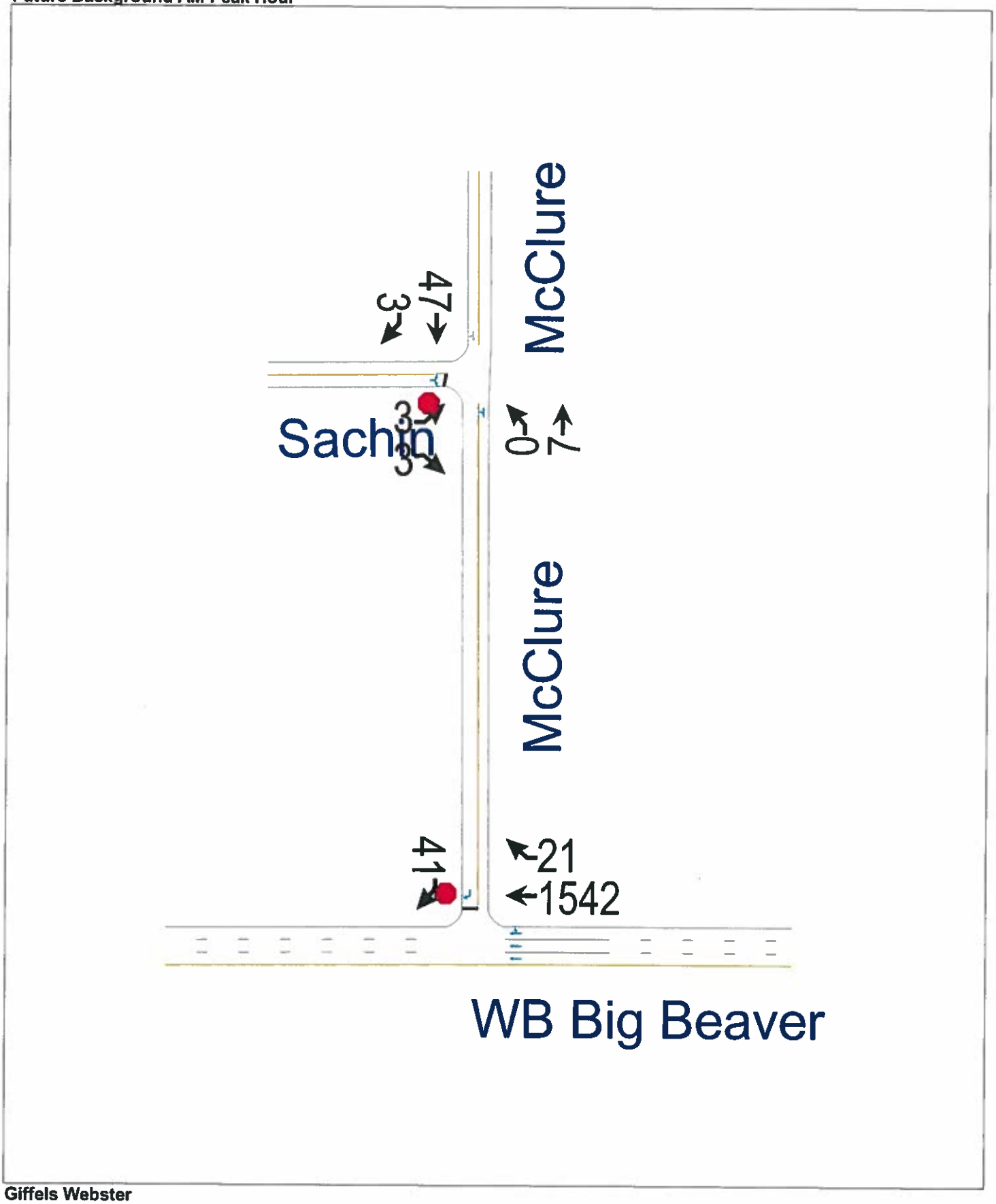
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2272	664	1327	0	-	0
Stage 1	1319	-	-	-	-	-
Stage 2	953	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	35	408	527	-	-	-
Stage 1	218	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	35	408	527	-	-	-
Mov Cap-2 Maneuver	35	-	-	-	-	-
Stage 1	218	-	-	-	-	-
Stage 2	337	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	246.3	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	527	-	47	-	-
HCM Lane V/C Ratio	0.008	-	0.932	-	-
HCM Control Delay (s)	11.9	-	246.3	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0	-	3.9	-	-

FUTURE BACKGROUND TRAFFIC

McClure
Future Background AM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	1542	21	0	41
Future Vol, veh/h	0	0	1542	21	0	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	83	83	92	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1858	25	0	44

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	942
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	227
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	227
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	24.6
HCM LOS		C

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	227
HCM Lane V/C Ratio	-	-	0.194
HCM Control Delay (s)	-	-	24.6
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	0.7

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	3	0	7	47	3
Future Vol, veh/h	3	3	0	7	47	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	92	60	64	64
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	0	12	73	5

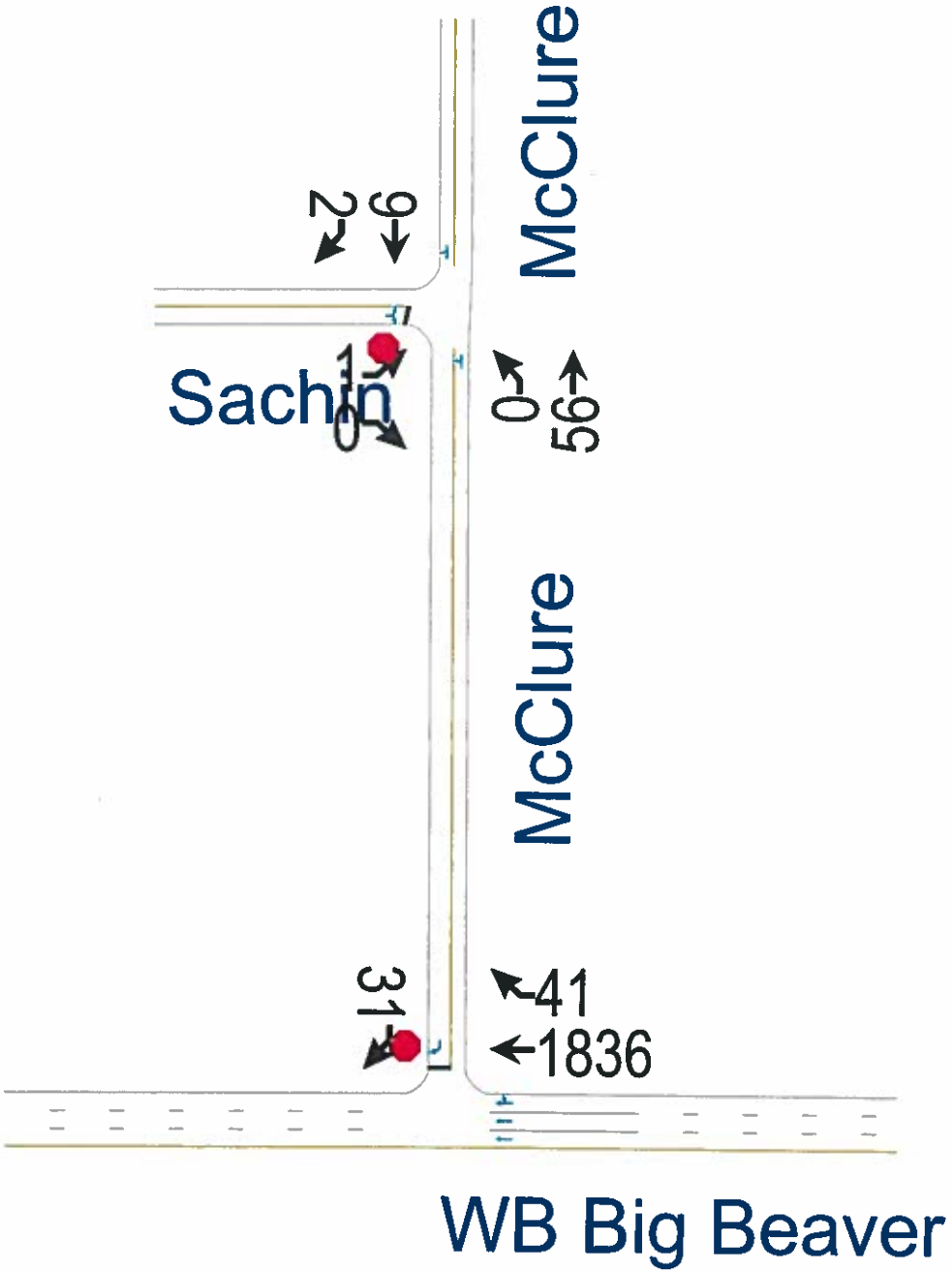
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	88	76	78	0	-	0
Stage 1	76	-	-	-	-	-
Stage 2	12	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	913	985	1520	-	-	-
Stage 1	947	-	-	-	-	-
Stage 2	1011	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	913	985	1520	-	-	-
Mov Cap-2 Maneuver	913	-	-	-	-	-
Stage 1	947	-	-	-	-	-
Stage 2	1011	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1520	-	948	-	-
HCM Lane V/C Ratio	-	-	0.008	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

McClure
Future Background PM Peak Hour

WB Deceleration Lane
Hypothetically Removed



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑↑↱			↱
Traffic Vol, veh/h	0	0	1836	41	0	31
Future Vol, veh/h	0	0	1836	41	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	66
Heavy Vehicles, %	2	2	1	1	2	2
Mvmt Flow	0	0	1996	45	0	47

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	1020
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	201
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	201
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	28.3
HCM LOS		D

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	201
HCM Lane V/C Ratio	-	-	0.234
HCM Control Delay (s)	-	-	28.3
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	0.9

Intersection	
Int Delay, s/veh	0.1

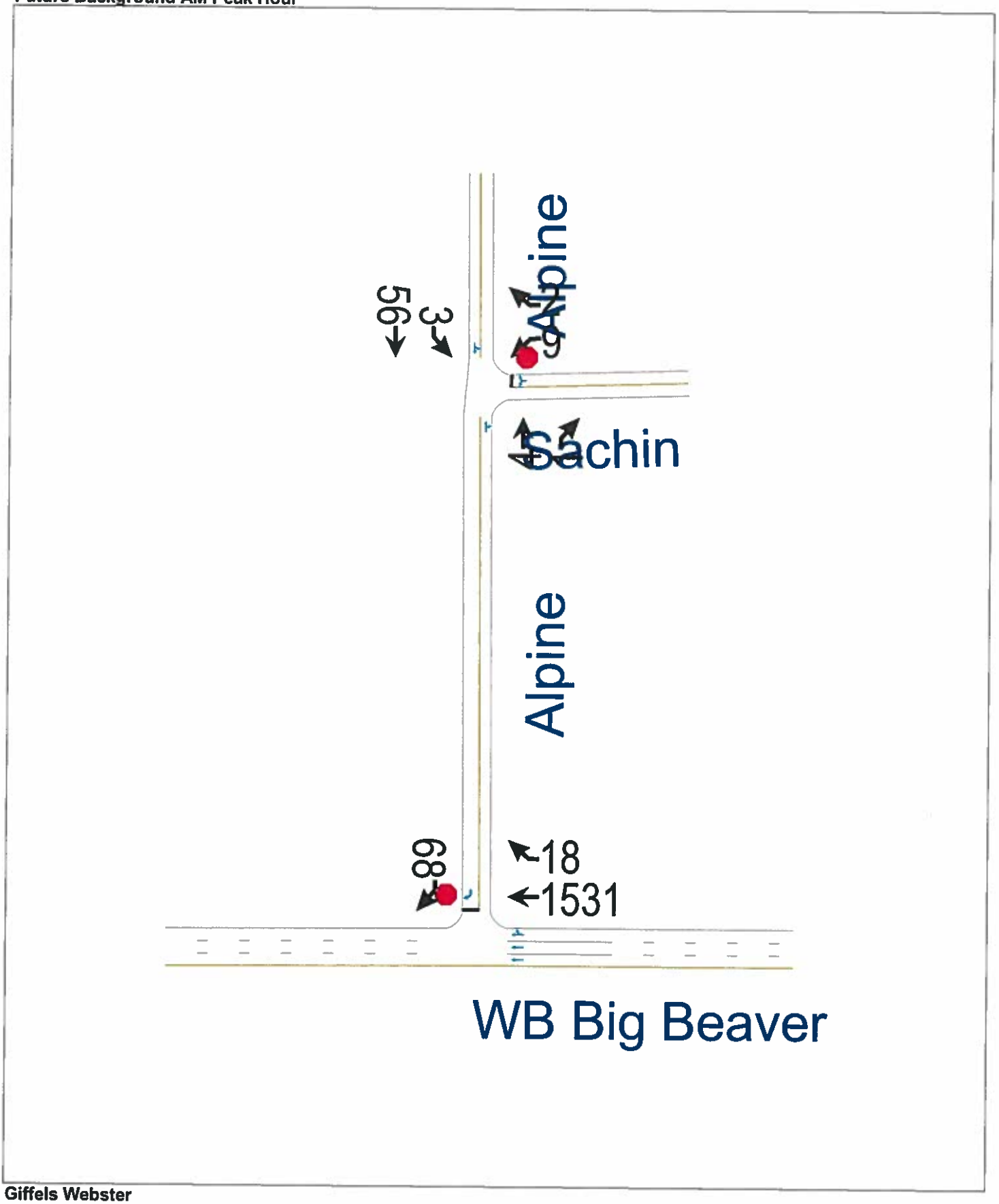
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	56	9	2
Future Vol, veh/h	1	0	0	56	9	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	60	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	0	0	93	15	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	110	17	18	0	-	0
Stage 1	17	-	-	-	-	-
Stage 2	93	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	887	1062	1599	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	887	1062	1599	-	-	-
Mov Cap-2 Maneuver	887	-	-	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	931	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1599	-	887	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Alpine
Future Background AM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑↑↱			↱
Traffic Vol, veh/h	0	0	1531	18	0	68
Future Vol, veh/h	0	0	1531	18	0	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	87	87	92	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1760	21	0	81

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	890
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	245
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	245
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	26.8
HCM LOS		D

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	245
HCM Lane V/C Ratio	-	-	0.33
HCM Control Delay (s)	-	-	26.8
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.4

Intersection	
Int Delay, s/veh	2

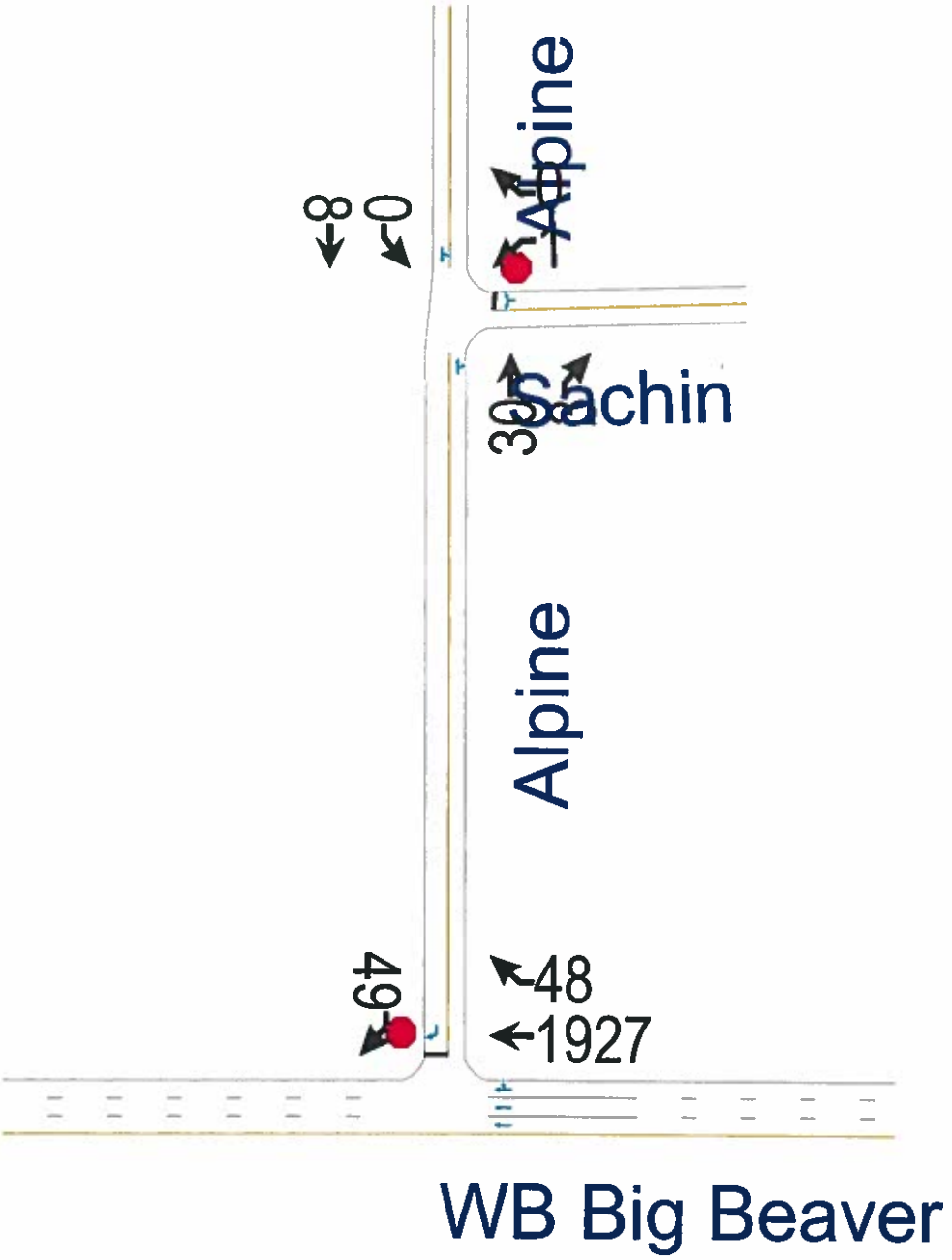
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	2	4	1	3	56
Future Vol, veh/h	9	2	4	1	3	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	60	60	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	3	7	2	4	66

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	81	8	0	0	8	0
Stage 1	8	-	-	-	-	-
Stage 2	73	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	921	1074	-	-	1612	-
Stage 1	1015	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	918	1074	-	-	1612	-
Mov Cap-2 Maneuver	918	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	947	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	943	1612	-
HCM Lane V/C Ratio	-	-	0.019	0.002	-
HCM Control Delay (s)	-	-	8.9	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Alpine
Future Background PM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑↑↱			↱
Traffic Vol, veh/h	0	0	1927	48	0	49
Future Vol, veh/h	0	0	1927	48	0	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	92	65
Heavy Vehicles, %	2	2	1	1	2	2
Mvmt Flow	0	0	2028	51	0	75

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	1039
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	195
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	195
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	34.6
HCM LOS		D

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	195
HCM Lane V/C Ratio	-	-	0.387
HCM Control Delay (s)	-	-	34.6
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.7

Intersection	
Int Delay, s/veh	0.2

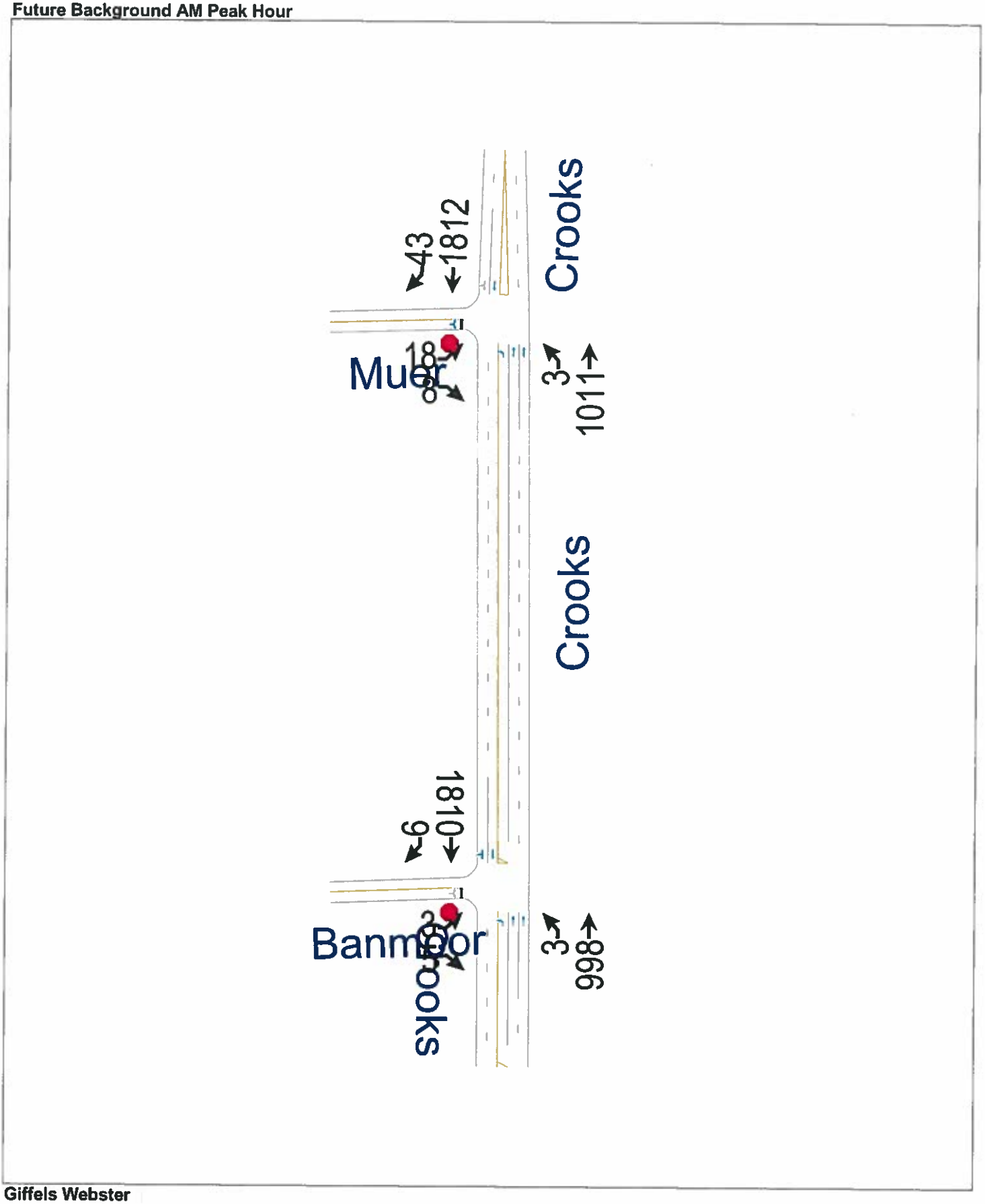
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	30	3	0	8
Future Vol, veh/h	1	0	30	3	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	62	62	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	0	48	5	0	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	64	51	0	0	53	0
Stage 1	51	-	-	-	-	-
Stage 2	13	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	942	1017	-	-	1553	-
Stage 1	971	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	942	1017	-	-	1553	-
Mov Cap-2 Maneuver	942	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	942	1553	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	-	-	8.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Crooks
Future Background AM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	5	3	998	1810	9
Future Vol, veh/h	3	5	3	998	1810	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	67	67	95	95	95	95
Heavy Vehicles, %	0	0	0	2	1	0
Mvmt Flow	4	7	3	1051	1905	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2442	957	1915	0	-	0
Stage 1	1910	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	27	262	314	-	-	-
Stage 1	104	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	27	262	314	-	-	-
Mov Cap-2 Maneuver	27	-	-	-	-	-
Stage 1	104	-	-	-	-	-
Stage 2	554	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	77.9	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	314	-	61	-	-
HCM Lane V/C Ratio	0.01	-	0.196	-	-
HCM Control Delay (s)	16.6	-	77.9	-	-
HCM Lane LOS	C	-	F	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	8	3	1011	1812	43
Future Vol, veh/h	18	8	3	1011	1812	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	660	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	65	65	95	95	95	95
Heavy Vehicles, %	0	38	0	3	1	0
Mvmt Flow	28	12	3	1064	1907	45

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2468	976	1953	0	-	0
Stage 1	1930	-	-	-	-	-
Stage 2	538	-	-	-	-	-
Critical Hdwy	6.8	7.66	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.68	2.2	-	-	-
Pot Cap-1 Maneuver	~ 26	194	303	-	-	-
Stage 1	102	-	-	-	-	-
Stage 2	555	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 26	194	303	-	-	-
Mov Cap-2 Maneuver	~ 26	-	-	-	-	-
Stage 1	102	-	-	-	-	-
Stage 2	550	-	-	-	-	-

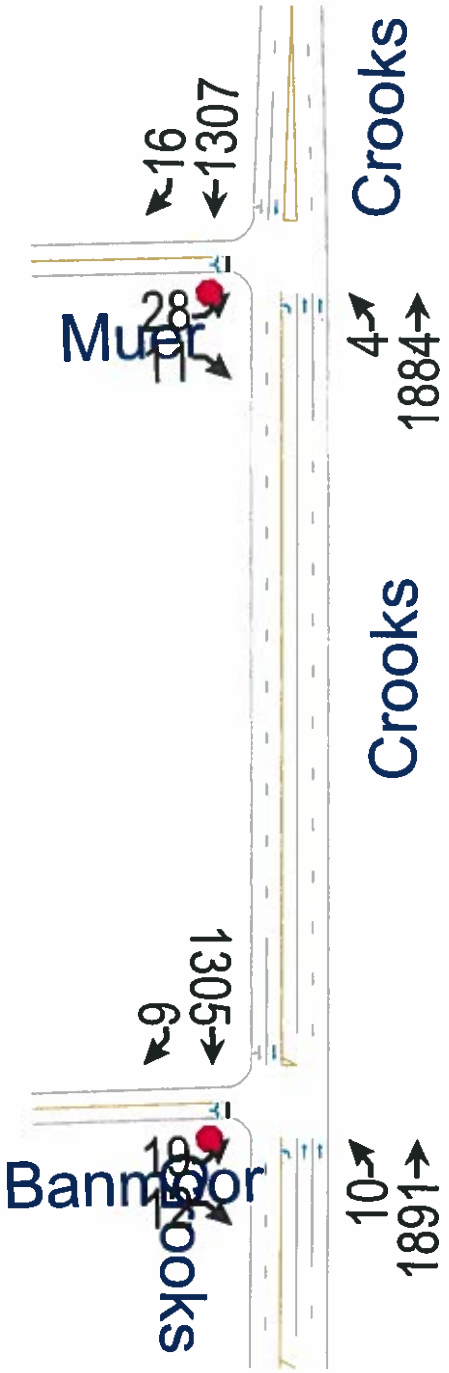
Approach	EB	NB	SB
HCM Control Delay, s	$ 372.2	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	303	-	35	-	-
HCM Lane V/C Ratio	0.01	-	1.143	-	-
HCM Control Delay (s)	17	-	$ 372.2	-	-
HCM Lane LOS	C	-	F	-	-
HCM 95th %tile Q(veh)	0	-	4.2	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Crooks
Future Background PM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	12	10	1891	1305	6
Future Vol, veh/h	19	12	10	1891	1305	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	95	95	95	95
Heavy Vehicles, %	0	0	0	1	1	17
Mvmt Flow	24	15	11	1991	1374	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2393	690	1380	0	-	0
Stage 1	1377	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	29	392	503	-	-	-
Stage 1	203	-	-	-	-	-
Stage 2	315	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	28	392	503	-	-	-
Mov Cap-2 Maneuver	28	-	-	-	-	-
Stage 1	203	-	-	-	-	-
Stage 2	308	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	248.7	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	503	-	44	-	-
HCM Lane V/C Ratio	0.021	-	0.903	-	-
HCM Control Delay (s)	12.3	-	248.7	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.1	-	3.6	-	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	11	4	1884	1307	16
Future Vol, veh/h	28	11	4	1884	1307	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	660	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	95	95	95	95
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	31	12	4	1983	1376	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2384	696	1393	0	-	0
Stage 1	1384	-	-	-	-	-
Stage 2	1000	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	~ 29	389	497	-	-	-
Stage 1	201	-	-	-	-	-
Stage 2	321	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 29	389	497	-	-	-
Mov Cap-2 Maneuver	~ 29	-	-	-	-	-
Stage 1	201	-	-	-	-	-
Stage 2	318	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 342.9	0	0
HCM LOS	F		

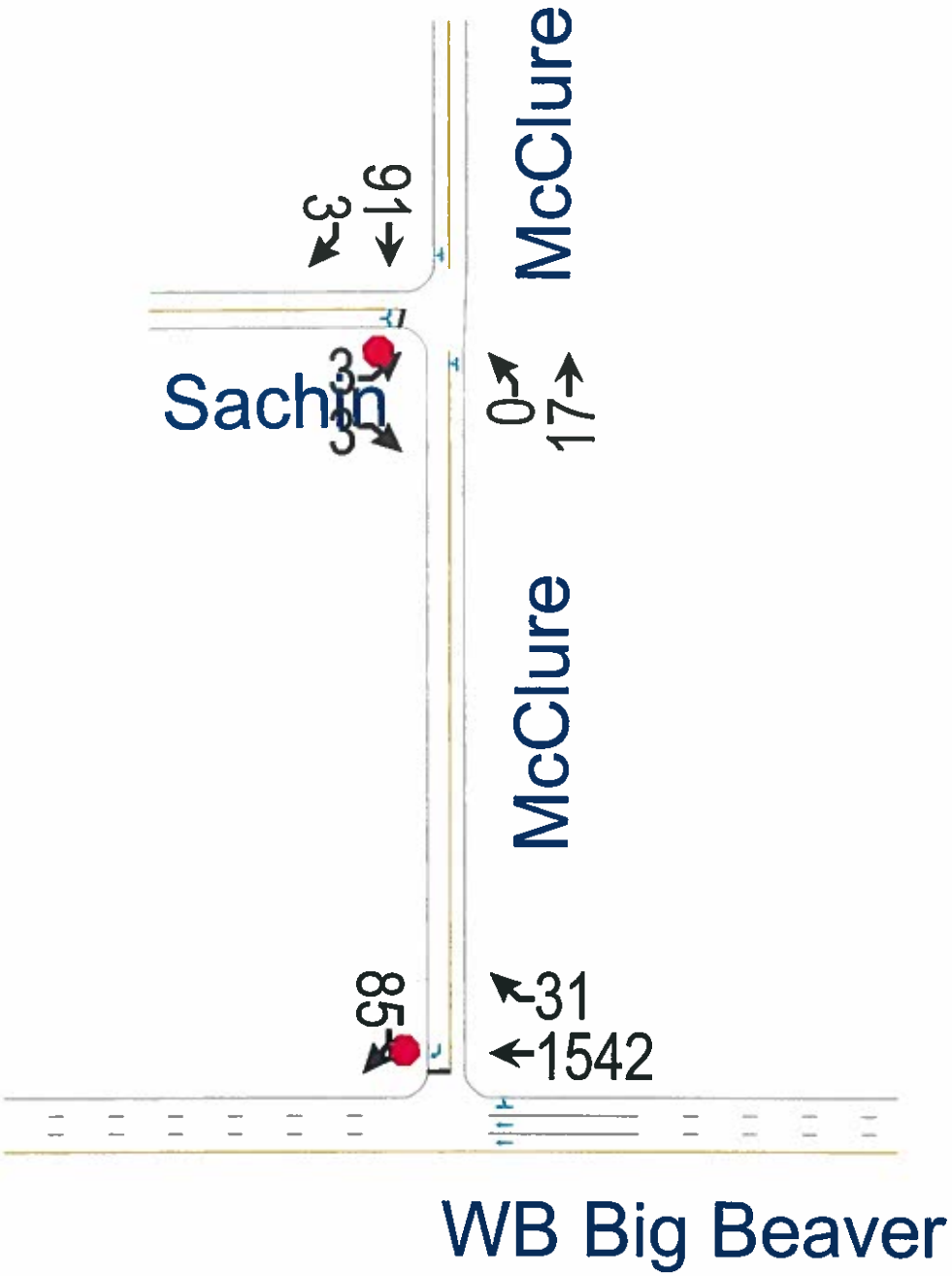
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	497	-	39	-	-
HCM Lane V/C Ratio	0.008	-	1.124	-	-
HCM Control Delay (s)	12.3	-	$ 342.9	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0	-	4.4	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

FUTURE TOTAL TRAFFIC

McClure
Future Total AM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	1542	31	0	85
Future Vol, veh/h	0	0	1542	31	0	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	83	83	92	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1858	37	0	91

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	948
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	225
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	225
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	31.5
HCM LOS		D

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	225
HCM Lane V/C Ratio	-	-	0.406
HCM Control Delay (s)	-	-	31.5
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.8

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	3	0	17	91	3
Future Vol, veh/h	3	3	0	17	91	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	92	75	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	0	23	107	4

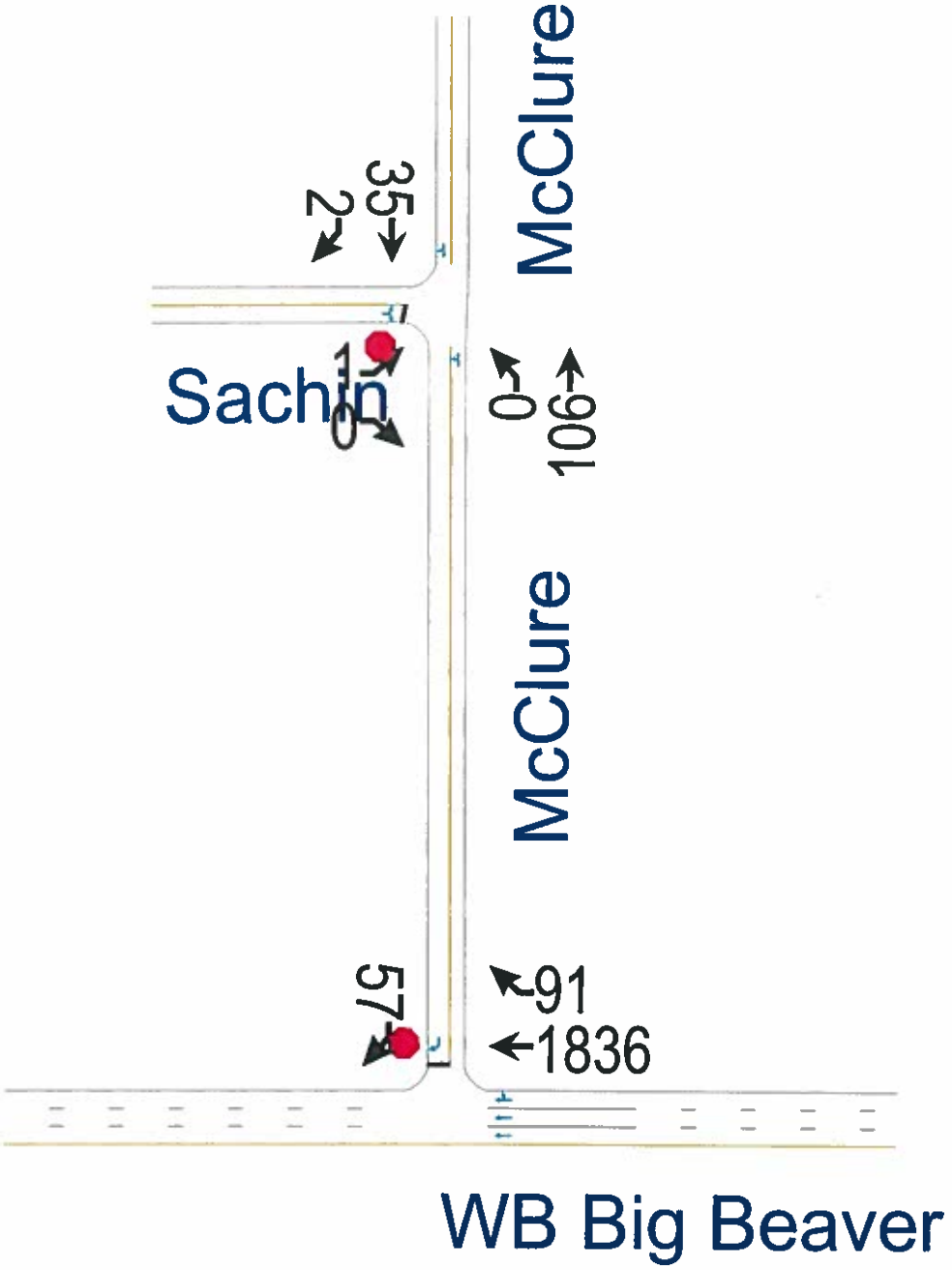
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	132	109	111	0	-	0
Stage 1	109	-	-	-	-	-
Stage 2	23	-	-	-	-	-
Critical Hdwy	7.12	6.22	4.12	-	-	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	840	945	1479	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	995	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	840	945	1479	-	-	-
Mov Cap-2 Maneuver	840	-	-	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	995	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1479	-	889	-	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

McClure
Future Total PM Peak Hour

WB Deceleration Lane
Hypothetically Removed



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑↑↱			↱
Traffic Vol, veh/h	0	0	1836	91	0	57
Future Vol, veh/h	0	0	1836	91	0	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	77
Heavy Vehicles, %	2	2	1	1	2	2
Mvmt Flow	0	0	1996	99	0	74

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	1047
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	193
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	193
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	34.8
HCM LOS		D

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	193
HCM Lane V/C Ratio	-	-	0.384
HCM Control Delay (s)	-	-	34.8
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.7

Intersection	
Int Delay, s/veh	0.1

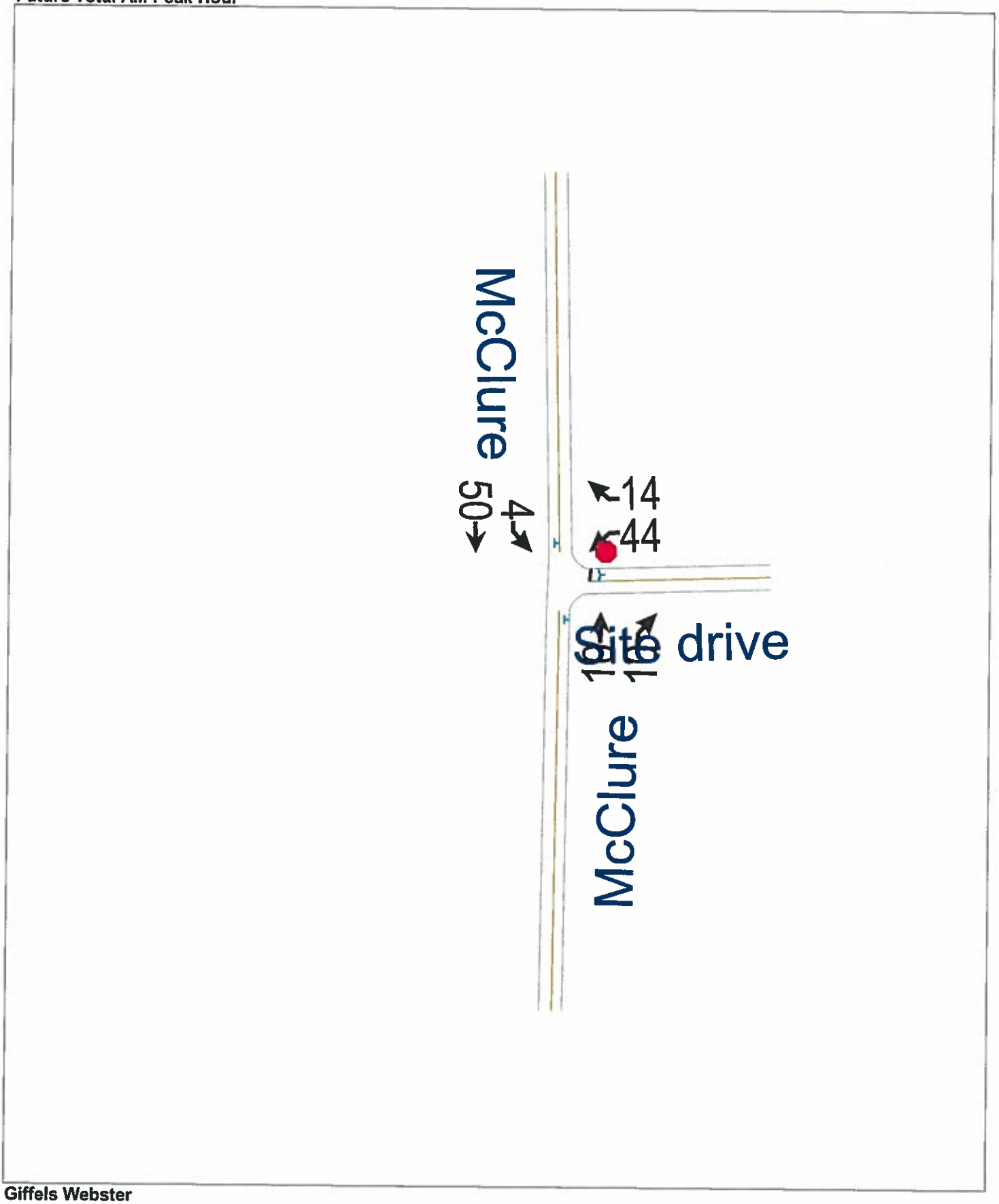
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	106	35	2
Future Vol, veh/h	1	0	0	106	35	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	60	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	0	0	151	50	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	202	51	53	0	-	0
Stage 1	51	-	-	-	-	-
Stage 2	151	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	787	1017	1553	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	877	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	787	1017	1553	-	-	-
Mov Cap-2 Maneuver	787	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	877	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1553	-	787	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Site Access
Future Total AM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	4.2

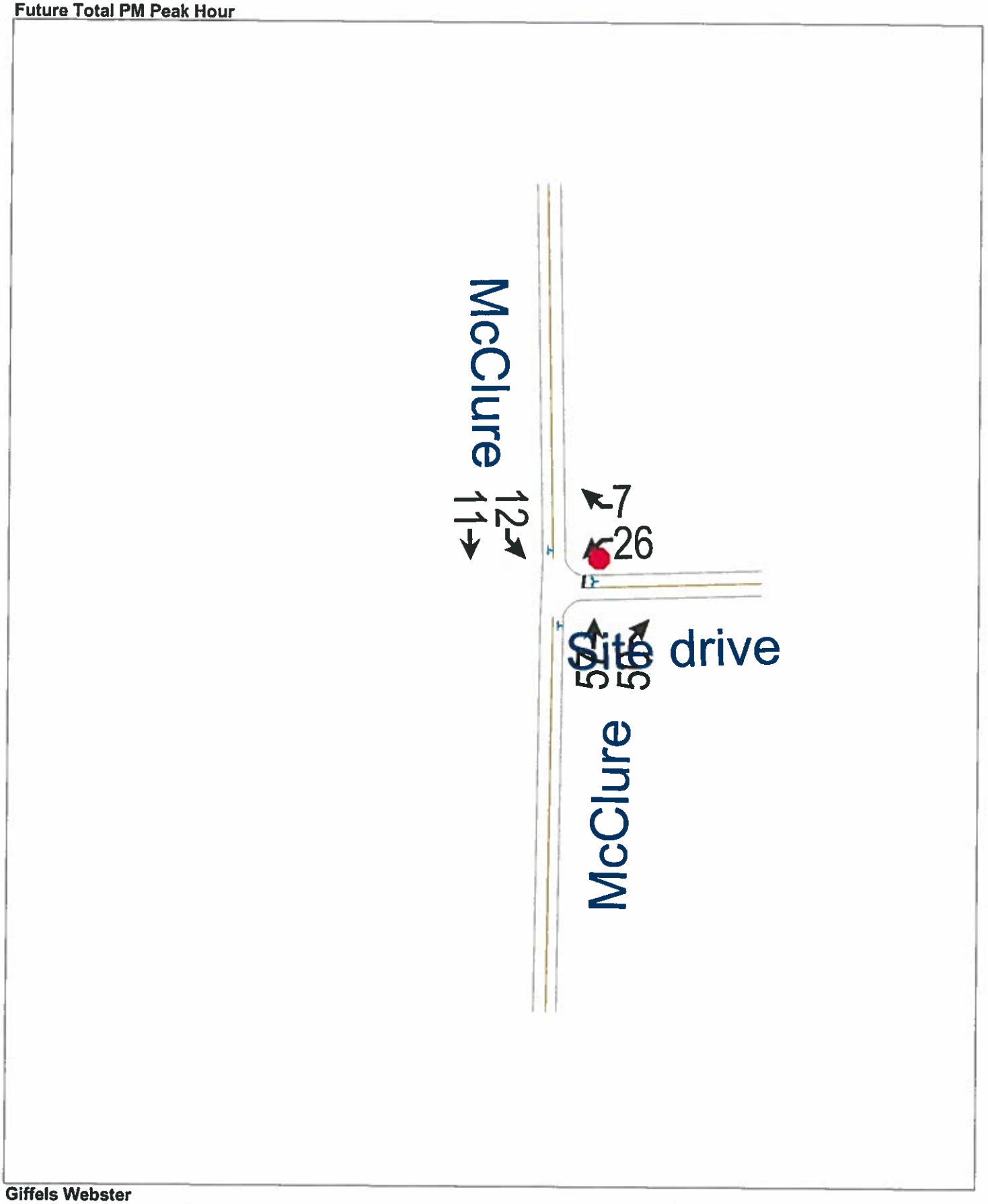
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	44	14	10	10	4	50
Future Vol, veh/h	44	14	10	10	4	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	59	19	13	13	5	67

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	97	20	0	0	27	0
Stage 1	20	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	907	1064	-	-	1600	-
Stage 1	1008	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	904	1064	-	-	1600	-
Mov Cap-2 Maneuver	904	-	-	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	948	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	938	1600	-
HCM Lane V/C Ratio	-	-	0.082	0.003	-
HCM Control Delay (s)	-	-	9.2	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Site Access
Future Total PM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	2.5

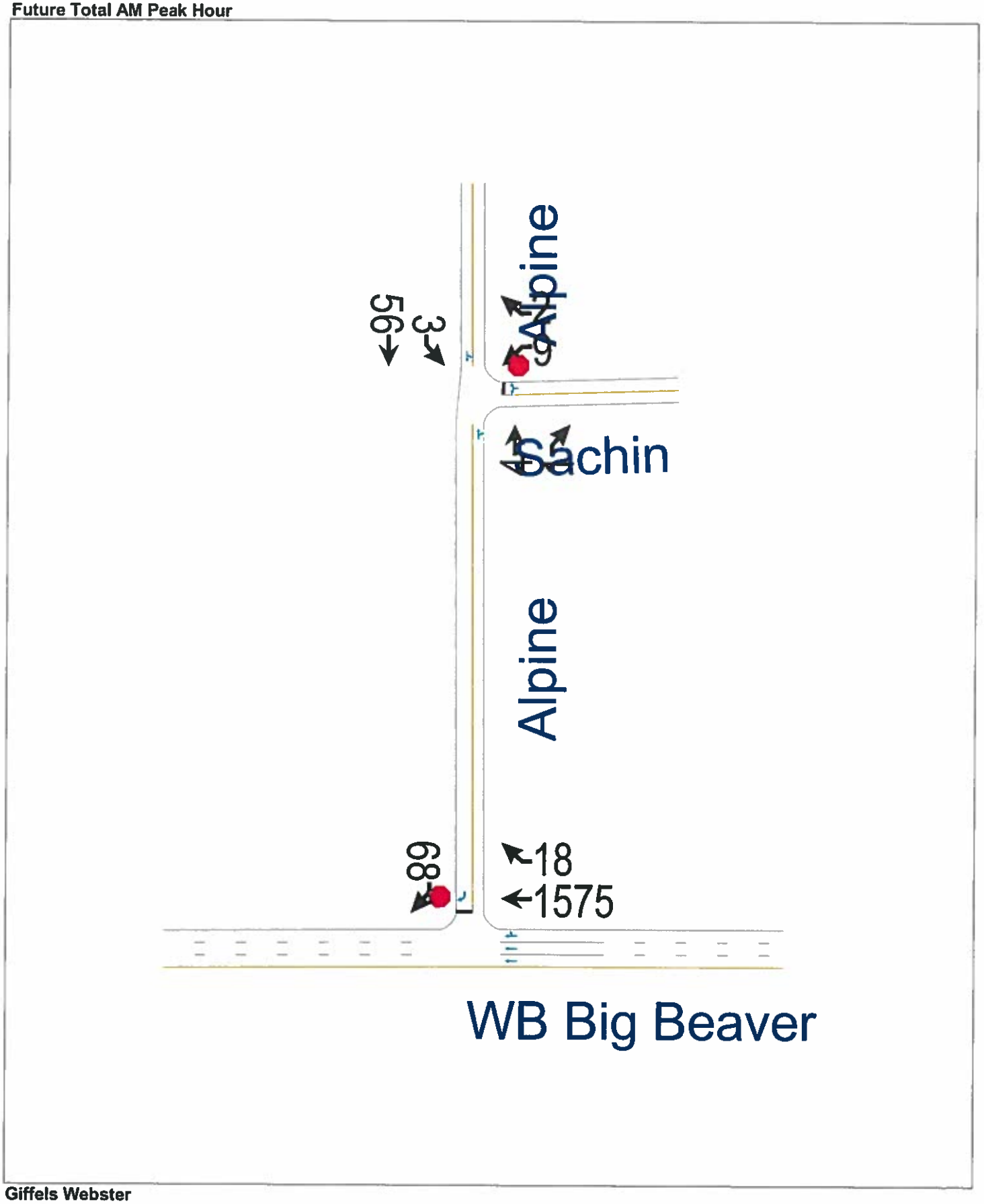
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	7	57	50	12	11
Future Vol, veh/h	26	7	57	50	12	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	37	10	81	71	17	16

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	167	117	0	0	153	0
Stage 1	117	-	-	-	-	-
Stage 2	50	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	828	941	-	-	1440	-
Stage 1	913	-	-	-	-	-
Stage 2	978	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	818	941	-	-	1440	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	913	-	-	-	-	-
Stage 2	966	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	3.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	841	1440	-
HCM Lane V/C Ratio	-	-	0.056	0.012	-
HCM Control Delay (s)	-	-	9.5	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Alpine
Future Total AM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑↑↱			↱
Traffic Vol, veh/h	0	0	1575	18	0	68
Future Vol, veh/h	0	0	1575	18	0	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	87	87	92	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1810	21	0	81

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	916
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	236
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	236
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	28
HCM LOS		D

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	236
HCM Lane V/C Ratio	-	-	0.343
HCM Control Delay (s)	-	-	28
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.5

Intersection	
Int Delay, s/veh	2

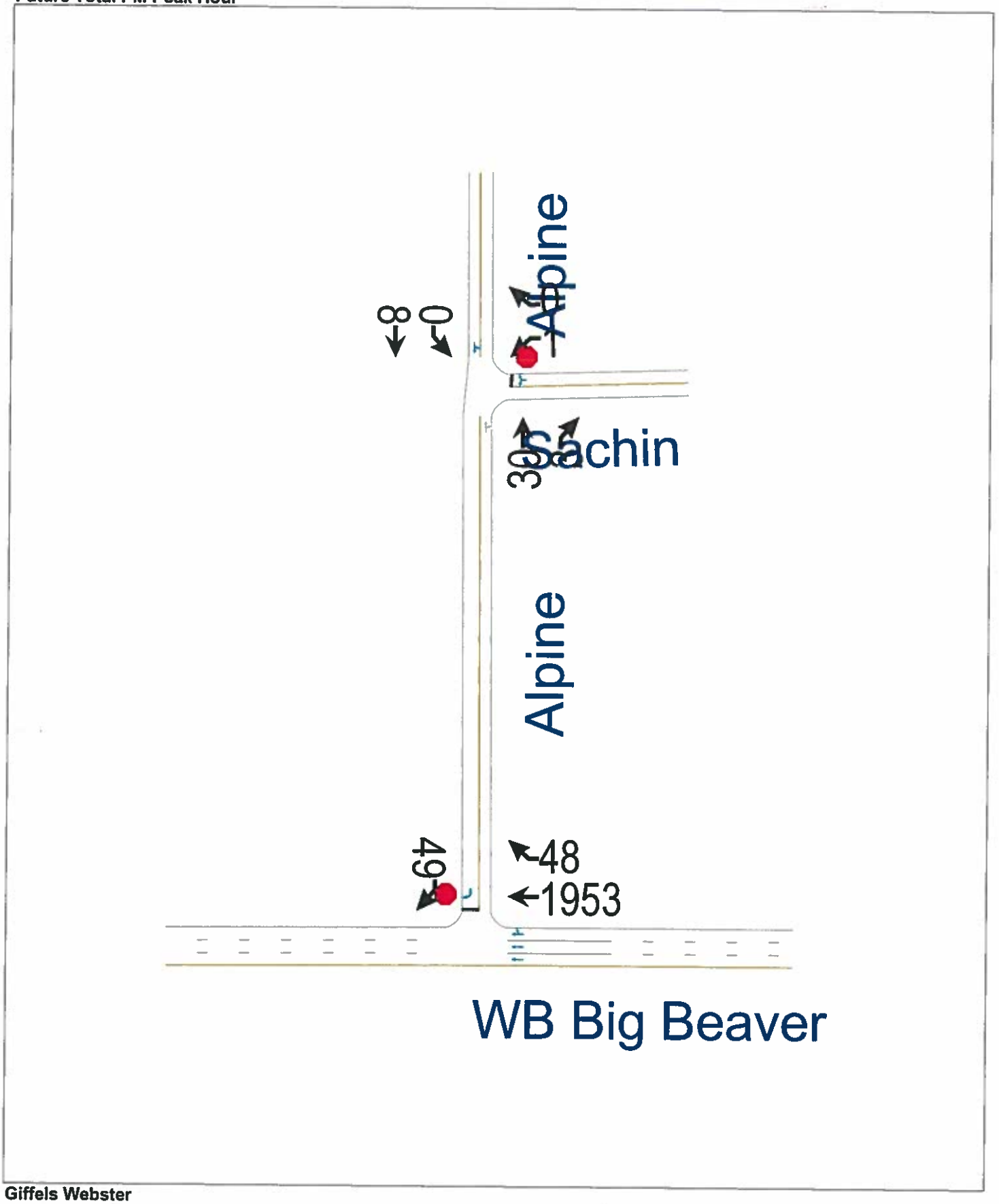
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	2	4	1	3	56
Future Vol, veh/h	9	2	4	1	3	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	60	60	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	3	7	2	4	66

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	81	8	0	0	8	0
Stage 1	8	-	-	-	-	-
Stage 2	73	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	921	1074	-	-	1612	-
Stage 1	1015	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	918	1074	-	-	1612	-
Mov Cap-2 Maneuver	918	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	947	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	943	1612	-
HCM Lane V/C Ratio	-	-	0.019	0.002	-
HCM Control Delay (s)	-	-	8.9	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Alpine
Future Total PM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑↑↱			↱
Traffic Vol, veh/h	0	0	1953	48	0	49
Future Vol, veh/h	0	0	1953	48	0	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	-	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	92	65
Heavy Vehicles, %	2	2	1	1	2	2
Mvmt Flow	0	0	2056	51	0	75

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	-	1053
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	191
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	-	191
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	35.6
HCM LOS		E

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	191
HCM Lane V/C Ratio	-	-	0.395
HCM Control Delay (s)	-	-	35.6
HCM Lane LOS	-	-	E
HCM 95th %tile Q(veh)	-	-	1.7

Intersection	
Int Delay, s/veh	0.2

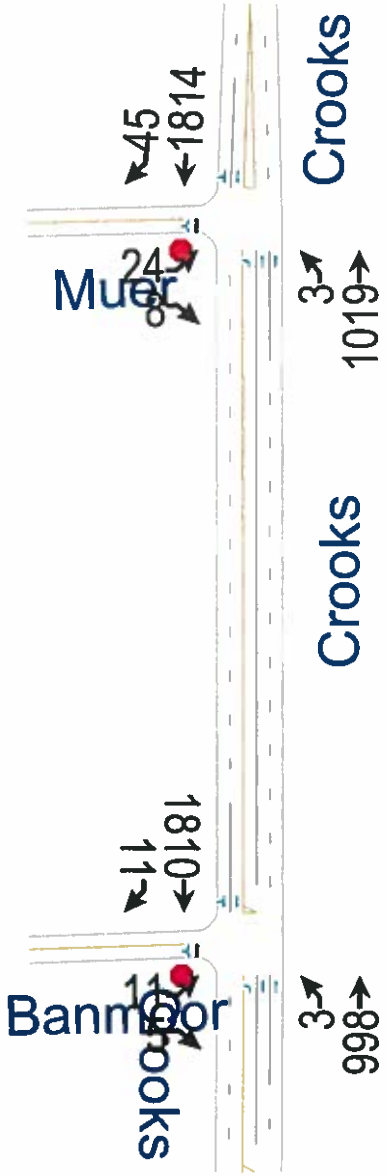
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	30	3	0	8
Future Vol, veh/h	1	0	30	3	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	62	62	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	0	48	5	0	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	64	51	0	0	53	0
Stage 1	51	-	-	-	-	-
Stage 2	13	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	942	1017	-	-	1553	-
Stage 1	971	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	942	1017	-	-	1553	-
Mov Cap-2 Maneuver	942	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	942	1553	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	-	-	8.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Crooks
Future Total AM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	5	3	998	1810	11
Future Vol, veh/h	11	5	3	998	1810	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	95	95	95	95
Heavy Vehicles, %	0	0	0	2	1	0
Mvmt Flow	15	7	3	1051	1905	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2443	958	1917	0	-	0
Stage 1	1911	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	27	261	313	-	-	-
Stage 1	104	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	27	261	313	-	-	-
Mov Cap-2 Maneuver	27	-	-	-	-	-
Stage 1	104	-	-	-	-	-
Stage 2	554	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	184.6	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	313	-	38	-	-
HCM Lane V/C Ratio	0.01	-	0.561	-	-
HCM Control Delay (s)	16.6	-	184.6	-	-
HCM Lane LOS	C	-	F	-	-
HCM 95th %tile Q(veh)	0	-	2	-	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	24	8	3	1019	1814	45
Future Vol, veh/h	24	8	3	1019	1814	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	660	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	95	95	95	95
Heavy Vehicles, %	0	38	0	3	1	0
Mvmt Flow	34	11	3	1073	1909	47

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2476	978	1957	0	-	0
Stage 1	1933	-	-	-	-	-
Stage 2	543	-	-	-	-	-
Critical Hdwy	6.8	7.66	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.68	2.2	-	-	-
Pot Cap-1 Maneuver	~ 25	193	302	-	-	-
Stage 1	101	-	-	-	-	-
Stage 2	552	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 25	193	302	-	-	-
Mov Cap-2 Maneuver	~ 25	-	-	-	-	-
Stage 1	101	-	-	-	-	-
Stage 2	547	-	-	-	-	-

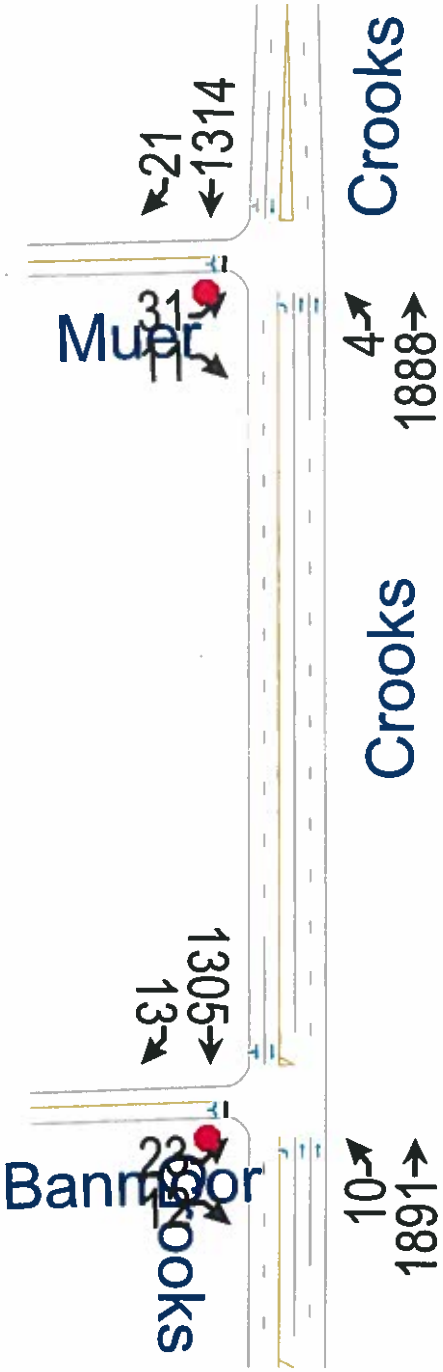
Approach	EB	NB	SB
HCM Control Delay, s	$ 499.6	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	302	-	32	-	-
HCM Lane V/C Ratio	0.01	-	1.429	-	-
HCM Control Delay (s)	17	-	$ 499.6	-	-
HCM Lane LOS	C	-	F	-	-
HCM 95th %tile Q(veh)	0	-	5.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Crooks
Future Total PM Peak Hour



Giffels Webster
W. A. Stimpson, P.E.

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	23	12	10	1891	1305	13
Future Vol, veh/h	23	12	10	1891	1305	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	95	95	95	95
Heavy Vehicles, %	0	0	0	1	1	17
Mvmt Flow	29	15	11	1991	1374	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2397	694	1387	0	-	0
Stage 1	1381	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	~ 29	390	500	-	-	-
Stage 1	202	-	-	-	-	-
Stage 2	315	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 28	390	500	-	-	-
Mov Cap-2 Maneuver	~ 28	-	-	-	-	-
Stage 1	202	-	-	-	-	-
Stage 2	308	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 323.1	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	500	-	41	-	-
HCM Lane V/C Ratio	0.021	-	1.094	-	-
HCM Control Delay (s)	12.4	-	$ 323.1	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.1	-	4.4	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	31	11	4	1888	1314	21
Future Vol, veh/h	31	11	4	1888	1314	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	660	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	95	95	95	95
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	35	12	4	1987	1383	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2396	703	1405	0	-	0
Stage 1	1394	-	-	-	-	-
Stage 2	1002	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	~ 29	385	492	-	-	-
Stage 1	199	-	-	-	-	-
Stage 2	320	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 29	385	492	-	-	-
Mov Cap-2 Maneuver	~ 29	-	-	-	-	-
Stage 1	199	-	-	-	-	-
Stage 2	317	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 390.6	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	492	-	38	-	-
HCM Lane V/C Ratio	0.009	-	1.242	-	-
HCM Control Delay (s)	12.4	-	$ 390.6	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0	-	4.8	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

APPENDIX E:

CUT-THROUGH TRAFFIC

Table E-1. Tally Sheet for Cut-Through Vehicles in AM Peak Period

Starting Location	WB & SB				NB & EB	
	Ending Location					
	McClure & Big Beaver	McClure & businesses	Alpine & Big Beaver	Alpine & businesses	Banmoor & Crooks	Muer & Crooks
Ending 7:00-7:15 a.m.						
Muer & Crooks	0	0	0	0		
Banmoor & Crooks	2	0				
McClure & businesses					0	0
Alpine & businesses						0
Ending 7:15-7:30 a.m.						
Muer & Crooks	0	0	1	0		
Banmoor & Crooks	0	0				
McClure & businesses					0	0
Alpine & businesses						0
Ending 7:30-7:45 a.m.						
Muer & Crooks	1	1	0	0		
Banmoor & Crooks	3	1				
McClure & businesses					0	0
Alpine & businesses						0
Ending 7:45-8:00 a.m.						
Muer & Crooks	2	1	0	0		
Banmoor & Crooks	1	0				
McClure & businesses					0	0
Alpine & businesses						0
Ending 8:00-8:15 a.m.						
Muer & Crooks	4	3	1	0		
Banmoor & Crooks	1	0				
McClure & businesses					0	0
Alpine & businesses						0
Ending 8:15-8:30 a.m.						
Muer & Crooks	0	0	1	0		
Banmoor & Crooks	1	0				
McClure & businesses					0	0
Alpine & businesses						0
Ending 8:30-8:45 a.m.						
Muer & Crooks	0	0	2	1		
Banmoor & Crooks	1	1				
McClure & businesses					0	0
Alpine & businesses						0
Ending 8:45-9:00 a.m.						
Muer & Crooks	1	0	1	0		
Banmoor & Crooks	2	1				
McClure & businesses					0	1
Alpine & businesses						0

Table E-2. Tally Sheet for Cut-Through Vehicles in PM Peak Period

Starting Location	WB & SB				NB & EB	
	Ending Location					
	McClure & Big Beaver	McClure & businesses	Alpine & Big Beaver	Alpine & businesses	Banmoor & Crooks	Muer & Crooks
Starting 3:55+ p.m.	Ending 4:00-4:15 p.m.					
Muer & Crooks	1	0	0	0		
Banmoor & Crooks	0	0				
McClure & businesses					1	2
Alpine & businesses						1
Starting 4:10+ p.m.	Ending 4:15-4:30 p.m.					
Muer & Crooks	0	0	0	0		
Banmoor & Crooks	1	0				
McClure & businesses					2	0
Alpine & businesses						0
Starting 4:25+ p.m.	Ending 4:30-4:45 p.m.					
Muer & Crooks	0	0	0	0		
Banmoor & Crooks	0	0				
McClure & businesses					3	0
Alpine & businesses						0
Starting 4:40+ p.m.	Ending 4:45-5:00 p.m.					
Muer & Crooks	1	0	0	0		
Banmoor & Crooks	3	0				
McClure & businesses					1	2
Alpine & businesses						0
Starting 4:55+ p.m.	Ending 5:00-5:15 p.m.					
Muer & Crooks	0	0	0	0		
Banmoor & Crooks	0	0				
McClure & businesses					0	1
Alpine & businesses						0
Starting 5:10+ p.m.	Ending 5:15-5:30 p.m.					
Muer & Crooks	0	0	0	0		
Banmoor & Crooks	0	0				
McClure & businesses					0	1
Alpine & businesses						1
Starting 5:25+ p.m.	Ending 5:30-5:45 p.m.					
Muer & Crooks	0	0	0	0		
Banmoor & Crooks	1	0				
McClure & businesses					1	0
Alpine & businesses						0
Starting 5:40+ p.m.	Ending 5:45-6:00 p.m.					
Muer & Crooks	0	0	0	0		
Banmoor & Crooks	1	0				
McClure & businesses					1	0
Alpine & businesses						0

APPENDIX F:

PARKING RATIOS

Table F-1. Parking Ratios for Multiple-Family Housing

Source	Requirement	Vehicle Ownership	Peak Demand
Troy Zoning Ordinance	**Efficiency 1 / d.u.** Other 2 / d.u.		
Nat'l sample of 48 cities	Median 1.5 / d.u.		
Nat'l Parking Association (1992)	Studio 1.25 / d.u. 1 bedroom 1.5 / d.u. 2+ bedrooms 2 / d.u.		
Eno Foundation (1990)	**Studio 1 / d.u.** 1 B.R. 1.5 / d.u. 2+ B.R. 2 / d.u. Elderly 0.5 / d.u. + 1 / day shift employee		**Studio 1.0 / d.u.** 1 bedroom 1.5 / d.u. 2+ bedrooms 2.0 / d.u. Elderly 0.7 / d.u.
American Planning Association (2002 examples)	Grants Pass, OR: **1 B.R. 1 / d.u.** & 2 B.R. 1.5 / d.u.; Cumberland, MD: 1 B.R. 1.25 / d.u. & 2 B.R. 1.5 / d.u.		
State of Colorado (and, for example, Boulder)	**1 B.R. 1 / d.u.** 2 B.R. 1.5 / d.u. 3+ B.R. 2 / d.u.		
City of Denton, TX	Studio or 1 B.R. < 500 s.f. **1 / d.u.** 1 B.R. > 500 s.f. 1.5 / d.u. 2 B.R. 1.75 / d.u. 3 B.R. 2 / d.u. 4+ B.R. **1 / bedroom** Seniors >= 55 1 / d.u.		
City of Eau Claire, WI	**1 / bedroom**		
Research Notes (January 2000)		Midwest average for apartments: 1.1 veh/d.u. Nat'l avg. for luxury low-rise apartments: 0-1 B.R. 1.1 veh/d.u. 2-3 B.R. 1.6 veh/d.u.	
Institute of Transportation Engineers, *Parking Generation – 3rd Edition* (for Land Use 221, Low/Mid-Rise Apartments)	Average supply at 44 study sites: 1.4 / d.u. Suburban sites (avg. 1.7 B.R.): **0.9 / bedroom**	Suburban sites: avg. of 1.4 vehicles/d.u.	Suburban sites: max. of 1.94 / d.u. & 85th %tile of 1.46 / d.u.; urban sites: max. of 1.43 / d.u. & 85th %tile of 1.17 / d.u.

6. CONDITIONAL REZONING APPLICATION (File Number CR JPCR2016-003) – Proposed McClure Road Apartments, North of Big Beaver, East of Crooks, East side of McClure (3142, 3114, 3086 McClure), Section 20, From R-1B (One Family Resident) District to BB (Big Beaver) District

Mr. Carlisle reviewed the revisions to the proposed application since last discussed at the July 12, 2016 meeting and addressed how the Big Beaver Corridor study relates to the zoning district.

Present were the applicant Sam Stafa, project architect Peter Stuhlreyer of Designhaus Architecture and Attorney Dennis Cowan.

There was discussion on:
- Height and form of the building.
- Residential buffer.
- Traffic study/report.
- Building materials.
- Informational meeting with neighbors.

Chair Edmunds opened the floor for public comment.

The following spoke in opposition of the proposed application. In general, the concerns relate to safety, incompatibility with surroundings, loss of privacy and cut-through traffic.
- Sandeep Sovani, 3205 McClure
- Kirit Patel, 1993 Sachin Way
- James Williams, 3317 McClure
- Andrew “Rocky” Raczkowski, 3204 McClure
- Ravi Gandra, 1961 Sachin Way
- Jeanne Stine, 1915 Boulan
- Keith Howard, 3229 McClure
- Bassam Salem, 3227 McClure
- Charles Walker, 3381 McClure
- Susan Tompkins, 1725 Banmoor
- Andrea Hernandez-Troya, 3183 McClure
- Denise Billups Walker, 3381 McClure
- Ann Bruttell, 3425 McClure
- Barbara Dawson, 1834 Boulan
- Azam Makki, 1915 Muer
- Xing Ping Chen, 3481 McClure

Chair Edmunds closed the floor for public comment.

Discussion followed on the concerns expressed by neighboring residents.

STUDY ITEM

6. CONDITIONAL REZONING APPLICATION (File Number CR JPCR2016-003 – Proposed McClure Road Apartments, North of Big Beaver, East of Crooks, East side of McClure (3142, 3114, 3086 McClure), Section 20, From R-1B (One Family Resident) District to BB (Big Beaver) District

Mr. Savidant introduced the proposed Conditional Rezoning application. Mr. Carlisle summarized the Planning Consultant report dated July 5, 2016.

Present were the applicant Sam Stafa, project architect Peter Stuhlreyer of Designhaus Architecture and Attorney Dennis Cowan.

Discussion on:

- Concept good; housing stock City needs.
- Building height, massing, “L” shape design.
- Site line from 2nd story neighboring single family homes.
- Traffic study required.

Κατηψ Χζαρνεχκι

From: Brent Savidant
Sent: Sunday, August 14, 2016 9:33 PM
To: Kathy Czarnecki; Ben Carlisle; Allan T Motzny
Subject: Fwd: Muer's Garden Farms
Attachments: Muer's Garden Farms.pdf

Follow Up Flag: Follow up
Due By: Monday, August 22, 2016 4:00 PM
Flag Status: Flagged

Sent from my Verizon 4G LTE smartphone

-------- Original message --------
From: Susan Tompkins <smtompkins@wowway.com>
Date: 8/14/16 21:22 (GMT-05:00)
To: Brent Savidant <SavidantB@troymi.gov>
Subject: Muer's Garden Farms

Dear Mr. Savidant,

At the planning commission meeting Tuesday, August 9th, it became apparent that some members of the planning commission were unfamiliar with the neighborhood where a 140+ apartment building has been proposed. I would like to clarify some key points and submit a map for review. I inserted the map and attached the pdf file of it for easy viewing. I hope you will consider forwarding this email to the planning commission members. I appreciate that this email is long and everyone's time is valuable. Hopefully, each member of the commission will, at a minimum, take time to review this map and become familiar with our neighborhood.

- Even though our neighborhood backs up to the "Big Beaver" area, it does not have the feel of being in a commercial area. The reason is that on every abutment, the Big Beaver side has a parking lot and/or built in green space. In most cases, this space between the business and houses is significant.

- The street Sachin Way with 3/4 Million dollar homes (new construction) does have the closest proximity to active businesses. There is a parking lot and natural tree buffers, but it is minimal compared to the rest of the neighborhood. The home owners knew this before purchasing. When these homes were designed, they were actually part of the gradual transition to the neighborhood. When viewing the plots south to north, it goes:
    1. Big Beaver business
    2. Parking lot
    3. Minimal green buffer
    4. Sachin high quality homes on smaller lots (denser than the pre-existing neighborhood)
    5. Large green buffer
    6. Homes on 1/2 to 1 acre lots.

  The current proposal does not have a gradual density change.

- The streets in the sub are sub-standard. If cars park on the street, they must use the shoulder which is grass. Home-owners that are paying thousands of dollars in

taxes on their million dollar homes want their front lawn used as a parking lot for strangers.

- Traffic- a history, current issues, and future dilemma. You heard a lot of complaints about traffic. Yes, there is a current problem. What you failed to acknowledge is that Troy government caused the problem. The traffic problem was created and allowed to continue with Troy government permission. Every year, we repeatedly contact police for help on traffic related issues that pose a threat to our children's safety. Some due to cut through traffic and some from members of our school community. In effect, the city has allowed designs that force our tax dollars to be spent on police to monitor the problem. What happens on the day that the police are not there? The residents of this community have raised this issue with the city numerous times.

  When you hear skepticism in our voices, it is because we have been burnt twice by Troy's promise to provide safety measures and then Troy's failure to do so. First, when the Big Beaver storefronts were built, we were promised a sign at each end (McClure and Alpine) of the parking lot indicating "No turn to through traffic". Turned out to be a flat out lie to gain neighborhood approval for the project. There was never a sign installed and our reminders ignored. The second traffic issue in the neighborhood is not related to development, but I'm going to briefly summarize it so you can understand how it effects our frustration, and it could exasperate the problem if school age children are in the proposed apartments.

  Parents try to bypass driving all the way around Wattles & Northfield Parkway to the school by dropping their children off on the dead end at Boulan. Then they back up or try to turn around in driveways, while children are walking to school (without sidewalks) and other parents are dropping off. It becomes a bottleneck. Several students were almost hit and two on bicycles had to dive into the ditch to avoid cars. We contacted the police who immediately agreed there was a problem. City management quickly put up signs. However, the signs are too small to read until you are already in the no drop off area. Requests for bigger print signs were ignored. A neighbor graciously allows police to park in her driveway to redirect misguided parents and ticket repeat offenders. These are some of the neighbors that don't believe the city when they comment that a 140 unit apartment (240 car) complex won't effect traffic in our neighborhood.

- Traffic continued... A proposal was put forth years ago about placing a barrier in the middle of the sub to reduce cut through traffic. It was strongly opposed by the neighbors that would only have access to Crooks. As you heard in the meeting it is very cumbersome to exit Big Beaver and follow all the turn arounds to get to Crooks. Neighbors like access to Big Beaver but more importantly to Crooks. Thinking that most of the 240 cars generated by an apartment complex are going to take the long way around by using Big Beaver is naive. Traffic on Banmoor, Muer and McClure especially, will increase by 240 cars per day. Remember, no sidewalks, no buses, sub-standard street widths. It is a recipe for disaster. I wish our streets had "no thru traffic" signs at Crooks. A traffic study may not show a problem exists but it only takes one car. We see that one car multiple times daily,

speeding through, late for work or home, trying to avoid the Big Beaver interchange. Why compound the problem with 240 more cars trying to get home?

- Correct me if I'm wrong, but at the meeting, this apartment development was compared to the Amber Townhomes being built on the corner of Towncenter and Livernois. The Amber Townhomes development does not sit adjacent to any residential homes.

- Historically, apartment buildings do not add to the value of a neighborhood. Immediate and future home values will be compromised with this development.

In summary the proposed apartment complex is a nice building with a bad proposal for location. Commission asked "if not here then where and what here". A lower density, single family design should go in the current location. The apartment complex should go in locations like the Kmart building area or Crooks and I75 area. Both areas are not directly accessible to pre-existing neighborhoods, still have the same outstanding Troy schools, and are in dire need of development. Stop trying to take our thriving, healthy neighborhood for less secure development. By pushing residents out, Troy will be destroying the very fabric that makes this city great. Thank you for your consideration.

Sincerely,
Barbara Dawson and Susan Tompkins

Κατηψ Χζαρνεχκι

From: Jeff Rains <jrains@telecomprofessionals.us>
Sent: Wednesday, October 26, 2016 12:40 PM
To: Planning
Subject: McClure 3142,3114, 3086

These parcels should not be rezoned. Look how the homes across the street from McClure 3142,3114, 3086 that were crammed next to one another that that was a bad decision. This rezoning would be even worse! Simply compare the homes crammed next to one another to the new construction on the original home lots throughout the subdivision. It is not the look that fits in with the Somerset Collection and the image of Big Beaver Road it lowers the values of the neighborhood and the entire area.

Jeff Rains
Telecom Professionals
Dual Ring 248.328.9125
Fax2Mail 248.328.9826

www.telecomprofessionals.us

Connect with us!

Confidential: This electronic message and all contents contain information from Telecom Professionals which may be privileged, confidential or otherwise protected from disclosure. If you have received this electronic message in error, please notify us immediately at (248) 251-3500, and destroy the original message and all copies.

An Open Letter and Formal Request to the City of Troy Planning Commission:

Date: 25 October, 2016

From: The Residents of Muer Garden Farms
3204 McClure Drive
Troy, Michigan 48084

To: The Chartered City of Troy Planning Commission:
Chair Donald Edmunds, Mr. Ollie Apahidean, Mr. Michael Hutson, Mrs. Karen Crusse,
Mr. Carlton Faison, Mr. Thomas Krent, Mrs. Padma Kuppa, Mr. Philip Sanzica & Mr. John Tagle

SUBJECT: Resident request to DENY Conditional Rezoning (File No. JPCR2016-003) and a formal request to visit McClure Rd to personally view the proposed development site.

Dear Chairman and Honorable Planning Commission Members,

As residents of Muer Garden Farms, we are firmly against the application for Conditional Rezoning of three parcels that include lot parcels 88-20-20-476-007, 88-20-20-476-008 & 88-20-20-476-009 for a 5 story multi-family apartment complex.

The opposition for the Conditional Rezoning is solely based on the Conditional Rezoning Standards of Approval (Sec. 16.04.C.3) There are five standards and to accept an application for Conditional Rezoning, the Planning Commission must meet all the standards. Finding of non-compliance with one standard is more than enough to DENY the application.

We would like the Planning Commission to consider a few of the most glaring issues with this application. The specific points focus on the Standards of Approval and adherence to those standards. They include the following:

> **Standard B:** The conditions, proposed development, and/or proposed use are not in material conflict with the Master Plan, or if there is material conflict with the Master Plan, such conflict is due to one of the following: i. A change in City policy since the Master Plan, ii. A change in conditions since the Master Plan was adopted, or iii. An error in the Master Plan.
>
> **Response:** The proposal is in direct material conflict with the Site Design Attributes, as well as the Building Design Attributes, as outlined on Page 86 of the Big Beaveer District portion of the City's Master Plan.
>
> This conflict between the Master Plan and the Conditional Rezoning is best outlined in a letter from from Mr. Richard Carlisle, President of Carlisle Wortman - City of Troy Planning Consultant to the Planning Director (dated July 26, 2016).
>
> Mr. Carlisle's letter spells out; "A key consideration in the District Plan was the Building Height Plan. In short, the Building Height Plan called for a transition in building height from properties adjacent to Big Beaver Road to properties interior from the roadway.

In other words, higher building were envisioned directly on Big Beaver transitioning to lower buildings adjacent to neighborhoods."

In this specific request, the development is 38 feet taller than the development that is directly to the South - which is physically located on Big Beaver. To the North, the adjacent property is a residential home that is 47 feet lower than the proposed development. Therefore, the proposal would put a buidling that is larger and higher than any property located on the North side of Big Beaver between Crooks and Coolidge Roads on an interior residential 20' wide non- standard road, well within a R-1B neighborhood.

Furthermore, the Big Beaver Road District, in the Master Plan (Page 86), also discusses the Site Design Attributes as the fact that 'Parking should be located in rear yards'. This proposed development is not located on Big Beaver, but actually located on the East side of McClure Drive. Currently, the design of the development has the parking lot to the North side of the development, abuting McClure Drive for over 100 feet. This is a direct conflict with the intent of the Master Plan.

also, there is this standard to consider as well:

Standard E: The conditions, proposed development, and/or proposed use shall insure compatibility with adjacent uses of land.

Response: The proposed development would be incompatible with adjacent uses of land. The reason for the incompatibility rests with placing a high-intensity, multi-family, highrise development between medium-intensity office buildings to the South and East, and low-intesity single family homes to the West and North of the development.

The 'intensity' issue is prominently discussed in the analysis to Standard C (above), and is highlighted in Section 5.04.E.4, titled Trasitional Features. Transitional features are architectural elements, site 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. As this development is proposed, it lacks compatibility between high and low intensity uses with no intermediate buffer zone, thus, negitively affecting the preservation of the uniqueness, harmony and characteristics of the Muer Gardens neighborhood.

We, the 338 residents, as represented by the attached 135 homeowners of Muer Garden Farms, respectfully petition the Planning Commission to review each and every standard that governs this specific McClure Apparment Conditional Rezoning Application. If you do so, you will find that this is a request that does not meet the standards for a Big Beaver District Conditional Rezoning development.

REQUEST: In accordance with the State of Michigan Open Meetings Act, we formally request and personally invite you to see the parcels for yourself. Seeing the proposed development site with your own eyes will paint a picture that words and presentations can not justify.

Please visit the location at: 3114 McClure Drive in Troy on your own schedule, or give us a call at: (248) 388-4664 to schedule a 5 minute individual tour with a few residents. We look forward to working with you to preserving and growing the city of Troy. We the undersigned are listed below:

FIRST NAME:	LAST NAME:	STREET #:	STREET:	CITY:	STATE:	ZIP CODE:
Sony	Abraham	1925	Muer Drive	Troy	MI	48084
Rawshan	Afrin	963	Banmoor Drive	Troy	MI	48084
Basma	Amer	1960	Sachin Way	Troy	MI	48084
Gloria	Anderlie	1625	Boulan	Troy	MI	48084
Sohail	Arshed	2041	Sachin Way	Troy	MI	48084
Michael	Auger	1734	Boulan	Troy	MI	48084
Sreenivasulu	Bajji	980	Banmoor Drive	Troy	MI	48084
Geoffrey	Barr	3165	Alpine Drive	Troy	MI	48084
Ed	Berbench	1630	Boulan	Troy	MI	48084
Jennifer and Mark	Beres	3322	McClure Drive	Troy	MI	48084
Julia	Berry	1575	Banmoor Drive	Troy	MI	48084
Thomas	Beshara	1937	Muer Drive	Troy	MI	48084
Tina & Stan	Bey	1480	Boulan	Troy	MI	48084
Simoon	Boks	3463	Crooks Rd	Troy	MI	48084
Lisa	Boltynck	1535	Muer Drive	Troy	MI	48084
Sever	Botezan	1855	Boulan	Troy	MI	48084
Ralph & Anne	Bourdeau	3162	McClure Drive	Troy	MI	48084
Ann	Bruttell	3425	McClure Drive	Troy	MI	48084
Heather and David	Bultynck	3470	Alpine Drive	Troy	MI	48099
Hector	Bultynck	1860	Boulan	Troy	MI	48084
Marilyn and Thomas	Burke	949	Banmoor Drive	Troy	MI	48084
Michelle	Burrell	1581	Muer Drive	Troy	MI	48084
Terri	Carter	1685	Boulan	Troy	MI	48084
Alaiah	Chadyashekay	3423	Alpine Drive	Troy	MI	48084
Chung	Chao	939	Muer Drive	Troy	MI	48084
Scott	Chavaux	1705	Banmoor Drive	Troy	MI	48084
Xingping	Chen	3481	McClure Drive	Troy	MI	48084
Avtar	Chhina	1940	Muer Drive	Troy	MI	48084
Nancy	Coyle	3463	McClure Drive	Troy	MI	48084
Barbara and Matthew	Dawson	1834	Boulan	Troy	MI	48084
Jerry	Debusschere	1885	Banmoor Drive	Troy	MI	48084
Roberta and Patrick	Delong	1451	Boulan	Troy	MI	48084
Maitry	Doshi	2008	Sachin Way	Troy	MI	48084
Ken	Downs	1808	Boulan	Troy	MI	48084
Valentina and Calmac	Dragos	967	Muer Drive	Troy	MI	48084
Michael and Catherine	Dunn	952	Banmoor Drive	Troy	MI	48084
Alan	Farrah	1755	Muer Drive	Troy	MI	48084
Craig	Fields	979	Muer Drive	Troy	MI	48084
Fred	Ford	1984	Muer Drive	Troy	MI	48084

Vanessa	Fremer	1673	Muer Drive	Troy	MI	48084
Ravi	Gandra	1971	Sachin Way	Troy	MI	48084
Rupali	Gawaskar	1977	Sachin Way	Troy	MI	48084
John	Glass	1900	Boulan	Troy	MI	48084
Lori and Geir	Gronstad	1782	Boulan	Troy	MI	48084
Andrea	Hernandez Troya	3183	McClure Drive	Troy	MI	48084
Keith	Howard	3229	McClure Drive	Troy	MI	48084
Subica and Shahid	Hussain	1734	Banmoor Drive	Troy	MI	48084
Monica and Daniel	Hwang	994	Banmoor Drive	Troy	MI	48084
Umesh	Inamdar	3201	McClure Drive	Troy	MI	48084
Kiran	Jasti	3225	Alpine Drive	Troy	MI	48084
Sandra	Jensen	896	Muer Drive	Troy	MI	48084
Hong	Jiang	1833	Boulan	Troy	MI	48084
Bonnie and John	Johnston	1510	Boulan	Troy	MI	48084
Shirley	Jordan	3268	Alpine Drive	Troy	MI	48084
Nabil & Sara	Kabra - Turshani	3373	Alpine Drive	Troy	MI	48091
Bhargavi	Kakasani	3547	Crooks Rd	Troy	MI	48084
Lulaj	Kanto	995	Muer Drive	Troy	MI	48084
Sue & Jim	Kator	1478	Banmoor Drive	Troy	MI	48084
Kristine	Khuiong	2072	Sachin Way	Troy	MI	48084
Peter & Pamela	Knappmann	3182	McClure Drive	Troy	MI	48084
Jean and Katherine	Knight	968	Muer Drive	Troy	MI	48084
Murty	Kompella	1754	Muer Drive	Troy	MI	48084
Ed	Konasky	1515	Muer Drive	Troy	MI	48084
Srinivasarao	Kottapalli	1507	Banmoor Drive	Troy	MI	48084
Thomas and Theresa	Krent	3184	Alpine Drive	Troy	MI	48096
Mark	Kuzma	3300	McClure Drive	Troy	MI	48084
Prateek	Lohia	1563	Banmoor Drive	Troy	MI	48084
Joanna	Losey	1535	Boulan	Troy	MI	48084
Shailender	Madani	2040	Sachin Way	Troy	MI	48084
John and Suzie	Malashanko	1455	Banmoor Drive	Troy	MI	48084
Jeanette and Tanafranca	Marlowe	940	Muer Drive	Troy	MI	48084
Harry and Lynn	Martindale	914	Muer Drive	Troy	MI	48084
Devin	McPherson	3396	Alpine Drive	Troy	MI	48084
Michael	Melaragni	1540	Muer Drive	Troy	MI	48084
Fred	Micsterseld	1576	Banmoor Drive	Troy	MI	48084
Linda	Minster	3365	Crooks Rd	Troy	MI	48084
Chad and Christi	Molitor	1558	Muer Drive	Troy	MI	48084
James	Moriarty	954	Muer Drive	Troy	MI	48084
Lisa and Randall	Mullins	903	Muer Drive	Troy	MI	48084

James	Myer	1491	Banmoor Drive	Troy	MI	48084
Ananth	Nagabhushana	1992	Sachin Way	Troy	MI	48084
Rudram	Naidu Muppuri	2073	Sachin Way	Troy	MI	48084
Alan and Debra	Nancarrow	1692	Banmoor Drive	Troy	MI	48084
Mitali and Roy	Nantu	1465	Muer Drive	Troy	MI	48084
Sahai and Prasad	Navin	1876	Boulan	Troy	MI	48084
Chad	Okilich	1805	Boulan	Troy	MI	48084
Eduardo	Palomino	1927	Muer Drive	Troy	MI	48084
Keith	Parke	1540	Boulan	Troy	MI	48084
Dianne and Earl	Parkerson	1681	Banmoor Drive	Troy	MI	48084
Vijay	Patel	3353	Alpine Drive	Troy	MI	48084
Kirit	Patel	1993	Sachin Way	Troy	MI	48084
Peter	Perakis	3393	Alpine Drive	Troy	MI	48090
Michelle and Jason	Phillips	853	Muer Drive	Troy	MI	48084
Judith	Prakash	1466	Muer Drive	Troy	MI	48084
Deepak Rameswarapu	Prasad Rashmi	927	Muer Drive	Troy	MI	48084
Donthireddy and Vijayalaks	Probhakar	3257	Alpine Drive	Troy	MI	48084
Paige	Pulson	3129	Alpine Drive	Troy	MI	48084
Sridevi	Puppala	2024	Sachin Way	Troy	MI	48084
Rocky & Amalia	Raczkowski	3204	McClure Drive	Troy	MI	48084
Betty	Reed	3147	Alpine Drive	Troy	MI	48084
Barbara	Reneaud	1958	Muer Drive	Troy	MI	48084
Lidia and Drasovean	Renei	953	Muer Drive	Troy	MI	48084
Chad	Richardson	3565	Crooks Rd	Troy	MI	48084
Charlotte	Roller	1731	Boulan	Troy	MI	48084
Lana and Ali	Saad	1711	Muer Drive	Troy	MI	48084
Abe & Nazira	Sassine	3226	McClure Drive	Troy	MI	48084
Kapllani	Sazan	1881	Boulan	Troy	MI	48084
Richard and Sandra	Schoenherr	3461	Alpine Drive	Troy	MI	48086
Deborah and William	Schramm	909	Banmoor Drive	Troy	MI	48084
Shirley and Walter	Smith	990	Muer Drive	Troy	MI	48084
Tejal	Soni	2025	Sachin Way	Troy	MI	48084
Mark	Sophiea	1900	Muer Drive	Troy	MI	48084
Sandeep	Sovani	3205	McClure Drive	Troy	MI	48084
Mahalingam	Srikanth	2057	Sachin Way	Troy	MI	48084
Jeanne	Stine	1915	Boulan	Troy	MI	48084
Ravi	Thalla	1708	Muer Drive	Troy	MI	48084
Raj	Thangamuthu	1926	Boulan	Troy	MI	48084
Vijay	Thota	1945	Boulan	Troy	MI	48084
Susan & Bill	Tompkins	1725	Banmoor Drive	Troy	MI	48084

Mike	Towle	1454	Banmoor Drive	Troy	MI	48084
Susan	Vaillancourt	1506	Banmoor Drive	Troy	MI	48084
Deborah	Vanittersum	1526	Muer Drive	Troy	MI	48084
Chris	Venable	2056	Sachin Way	Troy	MI	48084
Chuck and Denise	Walker	3381	McClure Drive	Troy	MI	48084
Linda	White	1505	Boulan	Troy	MI	48084
Holly	Williams	3431	Crooks Rd	Troy	MI	48084
Jim and Phyllis	Williams	3317	McClure Drive	Troy	MI	48084
Vicki and Matthew	Wind	1475	Boulan	Troy	MI	48084
Saish	Yalamanchili	1556	Banmoor Drive	Troy	MI	48084
Robert and Susan	York	980	Muer Drive	Troy	MI	48084
Mark	Zetouna	928	Muer Drive	Troy	MI	48084
Congjng	Zhad	3424	Alpine Drive	Troy	MI	48084
Xinhui	Zhang	1588	Boulan	Troy	MI	48084
Elaine	Zhu	2009	Sachin Way	Troy	MI	48084
Artur	Zukowski	1516	Muer Drive	Troy	MI	48084

We thank you for reviewing this document and petition you to DENY the Conditional Rezoning Application (File No. JPCR2016-003), and thank you for your consideration.

A. Rocky Raczkowski
A. Rocky Raczkowski

Sandeep Sovani
Sandeep Sovani

Umesh Inamdar
Umesh Inamdar

Sada Gawaskar
Sada Gawaskar

DATE: October 25, 2016

TO: Planning Commission

FROM: R. Brent Savidant, Planning Director

SUBJECT: PRELIMINARY SITE PLAN REVIEW (File Number SP JPLN2016-0028) – Proposed Troy Market Place (Additions), Southwest Corner of Big Beaver and Rochester, Section 27, Currently Zoned BB (Big Beaver) District

The petitioner Ramco-Gershenson, Inc. submitted the above referenced Preliminary Site Plan application for a number of outlot buildings and additions at the Troy Market Place development.

The property is currently zoned BB (Big Beaver) Zoning 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 JPLN 2016-0028 Troy Market Place Sec 27\PC Memo 2016 11 01.docx

PROPOSED RESOLUTION

PRELIMINARY SITE PLAN REVIEW (File Number SP JPLN2016-0028) – Proposed Troy Market Place (Additions), Southwest Corner of Big Beaver and Rochester, Section 27, Currently Zoned BB (Big Beaver) District

Resolution # PC-2016-11-
Moved by:
Seconded by:

RESOLVED, That Preliminary Site Plan Approval, pursuant to Article 8 of the Zoning Ordinance, as requested for the proposed Troy Market Place (Additions), located on the southwest corner of Big Beaver and Rochester, Section 27, within the BB (Big Beaver) District, be granted, subject to the applicant addressing the following conditions as part of the Final Site Plan submittal:

1. Work with engineering to place a pork chop or physical barrier in the drive approach to Big Beaver to force a right turn only.
2. Remove the spaces that are located just east and west of the proposed new trash enclosures.
3. Combine stormwater parcel along Rochester to main parcel to eliminate the status of the existing and proposed non-conforming building.
4. Submit building light fixtures.
5. Match detail on north elevation as south elevation for Outparcel C and D.
6. Provide the transparency calculation.

_____) or

(denied, for the following reasons: _____) or

(postponed, for the following reasons: _____)

Yes:
No:

MOTION CARRIED/FAILED

G:\SITE PLANS\SP JPLN 2016-0028 Troy Market Place Sec 27\Proposed PC Resolution 11 01 2016.doc

Troy Market Place

City of Troy Planning Department

Legend:

- Tax Parcel
- Aerial
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3

583 0 292 583 Feet

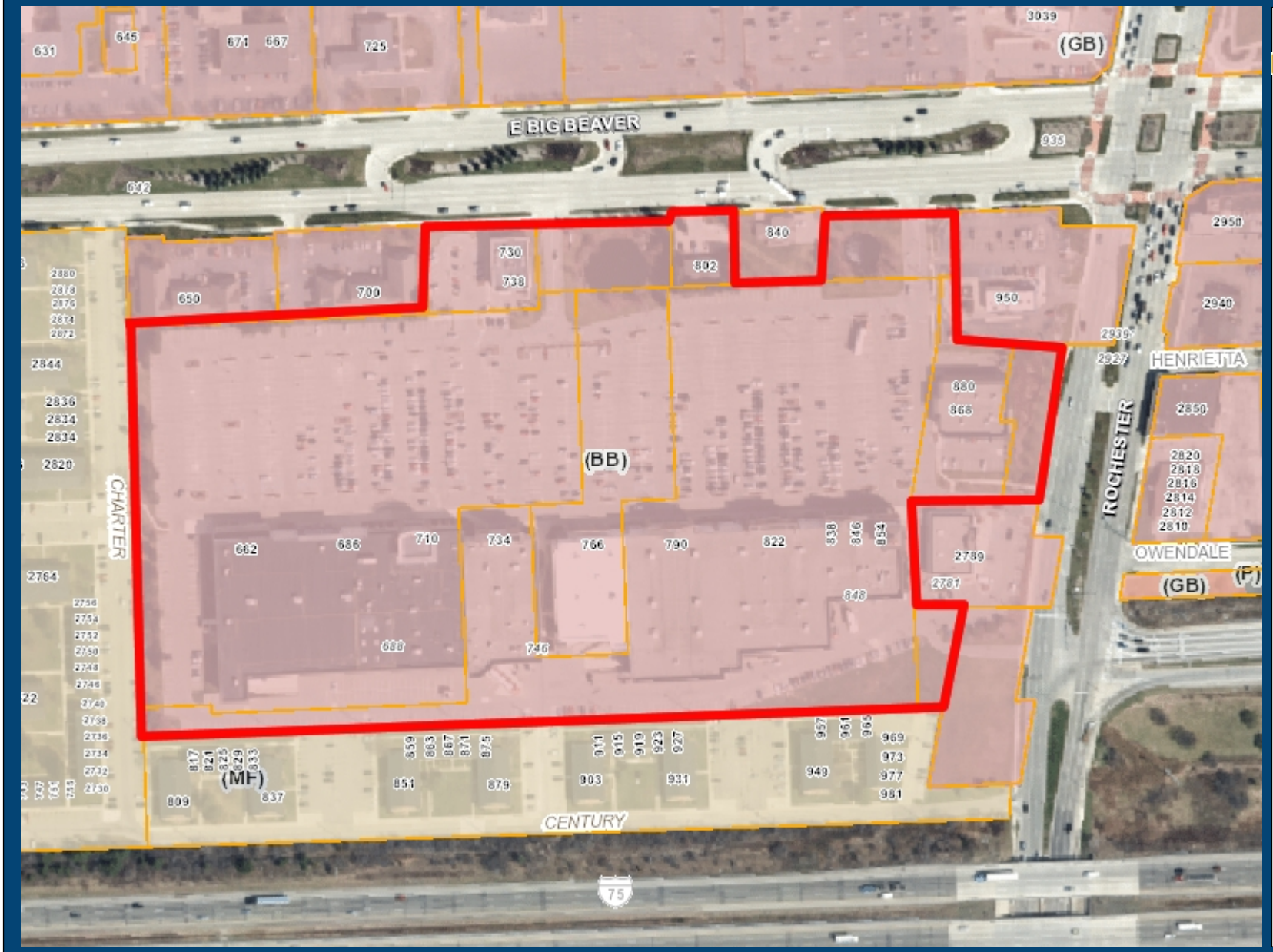
Scale 1: 3,500

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.

Printed: 10/7/2016

Troy Market Place

City of Troy Planning Department



Legend:

- Tax Parcel

Form Based Zoning 2

- (PUD) Planned Unit Development
- (PUD) Planned Unit Development
- (CF) Community Facilities District
- (EP) Environmental Protection District
- (BB) Big Beaver Road
- (MR) Maple Road
- (NN) Neighborhood Nodes (A-U)
- (CB) Community Business
- (GB) General Business
- (IB) Integrated Industrial Business District
- (O) Office Building District
- (OM) Office Mixed Use
- (P) Vehicular Parking District
- (R-1A) One Family Residential District
- (R-1B) One Family Residential District
- (R-1C) One Family Residential District
- (R-1D) One Family Residential District
- (R-1E) One Family Residential District
- (RT) One Family Attached Residential Distric
- (MF) Multi-Family Residential
- (MHP) Manufactured Housing
- (UR) Urban Residential
- (RC) Research Center District
- (PV) Planned Vehicle Sales

Aerial

- Red: Band_1
- Green: Band_2
- Blue: Band_3

667 0 333 667 Feet

Scale 1: 4,000

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.

Printed: 10/7/2016

CARLISLE | WORTMAN associates, inc.

605 S. Main Street, Ste. 1
Ann Arbor, MI 48104

(734) 662-2200
(734) 662-1935 Fax

October 25, 2016

Preliminary Site Plan
For
City of Troy, Michigan

Project Name:	Troy Market Place
Plan Date:	October 25, 2016
Location:	South side of Big Beaver, west of Rochester Road
Zoning:	BB, Big Beaver Form Base District
Action Requested:	Preliminary Site Plan

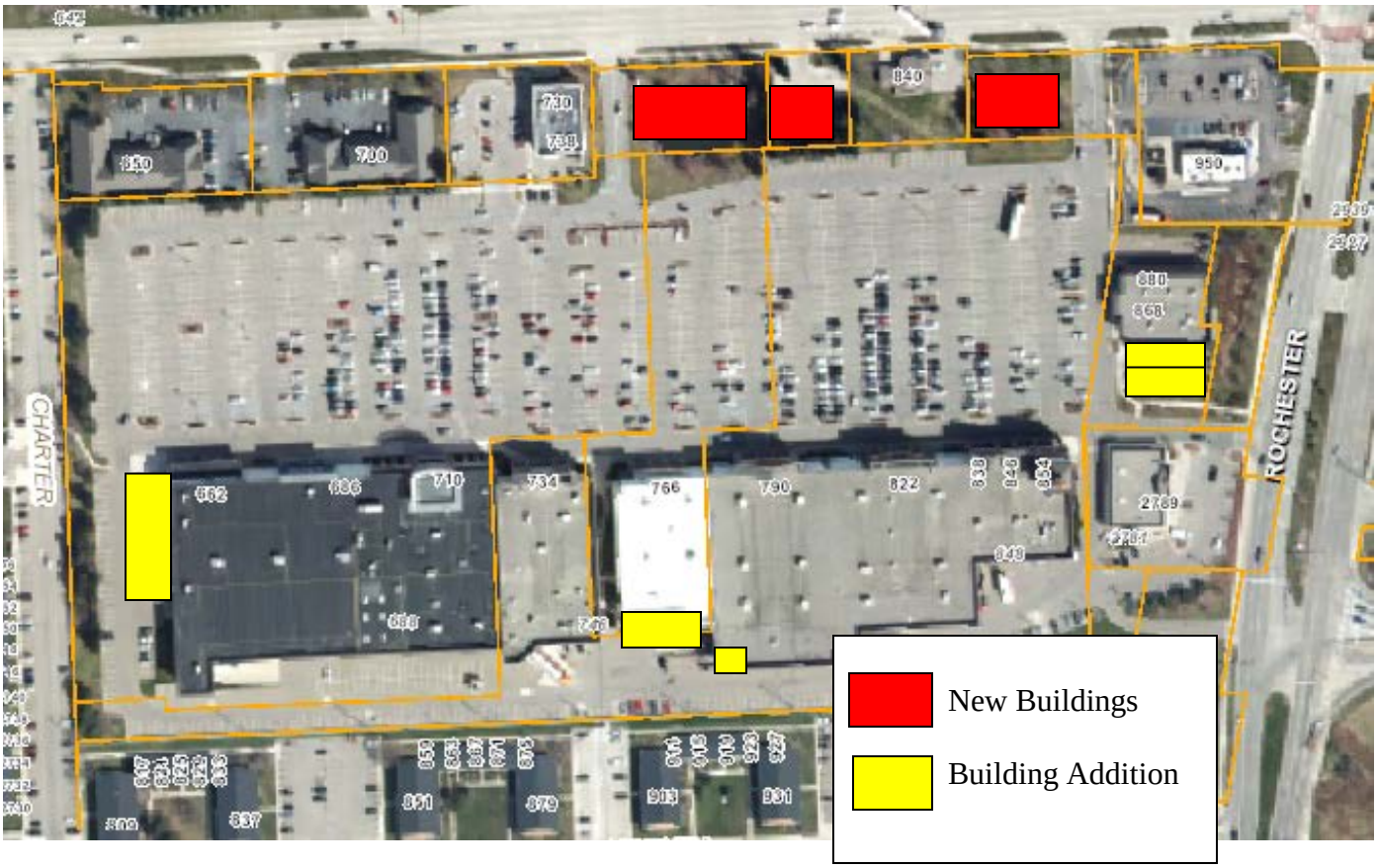
PROJECT AND SITE DESCRIPTION

We have received a site application for new construction and build-out of the existing Troy Market Place shopping center. The center is located at the southwest corner of Big Beaver and Rochester Road. Improvements include:

- Three new outlot freestanding buildings that front on Big Beaver. The middle building replaces an existing building on site. The buildings of each end replace existing detention ponds. Detention will be placed underground. There is one building on Big Beaver that is located between the three outlot buildings that is under different ownership and will remain.
- 8,800 sq/ft building expansion of the existing outlot building (mens warehouse/supercuts) on Rochester. Within the new addition, two (2) new tenants will be added.
- 5,000 sq/ft addition to the rear of the existing REI suite.
- New enclosed receiving area and truck well to the rear of existing GolfSmith suite.
- 7,615 sq/ft building addition on the west side of the development. Within the addition there will be one (1) new tenant.

The site is zoned Big Beaver and all improvements require site plan approval.

Location of Subject Property:



Size of Subject Property:
The overall size of the subject property is approximately 24 acres

Proposed Uses of Subject Parcel:
Commercial

Current Use of Subject Property:
Commercial

Current Zoning:
The property is currently zoned BB, Big Beaver

Direction	Zoning	Use
North	BB, Big Beaver	Commercial
South	MF, Multiple Family Residential	Multiple Family Residential
East	BB, Big Beaver	Commercial
West	MF, Multiple Family Residential	Multiple Family Residential

MASTER PLAN

The site was identified in the Big Beaver Corridor Study as a Rochester Corners Retail Transition Area. Rochester Corners is a retail transition area between the Signature Office District and the Smart Zone. Rochester Corners is a planned retail node. High quality, community retail uses are appropriate in this zone. Many of these uses will serve nearby residential areas.

Existing commercial structures currently encompass a significant portion of the site already. Infill of existing property with additional commercial uses is consistent with the Master Plan. There is an opportunity to develop a well-integrated site that includes creative yet consistent designed buildings. Because of its high visibility and prominence along Big Beaver, a key to site integration and cohesiveness, is a high quality and consistent building design pattern as well as the treatment and interaction between the buildings on the site.

Items to be Addressed: *Address site plan issues to ensure development is consistent with Master Plan.*

BUILDING ORIENTATION AND OVERALL SITE LAYOUT

Though the applicant is making significant site improvements, overall the primary building orientation and site layout remains. The applicant is infilling the site with new buildings and building additions.

Items to be Addressed: *None*

SITE ACCESS, and CIRCULATION

Direct site access is remaining as currently provided, which includes two (2) access points off Big Beaver and one (1) point off Rochester Road. For the most part, internal circulation within the site will not change. The only area of change to circulation is adjacent to the three (3) new buildings that front on Big Beaver. The applicant is adding a landscape and parking island to delineate the drive-aisle and the parking area.

The City Traffic Engineer notes that the main entrance (near PeiWei) and secondary access (near Burger King) on Big Beaver have long standing issues with drivers leaving site and attempting to go straight across Big Beaver to the cross over. There are signs at the main entrance and pavement markings at the secondary that prohibit this movement. However, these are often violated. The applicant should work with engineering to place a pork chop or physical barrier in the drive approach to Big Beaver to force a right turn only.

The parking space at the west and east end of the new parking lot, just north of the trash enclosure will be difficult to access and back out due to dumpster location. These spaces should be eliminated.

Items to be Addressed: *1). Work with engineering to place a pork chop or physical barrier in the drive approach to Big Beaver to force a right turn only; and 2). Remove the spaces that are located just north of the two new trash enclosures.*

AREA, WIDTH, HEIGHT, SETBACKS

Required and Provided Dimensions:

The site is being developed as a mixed building development meeting Building Form E requirements. Building Form E is a permitted building form for Site Type A. Table 5.03.B.4. establishes the dimensional requirements for the building form E:

	Required / Allowed	Provided	Compliance
Front (Big Beaver)	10 foot build-to-line	30-feet	Permitted with Planning Commission Approval.
Front (Rochester Road)	10 foot build-to-line	65 feet from street	Applicant proposes to consolidate lots with the stormwater parcel. Applicant has placed building as close to street as possible but restricted due to location of stormwater facility
Side (west)	N/A	64 feet	Complies
Rear (east)	40 foot minimum	52.5 feet	Complies
Open Space	15 percent	15.8 percent	Complies
Building Lot Coverage	30 percent	26.8 percent	Complies
Building Height	Minimum 14 feet	Varies: 24'-8" minimum	Complies
Parking	Big Beaver and Rochester Not located in front yard and screening	Not located in front yard	Complies

The applicant proposes to place the three (3) new buildings on Big Beaver 30-feet from the ROW in order to provide an area for a pedestrian plaza and bioswale. The 30-foot building placement is permitted with approval of the Planning Commission.

Items to be Addressed: *Planning Commission to consider 30-foot building placement.*

PARKING

For the various uses Section 13.06.G of the Zoning Ordinance requires:

	Required	Provided

General Retail: for retail centers over 50,000 sq/ft = 1 space per 300 gross sq.ft	255,759 sq.ft / 300 = 853 spaces	1,255 spaces
Restaurant: 1 space for 2 seats	418 seats = 209 spaces	
Barrier Free	23	48
Bicycle Parking	10	10
Loading	0	0
Total	**1,062 automobile**	**1,255 automobile**

Even though the applicant is additional buildings to the site, the site currently exceeds the minimum parking requirement. Applicant has added bike parking at new outlots buildings.

Items to be Addressed: *None*

PEDESTRIAN CIRCULATION

The applicant is providing full pedestrian access around the three (3) new buildings along Big Beaver. In addition, the applicant has added a sidewalk to connect buildings C and OL to Building D.

The applicant has also provided two (2) pedestrian crossings from the new buildings on Big Beaver to parking lot island and into the main parking lot.

Additional sidewalks have been added along the building addition on Rochester Road and the building addition along the western portion of the development.

Items to be Addressed: *None*

LANDSCAPING

The applicant has provided a landscape plan. The plan provides all necessary calculations regarding greenbelt, street trees, and parking lot landscaping requirements.

	Required:	Provided:	Compliance:
Street Trees: 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.	417 feet = 15 trees	15 street trees	Compliant
Site landscaping: A minimum of twenty percent (20%) of the site area shall be	15%	The applicant indicates 20% of	Compliant

comprised of landscape material.		landscape and softscape area	
Parking Lot Landscaping: 1 tree for every 8 parking spaces. Trees may be located adjacent to parking lot with planning commission approval.	86 spaces = 11 trees	11 trees	2 trees are located within parking lot, remaining 9 are located along perimeter. Compliant with Planning Commission approval.
Landmark Trees: 100% replacement for every in removed	Removing 12-inch Balled Cypress and sixteen-inch Red Maple	Twelve 2.5-inch caliper trees	Compliant
Screen / Buffer:	Screen Alt. 3 and/or wall	Existing 6 foot wall	Complaint

The applicant is removing two (2) landmark trees which total 28 total inches. The applicant has replaced with required 28-inches of mitigated trees.

Trash Enclosure:

Two (2) new trash enclosures are proposed to serve the three (3) new buildings along Big Beaver. Applicant has provided screening details on sheet C-3.2. Applicant proposes a c-brick wall, metal gates, and evergreen trees to screen the trash enclosure.

Items to be Addressed*: None*

LIGHTING

The applicant has submitted a photometric plan. The only additional site lighting is in the new parking lot behind the buildings on Big Beaver. All lights meet ordinance requirements.

The applicant has not shown any building lighting.

Items to be Addressed: *Submit building light fixtures for the final site plan.*

FLOOR PLAN AND ELEVATIONS

Floor plans and building elevations have been provided for all new outlot buildings. All the building have the same design and material palate, and match the design of the existing building on site. Additional detail is provided in the design standards noted below. We note that north elevation (Big Beaver) of Outparcel C and Outparcel D lacks the detail of the south elevation (parking lot) particularly in the center of the building.

The 7,615 sq/ft building addition on the west side of the development matches the architectural style and material of the existing building.

Items to be Addressed: *Match detail on north elevation as south elevation for Outparcel C and D.*

DESIGN STANDARDS

The Big Beaver design standards provide the Planning Commission with direction when reviewing the proposed design features of this development.

Façade Variation.

The maximum linear length of an uninterrupted building façade facing public streets and/or parks shall be thirty (30) feet. ***The applicant has provided variation through exterior building materials, colors, textures and relief.***

Pedestrian Access / Entrance.

a. *Primary Entrance: The primary building entrance shall be clearly identifiable and useable and located in the front façade parallel to the street.* ***The primary entrance for all buildings on Big Beaver front on Big Beaver. The building additions that front on Rochester cannot have a front entrance because of the detention pond; however a sidewalk is provided from Rochester to the entrance facing the parking lot.***

b. Pedestrian Connection. The pedestrian connection shall be fully paved and maintained surface not less than five (5) feet in width. ***Pedestrian access is accommodated for all buildings.***

c. Additional Entrances. In addition to the primary façade facing front façade and/or the right-of-way, if a parking area is located in the rear or side yard, must also have a direct pedestrian access to the parking area that is of a level of materials quality and design emphasis at least equal to that of the primary entrance. ***Complies***

Ground Story Activation.

The first floor of any front façade facing a right-of-way shall be no less than fifty (50) percent windows and doors, and the minimum transparency for facades facing a side street, side yard, or parking area shall be no less than 30 percent of the façade. Transparency alternatives are permitted up to 80% of the 50% total along the front of buildings, and up to 100% of the sides of buildings. The minimum transparency requirement shall apply to all sides of a building that abut an open space, including a side yard, or public right-of-way. Transparency requirements shall not apply to sides which abut an alley.

The applicant shows clear glass on the frontages of the buildings that front on Big Beaver. It appears that through the use of glass and alternatives, the required transparency is met. For the final site plan the applicant should provide the transparency calculation.

Transitional Features

a. *Transitional features are architectural elements, site 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.

Existing 6-foot high fence meets ordinance requirements.

Site Access and Parking

a. *Required Parking. Off-street parking shall be provided in accordance with the standards set forth in Article 13, Site Design Standards.* ***The applicant has provided the necessary parking.***

b. *Location.*
   I. *When parking is located in a side yard (behind the front building line) but fronts on the required building line, no more than fifty (50) percent of the total site's linear feet along the required building line or one hundred (100) feet, whichever is less, shall be occupied by parking.* ***Not Applicable***

   II. *For a corner lot, shall be no more than fifty (50) percent of the site's cumulative linear feet along the required building lines or one hundred (100) feet, whichever is less, shall be occupied by parking. The building shall be located in the corner of the lot adjacent to the intersection.* ***Not Applicable***

   III. *For a double frontage lot or a lot that has frontage on three (3) streets, the cumulative total of all frontages occupied by parking shall be no more than sixty-five (65) percent of the total site's linear feet along a required building line or one hundred and twenty-five (125) feet, whichever is less.* ***Not Applicable***

   IV. *Where off-street parking is visible from a street, it should be screened in accordance with the standards set forth in Section 13.02.C.* ***Not Applicable.***

SUMMARY OF FINDINGS

The applicant is adding a significant investment to the site. Provided the Planning Commission to grants the 30-foot build-to-line placement along Big Beaver, we recommend preliminary site plan approval with the following conditions to be addressed as part of the final site plan submittal:

1) *Work with engineering to place a pork chop or physical barrier in the drive approach to Big Beaver to force a right turn only.*
2) *Remove the spaces that are located just east and west of the proposed new trash enclosures.*
3) *Combine stormwater parcel along Rochester to main parcel to eliminate the status of the existing and proposed non-conforming building.*
4) *Submit building light fixtures.*
5) *Match detail on north elevation as south elevation for Outparcel C and D.*
6) *Provide the transparency calculation.*

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

PRELIMINARY SITE PLANS FOR

TROY MARKET PLACE ADDITIONS

PART OF THE NE 1/4 OF SECTION 27 T. 2N., R. 11E.,

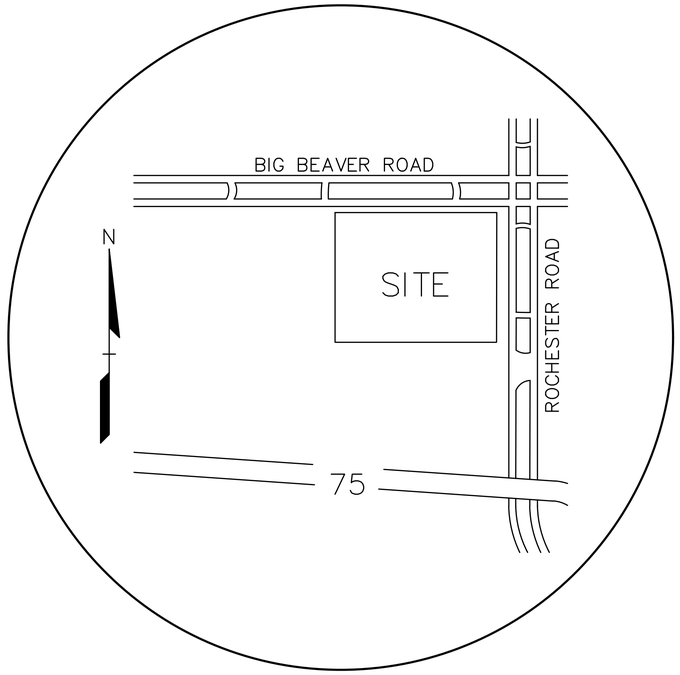
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

OWNER:

RAMCO GERSHENSON
31500 NORTHWESTERN HIGHWAY, SUITE 300
FARMINGTON HILLS, MI 48334
CONTACT: ROSS GALLENTINE RA
PHONE: (248) 592-6326
FAX: (248) 592-6327
EMAIL: RGALLENTINE@RGPT.COM

CIVIL ENGINEER:

PEA, INC.
2430 ROCHESTER CT, SUITE 100
TROY, MI 48083
CONTACT: DAVE HUNTER, PE
PHONE: (248) 689-9090 EXT. 113
FAX: (248) 689-1044
EMAIL: DHUNTER@PEAINC.COM



LOCATION MAP
NO SCALE

INDEX OF DRAWINGS:

C-0.0	COVER SHEET
C-1.0	BOUNDARY SURVEY
C-1.1	TOPOGRAPHIC SURVEY
C-1.2	TOPOGRAPHIC SURVEY
C-1.3	TOPOGRAPHIC SURVEY
C-2.0	OVERALL SITE PLAN
C-3.0	PRELIMINARY SITE PLAN
C-3.1	PRELIMINARY SITE PLAN
C-3.2	PRELIMINARY SITE PLAN
C-4.0	PRELIMINARY GRADING PLAN
C-4.1	PRELIMINARY GRADING PLAN
C-4.2	PRELIMINARY GRADING PLAN
L-1.0	PRELIMINARY LANDSCAPE PLAN
T-1.0	TREE PRESERVATION PLAN
A-1	CONCEPTUAL FLOOR PLAN RETAIL C
A-2	CONCEPTUAL BUILDING ELEVATIONS RETAIL C
A-3	CONCEPTUAL FLOOR PLAN OUTPARCEL C
A-4	CONCEPTUAL BUILDING ELEVATIONS OUTPARCEL C
A-5	CONCEPTUAL FLOOR PLAN RETAIL D
A-6	CONCEPTUAL BUILDING ELEVATIONS RETAIL D
A-7	CONCEPTUAL FLOOR PLAN RETAIL A
A-8	CONCEPTUAL BUILDING ELEVATIONS RETAIL A
A-9	CONCEPTUAL FLOOR PLAN RETAIL G
A-10	CONCEPTUAL BUILDING ELEVATIONS RETAIL G
A-11	CONCEPTUAL FLOOR & BUILDING ELEVATION RETAIL G
	SITE LIGHTING 1 OF 2
	SITE LIGHTING 2 OF 2

NOT FOR CONSTRUCTION

XREF: S:\PROJECTS\2016\2016028\DWG\16028-TOPOBASE.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X-BASE-16028.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X-TBLK-16028.DWG

No.	BY	CHK	DESCRIPTION	DATE
1	K.B	DMH	REVISED PER CITY OF TROY REVIEW	10/25/16

REVISIONS

CONSTRUCTION

THIS DRAWING AND DESIGN IS THE PROPERTY OF PEA, INC. THE "X" REFLECTS DOCUMENTS CONSTRUCTED OR COPYEDIT IN WHOLE OR IN PART. DESIGN FINISHING INFORMATION TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF PEA, INC. ALL COMMON LAW RIGHTS OF COPYRIGHT AND OTHERWISE HELD BY BY OFFICE ALLY R.S.R. © 2016 PEA, INC.

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811
Know what's below
Call before you dig
MISS DIG System, Inc.
1-800-482-7171 TOLL FREE www.missdig.net

PEA

PEA Inc.
2430 Rochester Ct. Ste 100
Troy, MI 48083
t: 248.689.9090
f: 248.689.1044
www.peainc.com

RAMCO GERSHENSON, INC.
31500 NORTHWESTERN HIGHWAY, SUITE 300
FARMINGTON HILLS, MI 48334

COVER SHEET
TROY MARKET PLACE ADDITIONS
PART OF THE NE 1/4 OF SECTION 27, T. 2N., R. 11E.
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

D.S.	RLS/TMK	DN.	TMK/CJ	S.R.	TS	P.M.	RLS

S:\PROJECTS\2016\2016-028 TROY MARKETPLACE-DMH\Dwg\Site Plans\(C-0.0) COVER-16028.dwg

ORIGINAL ISSUE DATE
SEPT. 9, 2016

PROJECT NO. 2016:028

SCALE NO SCALE

DRAWING NUMBER

C-0.0

LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING

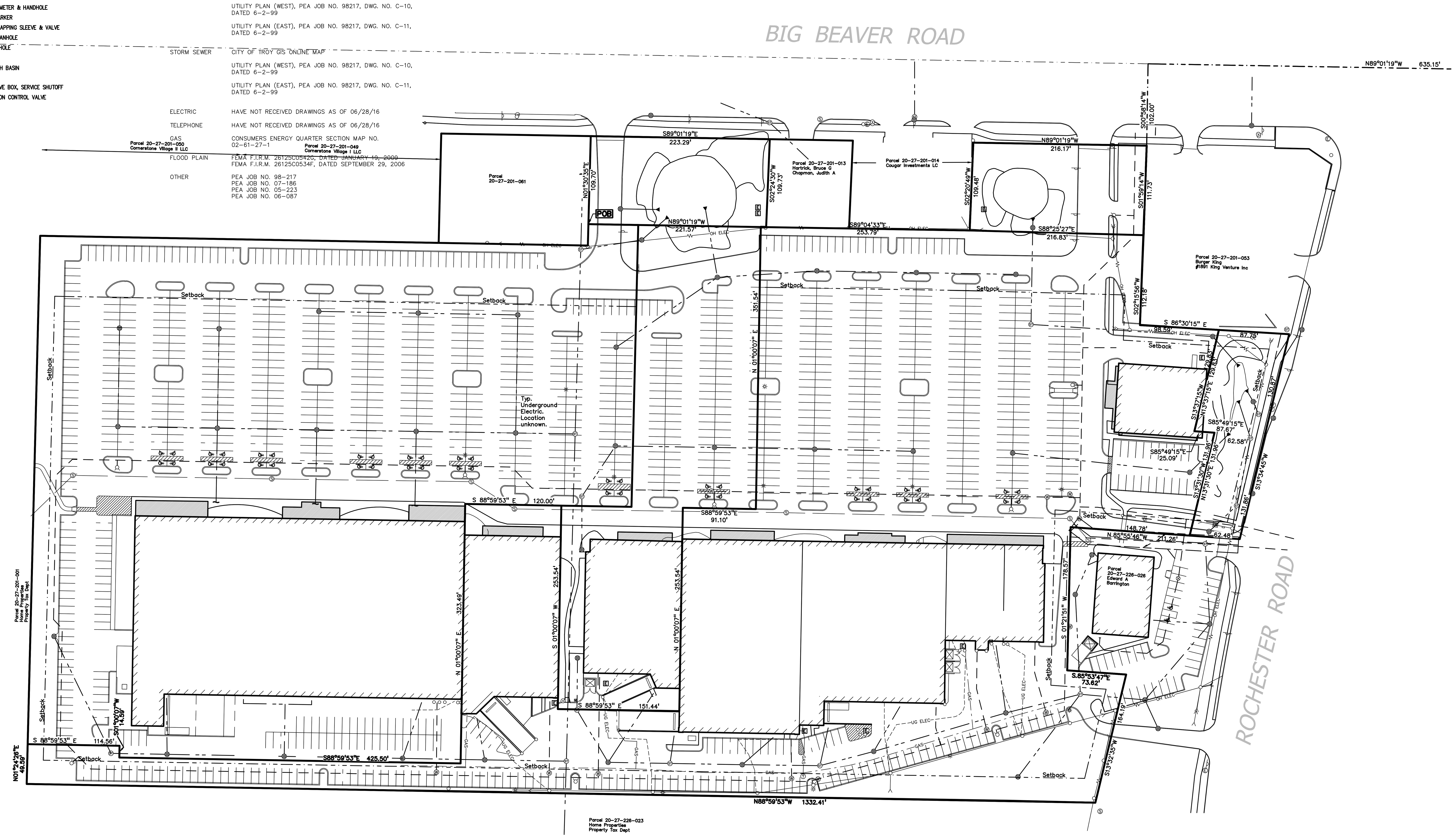
- ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UNDERGROUND CABLE TV, CATV PEDESTAL
- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER & MANHOLE
- SQUARE, ROUND & BEEHIVE CATCH BASIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- SPOT ELEVATION
- CONTOUR LINE
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN
- CONCRETE
- ASPHALT
- GRAVEL SHOULDER
- WETLAND

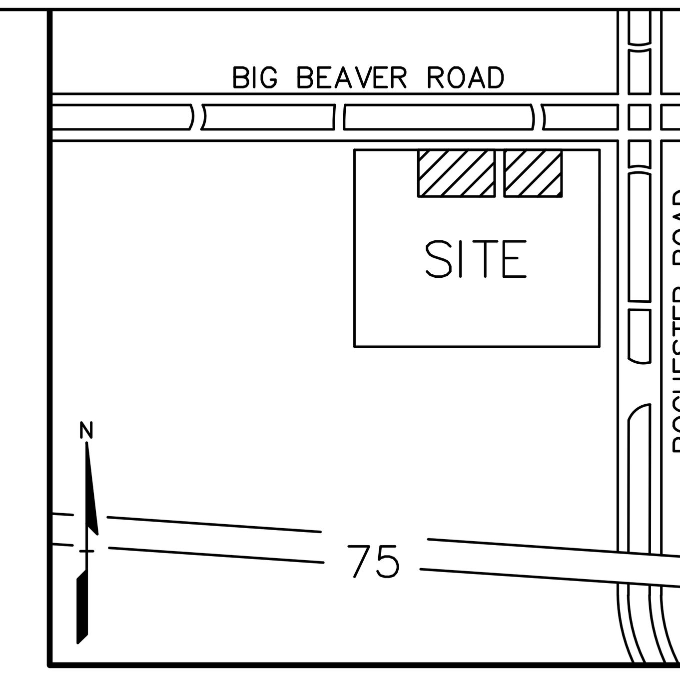
REFERENCE DRAWINGS

WATER MAIN	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
SANITARY SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
STORM SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
ELECTRIC	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
TELEPHONE	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
GAS	CONSUMERS ENERGY QUARTER SECTION MAP NO. 02–61–27–1
FLOOD PLAIN	~~FEMA F.I.R.M. 26125C0542G, DATED JANUARY 19, 2009~~ FEMA F.I.R.M. 26125C0534F, DATED SEPTEMBER 29, 2006
OTHER	PEA JOB NO. 98–217 PEA JOB NO. 07–186 PEA JOB NO. 05–223 PEA JOB NO. 06–087

GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.





LOCATION MAP – NOT TO SCALE

Land located in the City of Troy, County of Oakland, State of Michigan, and described as follows: (Per Lawyers Title Insurance Corporation, Commitment No. N–099145, Revised 12–21–05)

Part of Lot 8, all of Lots 9 to 14, inclusive, part of Lots 15 to 25, inclusive, all of Lots 26 to 29, inclusive, and part of Lots 30, 31, 33 and 34 of FORD SUBDIVISION, as recorded in Liber 58 of Plats, Page 24, and part of Lots 41, 42, 43, and 44 of SUPERVISOR'S PLAT NO.9, as recorded in Liber 46 of Plats, Page 41, and Lots 38, 39, and 40 and the West 20 feet of Lot 37 of SUPERVISOR'S PLAT NO.9, Except the North 69 feet taken for Big Beaver Road right–of–way, as recorded in Liber 46 of Plats, Page 41, and Lots 5, 6, 7, and 8 of FORD ESTATES, Except the North 69 feet taken for Big Beaver Road right–of–way, as recorded in Liber 55 of Plats, Page 40, Oakland County Records, including all that portion of vacated Owendale Street lying adjacent to said lands, which parcels are more particularly described as follows: Commencing at the Northeast corner of Section 27; thence North 89 degrees 01 minute 19 seconds West, 635.15 feet; thence South 00 degrees 58 minutes 14 seconds West, 102.00 feet; thence South 01 degree 59 minutes 14 seconds West, 111.73 feet (recorded 111.92 feet) to the Point of Beginning; thence South 02 degrees 15 minutes 56 seconds West, 112.18 feet (recorded 112.30 feet) to the North line of Lot 42 of said SUPERVISOR'S PLAT NO.9; thence along said North line, South 86 degrees 30 minutes 15 seconds East, 98.59 feet; thence South 13 degrees 37 minutes 15 seconds West, 129.83 feet; thence South 85 degrees 49 minutes 15 seconds East, 25.09 feet; thence South 13 degrees 31 minutes 30 seconds West, 131.96 feet to the North right–of–way line of Owendale Road (60 feet right–of–way); thence along the North right–of–way of Owendale, North 85 degrees 55 minutes 46 seconds West, 148.78 feet; thence South 01 degree 21 minutes 51 seconds West, 178.57 feet; thence South 85 degrees 53 minutes 47 seconds East, 73.62 feet to the Southwest corner of Lot 3 of said FORD SUBDIVISION; thence along the Easterly line of Lot 8 of said FORD SUBDIVISION, South 13 degrees 32 minutes 35 seconds West, 164.19 feet to the South line of said FORD SUBDIVISION; thence along said South line, North 88 degrees 59 minutes 53 seconds West, 1332.41 feet (recorded North 88 degrees 58 minutes 40 seconds West, 1332.20 feet); to the West line of said FORD SUBDIVISION; thence along said West line, North 01 degree 24 minutes 26 seconds East, 49.59 feet; thence South 88 degrees 59 minutes 53 seconds East, 114.56 feet; thence South 01 degree 00 minutes 07 seconds West, 14.59 feet; thence South 88 degrees 59 minutes 53 seconds East, 425.50 feet; thence North 01 degree 00 minutes 07 seconds East, 323.49 feet; thence South 88 degrees 59 minutes 53 seconds East, 120.00 feet; thence South 01 degree 00 minutes 07 seconds West, 253.54 feet; thence South 88 degrees 59 minutes 53 seconds East, 151.44 feet; thence North 01 degree 00 minutes 07 seconds East, 253.54 feet; thence South 88 degrees 59 minutes 53 seconds East, 91.10 feet; thence North 01 degree 00 minutes 07 seconds East, 351.54 feet; thence to the South line of FORD ESTATES, as recorded in Liber 58 of Plats, Page 24, Oakland County Records; thence along said South line, South 89 degrees 01 minutes 19 seconds East, 6.59 feet; thence along said South line, South 89 degrees 04 minutes 33 seconds East, 253.79 feet (recorded South 89 degrees 00 minutes 00 seconds East, 253.50 feet); thence South 88 degrees 25 minutes 27 seconds East, 216.83 feet to the Point of Beginning.

ALSO, Lots 38, 39 and 40 and the West 20 feet of Lot 37 of SUPERVISOR'S PLAT NO.9, as recorded in Liber 46 of Plats, Page 41, Oakland County Records, Except the North 69 feet taken for Big Beaver Road right–of–way, more particularly described as follows: Commencing at the Northeast corner of Section 27; thence North 89 degrees 01 minute 19 seconds West, 635.15 feet; thence South 00 degrees 58 minutes 14 seconds West, 102.00 feet to the Point of Beginning; thence South 01 degree 59 minutes 14 seconds West, 111.73 feet (recorded 111.92 feet); thence North 88 degrees 25 minutes 27 seconds West, 216.83 feet along the South line of said Lots 37, 38, 39 and 40, to the West line of said SUPERVISOR'S PLAT NO.9; thence along said West line, North 02 degrees 20 minutes 49 seconds East, 109.48 feet (recorded North 02 degrees 28 minutes 30 seconds East, 109.75 feet) to the South right–of–way line of Big Beaver Road; thence along said right–of–way line of Big Beaver Road, South 89 degrees 01 minute 19 seconds East, 216.17 feet (recorded South 89 degrees 00 minutes 00 seconds East, 215.81 feet) to the Point of Beginning.

ALSO, Lots 5, 6, 7, and 8 of FORD ESTATES, as recorded in Liber 55 of Plats, Page 40, Oakland County Records, Except the North 69 feet taken for the Big Beaver Road right–of–way, more particularly described as follows: Commencing at the Northeast corner of Section 27; thence North 89 degrees 01 minute 19 seconds West, 635.15 feet; thence South 00 degrees 58 minutes 14 seconds West, 102.00 feet; thence North 89 degrees 01 minute 19 seconds West, 216.17 feet (recorded North 89 degrees 00 minutes 00 seconds West, 215.81 feet); thence South 02 degrees 20 minutes 49 seconds West, 109.48 feet (recorded South 02 degrees 28 minutes 30 seconds East, 109.75 feet); thence North 89 degrees 04 minutes 33 seconds West, 253.79 feet (recorded North 89 degrees 00 minutes 00 seconds West, 253.50 feet) to the Point of Beginning, said point also being the Southeast corner of said Lot 5; thence along the South line of said FORD ESTATES, North 89 degrees 01 minute 19 seconds West, 221.57 feet to the West line of said FORD ESTATES; thence North 01 degree 30 minutes 35 seconds East, 109.70 feet to the right–of–way line of Big Beaver Road; thence along said right–of–way line, South 89 degrees 01 minute 19 seconds East, 223.29 feet; thence South 02 degrees 24 minutes 30 seconds West, 109.73 feet to the Point of Beginning.

ALSO, Part of Lots 42 and 43, of SUPERVISOR'S PLAT NO. 9, as recorded in Liber 46 of Plats, Page 41, described as: Commencing at the Northeast corner of Section 27; thence North 89 degrees 01 minute 19 seconds West, 635.15 feet; thence South 00 degrees 59 minutes 14 seconds West, 111.73 feet (recorded as 111.92 feet); thence South 02 degrees 15 minutes 56 seconds West, 112.18 feet (recorded as 112.30 feet); thence South 86 degrees 30 minutes 15 seconds East, 98.59 feet to the Point of Beginning; thence South 86 degrees 30 minutes 15 seconds East, 87.75 feet; thence South 13 degrees 34 minutes 45 seconds West, 130.87 feet; thence North 85 degrees 49 minutes 15 seconds West, 87.67 feet; thence North 13 degrees 37 minutes 15 seconds East, 129.83 feet to the Point of Beginning.

ALSO, Part of Lot 44 of of SUPERVISOR'S PLAT NO. 9, as recorded in Liber 46 of Plats, Page 41, more particularly described as follows: Commencing at the Northeast corner of Section 27; thence North 89 degrees 01 minute 19 seconds West, 635.15 feet; thence South 00 degrees 58 minutes 14 seconds West, 102.00 feet; thence South 01 degree 59 minutes 14 seconds West, 111.73 feet (recorded as 111.92 feet); thence South 02 degrees 15 minutes 56 seconds West, 112.18 feet (recorded as 112.30 feet); thence South 86 degrees 30 minutes 15 seconds East, 186.34 feet; thence South 13 degrees 34 minutes 45 seconds West, 130.87 feet to the Point of Beginning; thence South 13 degrees 34 minutes 45 seconds West, 131.86 feet; thence North 85 degrees 55 minutes 46 seconds West, 62.48 feet; thence North 13 degrees 31 minutes 30 seconds East, 131.96 feet; thence South 85 degrees 49 minutes 15 seconds East, 62.58 feet to the Point of Beginning.

Together with non–exclusive perpetual easements for ingress and egress, parking and utilities on, over, across, and/or in and/or on Lots 1, 2, 3 and part of Lot 8, FORD SUBDIVISION, Liber 58 of Plats, Page 24, Oakland County Records, granted in the Amended and Restated Agreement dated as of June 3, 1999 between Rochester 75 Development Company L.L.C. and Edward A. Barrington, recorded June 22, 1999 in Liber 20166, Page 14, Oakland County Records.

Together with a permanent, mutual, reciprocal, non–exclusive easement and right to use common areas granted in and as more particularly described in that certain agreement dated as of June 3, 1999 by and between Rochester 75 Development Company L.L.C. and Recreational Equipment, Inc., recorded June 22, 1999 in Liber 20166, Page 75, Oakland County Records.

Together with an exclusive perpetual easement on, over, through and across Lots 4 and 5 of FORD SUBDIVISION, Liber 58 of Plats, Page 24, Oakland County Records, granted in easement dated as of June 3, 1999 and recorded June 22, 1999 in Liber 20166, Page 41, Oakland County Records.

Together with and subject to perpetual, non–exclusive easements for ingress and egress of vehicular and pedestrian traffic (over any sidewalks constructed within the designated parcels) as created under a certain Agreement by and between King Venture Development L.L.C. and Rochester 75 Development Company L.L.C. dated as of April 20, 2000 and recorded May 11, 2000 in Liber 21379, Page 63, Oakland County Records.

Together with the exclusive perpetual easements granted in Owendale Street Vacation Agreement between Rochester 75 Development Company, L.L.C. and the City of Troy, dated as of May 10, 1999 and recorded September 2, 1999 in Liber 20494, Page 3, Oakland County Records.

NOT FOR CONSTRUCTION

XREF: S:PROJECTS\2016\2016028\DWG\16028–TOPOBASE.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X–BASE–16028.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X–TBLK–16028.DWG

No.	BY	CHK	DESCRIPTION	DATE
1	K□B	DNH	R□□IS□D P□R CITY OF TROY R□□I□W	10/25/16

R□□ISIONS

C□□TION□
TH□ LOC□TIONS □ND □L□□□TIONS OF □□ISTING □ND□RGRO□ND □TILITI□S □S SHOWN ON THIS DR□WING □R□ ONLY □PPRO□IM□T□. NO G□□R□NT□□ IS □ITH□R □□PR□SS□D OR IMPLI□D □S TO TH□ COMPL□T□N□SS OR □CC□R□CY TH□R□OF. TH□ CONTR□CTOR SH□LL B□ □□CL□SI□□LY R□SPONSIBL□ FOR D□T□RMINING TH□ □□□CT □TILITY LOC□TIONS □ND □L□□□TIONS PRIOR TO TH□ ST□RT OF CONSTR□CTION.

THIS DR□WING □ND D□SIGN □R□ TH□ PROP□RTY OF P□□□INC. TH□Y □R□ S□BMITT□D ON TH□ CONDITION TH□T TH□Y □R□ NOT TO B□ □S□D□R□PROD□C□D□OR COPI□D□IN WHOL□ OR IN P□RT□OR □S□D FOR F□RNISHING INFORM□TION TO OTH□RS□WITHO□T TH□ PRIOR WRITT□N CONS□NT OF P□□□INC. □LL COMMON L□W RIGHTS OF COPYRIGHT □ND OTH□RWIS□ □R□ H□R□BY SP□CIFIC□LLY R□S□R□□D. © 2016 P□□□INC.

CONSTR□CTION CONTR□CTOR □GR□□S TH□T IN □CCORD□NC□ WITH G□N□R□LLY □CC□PT□D CONSTR□CTION PR□CTIC□S□CONSTR□CTION CONTR□CTOR WILL B□ R□□□IR□D TO □SS□M□ SOL□ □ND COMPL□T□ R□SPONSIBILITY FOR □OB SIT□ CONDITIONS D□RING TH□ CO□RS□ OF CONSTR□CTION OF TH□ PRO□□CT□INCL□DING S□F□TY OF □LL P□RSONS □ND PROP□RTY□TH□T THIS R□□□IR□M□NT SH□LL B□ M□D□ TO □PPLY CONTIN□O□SLY □ND NOT B□ LIMIT□D TO NORM□L WORKING HO□RS□□ND CONSTR□CTION CONTR□CTOR F□RTH□R □GR□□S TO D□F□ND□ IND□MNIFY □ND HOLD D□SIGN PROF□SSION□L H□RML□SS FROM □NY □ND □LL LI□BILITY□R□□L OR □LL□G□D□IN CONN□CTION WITH TH□ P□RFORM□NC□ OF WORK ON THIS PRO□□CT □□C□PTING LI□BILITY □RISING FROM TH□ SOL□ N□GLIG□NC□ OF TH□ D□SIGN PROF□SSION□L.

3 FULL WORKING DAYS BEFORE YOU DIG CALL
811
Know what□s □elow
Call □efore you dig
MISS DIG System, Inc.
1□□00□□□2□□1□1 www.missdig.net
□TOLL FR□□□

P□□□Inc.
2□□0 Rochester Ct□Ste 100
Troy□MI □□0□□□1□□2
t□2□□.6□9.9090
f□2□□.6□9.10□□
www.peainc.com

RAMCO GERSHENSON, INC.
□1500 NORTHW□ST□RN HIGHW□Y□S□IT□ □00
F□RMINGTON HILLS□MI □□□□□

BOUNDARY SURVEY
TROY MARKET PLACE ADDITIONS
P□RT OF TH□ N□ 1/□ OF S□CTION 2□ T. 2N.□R. 11□.□
CITY OF TROY□O□KL□ND CO□NTY□MICHIG□N

D□S.	DN.	S□R.	P.M.
RLS/TMK	TMK/□C	TS	RLS

S:\PROJECTS\2016\2016–028 TROY MARKETPLACE–DNH\Dwg\Site Plans\(C–1.0) BOUNDARY.dwg

ORIGIN□L ISS□□ D□T□□
S□PT. 9□2016

P□□ □OB NO. 2016□02□

SC□L□□1" □ □0□

DR□WING N□MB□R□
C□1.0

LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING

—OH—ELEC—	ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
—UG—CATV—	UNDERGROUND CABLE TV, CATV PEDESTAL
—UG—PHONE—	TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
—UG—ELEC—	ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
	GAS MAIN, VALVE & GAS LINE MARKER
	WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
	SANITARY SEWER, CLEANOUT & MANHOLE
	STORM SEWER, CLEANOUT & MANHOLE
	COMBINED SEWER & MANHOLE
	SQUARE, ROUND & BEEHIVE CATCH BASIN
	POST INDICATOR VALVE
	WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
M T I	MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
?	UNIDENTIFIED STRUCTURE
816.06	SPOT ELEVATION
—670—	CONTOUR LINE
	FENCE
	GUARD RAIL
	STREET LIGHT
	SIGN
CONC.	CONCRETE
ASPH.	ASPHALT
GRAVEL	GRAVEL SHOULDER
	WETLAND

REFERENCE DRAWINGS

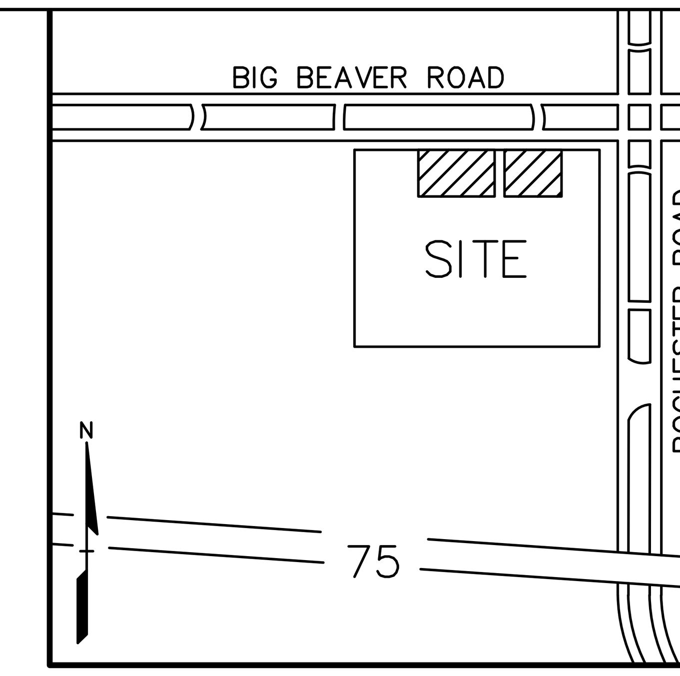
WATER MAIN	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
SANITARY SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
STORM SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
ELECTRIC	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
TELEPHONE	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
GAS	CONSUMERS ENERGY QUARTER SECTION MAP NO. 02-61-27-1
FLOOD PLAIN	FEMA F.I.R.M. 26125C0542G, DATED JANUARY 19, 2009 FEMA F.I.R.M. 26125C0534F, DATED SEPTEMBER 29, 2006
OTHER	PEA JOB NO. 98-217 PEA JOB NO. 07-186 PEA JOB NO. 05-223 PEA JOB NO. 06-087

GRAPHIC SCALE

-30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

N

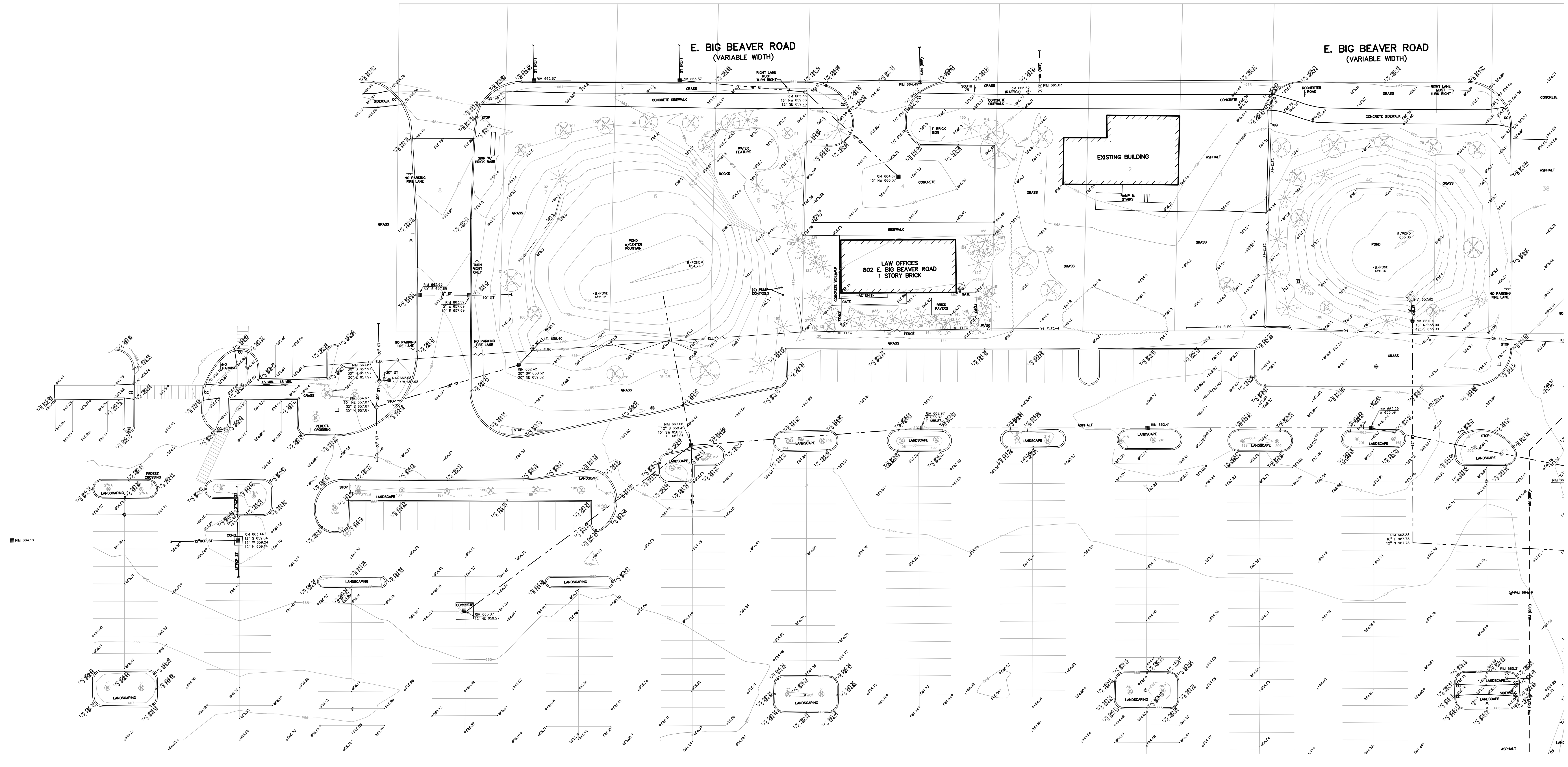


LOCATION MAP – NOT TO SCALE

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0542G, DATED JANUARY 16, 2009 AND MAP NUMBER 26125C0534F, DATED SEPTEMBER 29, 2006.

BENCHMARKS
(CITY OF TROY– NAVD88)

BM #5 (CITY OF TROY BM #1300)
ARROW ON TOP OF HYDRANT #27-101 LOCATED AT THE SOUTHWEST CORNER OF BIG BEAVER ROAD AND ROCHESTER ROAD, IN FRONT OF BURGER KING PARKING LOT.
ELEV. – 667.59



No.	BY	CHK	DESCRIPTION	DATE
1	K□B	DNH	R□□IS□D P□R CITY OF TROY R□□I□W	10/25/16

R□□ISIONS

C□□TION□
TH□ LOC□TIONS □ND □L□□□TIONS OF □□ISTING □ND□RGRO□ND □TILITI□S □S SHOWN ON THIS DR□WING □R□ ONLY □PPRO□IM□T□. NO G□□R□NT□□ IS □ITH□R □□PR□SS□D OR IMPLI□D □S TO TH□ COMPL□T□N□SS OR □CC□R□CY TH□R□OF. TH□ CONTR□CTOR SH□LL B□ □□CL□SI□□LY R□SPONSIBL□ FOR D□T□RMINING TH□ □□□CT □TILITY LOC□TIONS □ND □L□□□TIONS PRIOR TO TH□ ST□RT OF CONSTR□CTION.

THIS DR□WING □ND D□SIGN □R□ TH□ PROP□RTY OF P□□□INC. TH□Y □R□ S□BMITT□D ON TH□ CONDITION TH□T TH□Y □R□ NOT TO B□ □S□D□R□PROD□C□D□OR COPI□D□IN WHOL□ OR IN P□RT□OR □S□D FOR F□RNISHING INFORM□TION TO OTH□RS□WITHO□T TH□ PRIOR WRITT□N CONS□NT OF P□□□INC. □LL COMMON L□W RIGHTS OF COPYRIGHT □ND OTH□RWIS□ □R□ H□R□BY SP□CIFIC□LLY R□S□R□□D. © 2016 P□□□INC.

CONSTR□CTION CONTR□CTOR □GR□□S TH□T IN □CCORD□NC□ WITH G□N□R□LLY □CC□PT□D CONSTR□CTION PR□CTIC□S□CONSTR□CTION CONTR□CTOR WILL B□ R□□□IR□D TO □SS□M□ SOL□ □ND COMPL□T□ R□SPONSIBILITY FOR □OB SIT□ CONDITIONS D□RING TH□ CO□RS□ OF CONSTR□CTION OF TH□ PRO□□CT□INCL□DING S□F□TY OF □LL P□RSONS □ND PROP□RTY□TH□T THIS R□□□IR□M□NT SH□LL B□ M□D□ TO □PPLY CONTIN□O□SLY □ND NOT B□ LIMIT□D TO NORM□L WORKING HO□RS□□ND CONSTR□CTION CONTR□CTOR F□RTH□R □GR□□S TO D□F□ND□ IND□MNIFY □ND HOLD D□SIGN PROF□SSION□L H□RML□SS FROM □NY □ND □LL LI□BILITY□R□□L OR □LL□G□D□IN CONN□CTION WITH TH□ P□RFORM□NC□ OF WORK ON THIS PRO□□CT □□C□PTING LI□BILITY □RISING FROM TH□ SOL□ N□GLIG□NC□ OF TH□ D□SIGN PROF□SSION□L.

3 FULL WORKING DAYS BEFORE YOU DIG CALL
811
Know what□s □elow
Call □efore you dig
MISS D□G System, Inc.
1□□00□□□2□□1□1 www.missdig.net
□TOLL FR□□□

PEA

P□□□Inc.
2□□0 Rochester Ct□Ste 100
Troy□MI □□0□□□1□□2
t□2□□.6□9.9090
f□2□□.6□9.10□□
www.peainc.com

RAMCO GERSHENSON, INC.
□1500 NORTHW□ST□RN HIGHW□Y S□IT□ □00
F□RMINGTON HILLS□MI □□□□□

PARTIAL TOPOGRAPHIC SURVEY
TROY MARKET PLACE ADDITIONS
P□RT OF TH□ N□ 1/□ OF S□CTION 2□ T. 2N.□R. 11□.□
CITY OF TROY□O□KL□ND CO□NTY□MICHIG□N

D□S.	DN.	S□R.	P.M.
RLS/TMK	TMK/□C	TS	RLS

S:\PROJECTS\2016\2016-028 TROY MARKETPLACE-DNH\Dwg\Site Plans\(C-1.1) TOPO-16028.dwg

ORIGIN□L ISS□□ D□T□□
S□PT. 9□2016

P□□ □OB NO. 2016□02□

SC□L□□1" □ □0□

DR□WING N□MB□R□
C□1.1

NOT FOR CONSTRUCTION

XREF: S:PROJECTS\2016\2016028\DWG\16028-TOPOBASE.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X-BASE-16028.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X-TBLK-16028.DWG

LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING

- ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UNDERGROUND CABLE TV, CATV PEDESTAL
- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER & MANHOLE
- SQUARE, ROUND & BEEHIVE CATCH BASIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- 816.06 SPOT ELEVATION
- 670 CONTOUR LINE
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN
- CONC. CONCRETE
- ASPH. ASPHALT
- GRAVEL GRAVEL SHOULDER
- WETLAND

REFERENCE DRAWINGS

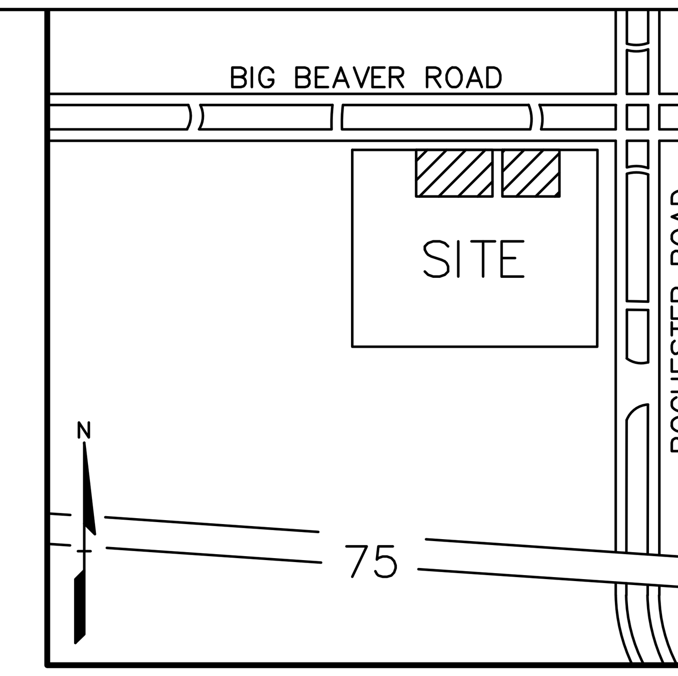
WATER MAIN	CITY OF TROY GIS ONLINE MAP UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99 UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
SANITARY SEWER	CITY OF TROY GIS ONLINE MAP UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99 UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
STORM SEWER	CITY OF TROY GIS ONLINE MAP UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99 UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
ELECTRIC	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
TELEPHONE	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
GAS	CONSUMERS ENERGY QUARTER SECTION MAP NO. 02-61-27-1
FLOOD PLAIN	FEMA F.I.R.M. 26125C0542G, DATED JANUARY 19, 2009 FEMA F.I.R.M. 26125C0534F, DATED SEPTEMBER 29, 2006
OTHER	PEA JOB NO. 98-217 PEA JOB NO. 07-186 PEA JOB NO. 05-223 PEA JOB NO. 06-087

GRAPHIC SCALE

-30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

N

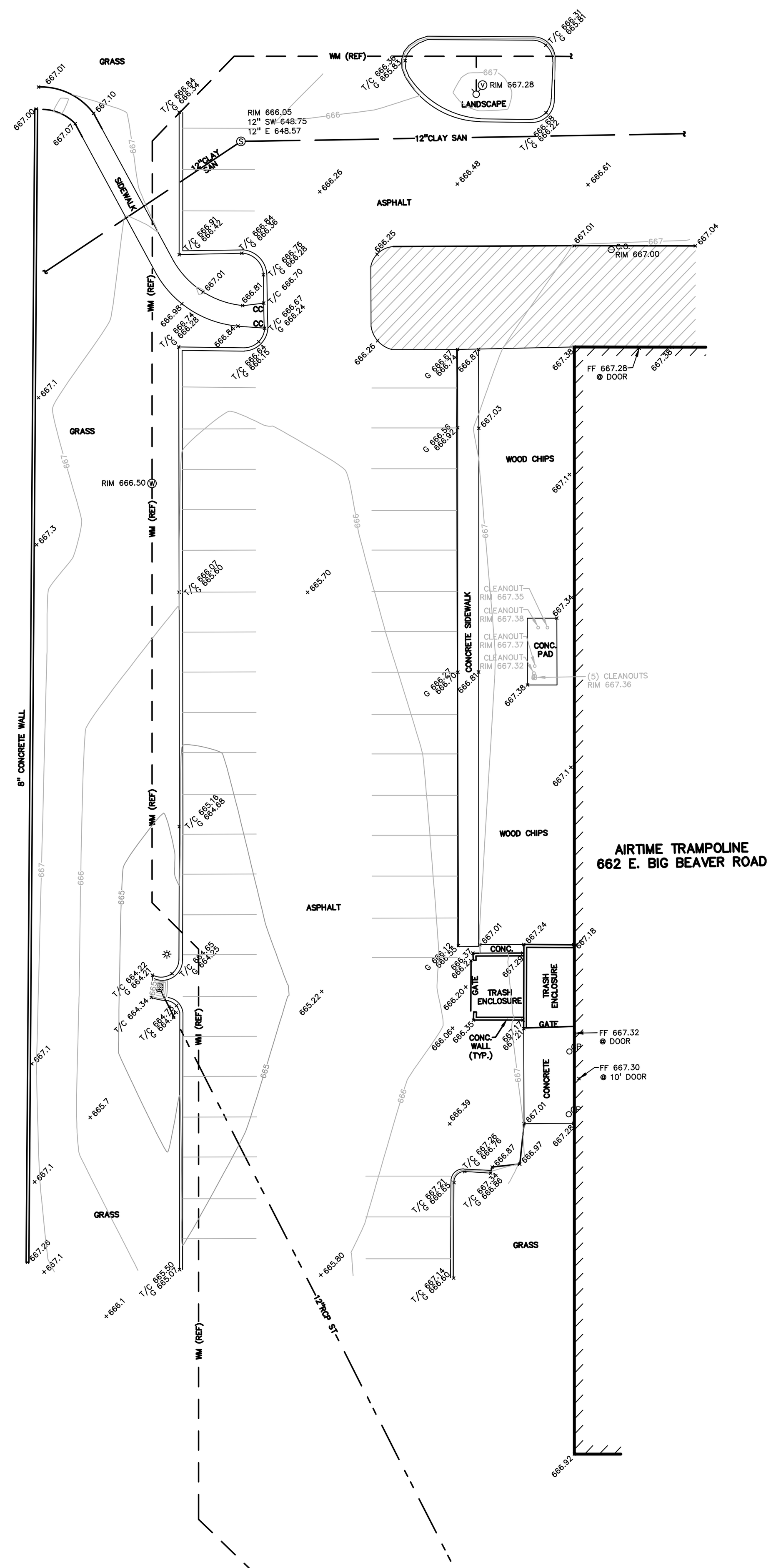


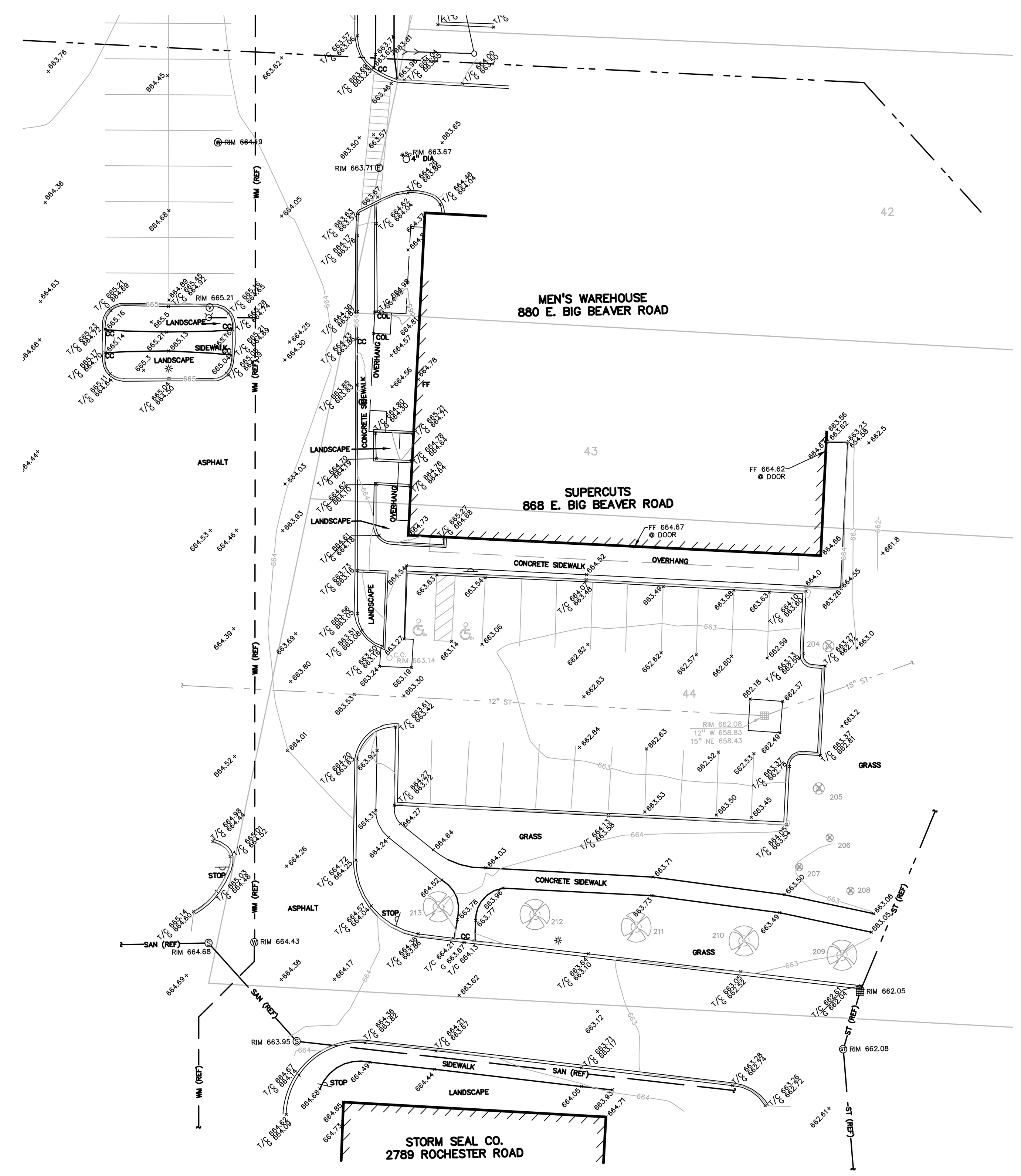
LOCATION MAP – NOT TO SCALE

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0542G, DATED JANUARY 16, 2009 AND MAP NUMBER 26125C0534F, DATED SEPTEMBER 29, 2006.

BENCHMARKS
(CITY OF TROY– NAVD88)

BM #5 (CITY OF TROY BM #1300)
ARROW ON TOP OF HYDRANT #27-101 LOCATED AT THE SOUTHWEST CORNER OF BIG BEAVER ROAD AND ROCHESTER ROAD, IN FRONT OF BURGER KING PARKING LOT.
ELEV. – 667.59





C□□TION□
TH□ LOC□TIONS □ND □L□□□TIONS OF □□ISTING □ND□RGRO□ND □TILITI□S □S SHOWN ON THIS DR□WING □R□ ONLY □PPRO□IM□T□. NO G□□R□NT□□ IS □ITH□R □□PR□SS□D OR IMPLI□D □S TO TH□ COMPL□T□N□SS OR □CC□R□CY TH□R□OF. TH□ CONTR□CTOR SH□LL B□ □□CL□SI□□LY R□SPONSIBL□ FOR D□T□RMINING TH□ □□□CT □TILITY LOC□TIONS □ND □L□□□TIONS PRIOR TO TH□ ST□RT OF CONSTR□CTION.

THIS DR□WING □ND D□SIGN □R□ TH□ PROP□RTY OF P□□□INC. TH□Y □R□ S□BMITT□D ON TH□ CONDITION TH□T TH□Y □R□ NOT TO B□ □S□D□R□PROD□C□D□OR COPI□D□IN WHOL□ OR IN P□RT□OR □S□D FOR F□RNISHING INFORM□TION TO OTH□RS□WITHO□T TH□ PRIOR WRITT□N CONS□NT OF P□□□INC. □LL COMMON L□W RIGHTS OF COPYRIGHT □ND OTH□RWIS□ □R□ H□R□BY SP□CIFIC□LLY R□S□R□□D. © 2016 P□□□INC.

CONSTR□CTION CONTR□CTOR □GR□□S TH□T IN □CCORD□NC□ WITH G□N□R□LLY □CC□PT□D CONSTR□CTION PR□CTIC□S□CONSTR□CTION CONTR□CTOR WILL B□ R□□□IR□D TO □SS□M□ SOL□ □ND COMPL□T□ R□SPONSIBILITY FOR □OB SIT□ CONDITIONS D□RING TH□ CO□RS□ OF CONSTR□CTION OF TH□ PRO□□CT□INCL□DING S□F□TY OF □LL P□RSONS □ND PROP□RTY□TH□T THIS R□□□IR□M□NT SH□LL B□ M□D□ TO □PPLY CONTIN□O□SLY □ND NOT B□ LIMIT□D TO NORM□L WORKING HO□RS□□ND CONSTR□CTION CONTR□CTOR F□RTH□R □GR□□S TO D□F□ND□ IND□MNIFY □ND HOLD D□SIGN PROF□SSION□L H□RML□SS FROM □NY □ND □LL LI□BILITY□R□□L OR □LL□G□D□IN CONN□CTION WITH TH□ P□RFORM□NC□ OF WORK ON THIS PRO□□CT □□C□PTING LI□BILITY □RISING FROM TH□ SOL□ N□GLIG□NC□ OF TH□ D□SIGN PROF□SSION□L.

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811
Know what's below
Call before you dig
MISS DIG System, Inc.
1□□00□□□2□□1□1 www.missdig.net
TOLL FR□□

P□□□Inc.
2□□0 Rochester Ct□Ste 100
Troy□MI □□0□□□1□□2
t□2□□.6□9.9090
f□2□□.6□9.10□□
www.peainc.com

RAMCO GERSHENSON, INC.
□1500 NORTHW□ST□RN HIGHW□Y□S□IT□ □00
F□RMINGTON HILLS□MI □□□□□

PARTIAL TOPOGRAPHIC SURVEY
TROY MARKET PLACE ADDITIONS
P□RT OF TH□ N□ 1/□ OF S□CTION 2□ T. 2N.□R. 11□.□
CITY OF TROY□O□KL□ND CO□NTY□MICHIG□N

D□S.	DN.	S□R.	P.M.
RLS/TMK	TMK/□C	TS	RLS

S:\PROJECTS\2016\2016-028 TROY MARKETPLACE-DNH\Dwg\Site Plans\(C-1.1) TOPO-16028.dwg

No.	BY	CHK	D□SCRIPTION	D□T□
1	K□B	DNH	R□□IS□D P□R CITY OF TROY R□□I□W	10/25/16

R□□ISIONS

ORIGIN□L ISS□□ D□T□□
S□PT. 9□2016

P□□ □OB NO. 2016□02□

SC□L□□1" □ □0□

DR□WING N□MB□R□
C□1.2

NOT FOR CONSTRUCTION
XREF: S:PROJECTS\2016\2016028\DWG\16028-TOPOBASE.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X-BASE-16028.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X-TBLK-16028.DWG

LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING

- —OH—ELEC— ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- —UG—CATV— UNDERGROUND CABLE TV, CATV PEDESTAL
- —UG—PHONE— TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- —UG—ELEC— ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER & MANHOLE
- SQUARE, ROUND & BEEHIVE CATCH BASIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- 816.06 SPOT ELEVATION
- —670— CONTOUR LINE
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN
- CONC. CONCRETE
- ASPH. ASPHALT
- GRAVEL GRAVEL SHOULDER
- WETLAND

REFERENCE DRAWINGS

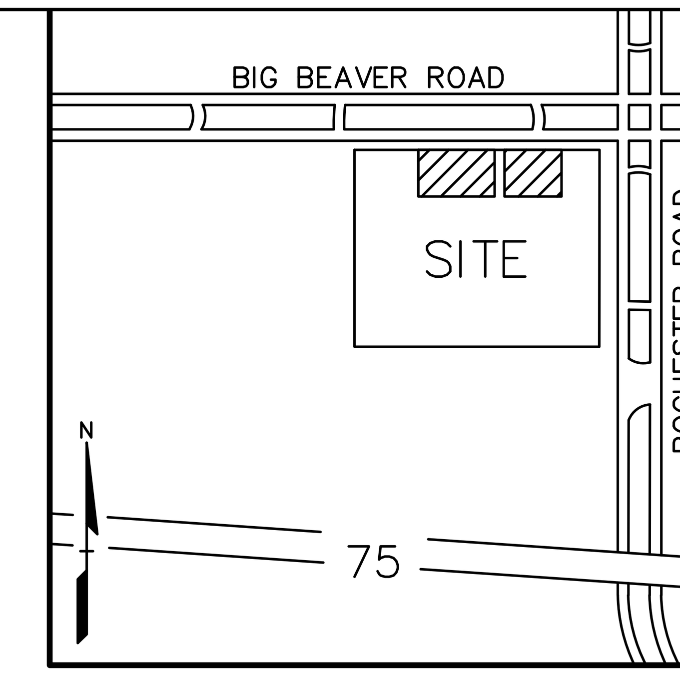
WATER MAIN	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
SANITARY SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
STORM SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
ELECTRIC	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
TELEPHONE	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
GAS	CONSUMERS ENERGY QUARTER SECTION MAP NO. 02–61–27–1
FLOOD PLAIN	FEMA F.I.R.M. 26125C0542G, DATED JANUARY 19, 2009 FEMA F.I.R.M. 26125C0534F, DATED SEPTEMBER 29, 2006
OTHER	PEA JOB NO. 98–217 PEA JOB NO. 07–186 PEA JOB NO. 05–223 PEA JOB NO. 06–087

GRAPHIC SCALE

–30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

N

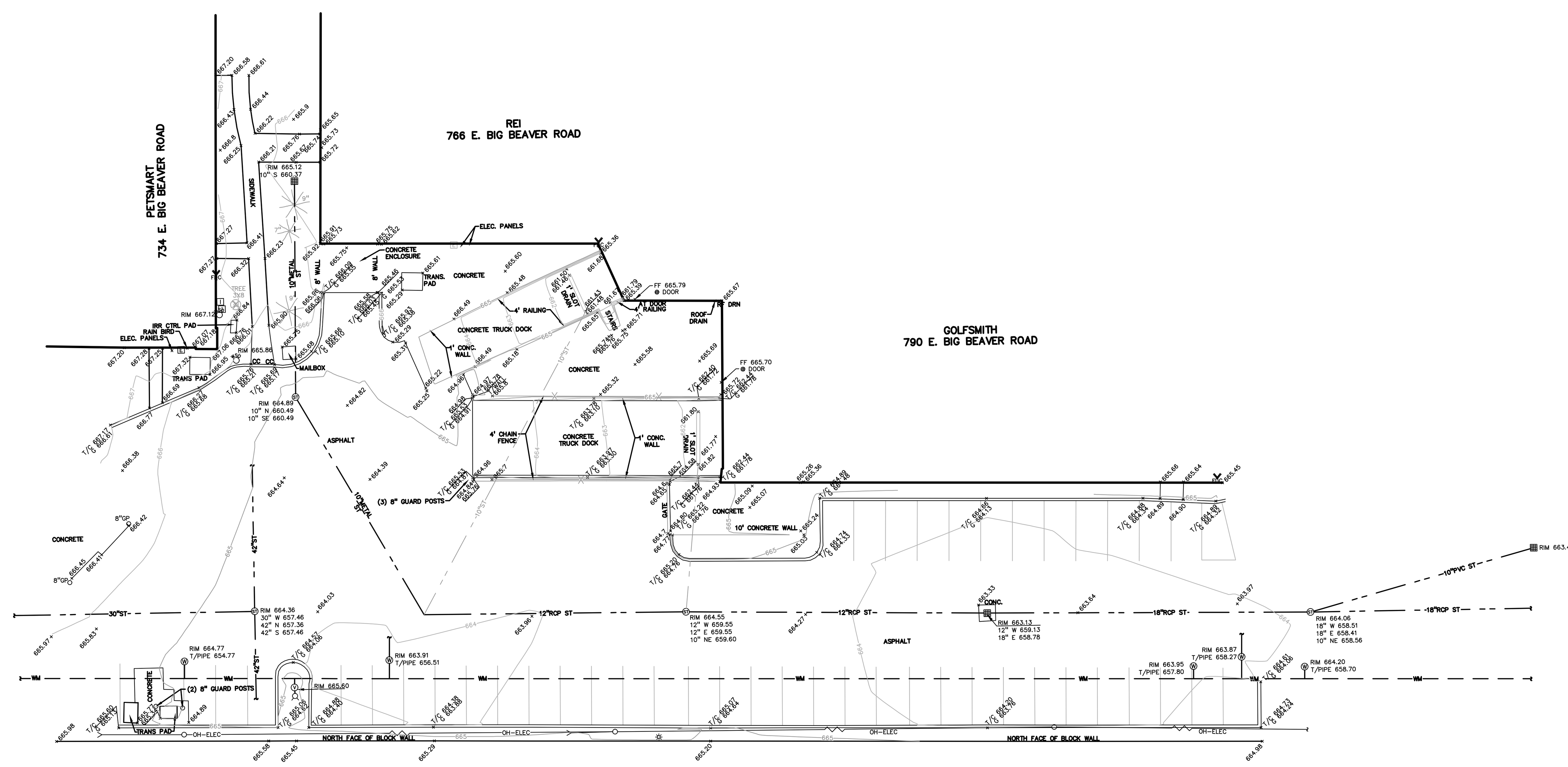


LOCATION MAP – NOT TO SCALE

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0542G, DATED JANUARY 16, 2009 AND MAP NUMBER 26125C0534F, DATED SEPTEMBER 29, 2006.

BENCHMARKS
(CITY OF TROY– NAVD88)

BM #5 (CITY OF TROY BM #1300)
ARROW ON TOP OF HYDRANT #27–101 LOCATED AT THE SOUTHWEST CORNER OF BIG BEAVER ROAD AND ROCHESTER ROAD, IN FRONT OF BURGER KING PARKING LOT.
ELEV. – 667.59



No.	BY	CHK	DESCRIPTION	DATE
1	K□B	DNH	R□□IS□D P□R CITY OF TROY R□□I□W	10/25/16

R□□ISIONS

C□□TION□
TH□ LOC□TIONS □ND □L□□□TIONS OF □□ISTING □ND□RGRO□ND □TILITI□S □S SHOWN ON THIS DR□WING □R□ ONLY □PPRO□IM□T□. NO G□□R□NT□□ IS □ITH□R □□PR□SS□D OR IMPLI□D □S TO TH□ COMPL□T□N□SS OR □CC□R□CY TH□R□OF. TH□ CONTR□CTOR SH□LL B□ □□CL□SI□□LY R□SPONSIBL□ FOR D□T□RMINING TH□ □□□CT □TILITY LOC□TIONS □ND □L□□□TIONS PRIOR TO TH□ ST□RT OF CONSTR□CTION.

THIS DR□WING □ND D□SIGN □R□ TH□ PROP□RTY OF P□□□INC. TH□Y □R□ S□BMITT□D ON TH□ CONDITION TH□T TH□Y □R□ NOT TO B□ □S□D□R□PROD□C□D□OR COPI□D□IN WHOL□ OR IN P□RT□OR □S□D FOR F□RNISHING INFORM□TION TO OTH□RS□WITHO□T TH□ PRIOR WRITT□N CONS□NT OF P□□□INC. □LL COMMON L□W RIGHTS OF COPYRIGHT □ND OTH□RWIS□ □R□ H□R□BY SP□CIFIC□LLY R□S□R□□D. © 2016 P□□□INC.

CONSTR□CTION CONTR□CTOR □GR□□S TH□T IN □CCORD□NC□ WITH G□N□R□LLY □CC□PT□D CONSTR□CTION PR□CTIC□S□CONSTR□CTION CONTR□CTOR WILL B□ R□□□IR□D TO □SS□M□ SOL□ □ND COMPL□T□ R□SPONSIBILITY FOR □OB SIT□ CONDITIONS D□RING TH□ CO□RS□ OF CONSTR□CTION OF TH□ PRO□□CT□INCL□DING S□F□TY OF □LL P□RSONS □ND PROP□RTY□TH□T THIS R□□□IR□M□NT SH□LL B□ M□D□ TO □PPLY CONTIN□O□SLY □ND NOT B□ LIMIT□D TO NORM□L WORKING HO□RS□□ND CONSTR□CTION CONTR□CTOR F□RTH□R □GR□□S TO D□F□ND□ IND□MNIFY □ND HOLD D□SIGN PROF□SSION□L H□RML□SS FROM □NY □ND □LL LI□BILITY□R□□L OR □LL□G□D□IN CONN□CTION WITH TH□ P□RFORM□NC□ OF WORK ON THIS PRO□□CT □□C□PTING LI□BILITY □RISING FROM TH□ SOL□ N□GLIG□NC□ OF TH□ D□SIGN PROF□SSION□L.

3 FULL WORKING DAYS BEFORE YOU DIG CALL
811
Know what□s □elow
Call □efore you dig
MISS D□G System, Inc.
1□□00□□□2□□1□1 www.missdig.net
□TOLL FR□□□

P□□□Inc.
2□□0 Rochester Ct□Ste 100
Troy□MI □□0□□□1□□2
t□2□□.6□9.9090
f□2□□.6□9.10□□
www.peainc.com

RAMCO GERSHENSON, INC.
□1500 NORTHW□ST□RN HIGHW□Y□S□IT□ □00
F□RMINGTON HILLS□MI □□□□□

PARTIAL TOPOGRAPHIC SURVEY
TROY MARKET PLACE ADDITIONS
P□RT OF TH□ N□ 1/□ OF S□CTION 2□ T. 2N.□R. 11□.□
CITY OF TROY□O□KL□ND CO□NTY□MICHIG□N

D□S.	DN.	S□R.	P.M.
RLS/TMK	TMK/□C	TS	RLS

S:\PROJECTS\2016\2016–028 TROY MARKETPLACE–DNH\Dwg\Site Plans\(C–1.1) TOPO–16028.dwg

ORIGIN□L ISS□□ D□T□□
S□PT. 9□2016

P□□ □OB NO. 2016□02□

SC□L□□1" □ □0□

DR□WING N□MB□R□
C□1.□

NOT FOR CONSTRUCTION
XREF: S:PROJECTS\2016\2016028\DWG\16028–TOPOBASE.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X–BASE–16028.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X–TBLK–16028.DWG

LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING

Symbol	Description
—OH—ELEC—	ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
—UG—CATV— TV	UNDERGROUND CABLE TV, CATV PEDESTAL
—UG—PHONE— T	TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
—UG—ELEC— E	ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
G GAS	GAS MAIN, VALVE & GAS LINE MARKER
W	WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
CO S	SANITARY SEWER, CLEANOUT & MANHOLE
CO ST	STORM SEWER, CLEANOUT & MANHOLE
C	COMBINED SEWER & MANHOLE
	SQUARE, ROUND & BEEHIVE CATCH BASIN
	POST INDICATOR VALVE
V WSO	WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
M T I	MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
?	UNIDENTIFIED STRUCTURE
×816.06	SPOT ELEVATION
—670—	CONTOUR LINE
—×—×—	FENCE
	GUARD RAIL
	STREET LIGHT
	SIGN
CONC.	CONCRETE
ASPH.	ASPHALT
GRAVEL	GRAVEL SHOULDER
	WETLAND

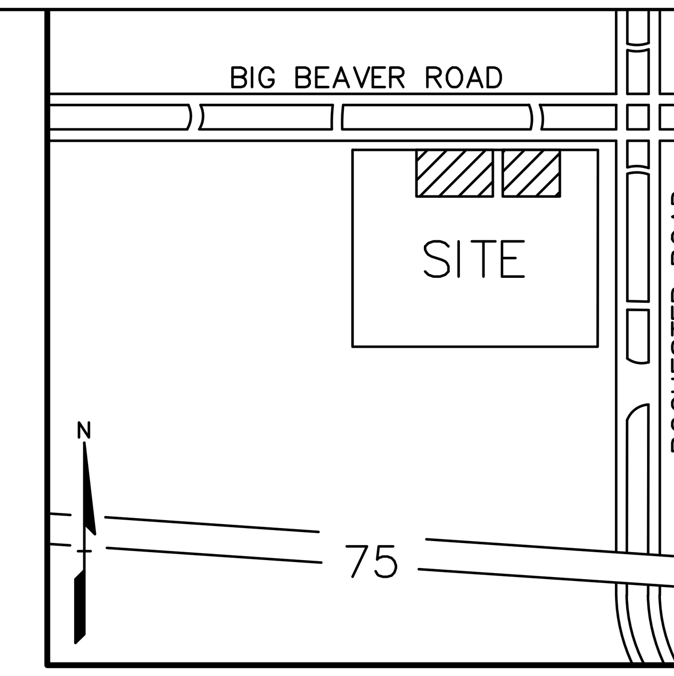
REFERENCE DRAWINGS

WATER MAIN	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
SANITARY SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
STORM SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
ELECTRIC	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
TELEPHONE	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
GAS	CONSUMERS ENERGY QUARTER SECTION MAP NO. 02–61–27–1
FLOOD PLAIN	FEMA F.I.R.M. 26125C0542G, DATED JANUARY 19, 2009 FEMA F.I.R.M. 26125C0534F, DATED SEPTEMBER 29, 2006
OTHER	PEA JOB NO. 98–217 PEA JOB NO. 07–186 PEA JOB NO. 05–223 PEA JOB NO. 06–087

GRAPHIC SCALE

−30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

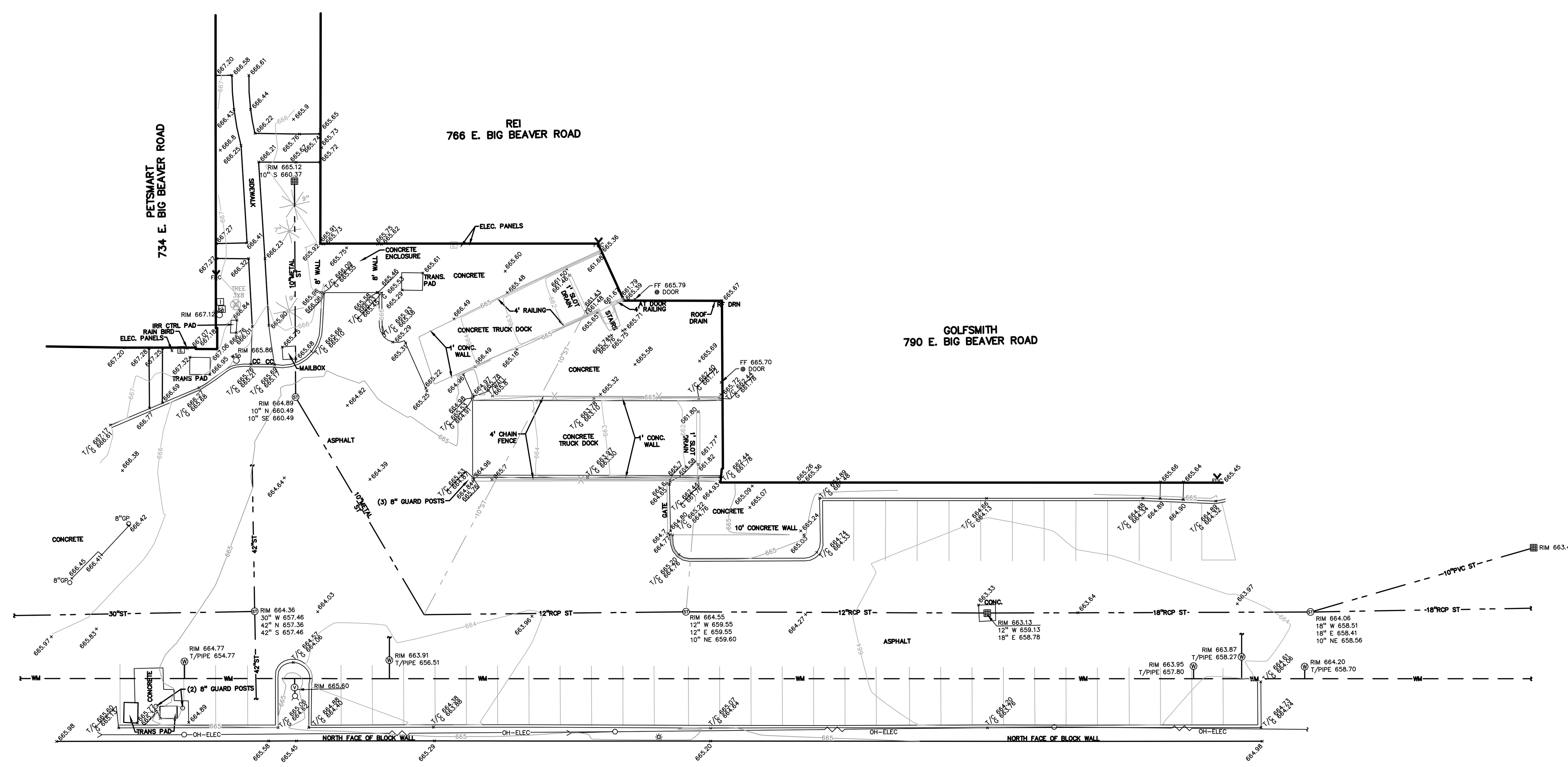


LOCATION MAP – NOT TO SCALE

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0542G, DATED JANUARY 16, 2009 AND MAP NUMBER 26125C0534F, DATED SEPTEMBER 29, 2006.

BENCHMARKS
(CITY OF TROY– NAVD88)

BM #5 (CITY OF TROY BM #1300)
ARROW ON TOP OF HYDRANT #27–101 LOCATED AT THE SOUTHWEST CORNER OF BIG BEAVER ROAD AND ROCHESTER ROAD, IN FRONT OF BURGER KING PARKING LOT.
ELEV. – 667.59



NOT FOR CONSTRUCTION

XREF: S:PROJECTS\2016\2016028\DWG\16028–TOPOBASE.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X–BASE–16028.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X–TBLK–16028.DWG

No.	BY	CHK	DESCRIPTION	DATE
1	K□B	DNH	R□□IS□D P□R CITY OF TROY R□□I□W	10/25/16

R□□ISIONS

C□□TION□
TH□ LOC□TIONS □ND □L□□□TIONS OF □□ISTING □ND□RGRO□ND □TILITI□S □S SHOWN ON THIS DR□WING □R□ ONLY □PPRO□IM□T□. NO G□□R□NT□□ IS □ITH□R □□PR□SS□D OR IMPLI□D □S TO TH□ COMPL□T□N□SS OR □CC□R□CY TH□R□OF. TH□ CONTR□CTOR SH□LL B□ □□CL□SI□□LY R□SPONSIBL□ FOR D□T□RMINING TH□ □□□CT □TILITY LOC□TIONS □ND □L□□□TIONS PRIOR TO TH□ ST□RT OF CONSTR□CTION.

THIS DR□WING □ND D□SIGN □R□ TH□ PROP□RTY OF P□□□INC. TH□Y □R□ S□BMITT□D ON TH□ CONDITION TH□T TH□Y □R□ NOT TO B□ □S□D□R□PROD□C□D□OR COPI□D□IN WHOL□ OR IN P□RT□OR □S□D FOR F□RNISHING INFORM□TION TO OTH□RS□WITHO□T TH□ PRIOR WRITT□N CONS□NT OF P□□□INC. □LL COMMON L□W RIGHTS OF COPYRIGHT □ND OTH□RWIS□ □R□ H□R□BY SP□CIFIC□LLY R□S□R□□D. © 2016 P□□□INC.

CONSTR□CTION CONTR□CTOR □GR□□S TH□T IN □CCORD□NC□ WITH G□N□R□LLY □CC□PT□D CONSTR□CTION PR□CTIC□S□CONSTR□CTION CONTR□CTOR WILL B□ R□□□IR□D TO □SS□M□ SOL□ □ND COMPL□T□ R□SPONSIBILITY FOR □OB SIT□ CONDITIONS D□RING TH□ CO□RS□ OF CONSTR□CTION OF TH□ PRO□□CT□INCL□DING S□F□TY OF □LL P□RSONS □ND PROP□RTY□TH□T THIS R□□□IR□M□NT SH□LL B□ M□D□ TO □PPLY CONTIN□O□SLY □ND NOT B□ LIMIT□D TO NORM□L WORKING HO□RS□□ND CONSTR□CTION CONTR□CTOR F□RTH□R □GR□□S TO D□F□ND□ IND□MNIFY □ND HOLD D□SIGN PROF□SSION□L H□RML□SS FROM □NY □ND □LL LI□BILITY□R□□L OR □LL□G□D□IN CONN□CTION WITH TH□ P□RFORM□NC□ OF WORK ON THIS PRO□□CT □□C□PTING LI□BILITY □RISING FROM TH□ SOL□ N□GLIG□NC□ OF TH□ D□SIGN PROF□SSION□L.

3 FULL WORKING DAYS BEFORE YOU DIG CALL
811
Know what□s □elow
Call □efore you dig
MISS DIG System, Inc.
1□□00□□□2□□1□1 www.missdig.net
□TOLL FR□□□

P□□□Inc.
2□□0 Rochester Ct□Ste 100
Troy□MI □□0□□□1□□2
t□2□□.6□9.9090
f□2□□.6□9.10□□
www.peainc.com

RAMCO GERSHENSON, INC.
□1500 NORTHW□ST□RN HIGHW□Y□S□IT□ □00
F□RMINGTON HILLS□MI □□□□□

PARTIAL TOPOGRAPHIC SURVEY
TROY MARKET PLACE ADDITIONS
P□RT OF TH□ N□ 1/□ OF S□CTION 2□ T. 2N.□R. 11□.□
CITY OF TROY□O□KL□ND CO□NTY□MICHIG□N

D□S.	DN.	S□R.	P.M.
RLS/TMK	TMK/□C	TS	RLS

S:\PROJECTS\2016\2016–028 TROY MARKETPLACE–DNH\Dwg\Site Plans\(C–1.1) TOPO–16028.dwg

ORIGIN□L ISS□□ D□T□□
S□PT. 9□2016

P□□ □OB NO. 2016□02□

SC□L□□1" □ □0□

DR□WING N□MB□R□
C□1.□

EXISTING PARKING CALCULATIONS:

RETAIL = 1 SPACE PER 300 GROSS S.F.

MAJOR A = 36,383 S.F./300 S.F. = 121
MAJOR B = 35,982 S.F./300 S.F. = 120
MAJOR C = 20,600 S.F./300 S.F. = 69
MAJOR D = 24,500 S.F./300 S.F. = 82
MAJOR E = 45,000 S.F./300 S.F. = 150
MAJOR G = 31,661 S.F./300 S.F. = 106
A–100 = 8,650 S.F./300 S.F. = 29
A–110 = 2,013 S.F./300 S.F. = 7
A–130 = 5,560 S.F./300 S.F. = 19
A–140 = 3,000 S.F./300 S.F. = 10
F–100 = 15,395 S.F./300 S.F. = 51

TOTAL RETAIL PARKING REQUIRED = 764 SPACES

RESTAURANT = 1 SPACE PER 2 SEATS

A–120 = 120 SEATS/2 SEATS = 60
OL–A1 = 82 SEATS/2 SEATS = 41
OL–A2 = 46 SEATS/2 SEATS = 23

TOTAL RESTAURANT REQUIRED PARKING = 124 SPACES

TOTAL REQUIRED PARKING = 888

TOTAL EXISTING PARKING SPACES = 1,394

PROPOSED PARKING CALCULATIONS:

RETAIL = 1 SPACE PER 300 GROSS S.F.

MAJOR A = 36,383 S.F./300 S.F. = 121
MAJOR B = 35,982 S.F./300 S.F. = 120
MAJOR C = 20,600 S.F./300 S.F. = 69
MAJOR D = 24,500 S.F./300 S.F. = 82
MAJOR E = 45,000 S.F./300 S.F. = 150
MAJOR G = 31,661 S.F./300 S.F. = 106
A–100 = 8,650 S.F./300 S.F. = 29
A–110 = 2,013 S.F./300 S.F. = 7
A–130 = 5,560 S.F./300 S.F. = 19
A–140 = 3,000 S.F./300 S.F. = 10
A–160 = 3,000 S.F./300 S.F. = 10
A–180 = 5,800 S.F./300 S.F. = 19
C–120 = 1,800 S.F./300 S.F. = 6
C–140 = 2,000 S.F./300 S.F. = 7
D–120 = 4,000 S.F./300 S.F. = 13
F–100 = 15,395 S.F./300 S.F. = 51
G–100 = 7,615 S.F./300 S.F. = 25
OL–C2 = 2,800 S.F./300 S.F. = 9

TOTAL RETAIL PARKING REQUIRED = 853 SPACES

RESTAURANT = 1 SPACE PER 2 SEATS

A–120 = 120 SEATS/2 SEATS = 60
C–100 = 38 SEATS/2 SEATS = 19
C–160 = 35 SEATS/2 SEATS = 18
D–100 = 28 SEATS/2 SEATS = 14
OL–A1 = 82 SEATS/2 SEATS = 41
OL–A2 = 46 SEATS/2 SEATS = 23
OL–C2 = 68 SEATS/2SEATS = 34

TOTAL RESTAURANT REQUIRED PARKING = 209 SPACES

TOTAL REQUIRED PARKING = 1,062

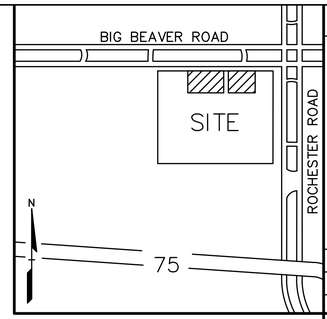
TOTAL PROPOSED PARKING SPACES = 1,253

GRAPHIC SCALE

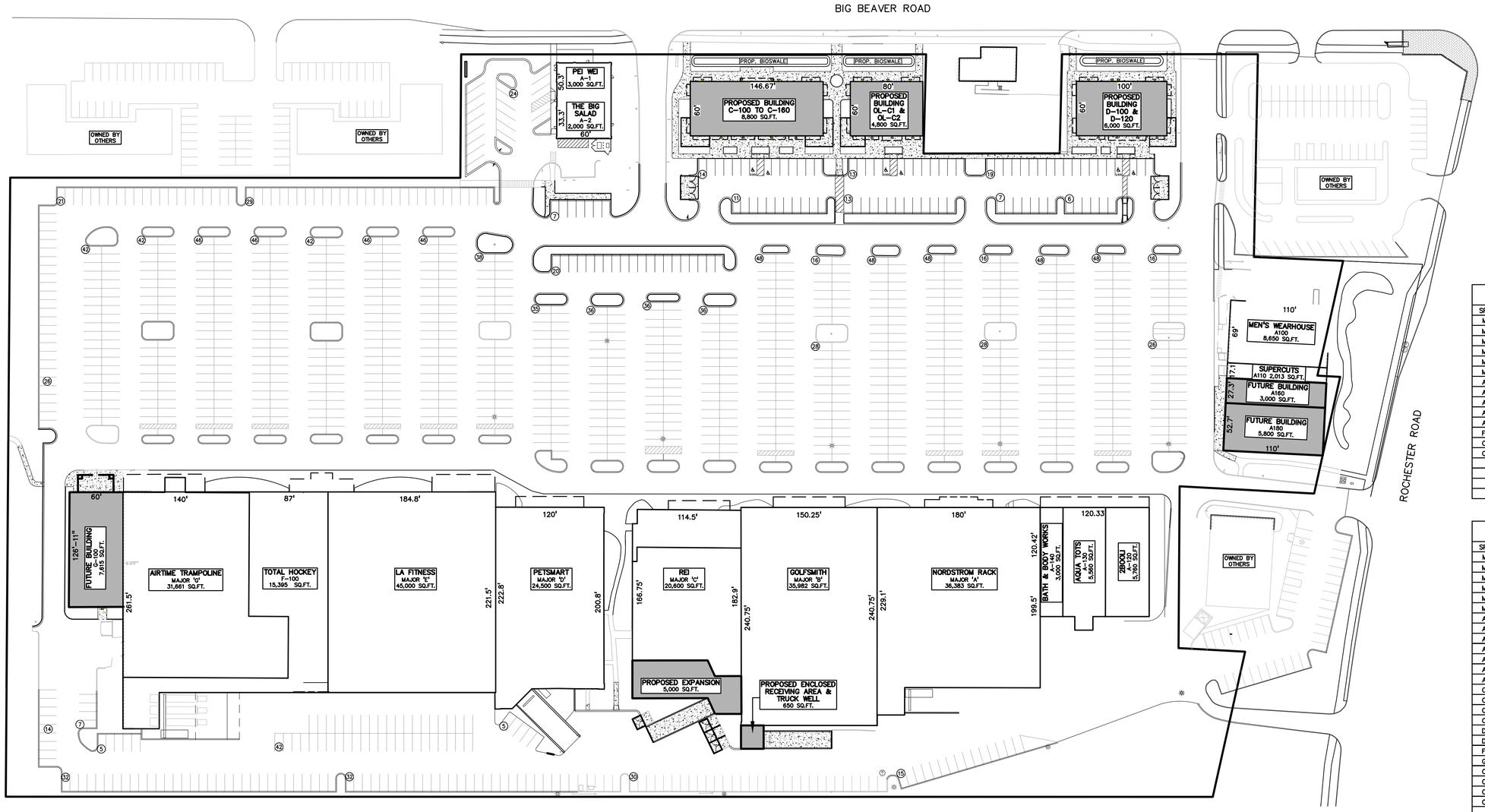
–60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

N



LOCATION MAP – NOT TO SCALE



OPEN SPACE AREA:

EXISTING OPEN SPACE:	19.1%
PROPOSED OPEN SPACE:	15.8%
CITY REQUIREMENT: GREATER THAN	15.0%

BUILDING COVERAGE:

EXISTING BUILDING COVERAGE:	23.6%
PROPOSED BUILDING COVERAGE:	26.8%
CITY REQUIREMENT: LESS THAN	30.0%

EXISTING SITE DATA

SPACE:	AREA	TENANT:
MAJOR A	36,383 S.F.	NORDSTROM RACK
MAJOR B	35,982 S.F.	GOLFSMITH
MAJOR C	20,600 S.F.	REI
MAJOR D	24,500 S.F.	PETSMART
MAJOR E	45,000 S.F.	LA FITNESS
MAJOR G	31,661 S.F.	AIRTIME TRAMPOLINE
A–100	7,500 S.F.	MEN'S WEARHOUSE
A–110	2,013 S.F.	SUPERCUTS
A–120	5,760 S.F.	2BOOJ
A–130	5,560 S.F.	AQUA TOTS
A–140	3,000 S.F.	BATH & BODY WORKS
F–100	15,395 S.F.	TOTAL HOCKEY
OL–A1	3,000 S.F.	PEI WEI
OL–A2	2,000 S.F.	THE BIG SALAD
238,354 S.F. TOTAL		
TOTAL PARKING		1,394 SPACES
PARKING RATIO		5.85 / 1,000 S.F.
TOTAL PROPERTY ACREAGE		24.042 A.C.

PROPOSED SITE DATA

SPACE:	AREA	TENANT:
MAJOR A	36,383 S.F.	NORDSTROM RACK
MAJOR B	36,632 S.F.	GOLFSMITH
MAJOR C	25,600 S.F.	REI
MAJOR D	24,500 S.F.	PETSMART
MAJOR E	45,000 S.F.	LA FITNESS
MAJOR G	31,661 S.F.	AIRTIME TRAMPOLINE
A–100	8,650 S.F.	MEN'S WEARHOUSE
A–110	2,013 S.F.	SUPERCUTS
A–120	5,760 S.F.	2BOOJ
A–130	5,560 S.F.	AQUA TOTS
A–140	3,000 S.F.	BATH & BODY WORKS
A–160	3,000 S.F.	FUTURE
A–180	5,800 S.F.	FUTURE
C–100	2,600 S.F.	PROPOSED RESTAURANT
C–120	1,800 S.F.	PROPOSED RETAIL
C–140	2,000 S.F.	PROPOSED RETAIL
C–160	2,400 S.F.	PROPOSED RESTAURANT
D–100	2,000 S.F.	PROPOSED RESTAURANT
D–120	4,000 S.F.	PROPOSED RETAIL
F–100	15,395 S.F.	TOTAL HOCKEY
G–100	7,615 S.F.	FUTURE
OL–A1	3,000 S.F.	PEI WEI
OL–A2	2,000 S.F.	THE BIG SALAD
OL–C1	2,000 S.F.	PROPOSED RESTAURANT
OL–C2	2,800 S.F.	PROPOSED RETAIL
281,169 S.F. TOTAL		
TOTAL PARKING		1,253 SPACES
PARKING RATIO		4.46 / 1,000 S.F.
TOTAL PROPERTY ACREAGE		24.042 A.C.

NOT FOR CONSTRUCTION

XREF: S:\PROJECTS\2016\2016028\DWG\16028–TOPOBASE.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X–BASE–16028.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X–TBLK–16028.DWG

No.	BY:	CHK:	DESCRIPTION:	DATE:
1	K.B.	DNH	R.:IS D.P.R.CITY OF TROY R.:1.W	10/25/16 D.T.

REVISIONS

CAUTION

THE LOCATIONS AND LIMITATIONS OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO ATTEMPT HAS BEEN MADE TO DETERMINE ALL SUCH UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXISTENCE OF ALL UTILITY LOCATIONS AND LIMITATIONS PRIOR TO THE START OF CONSTRUCTION.

THIS DRAWING AND DESIGN IS THE PROPERTY OF PEA, INC. THE "X" IS RESTRICTED TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF PEA, INC. ALL COMMON LAW RIGHTS OF COPYRIGHT AND OTHER RESERVED. © 2016 P.E.A., INC.

CONSTRUCTION CONTRACTOR AGREES TO ASSUME SOLE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION. THIS DRAWING IS NOT TO BE SCALED. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, DATUMS, AND LEVELS PRIOR TO THE COMMENCEMENT OF WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.

3 FULL WORKING DAYS BEFORE YOU DIG CALL

811

Know what's below
Call before you dig

MISS DIG System, Inc.

1-800-482-7171 www.missdig.net

PEA

P.E.A. Inc.
2200 Rochester Ct. Ste 100
Troy, MI 48083
t:248.689.9090
f:248.689.9100
www.peainc.com

RAMCO GERSHENSON, INC.
1500 NORTHWESTERN HIGHWAY S.LITH.00
FARMINGTON HILLS, MI 48334

OVERALL SITE PLAN
TROY MARKET PLACE ADDITIONS
PART OF NW 1/4 OF SECTION 21, T.2N., R.11E.
CITY OF TROY, O.L. ND COUNTY, MICHIGAN

D.S.	R.L.S/T.M.K.	DN.	T.M.K./C.	S.R.	T.S.	P.M.	R.L.S.

S:\PROJECTS\2016\2016-028 TROY MARKETPLACE-TSM\Dwg\Xref\X-2.0 OVERALL-16028.dwg

ORIGINAL ISSUE DATE
SEPT. 9, 2016

PROJECT NO. 2016-028

SCALE 1" = 60'

DRAWING NUMBER

C-2.0

LEGEND

IRON FOUND
IRON SET
NAIL FOUND
NAIL & CAP SET
BRASS PLUG SET
MONUMENT FOUND
MONUMENT SET
SEC. CORNER FOUND
R RECORDED
M MEASURED
C CALCULATED

EXISTING		PROPOSED
OH-ELEC-W	ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE	
UG-CATV	UNDERGROUND CABLE TV, CATV PEDESTAL	
UG-PHONE	TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE	
UG-ELEC	ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE	
GAS	GAS MAIN, VALVE & GAS LINE MARKER	
W	WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE	C.O.W. C.O.W. C.O.W.
S	SANITARY SEWER, CLEANOUT & MANHOLE	
S	STORM SEWER, CLEANOUT & MANHOLE	
C	COMBINED SEWER & MANHOLE	
	SQUARE, ROUND & BEEHIVE CATCH BASIN	V.D.
	POST INDICATOR VALVE	
	WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF	
M T I	MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE	
	UNIDENTIFIED STRUCTURE	
816.06	SPOT ELEVATION	671.21
670	CONTOUR LINE	671
	FENCE	
	GUARD RAIL	
	STREET LIGHT	
	SIGN	
CONC.	CONCRETE	STD DUTY, HEAVY DUTY, R.O.W. ONLY
ASPH.	ASPHALT	STD DUTY, HEAVY DUTY, DEEP STRENGTH
GRAVEL	GRAVEL SHOULDER	
	WETLAND	

REFERENCE DRAWINGS

WATER MAIN	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
SANITARY SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
STORM SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
ELECTRIC	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
TELEPHONE	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
GAS	CONSUMERS ENERGY QUARTER SECTION MAP NO. 02–61–27–1
FLOOD PLAIN	FEMA F.I.R.M. 26125C0542G, DATED JANUARY 19, 2009 FEMA F.I.R.M. 26125C0534F, DATED SEPTEMBER 29, 2006
OTHER	PEA JOB NO. 98–217 PEA JOB NO. 07–186 PEA JOB NO. 05–223 PEA JOB NO. 06–087

GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. 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.
2. 'NO PARKING–FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100 FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
3. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF TROY CURRENT STANDARDS AND REGULATIONS.
4. THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
5. ANY WORK WITHIN THE STREET OR HIGHWAY RIGHT–OF–WAYS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION AND SHALL NOT BEGIN UNTIL ALL NECESSARY PERMITS HAVE BEEN ISSUED FOR THE WORK.
6. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST THE TOP OF ALL EXISTING AND PROPOSED STRUCTURES (MANHOLES, CATCH BASINS, INLETS, GATE WELLS ETC.) WITHIN GRADED AND /OR PAVED AREAS TO FINAL GRADE SHOWN ON THE PLANS. ALL SUCH ADJUSTMENTS SHALL BE INCIDENTAL TO THE JOB AND WILL NOT BE PAID FOR SEPARATELY.

SITE DATA TABLE:

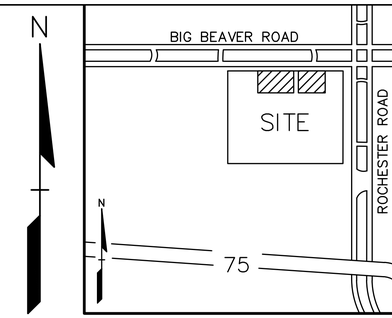
SEE OVERALL SITE PLAN FOR SITE DATA INFORMATION.

SIDEWALK RAMP LEGEND:

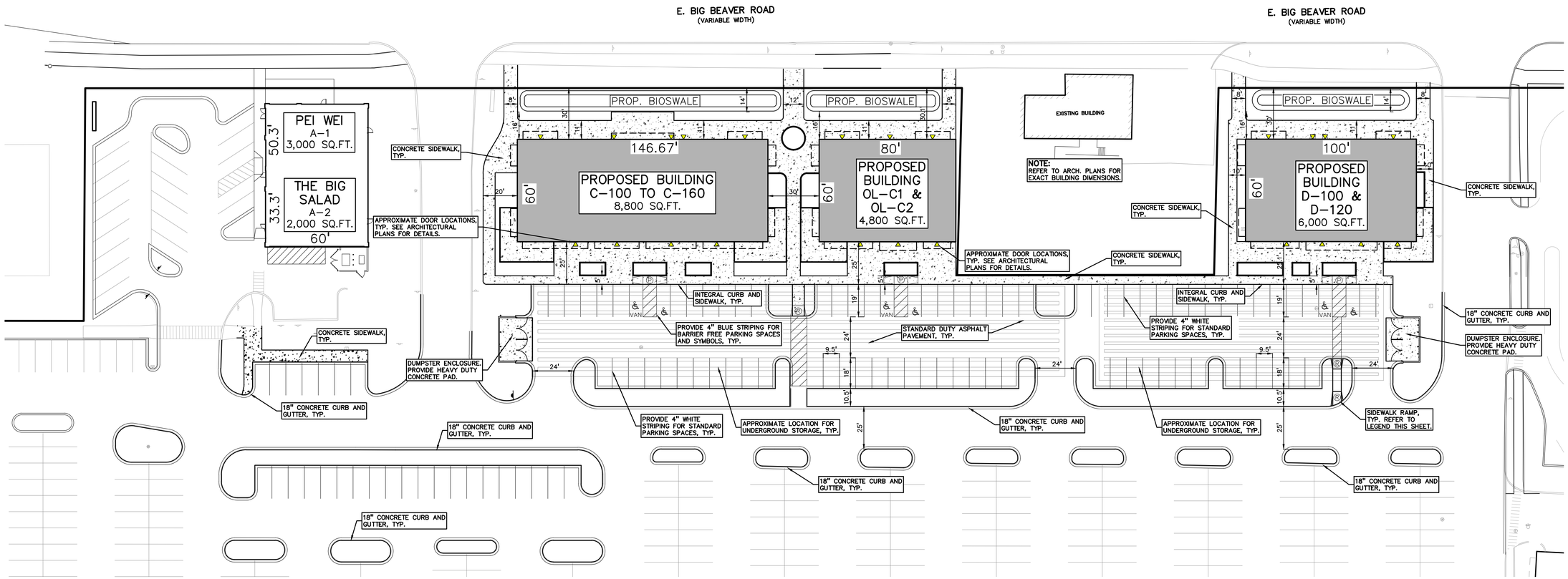
SIDEWALK RAMP 'TYPE R' Ⓡ
SIDEWALK RAMP 'TYPE P' Ⓟ

REFER TO LATEST M.D.O.T. R–28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

GRAPHIC SCALE
–30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.



LOCATION MAP – NOT TO SCALE



NOT FOR CONSTRUCTION

XREF: S:\PROJECTS\2016\2016028\DWG\16028–TOPOBASE.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X–BASE–16028.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X–TBLK–16028.DWG

No.	BY	CHK	D. SCRIPTION	D.T.
1	K.S.	DNH	R.: S. D.P.R. CITY OF TROY R.: I.W	10/25/16

R□□ISIONS

C□□TION□

TH□ LOC□TIONS □ND □L□□□TIONS OF □□ISTING □ND □RGRO□ND □TILITI□S □S SHOWN ON THIS DR□WING □R □ONLY □PPRO□MAT□. ND□G□□R□NT□□□S □TH□R □□PR□SS□D OR IMPLI□D □S TO TH□ □□CURACY □ND □OMPL□T□N□SS OF THE DATA SHOWN. TH□ CONTR□CTOR SH□LL B□ □□LL□□□□SIBLY R□SPONSIBL□ FOR D□T□RMINING TH□ □□□CT□□TILITY LOC□TIONS □ND □L□□□TIONS PRIOR TO TH□ □ST□RT OF CONSTR□CTION.

THIS DR□WING □ND D□SIGN □R□ TH□ PROP□RTY OF P□□□ING TH□Y □R□ □S BMITT□D ON TH□ CONDITION THAT THEY □RE TO BE KEPT □ONFID□NTIAL □ND NOT TO BE □SED OR COPI□D IN WHOL□ OR IN P□RT OR □S □SED FOR F□RNISHING INFORM□TION TO OTH□RS WITHO□T TH□ PRIOR WRITT□N CONS□NT OF P□□□ING □LL COMMON L□W RIGHTS OF COPYRIGHT □ND OTH□RWIS□ □R□ H□R□BY SP□CIF□□LLY R□S□R□□D. © 2016 P□□□ING □NC.

CONSTR□CTION CONTR□CTOR □GR□□S TH□T IN □□CORD NC□ WITH □□ IN □□LLY □□D □PT□□ CONSTR□CTION PR□CTIC□S CONSTR□CTION CONTR□CTOR WILL B□ R□□□PONSIBL□ TO □SS□M□ SOL□□ND COMPL□T□ R□SPONSIBILITY FOR □OB SIT□ CONDITIONS D□RING TH□ □OB R□S□□OF CONSTR□CTION OF TH□ PRO□□CT INCL□DING S□F□TY OF □LL P□RSONS □ND PROP□RTY □ON□RNING TH□S R□□□□□ND M□NT SH□LL B□ M□DIF□□D □PPROPRIATONC□□S □ND NOTIF□□ LSMT □D □NGINEER □ND □WNER □F □NY □ND □LL DISCRIPTION CONTR□CTOR F□RTH□R □GR□□S TO D□F□ND □NC□□ IND□MNIFY □ND HOLD D□SIGN PROF□SSION□L H□RML□SS FROM □NY □ND □LL L□SSES □ND □LL □□□□ □D IN CONN□CTION WITH TH□ □P□RFORM□NC□ OF WORK ON THIS PRO□□CT □□CT□□□PTING L□BILITY □RISING FROM TH□ SOL□□N GLIG NC□ OF TH□ D□SIGN PROF□SSION□L

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811
Know what's □elow
Call □efore you dig
MISS DIG System, Inc.
1□00□□2□□1□1 www.missdig.net

P□□□Inc.
2□□0 Rochester Ct□Ste 100
Troy□MI □□D□□1□□2
t□2□□6□9.9090
f□2□□6□9.10□□
www.peainc.com

RAMCO GERSHENSON, INC.
□1500 NORTHW□ST□RN HIGHW□Y S□□IT□ □00
F□RMINGTON HILLS□ MI □□□□

PRELIMINARY SITE PLAN
TROY MARKET PLACE ADDITIONS
P□RTION OF SECTION 2□ T□N R□1□□
CITY OF TROY O□KL□ND COONTY□ MIC□IG□N

D.S.	RLS/TMK	DN.	TMK/C	S.R.	TS	P.M.	RLS

S:\PROJECTS\2016\2016–028 TROY MARKETPLACE–DWG\Dwg\Site Plans\(C–3.0) SITE–16028.dwg

ORIGIN□L ISS□□ D□T□□
S□PT. 9□2016

P□□ □OB NO. 2016□02□

SC□□L□□1" □ □D□

DR□WING N□MB□R□
C□□.0

LEGEND

IRON FOUND
IRON SET
NAIL FOUND
NAIL & CAP SET
BRASS PLUG SET
MONUMENT FOUND
MONUMENT SET
SEC. CORNER FOUND
R RECORDED
M MEASURED
C CALCULATED

EXISTING		PROPOSED
—OH—ELEC—W—	ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE	
—UG—CATV—	UNDERGROUND CABLE TV, CATV PEDESTAL	
—UG—PHONE—	TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE	
—UG—ELEC—	ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE	
	GAS MAIN, VALVE & GAS LINE MARKER	
	WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE	C.O.V.
	SANITARY SEWER, CLEANOUT & MANHOLE	C.O.
	STORM SEWER, CLEANOUT & MANHOLE	C.O.
	COMBINED SEWER & MANHOLE	
	SQUARE, ROUND & BEEHIVE CATCH BASIN	F.D.
	POST INDICATOR VALVE	
	WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF	
	MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE	
	UNIDENTIFIED STRUCTURE	
816.06	SPOT ELEVATION	x671.21
670	CONTOUR LINE	671
	FENCE	
	GUARD RAIL	
	STREET LIGHT	
	SIGN	
CONC.	CONCRETE	STD DUTY / HEAVY DUTY / R.O.W. ONLY
ASPH.	ASPHALT	STD DUTY / HEAVY DUTY / DEEP STRENGTH
GRAVEL	GRAVEL SHOULDER	
	WETLAND	

REFERENCE DRAWINGS

WATER MAIN	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
SANITARY SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
STORM SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
ELECTRIC	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
TELEPHONE	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
GAS	CONSUMERS ENERGY QUARTER SECTION MAP NO. 02–61–27–1
FLOOD PLAIN	FEMA F.I.R.M. 26125C0542G, DATED JANUARY 19, 2009 FEMA F.I.R.M. 26125C0534F, DATED SEPTEMBER 29, 2006
OTHER	PEA JOB NO. 98–217 PEA JOB NO. 07–186 PEA JOB NO. 05–223 PEA JOB NO. 06–087

GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. 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.
2. 'NO PARKING–FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100 FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
3. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF TROY CURRENT STANDARDS AND REGULATIONS.
4. THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
5. ANY WORK WITHIN THE STREET OR HIGHWAY RIGHT–OF–WAYS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION AND SHALL NOT BEGIN UNTIL ALL NECESSARY PERMITS HAVE BEEN ISSUED FOR THE WORK.
6. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST THE TOP OF ALL EXISTING AND PROPOSED STRUCTURES (MANHOLES, CATCH BASINS, INLETS, GATE WELLS ETC.) WITHIN GRADED AND /OR PAVED AREAS TO FINAL GRADE SHOWN ON THE PLANS. ALL SUCH ADJUSTMENTS SHALL BE INCIDENTAL TO THE JOB AND WILL NOT BE PAID FOR SEPARATELY.

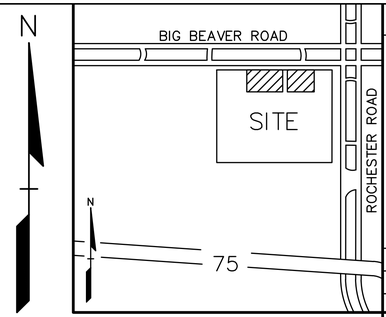
SITE DATA TABLE:

SEE OVERALL SITE PLAN FOR SITE DATA INFORMATION.

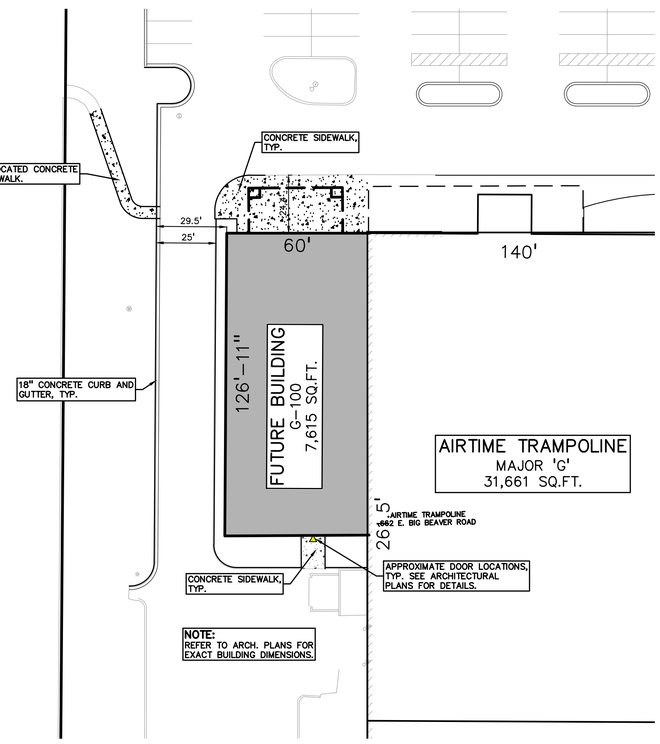
GRAPHIC SCALE

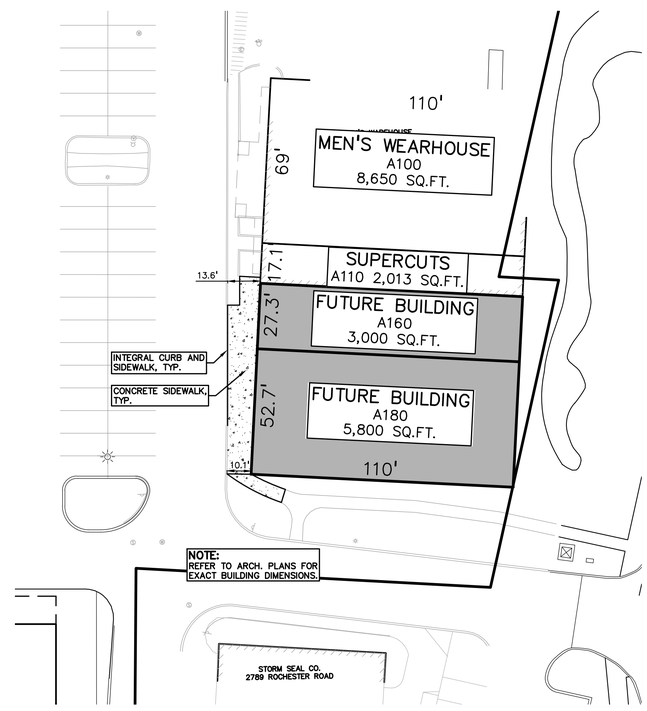
–30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.



LOCATION MAP – NOT TO SCALE





NOT FOR CONSTRUCTION

XREF: S:\PROJECTS\2016\2016028\DWG\16028–TOPOBASE.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X–BASE–16028.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X–TBLK–16028.DWG

No.	BY	CHK	D. SCRIPTION	R.	IS.	D.P.R.	CITY OF TROY R.	I.W	D.T.
1	K.S.	DNH	R.						10/25/16

REVISIONS

C□□TION□

TH□ LOC□TIONS □ND □L□□□TIONS OF □□ISTING □ND □RGRO□ND □TILITI□S □S SHOWN ON THIS DR□WING □R □ONLY □PPRO□MAT□. NO □□R□NT□□□S □TH□R □□PR□SS □ OR IMPL□D □S TO TH□ □CCURACY □R COMPL□T□NESS □F THE □ATA □N THIS □ONTR□CTION□□TOR SH□LL B□ □□SL□B□□LY R□SPONSIBL□ FOR D□T□RMINING TH□ □□□CT□□TILITY LOC□TIONS □ND □L□□□TIONS PRIOR TO TH□□ST□RT OF CONSTR□CTION.

THIS DR□WING □ND D□SIGN □R□ TH□ PROP□RTY OF P□□ING TH□Y □R□S BMITT□D ON TH□ CONDITION THAT THEY □RE TO BE KP□T CONFID□NTIAL AND □O □OT COPY □ IN WHOL□ OR IN P□RT OR □S □SD FOR F□RNISHING INFORM□TION TO OTH□RS WITHO□T TH□ PRIOR WRITT□N CONS NT OF P□□ING □NC□ □LL COMMON L□W RIGHTS OF COPYRIGHT □ND OTH□RWIS□ □R□ H□R BY SP□CIFIC□LLY R□S□R□□D. □ 2016 P□□ING □NC.

CONSTR□CTION CONTR□CTOR □GR□□S TH□T IN □CCORD NC□ WITH G□N□RAL NOTES □N THIS DR□WING CONSTR□CTION PR□CTIC□S CONSTR□CTION CONTR□CTOR WILL B□ R□□PONSIBL□ FOR □OB SITE CONDITIONS D□RING TH□ □OURSE OF CONSTR□CTION OF TH□ PRO□CT INCL□DING S□F□TY OF □LL P□RSONS □ND PROP□RTY □ON□RNING TH□ PROJ□CT □ND SHALL □ND□MNIFY □GAINST □LL CLAIMS □RISING □ROM THE WORK OF THE CONSTR□CTION CONTR□CTOR F□RTH□R □GR□□S TO D□F□ND □ND □NDEMNIFY □ND HOLD D□SIGN PROF□SSION□L H□RML□SS FROM □NY □ND □LL LI□BILITY □R □L OR □LL □G□INS CONN□CTION WITH TH□ P□RFORM□NC□ OF WORK ON THIS PRO□□CT □□C□PTING LI□BILITY □RISING FROM TH□ SOL□N GLIG NC□ OF TH□ D□SIGN PROF□SSION□L

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811

Know what's □elow
Call □efore you dig
MISS DIG System, Inc.
1□00□□2□□1□1 www.missdig.net
TOLL FR□□

PEA

P□□□Inc.
2□□0 Rochester Ct□Ste 100
Troy□MI □□0□□1□□2
t□2□□6□9.9090
f□2□□6□9.10□□
www.peainc.com

RAMCO GERSHENSON, INC.
□1500 NORTHWEST□RN HIGHW□Y□S□IT□ □00
F□RMINGTON HILLS MI □□□□

PRELIMINARY SITE PLAN
TROY MARKET PLACE ADDITIONS
P□RTIONS OF SECTIONS □□ AND 11□□
CITY OF TROY □ OAKLAND COUNTY, MICHIG□N

D.S.	RLS/TMK	DN	TMK/C	S.R.	TS	P.M.	RLS

S:\PROJECTS\2016\16028–TROY MARKETPLACE–DWG\Dwg\Site Plans\(C–3.0) SITE–16028.dwg

ORIGIN□L ISS□□ D□T□□
S□PT. 9□2016

P□□ □OB NO. 2016□02□

SC□L□□1" □ □0□

DR□WING N□MB□R□
C□□.1

LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING / PROPOSED

- ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UNDERGROUND CABLE TV, CATV PEDESTAL
- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER & MANHOLE
- SQUARE, ROUND & BEEHIVE CATCH BASIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- SPOT ELEVATION (816.06 / 671.21)
- CONTOUR LINE (670 / 671)
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN
- CONCRETE (STD DUTY, HEAVY DUTY, R.O.W. ONLY)
- ASPHALT (STD DUTY, HEAVY DUTY, DEEP STRENGTH)
- GRAVEL SHOULDER
- WETLAND

REFERENCE DRAWINGS

WATER MAIN	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
SANITARY SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
STORM SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
ELECTRIC	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
TELEPHONE	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
GAS	CONSUMERS ENERGY QUARTER SECTION MAP NO. 02-61-27-1
FLOOD PLAIN	FEMA F.I.R.M. 26125C0542G, DATED JANUARY 19, 2009 FEMA F.I.R.M. 26125C0534F, DATED SEPTEMBER 29, 2006
OTHER	PEA JOB NO. 98-217 PEA JOB NO. 07-186 PEA JOB NO. 05-223 PEA JOB NO. 06-087

SITE DATA TABLE:

SEE OVERALL SITE PLAN FOR SITE DATA INFORMATION.

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R' Ⓡ

SIDEWALK RAMP 'TYPE P' Ⓟ

REFER TO LATEST M.D.O.T. R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

GENERAL NOTES:

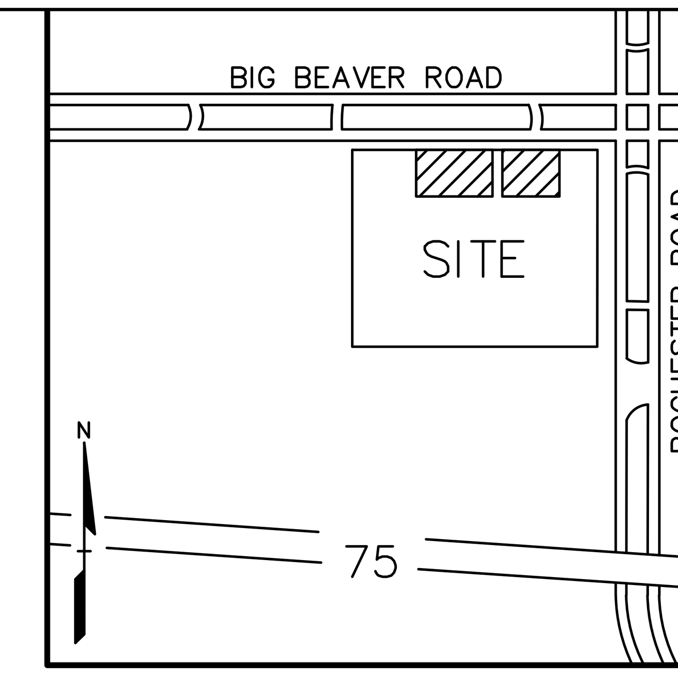
THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. 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.
2. 'NO PARKING-FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100 FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
3. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF TROY CURRENT STANDARDS AND REGULATIONS.
4. THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
5. ANY WORK WITHIN THE STREET OR HIGHWAY RIGHT-OF-WAYS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION AND SHALL NOT BEGIN UNTIL ALL NECESSARY PERMITS HAVE BEEN ISSUED FOR THE WORK.
6. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST THE TOP OF ALL EXISTING AND PROPOSED STRUCTURES (MANHOLES, CATCH BASINS, INLETS, GATE WELLS ETC.) WITHIN GRADED AND /OR PAVED AREAS TO FINAL GRADE SHOWN ON THE PLANS. ALL SUCH ADJUSTMENTS SHALL BE INCIDENTAL TO THE JOB AND WILL NOT BE PAID FOR SEPARATELY.

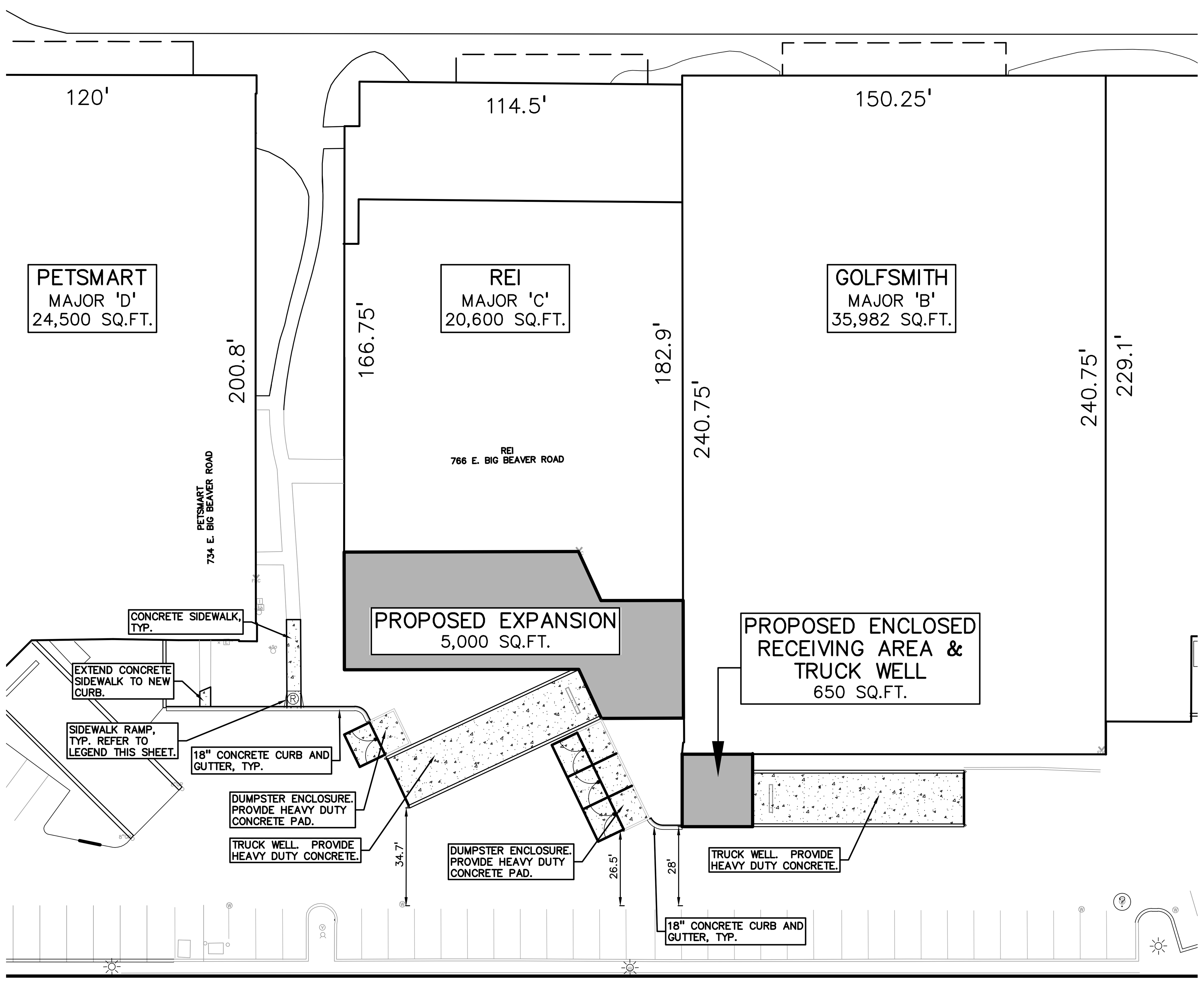
GRAPHIC SCALE

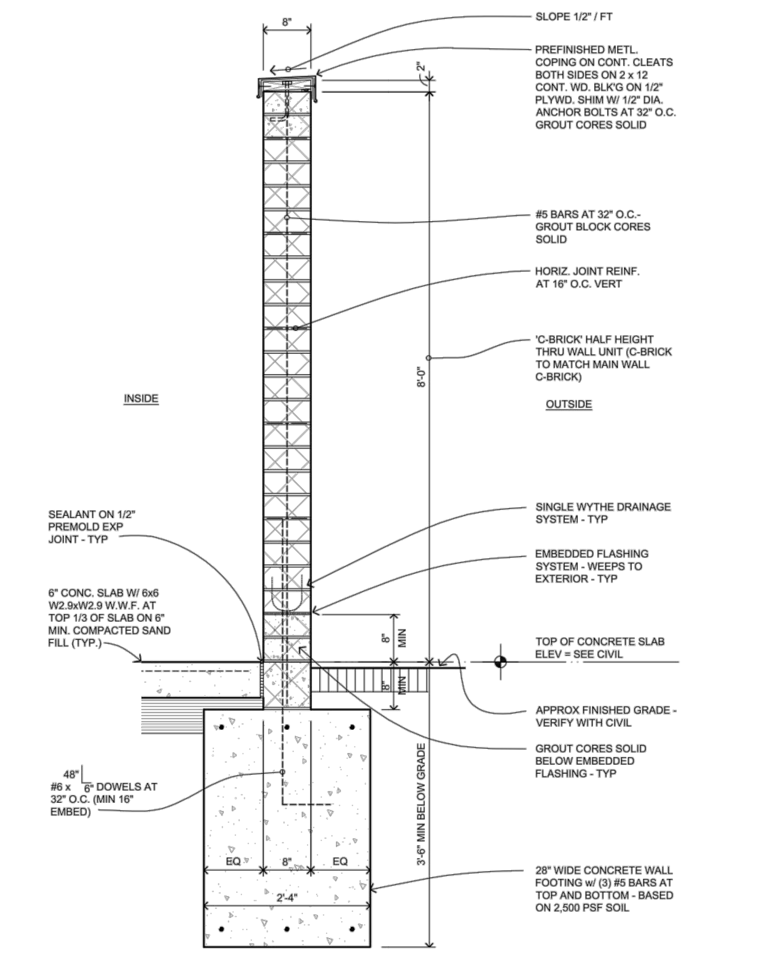
-30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

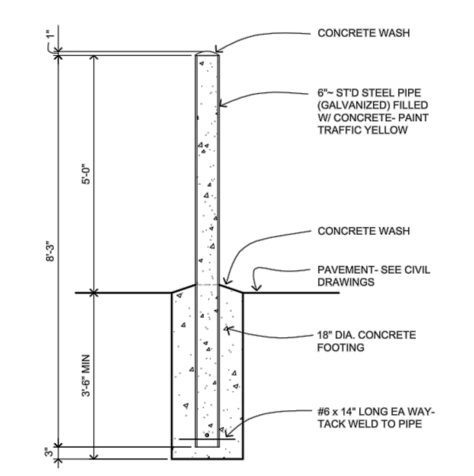


LOCATION MAP – NOT TO SCALE

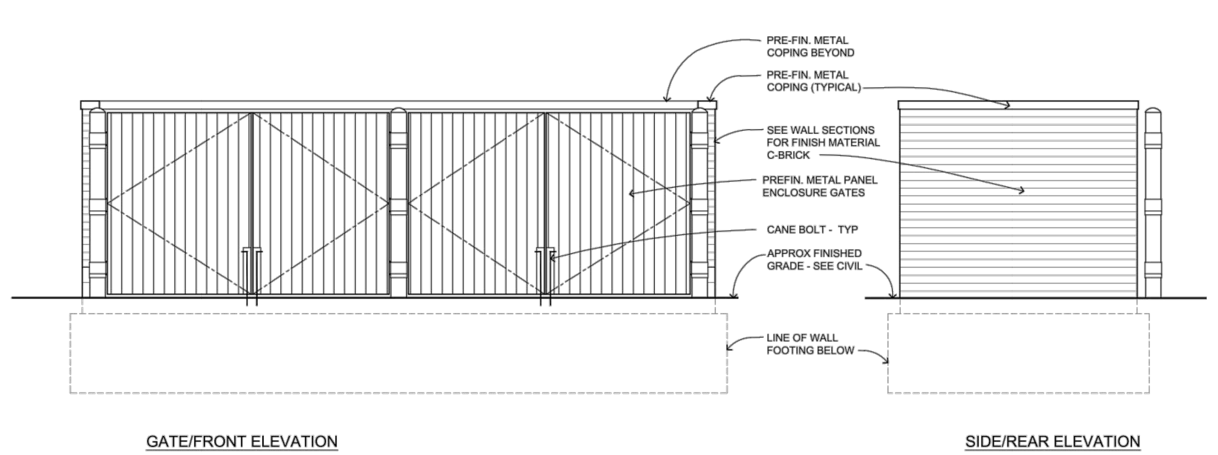




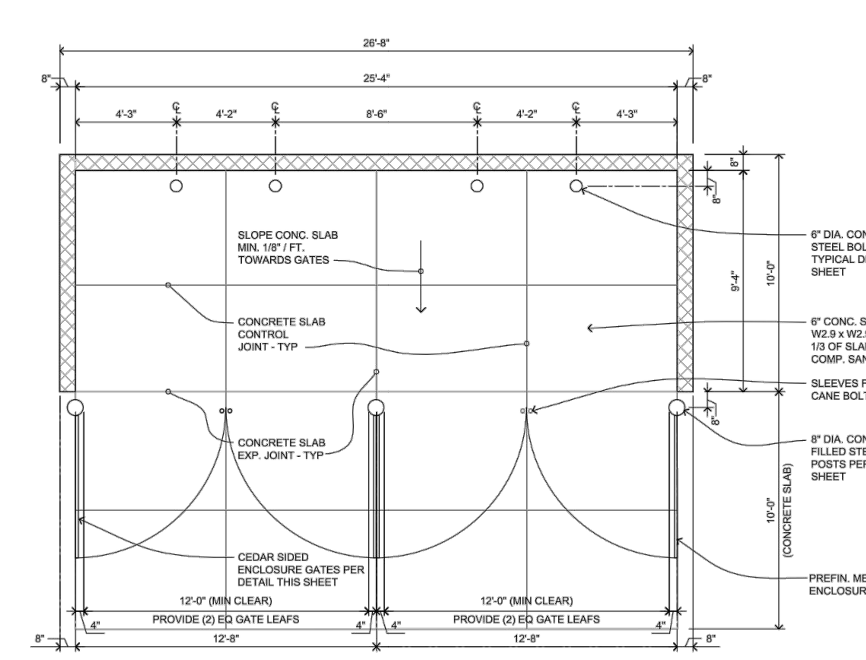
Dumpster Enclosure / Screen Wall Section



Typical Guard Post Detail



Dumpster Enclosure Elevations



Dumpster Enclosure Plan

No.	BY	CHK	DESCRIPTION	DATE
1	K B	DNH	REVISED PER CITY OF TROY REVIEW	10/25/16

REVISIONS

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

THIS DRAWING AND DESIGN ARE THE PROPERTY OF PEA, INC. THEY ARE SUBMITTED ON THE CONDITION THAT THEY ARE NOT TO BE USED, REPRODUCED OR COPIED IN WHOLE OR IN PART OR USED FOR FURNISHING INFORMATION TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF PEA, INC. ALL COMMON LAW RIGHTS OF COPYRIGHT AND OTHERWISE ARE HEREBY SPECIFICALLY RESERVED. © 2016 PEA, INC.

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.

3 FULL WORKING DAYS BEFORE YOU DIG CALL

811

Know what's below
Call before you dig

MISS DIG System, Inc.

1-800-482-7171 (TOLL FREE) www.missdig.net

PEA Inc.
2430 Rochester Ct, Ste 100
Troy, MI 48083-1872
t: 248.689.9090
f: 248.689.1044
www.peainc.com

RAMCO GERSHENSON, INC.
31500 NORTHWESTERN HIGHWAY, SUITE 300
FARMINGTON HILLS, MI

PRELIMINARY SITE PLAN
TROY MARKET PLACE ADDITIONS
PART OF THE NE 1/4 OF SECTION 27, T. 2N., R. 11 E.
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

DES.	DN.	SUR.	P.M.
RLS/TMK	TMK/JC	TS	RLS

S:\PROJECTS\2016\2016-028 TROY MARKETPLACE-DNH\Dwg\Site Plans\(C-3.0) SITE-16028.dwg

ORIGINAL ISSUE DATE:
SEPT. 9, 2016

PEA JOB NO. 2016-028

SCALE: 1" = 30'

DRAWING NUMBER:
C-3.2

NOT FOR CONSTRUCTION

XREF: S:PROJECTS\2016\2016028\DWG\16028-TOPOBASE.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X-BASE-16028.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X-TBLK-16028.DWG

LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING		PROPOSED
—OH—ELEC—	ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE	
—UG—CATV—	UNDERGROUND CABLE TV, CATV PEDESTAL	
—UG—PHONE—	TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE	
—UG—ELEC—	ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE	
	GAS MAIN, VALVE & GAS LINE MARKER	
	WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE	
	SANITARY SEWER, CLEANOUT & MANHOLE	
	STORM SEWER, CLEANOUT & MANHOLE	
	COMBINED SEWER & MANHOLE	
	SQUARE, ROUND & BEEHIVE CATCH BASIN	
	POST INDICATOR VALVE	
	WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF	
	MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE	
	UNIDENTIFIED STRUCTURE	
816.06	SPOT ELEVATION	671.21
670	CONTOUR LINE	671
	FENCE	
	GUARD RAIL	
	STREET LIGHT	
	SIGN	
CONC.	CONCRETE	STD DUTY / HEAVY DUTY / R.O.W. ONLY
ASPH.	ASPHALT	STD DUTY / HEAVY DUTY / DEEP STRENGTH
GRAVEL	GRAVEL SHOULDER	
	WETLAND	

REFERENCE DRAWINGS

WATER MAIN	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
SANITARY SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
STORM SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
ELECTRIC	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
TELEPHONE	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
GAS	CONSUMERS ENERGY QUARTER SECTION MAP NO. 02–61–27–1
FLOOD PLAIN	FEMA F.I.R.M. 26125C0542G, DATED JANUARY 19, 2009 FEMA F.I.R.M. 26125C0534F, DATED SEPTEMBER 29, 2006
OTHER	PEA JOB NO. 98–217 PEA JOB NO. 07–186 PEA JOB NO. 05–223 PEA JOB NO. 06–087

SYMBOLS: GRADING

PROPOSED SPOT GRADE ELEVATION. ALL GRADES INDICATED ARE TOP OF PAVEMENT UNLESS OTHERWISE NOTED. — 94.50

PROPOSED CONTOUR LINE — 695 —

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R' Ⓡ

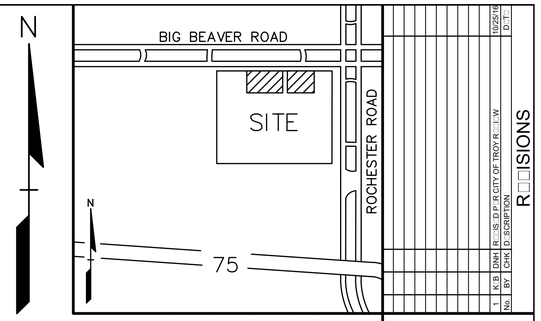
SIDEWALK RAMP 'TYPE P' Ⓟ

REFER TO LATEST M.D.O.T. R–28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

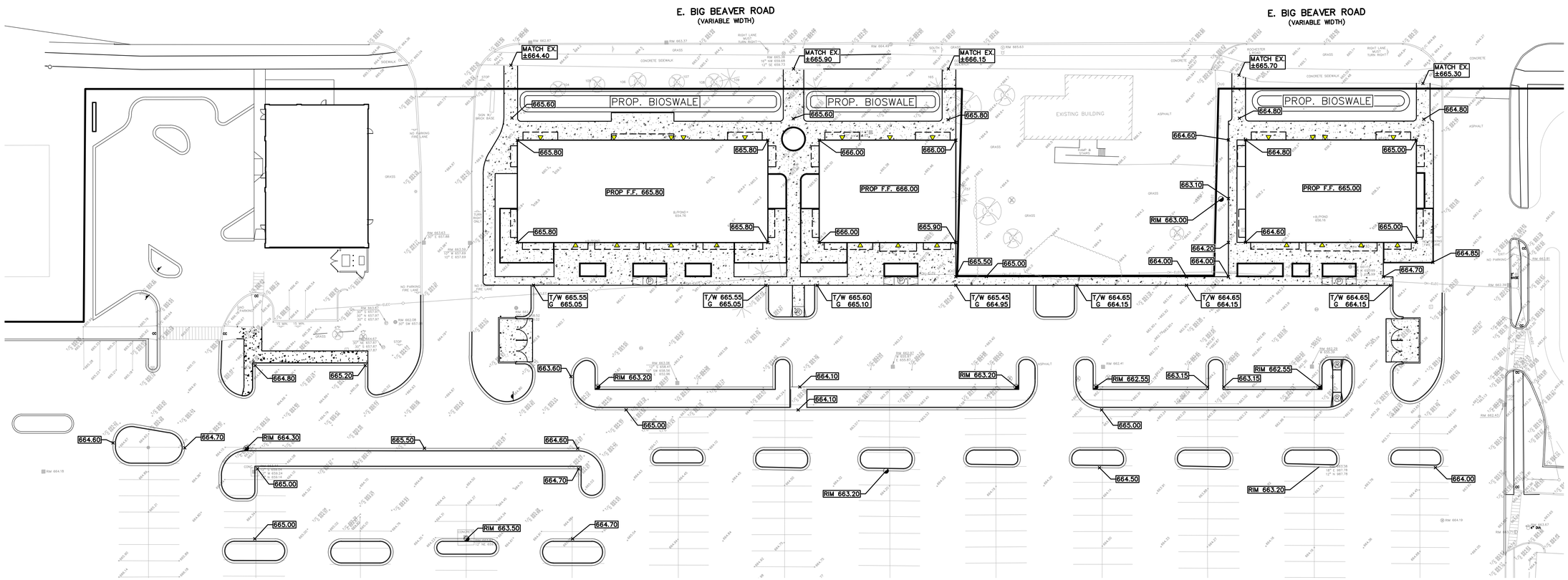
GRAPHIC SCALE

–30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.



LOCATION MAP – NOT TO SCALE



NOT FOR CONSTRUCTION

XREF: S:\PROJECTS\2016\2016028\DWG\16028–TOPOBASE.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X–BASE–16028.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X–TBLK–16028.DWG

No.	BY	CHK	D. SCRIPTION	D.T.
1	K.S.	DNH	R.: IS. D.P.R. CITY OF TROY R.: I.W	10/25/16

R□□ISIONS

C□□TION□

TH□ LOC□TIONS □ND □L□□□TIONS OF □□ISTING □ND □RGRO□ND □TILITI□S □S SHOWN ON THIS DR□WING □R □ONLY □PPRO□MAT□. NO G□□R□NT□□ IS □TH□R □□PRE□SS □ OR IMPLI□D □S TO TH□ □CCURACY □R COMPL□TENE□S OF THE □ATA. TH□ CONTR□CTOR SH□LL B□ □□LL□B□□LY R□SPONSIB□□ FOR D□T□RMINING TH□ □□□CT □TILITY LOC□TIONS □ND □L□□□TIONS PRIOR TO TH□ □ST□RT OF CONSTR□CTION.

THIS DR□WING □ND D□SIGN □R□ TH□ PROP□RTY OF P□□INC. TH□Y □R□ S□BMITT□D ON TH□ CONDITION THAT THEY □RE TO BE KEPT □ONFID□NTIAL □ND TO □OT OTH□R □S IN WHOL□ OR IN P□RT OR □S □ □SED FOR F□RNISHING INFORM□TION TO OTH□RS WITHO□T TH□ PRIOR WRITT□N CONS□NT OF P□□INC. □LL COMMON L□W RIGHTS OF COPYRIGHT □ND OTH□R RIHS □R□ H□R□BY SP□CIF□□LLY R□S□R□□D. © 2016 P□□INC.

CONSTR□CTION CONTR□CTOR □GR□□S TH□T IN □CORD NC□ WITH G□N□R□L □X□LLY □DD□PT□D CONSTR□CTION PR□CTIC□S CONSTR□CTION CONTR□CTOR WILL B□ R□□□PONSIB□□ FOR □OB SIT□ CONDITIONS □□RING TH□ □OB □RS□ □F CONSTR□CTION OF TH□ PRO□□CT INCL□DING S□F□TY OF □LL P□RSONS □ND PROP□RTY □SSOCIATD WITH B□□□ □ND NT SH□□LL B□ M□□□ PROP□RTY OWN□R□ □S □ NO□□ NOT B□ □LMT□D TO NORM□L WORKING HOURS. □ND THE CONSTR□CTION CONTR□CTOR F□RTH□R □GR□□S TO D□F□ND□NC□ IND□MNIFY □ND HOLD D□SIGN PROF□SSION□L H□RM□LSS FROM □NY □ND □LL LI□BILITY □□□LL □G□INST D□SIGN CONS□CTION WITH TH□ □P□RFORM□NC□ OF WORK ON THIS PRO□□CT □□CT □□PTING LI□BILITY □RISING FROM TH□ SOL□ N□GLIG□NC□ OF TH□ □SIGN PROF□SSION□L.

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811

Know what's □elow
Call □efore you dig
MISS DIG System, Inc.
1□00□□2□□1□1 TOLL FR□ www.missdig.net

PEA

P□□□Inc.
2□□0 Rochester Ct□Ste 100
Troy□MI □□0□□1□□2
t□2□□6□9.9090
f□2□□6□9.10□□
www.peainc.com

RAMCO GERSHENSON, INC.
□1500 NORTHWESTERN HIGHWAY□S□ITE□□00
F□RMINGTON HILLS□MI □□□□□

PRELIMINARY GRADING PLAN
TROY MARKET PLACE ADDITIONS
P□RCEL NO□ □□□□□□□□□□□□□□□□□□□□
CITY OF TROY□O□KL□ND COUNTY□MICHIG□N

D.S.	RLS/TMK	DN.	TMK/C.	S.R.	TS	P.M.	RLS

S:\PROJECTS\2016\2016–028_TROY MARKETPLACE–CSM\Dwg\Site Plans\LC–4.0 (BASE–16028.dwg

ORIGIN□L ISS□□ D□T□□□
S□PT. 9□2016

P□□ □OB NO. 2016:02□

SC□L□□1" □ □□

DR□WING N□MB□R□

C□□.0

LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING / PROPOSED

- ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UNDERGROUND CABLE TV, CATV PEDESTAL
- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER & MANHOLE
- SQUARE, ROUND & BEEHIVE CATCH BASIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- SPOT ELEVATION (816.06 / 671.21)
- CONTOUR LINE (670 / 671)
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN
- CONCRETE (STD DUTY, HEAVY DUTY, R.O.W. ONLY)
- ASPHALT (STD DUTY, HEAVY DUTY, DEEP STRENGTH)
- GRAVEL SHOULDER
- WETLAND

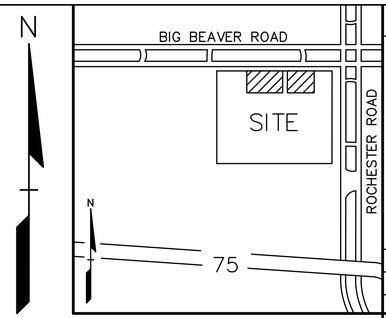
REFERENCE DRAWINGS

WATER MAIN	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
SANITARY SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
STORM SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C–10, DATED 6–2–99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C–11, DATED 6–2–99
ELECTRIC	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
TELEPHONE	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
GAS	CONSUMERS ENERGY QUARTER SECTION MAP NO. 02–61–27–1
FLOOD PLAIN	FEMA F.I.R.M. 26125C0542G, DATED JANUARY 19, 2009 FEMA F.I.R.M. 26125C0534F, DATED SEPTEMBER 29, 2006
OTHER	PEA JOB NO. 98–217 PEA JOB NO. 07–186 PEA JOB NO. 05–223 PEA JOB NO. 06–087

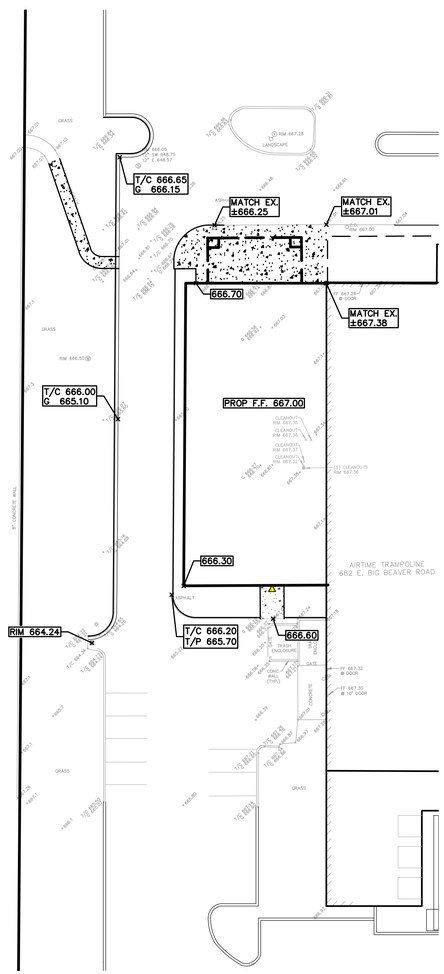
GRAPHIC SCALE

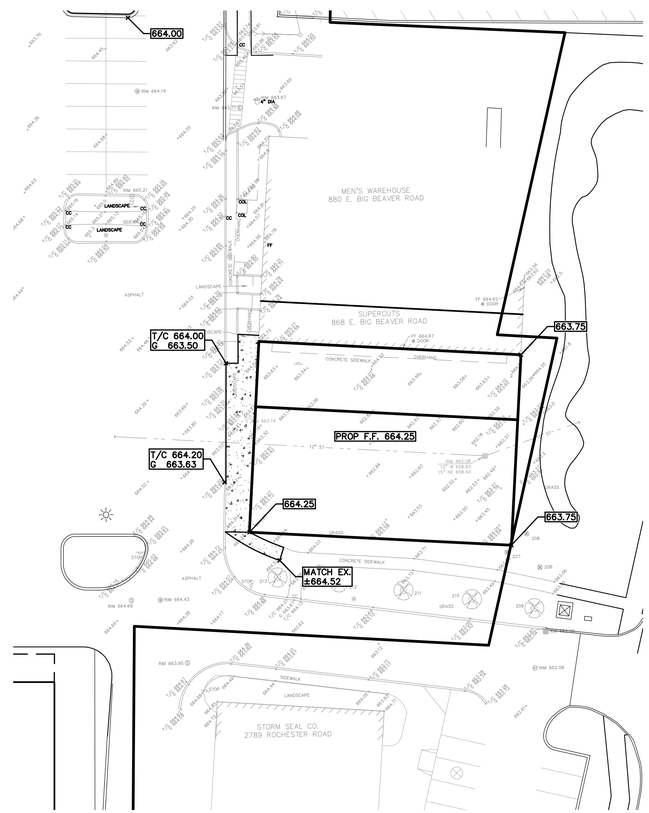
–30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.



LOCATION MAP – NOT TO SCALE





NOT FOR CONSTRUCTION

XREF: S:\PROJECTS\2016\2016028\DWG\16028–TOPOBASE.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X–BASE–16028.DWG
XREF: S:\PROJECTS\2016\2016028\DWG\SITE PLANS\X–TBLK–16028.DWG

No.	BY	CHK	D.SCRIPTION	R.□ISIONS
1	K.B.	DNH	R.□IS.D.P.R.CITY OF TROY R.□□W	10/25/16 D.T.

C□□TION□

TH□LOC□TIONS □ND □L□□□TIONS OF □□ISTING □ND □RGRO□ND □TILITI□S □S SHOWN ON THIS DR□WING □R □ONLY □PPRO□MAT□. NO □□□R□NT□□□ IS □TH□R □□PRE□SS □ OR IMPLI□D □S TO TH□ □CCURACY □R □OMPL□T□NE□S OF THE □NF□RMATI□N CONTR□CTOR SH□LL B□□□□□L□B□□□□□LY R□SPONSIBL□ FOR D□T□RMINING TH□ □□□□CT□□TILITY LOC□TIONS □ND □L□□□TIONS PRIOR TO TH□□ST□RT OF CONSTR□CTION.

THIS DR□WING □ND D□SIGN □R□ TH□ PROP□RTY OF P□□INC. TH□Y □R□S BMITT□D ON TH□ CONDITION THAT THEY □RE TO BE KEPT □ONFID□NTIAL □ND □ND D OR COPY □ IN WHOL□ OR IN P□RT OR □S □ S FOR F□RNISHING INFORM□TION TO OTH□RS WITHO□T TH□ PRIOR WRITT□N CONS NT OF P□□INC. □LL COMMON L□W RIGHTS OF COPYRIGHT □ND OTH□RWIS□□R□ H□R BY SP□CIFIC□LLY R□S□R□□D. © 2016 P□□INC.

CONSTR□CTION CONTR□CTOR □GR□□S TH□T IN □CORD NC□WITH □LL N□□K LY □D□PT□D CONSTR□CTION PR□CTIC□S CONSTR□CTION CONTR□CTOR WILL B□R□□□IR□D TO □SS□M□BOL□ □ND COMPL□T□R□SPONSIBILITY FOR □DB□SIT□ CONDITIONS D□RING TH□□CO□RS□OF CONSTR□CTION OF TH□PRO□CT INCL□DING S□F□TY OF □LL P□RSONS □ND PROP□RTY D□RING THIS R□□□□□□M NT SH□LL B□ M□DIFI□D WITHOUT WRITT□N CONS NT □SLY □ND NOTR□SPONSIBL□ FOR □NY □DDITIONS □ND □LTR□TIONS CONTR□CTOR F□RTH□R □GR□□S TO D□F□ND □ND □MNIFY □ND HOLD D□SIGN PROF□SSION□L H□RML□SS FROM □NY □ND □LL □LIB□ILITY □R □L OR □LL □D□M□GES □RISING FROM TH□SOL□N□GLIG NC□OF TH□D□SIGN PROF□SSION□L

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811

Know what's □elow
Call □efore you dig

MISS DIG System, Inc.

1□00□□2□□1 TOLL FR www.missdig.net

PEA

P□□□Inc.

2□□0 Rochester Ct□Ste 100
Troy□MI □□0□□1□□2
t□2□□6□9.9090
f□2□□6□9.10□□
www.peainc.com

RAMCO GERSHENSON, INC.
□1500 NORTHWESTERN HIGHWAY S□TE□□00
F□RMINGTON HILLS, MI □□□□□

PRELIMINARY GRADING PLAN
TROY MARKET PLACE ADDITIONS
P□RTIONS OF SECTIONS 27 □□□
CITY OF TROY□ OAKLAND COUNTY□MICHIG□N

D.S.	RLS/TMK	DN.	TMK/C.	S.R.	TS	P.M.	RLS

S:\PROJECTS\2016\2016–028 TROY MARKETPLACE–CMH\Dwg\Site Plans\C–410 (SP&E–16028.dwg

ORIGIN□L ISS□□ D□T□□
S□PT. 9□2016

P□□ □OB NO. 2016□02□

SC□L□□1" □ □0□

DR□WING N□MB□R□

C□□.1

LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

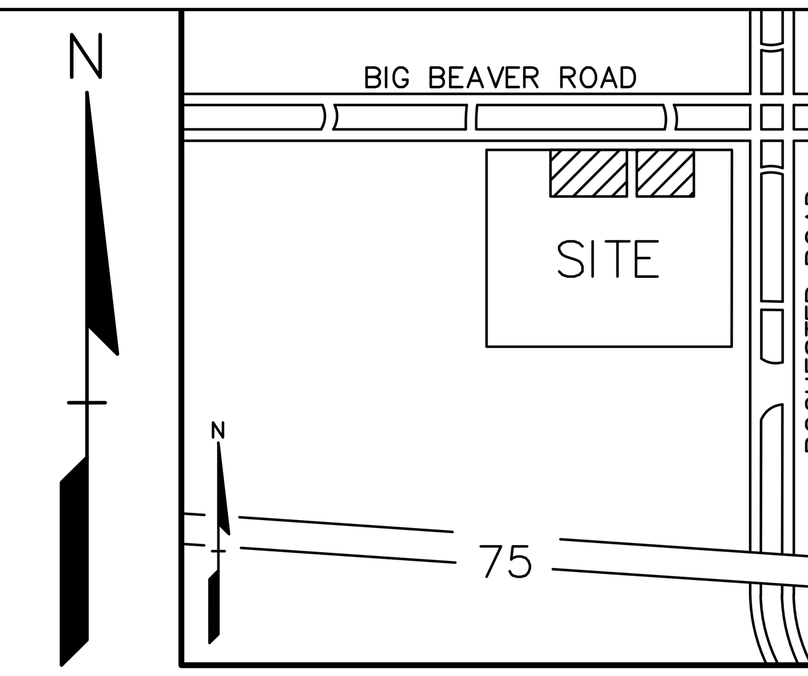
EXISTING		PROPOSED
—OH—ELEC—	ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE	
—UG—CATV—	UNDERGROUND CABLE TV, CATV PEDESTAL	
UG—PHONE	TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE	
—UG—ELEC—	ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE	
GAS	GAS MAIN, VALVE & GAS LINE MARKER	
	WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE	
	SANITARY SEWER, CLEANOUT & MANHOLE	C.O.
	STORM SEWER, CLEANOUT & MANHOLE	C.O.
	COMBINED SEWER & MANHOLE	
	SQUARE, ROUND & BEEHIVE CATCH BASIN	Y.D.
	POST INDICATOR VALVE	
	WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF	
M T I	MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE	
?	UNIDENTIFIED STRUCTURE	
816.06	SPOT ELEVATION	671.21
670	CONTOUR LINE	671
	FENCE	
	GUARD RAIL	
	STREET LIGHT	
	SIGN	
CONC.	CONCRETE	STD DUTY / HEAVY DUTY / R.O.W. ONLY
ASPH.	ASPHALT	STD DUTY / HEAVY DUTY / DEEP STRENGTH
GRAVEL	GRAVEL SHOULDER	
	WETLAND	

REFERENCE DRAWINGS

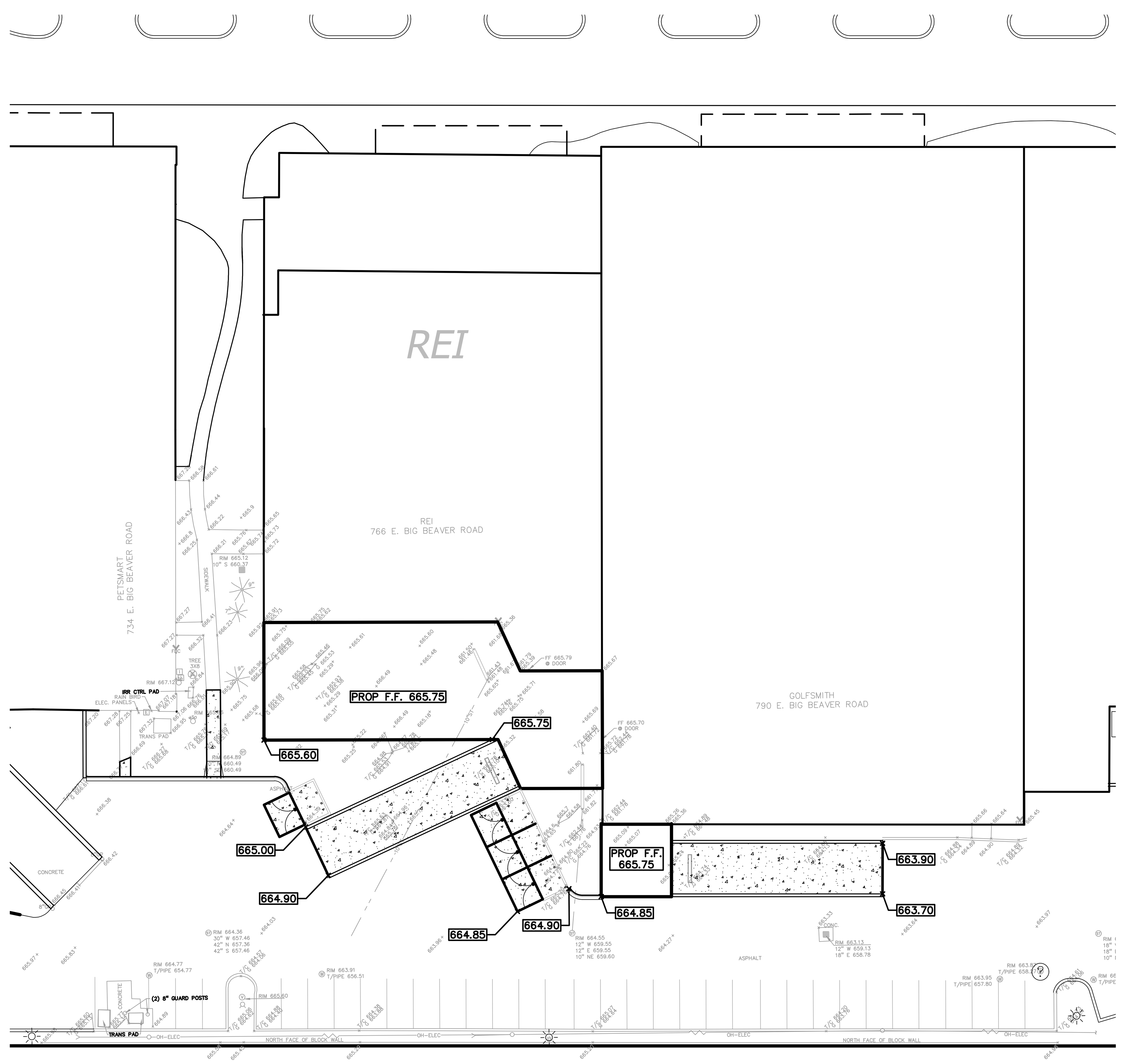
WATER MAIN	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
SANITARY SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
STORM SEWER	CITY OF TROY GIS ONLINE MAP
	UTILITY PLAN (WEST), PEA JOB NO. 98217, DWG. NO. C-10, DATED 6-2-99
	UTILITY PLAN (EAST), PEA JOB NO. 98217, DWG. NO. C-11, DATED 6-2-99
ELECTRIC	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
TELEPHONE	HAVE NOT RECEIVED DRAWINGS AS OF 06/28/16
GAS	CONSUMERS ENERGY QUARTER SECTION MAP NO. 02-61-27-1
FLOOD PLAIN	FEMA F.I.R.M. 26125C0542G, DATED JANUARY 19, 2009 FEMA F.I.R.M. 26125C0534F, DATED SEPTEMBER 29, 2006
OTHER	PEA JOB NO. 98-217 PEA JOB NO. 07-186 PEA JOB NO. 05-223 PEA JOB NO. 06-087

GRAPHIC SCALE

(IN FEET)
1 inch = 30 ft.



LOCATION MAP – NOT TO SCALE



No.	BY	CHK	DESCRIPTION	DATE
1	K.B	DNH	REVISED PER CITY OF TROY REVIEW	10/25/16

REVISIONS

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

THIS DRAWING AND DESIGN ARE THE PROPERTY OF PEA, INC. THEY ARE SUBMITTED ON THE CONDITION THAT THEY ARE NOT TO BE USED, REPRODUCED OR COPIED IN WHOLE OR IN PART, OR USED FOR FURNISHING INFORMATION TO OTHERS, WITHOUT THE PRIOR WRITTEN CONSENT OF PEA, INC. ALL COMMON LAW RIGHTS OF COPYRIGHT AND OTHERWISE ARE HEREBY SPECIFICALLY RESERVED. © 2016 PEA, INC.

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811
Know what's below. Call before you dig
MISS DIG System, Inc.
1-800-482-7171 (TOLL FREE) www.missdig.net

PEA, Inc.
2430 Rochester Ct., Ste 100
Troy, MI 48083-1872
t: 248.689.9090
f: 248.689.1044
www.peainc.com

RAMCO GERSHENSON, INC.
31500 NORTHWESTERN HIGHWAY, SUITE 300
FARMINGTON HILLS, MI

PRELIMINARY GRADING PLAN
TROY MARKET PLACE ADDITIONS
PART OF THE NE 1/4 OF SECTION 23, T. 2N., R. 11 E.
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

DES.	DN.	SUR.	P.M.
RLS/TMK	TMK/AC	TS	RLS

S:\PROJECTS\2016\2016-028 TROY MARKETPLACE-DNH\Dwg\Site Plans\(C-4.0) GRADE-16028.dwg

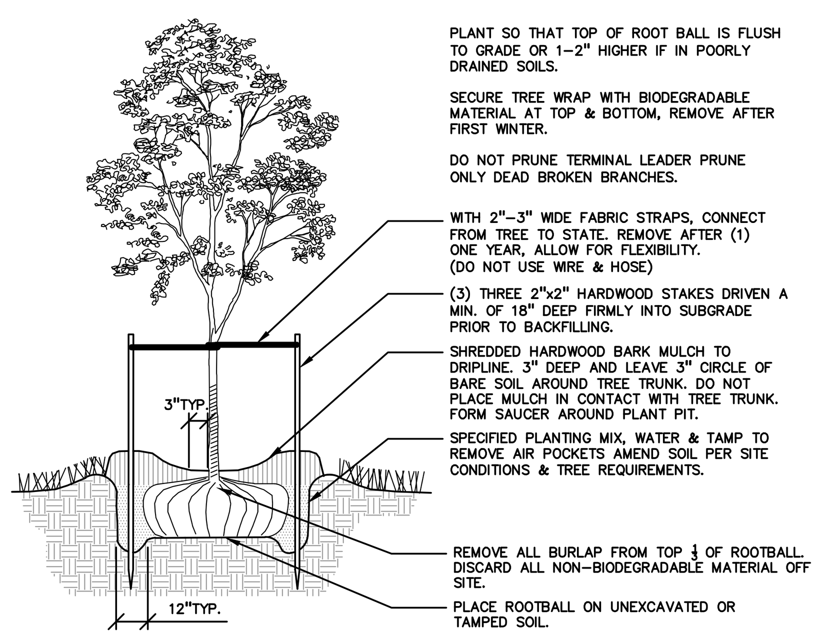
ORIGINAL ISSUE DATE:
SEPT. 9, 2016

PEA JOB NO. 2016-028

SCALE: 1" = 30'

DRAWING NUMBER:
C-4.2

NOT FOR CONSTRUCTION
XREF: S:PROJECTS\2016\2016028\DWG\16028-TOPOBASE.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X-BASE-16028.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X-TBLK-16028.DWG



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.

WITH 2"–3" WIDE FABRIC STRAPS, CONNECT FROM TREE TO STATE. REMOVE AFTER (1) ONE YEAR, ALLOW FOR FLEXIBILITY. (DO NOT USE WIRE & HOSE)

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

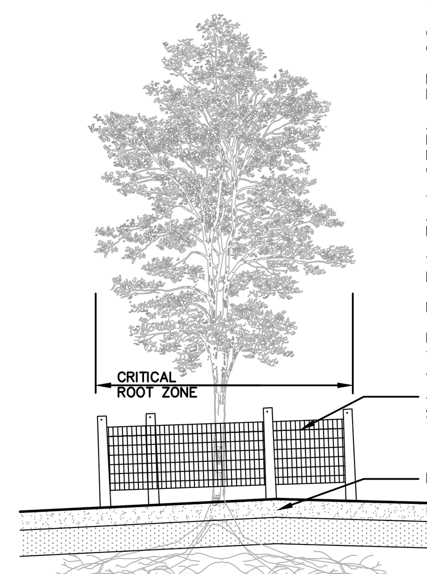
SHREDDED HARDWOOD BARK MULCH TO DRIPLINE. 3" DEEP AND LEAVE 3" CIRCLE OF BARE SOIL AROUND TREE TRUNK. DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK. FORM SAUCER AROUND PLANT PIT.

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

REMOVE ALL BURLAP FROM TOP ⅓ OF ROOTBALL. DISCARD ALL NON–BIODEGRADABLE MATERIAL OFF SITE.

PLACE ROOTBALL ON UNEXCAVATED OR TAMPED SOIL.

DECIDUOUS TREE PLANTING DETAIL
NOT TO SCALE



TREE PROTECTION WILL BE ERECTED PRIOR TO START OF CONSTRUCTION ACTIVITIES AND SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.

NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE DRIP LINE OF ANY TREE DESIGNATED TO REMAIN;INCLUDING, BUT NOT LIMITED TO PLACING SOLVENTS, BUILDING MATERIAL, CONSTRUCTION EQUIPMENT OR SOIL DEPOSITS WITHIN DRIP LINES.

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.

TREES LOCATED ON ADJACENT PROPERTY THAT MAY BE AFFECTED BY CONSTRUCTION ACTIVITIES MUST BE PROTECTED.

TREES TO BE PRESERVED SHALL BE IDENTIFIED WITH FLAGGING PRIOR TO THE TREE CLEARING OPERATIONS.

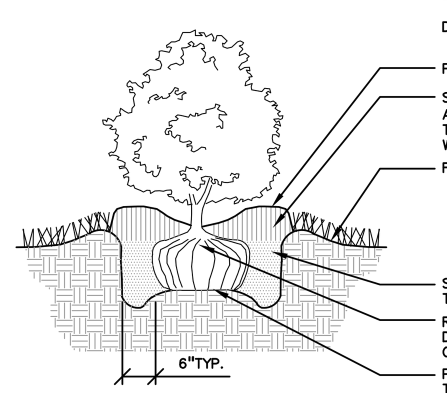
PROVIDE FENCE AROUND CRITICAL ROOT ZONE OF TREE.

FENCE SHALL BE PLACED IN A CIRCLE WITH A RADIUS OF 1' PER 1" DIAMETER OF THE TREE MEASURED AT 4.5' ABOVE GROUND.

4' HIGH PROTECTIVE FENCING WITH STEEL POSTS – 10' O.C.

EXISTING SOIL

TREE PROTECTION DETAIL
NOT TO SCALE



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.

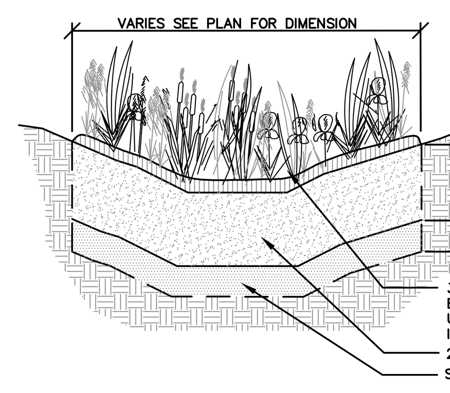
FINISH GRADE.

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

REMOVE ALL BURLAP FROM TOP ⅓ OF ROOTBALL. DISCARD ALL NON–BIODEGRADABLE MATERIAL OFF SITE.

PLACE ROOTBALL ON UNEXCAVATED OR TAMPED SOIL.

SHRUB PLANTING DETAIL
NOT TO SCALE



BIOSWALE – TYPICAL CROSS SECTION
NOT TO SCALE

GRAPHIC SCALE

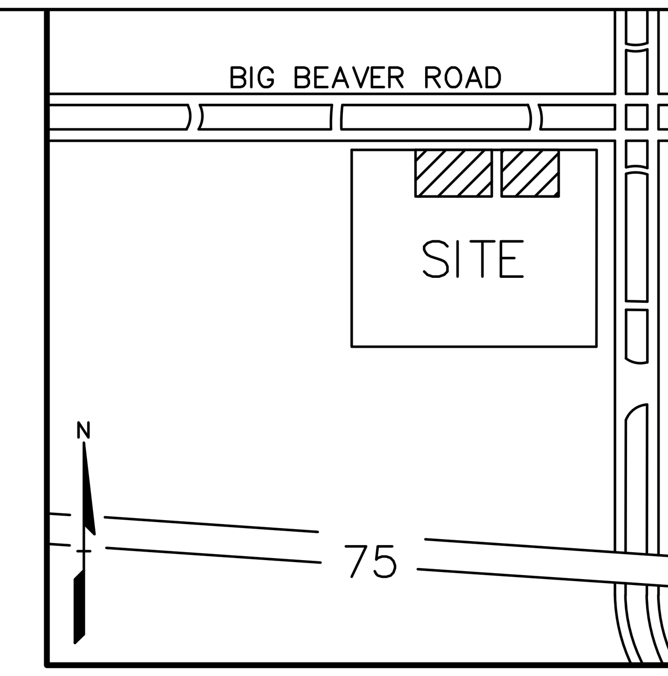
–30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

N

TREE PLANT LIST:

QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	COMMENT
8	GP2.5	Princeton Sentry Ginkgo	*Ginkgo biloba 'Princeton Sentry'*	2.5" Cal.	B&B	NON-NATIVE
16	TA2.5	Boulevard Linden	*Tilia americana 'Boulevard*	2.5" Cal.	B&B	NATIVE
6	UA2.5	Princeton Elm	*Ulmus japonica x wilsoniana 'Accolade'*	2.5" Cal.	B&B	NATIVE



LOCATION MAP – NOT TO SCALE

LANDSCAPE CALCULATIONS:
PER CITY OF TROY ZONING ORDINANCE

GENERAL SITE LANDSCAPE
REQUIRED: 20% OF SITE AREA SHALL BE LANDSCAPE MATERIAL
(CALCS INCLUDE ONLY AREA WITHIN LIMIT OF DISTURBANCE)

139,911 SQ FT * 20% = 27,982 SQ FT

PROVIDED: 28,091 SQ FT OF SOFT–SCAPE (LAWN & PLANT BEDS)
(20.08% SOFT–SCAPE PROVIDED)

PARKING LOT LANDSCAPE
REQUIRED: 1 TREE / 8 PARKING SPACES

86 PARKING SPACES / 8 = 11 TREES REQUIRED

PROVIDED: 11 TREES

GREENBELT
REQUIRED: 1 TREE / 30 LF OF FRONTAGE

BIG BEAVER ROAD WEST = 284 LF FRONTAGE / 30 = 10 TREES
BIG BEAVER ROAD EAST = 131 LF FRONTAGE / 30 = 5 TREES

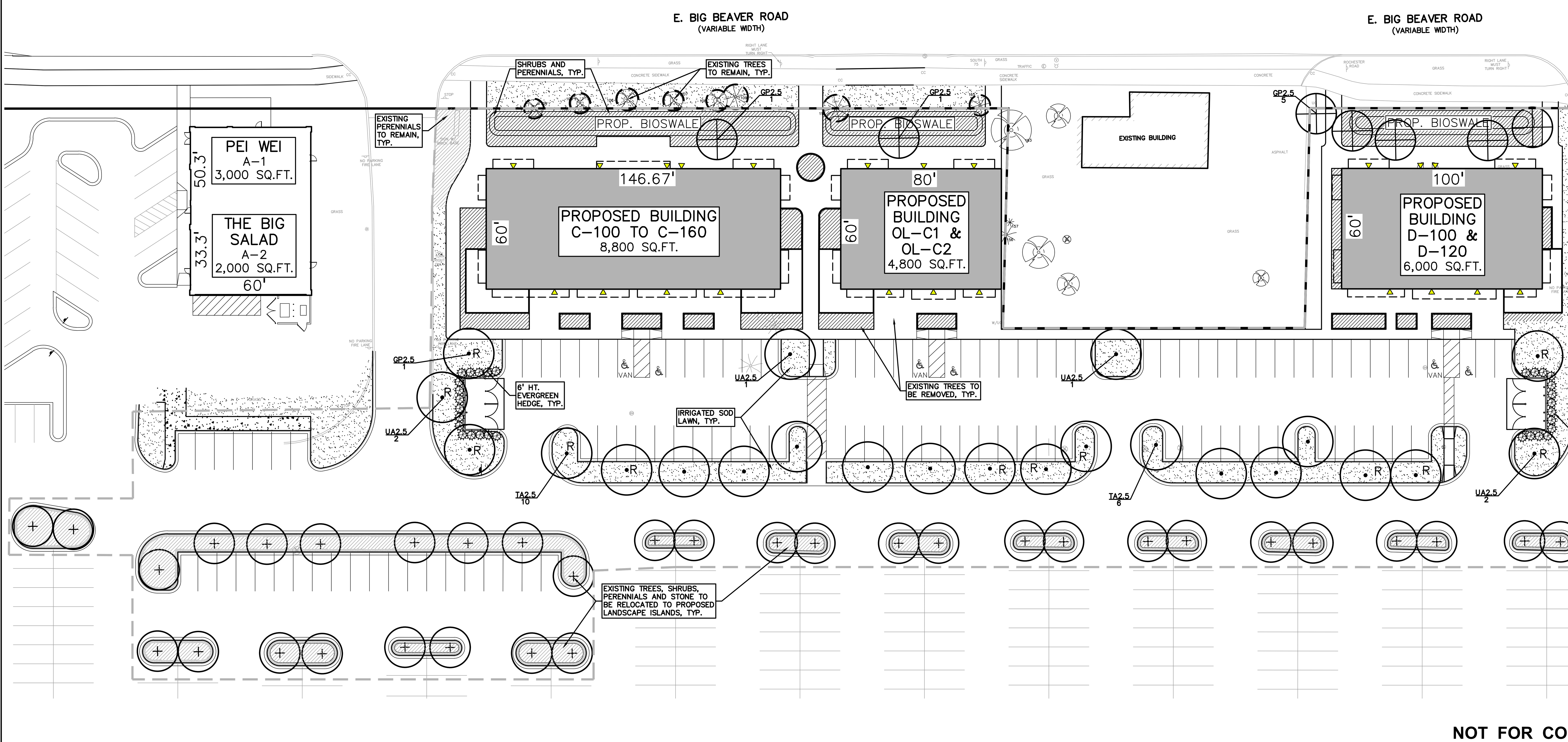
PROVIDED: BIG BEAVER ROAD WEST: 8 EXISTING & 2 PROPOSED
BIG BEAVER ROAD EAST: 5 TREES

TREE REPLACEMENT
REQUIRED: 28" OF LANDMARK TREES REMOVED, 28" OF TREE REPLACEMENT REQUIRED

PROVIDED: (12) 2.5" CAL. TREES= 30" OF REPLACEMENT TREES

KEY:

- = PARKING LOT TREES
- = GREENBELT TREES
- = RELOCATED TREES
- = REPLACEMENT TREES
- = EXISTING TREES TO REMAIN WITH TREE PROTECTION FENCE
- = SCREENING SHRUBS
- = SHRUBS / PERENNIALS
- = EXISTING SHRUBS / PERENNIALS
- = IRRIGATED SOD LAWN



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, SEE SPECIFICATIONS. SHREDDED PALETTE AND DIED 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.

NOT FOR CONSTRUCTION

XREF: S:PROJECTS\2016\2016028\DWG\16028–TOPOBASE.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X–BASE–16028.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X–TBLK–16028.DWG

REVISIONS

No.	BY	CHK	DESCRIPTION	DATE
01	TS	TS	REVISED PER REVIEW COMMENTS	10-2-16

STATE OF MICHIGAN – JEFFREY T. SMITH – LANDSCAPE ARCHITECT – No. 1328 – REGISTERED LANDSCAPE ARCHITECT

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

THIS DRAWING AND DESIGN ARE THE PROPERTY OF PEA INC. THEY ARE SUBMITTED ON THE CONDITION THAT THEY ARE NOT TO BE USED, REPRODUCED OR COPIED IN WHOLE OR IN PART OR USED FOR FURNISHING INFORMATION TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF PEA INC. ALL COMMON LAW RIGHTS OF COPYRIGHT AND OTHERWISE ARE HEREBY SPECIFICALLY RESERVED. © 2016 PEA INC.

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY REAL OR ALLEGED IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT ACCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.

3 FULL WORKING DAYS BEFORE YOU DIG CALL
811
Know what's below
Call before you dig
MISS DIG System, Inc.
1-800-482-7171 www.missdig.net
TOLL FREE

PEA Inc.
Rochester Ct, Ste 100
Troy, MI
www.peainc.com

RAMCO GERSHENSON, INC.
NORTHWESTERN HIGHWAY, SUITE
FARMINGTON HILLS, MI

PRELIMINARY LANDSCAPE PLAN
TROY MARKET PLACE ADDITIONS
PART OF THE N. 1/2 OF SECTION 2, T. 2N., R. 11 E.
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

D.S.	DN.	S.R.	P.M.
RLS/TMK	TMK/C	TS	RLS

S:\PROJECTS\2016\2016–028 TROY MARKETPLACE–DNH\Dwg\2016–028L\SITE PLAN\(L–1.0) LANDSCAPE–16028.dwg

ORIGINAL ISSUE DATE:
SEPT. 9, 2016

PEA JOB NO. 2016-028

SCALE: 1" = 30'

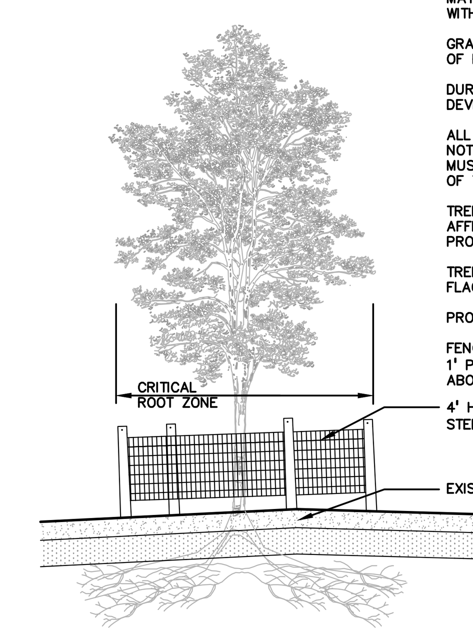
DRAWING NUMBER:
L-1.0

PLAN NO.	CODE	DBH	COMMON NAME	LATIN NAME	CONDITION	NOTE
100	RM	8	Red Maple	Acer rubrum	FAIR	TO BE REMOVED
101	RM	12	Red Maple	Acer rubrum	FAIR	TO BE REMOVED
102	BD	12	Balled Cypress	Taxodium distichum	FAIR	TO BE REMOVED
103	NM	6	Norway Maple	Acer platanoides	FAIR	TO BE REMOVED
104	NM	9	Norway Maple	Acer platanoides	FAIR	REMAIN
105	NM	9	Norway Maple	Acer platanoides	FAIR	REMAIN
106	NM	10	Norway Maple	Acer platanoides	FAIR	REMAIN
107	NM	9	Norway Maple	Acer platanoides	FAIR	REMAIN
108	NM	8	Norway Maple	Acer platanoides	FAIR	REMAIN
109	AU	12	Austrian Pine	Pinus nigra	FAIR	REMAIN
110	BN	5-3, 4, 4, 6, 6	River Birch	Betula Nigra	FAIR	TO BE REMOVED
111	PB	2-6, 2-5	Paper Birch	Betula papyrifera	FAIR	TO BE REMOVED
112	BS	13	Blue Spruce	Picea pungens	FAIR	REMAIN
113	AU	10	Austrian Pine	Pinus nigra	FAIR	TO BE REMOVED
114	AU	12	Austrian Pine	Pinus nigra	FAIR	TO BE REMOVED
115	T	9	Tamarack	Larix laricina	FAIR	TO BE REMOVED
116	AU	12	Austrian Pine	Pinus nigra	FAIR	TO BE REMOVED
117	AU	10	Austrian Pine	Pinus nigra	FAIR	TO BE REMOVED
118	BS	10	Blue Spruce	Picea pungens	FAIR	TO BE REMOVED
119	BS	12	Blue Spruce	Picea pungens	FAIR	TO BE REMOVED
120	BS	4	Blue Spruce	Picea pungens	FAIR	TO BE REMOVED
121	BS	10	Blue Spruce	Picea pungens	FAIR	TO BE REMOVED
122	BS	9	Blue Spruce	Picea pungens	FAIR	TO BE REMOVED
123	BS	10	Blue Spruce	Picea pungens	FAIR	TO BE REMOVED
124	BS	9	Blue Spruce	Picea pungens	FAIR	TO BE REMOVED
125	AU	9	Austrian Pine	Pinus nigra	FAIR	TO BE REMOVED
126	AU	10	Austrian Pine	Pinus nigra	FAIR	TO BE REMOVED
127	BS	5	Blue Spruce	Picea pungens	FAIR	TO BE REMOVED
128	BN	9	River Birch	Betula Nigra	FAIR	TO BE REMOVED
129	RM	16	Red Maple	Acer rubrum		TO BE REMOVED
130	BX	3x4	Box elder	Acer negundo		TO BE REMOVED
131	BX	6	Box elder	Acer negundo		TO BE REMOVED
132	AU	12	Austrian Pine	Pinus nigra		TO BE REMOVED
133	AU	10	Austrian Pine	Pinus nigra		TO BE REMOVED
134	BS	8	Blue Spruce	Picea pungens		TO BE REMOVED
135	BS	10	Blue Spruce	Picea pungens		TO BE REMOVED
136	BS	9	Blue Spruce	Picea pungens		TO BE REMOVED
137	BS	6	Blue Spruce	Picea pungens		TO BE REMOVED
138	BS	12	Blue Spruce	Picea pungens		TO BE REMOVED
139	BS	9	Blue Spruce	Picea pungens		TO BE REMOVED
140	BS	9	Blue Spruce	Picea pungens	POOR	TO BE REMOVED
141	BS	5	Blue Spruce	Picea pungens	POOR	TO BE REMOVED
142	BS	9	Blue Spruce	Picea pungens	POOR	TO BE REMOVED
143	BS	7	Blue Spruce	Picea pungens		TO BE REMOVED
144	BX	8x3	Box elder	Acer negundo		TO BE REMOVED
145	BS	5	Blue Spruce	Picea pungens		TO BE REMOVED
146	BS	9	Blue Spruce	Picea pungens		TO BE REMOVED
147	BX	6x4	Box elder	Acer negundo		TO BE REMOVED
148	AU	14	Austrian Pine	Pinus nigra		TO BE REMOVED
149	BS	7	Blue Spruce	Picea pungens		TO BE REMOVED
150	AU	14	Austrian Pine	Pinus nigra		TO BE REMOVED
151	BX	6	Box elder	Acer negundo		TO BE REMOVED
152	AU	12	Austrian Pine	Pinus nigra		TO BE REMOVED
153	BS	10	Blue Spruce	Picea pungens		TO BE REMOVED
154	BS	12	Blue Spruce	Picea pungens		TO BE REMOVED
155	BS	6	Blue Spruce	Picea pungens		TO BE REMOVED
156	BS	10	Blue Spruce	Picea pungens		REMAIN
157	RC	4	Red Cedar	Juniperus virginiana		REMAIN
158	BS	10	Blue Spruce	Picea pungens		TO BE REMOVED
159	AU	12	Austrian Pine	Pinus nigra		REMAIN
160	AU	11	Austrian Pine	Pinus nigra		REMAIN
161	NM	4	Norway Maple	Acer platanoides		REMAIN
163	WA	20	White Ash	Fraxinus americana		REMAIN
164	NS	13	Norway Spruce	Picea abies		TO BE REMOVED
165	WS	10x2	White Spruce	Picea glauca		REMAIN
166	NM	2	Norway Maple	Acer platanoides	DEAD	REMAIN
167	AU	12x2	Austrian Pine	Pinus nigra		TO BE REMOVED
168	BN	7x3	River Birch	Betula Nigra		TO BE REMOVED
169	BD	7	Balled Cypress	Taxodium distichum		TO BE REMOVED
170	AU	12	Austrian Pine	Pinus nigra		TO BE REMOVED
171	AU	12	Austrian Pine	Pinus nigra		TO BE REMOVED
172	BN	10	River Birch	Betula Nigra		TO BE REMOVED
173	AU	9	Austrian Pine	Pinus nigra		TO BE REMOVED
174	NM	9	Norway Maple	Acer platanoides		TO BE REMOVED
175	BD	9	Balled Cypress	Taxodium distichum		TO BE REMOVED
176	NM	10	Norway Maple	Acer platanoides		TO BE REMOVED
177	NM	13	Norway Maple	Acer platanoides		TO BE REMOVED
178	NM	10	Norway Maple	Acer platanoides		TO BE REMOVED
179	NM	9	Norway Maple	Acer platanoides		TO BE REMOVED
180	NM	9	Norway Maple	Acer platanoides		TO BE REMOVED
181	BN	3 -8, 8, 11	River Birch	Betula Nigra		TO BE REMOVED
182	T	9	Tamarack	Larix laricina		TO BE REMOVED
183	RM	7	Red Maple	Acer rubrum		TO BE REMOVED
184	BD	9	Balled Cypress	Taxodium distichum		TO BE REMOVED
185	FS	3	Purple Beech	Fagus slyvatica f. Purpea		TO BE REMOVED
186	FS	3	Purple Beech	Fagus slyvatica f. Purpea		TO BE REMOVED
187	FS	3	Purple Beech	Fagus slyvatica f. Purpea		TO BE REMOVED
188	FS	4	Purple Beech	Fagus slyvatica f. Purpea		TO BE REMOVED
189	FS	4	Purple Beech	Fagus slyvatica f. Purpea		TO BE REMOVED
190	FS	4	Purple Beech	Fagus slyvatica f. Purpea		TO BE REMOVED
191	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
192	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
193	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
194	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
195	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
196	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
197	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
198	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
199	RM	2	Red Maple	Acer rubrum		TO BE REMOVED
200	RM	2	Red Maple	Acer rubrum		TO BE REMOVED
201	RM	2	Red Maple	Acer rubrum		TO BE REMOVED
202	RM	2	Red Maple	Acer rubrum		TO BE REMOVED
203	RM	2	Red Maple	Acer rubrum		TO BE REMOVED
204	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
205	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
206	SB	2x4	Service Berry	Amelanchier arborea		REMAIN
207	SB	2x4	Service Berry	Amelanchier arborea		REMAIN
208	SB	2x4	Service Berry	Amelanchier arborea		REMAIN
209	NM	8	Norway Maple	Acer platanoides		REMAIN
210	NM	8	Norway Maple	Acer platanoides		REMAIN
211	NM	8	Norway Maple	Acer platanoides		REMAIN
212	NM	8	Norway Maple	Acer platanoides		REMAIN
213	NM	8	Norway Maple	Acer platanoides		REMAIN
214	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
215	RM	3	Red Maple	Acer rubrum		TO BE REMOVED
216	RM	3	Red Maple	Acer rubrum		TO BE REMOVED

GRAPHIC SCALE

−30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.



TREE PROTECTION WILL BE ERECTED PRIOR TO START OF CONSTRUCTION ACTIVITIES AND SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.

NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE DRIP LINE OF ANY TREE DESIGNATED TO REMAIN;INCLUDING, BUT NOT LIMITED TO PLACING SOLVENTS, BUILDING MATERIAL, CONSTRUCTION EQUIPMENT OR SOIL DEPOSITS WITHIN DRIP LINES.

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.

TREES LOCATED ON ADJACENT PROPERTY THAT MAY BE AFFECTED BY CONSTRUCTION ACTIVITIES MUST BE PROTECTED.

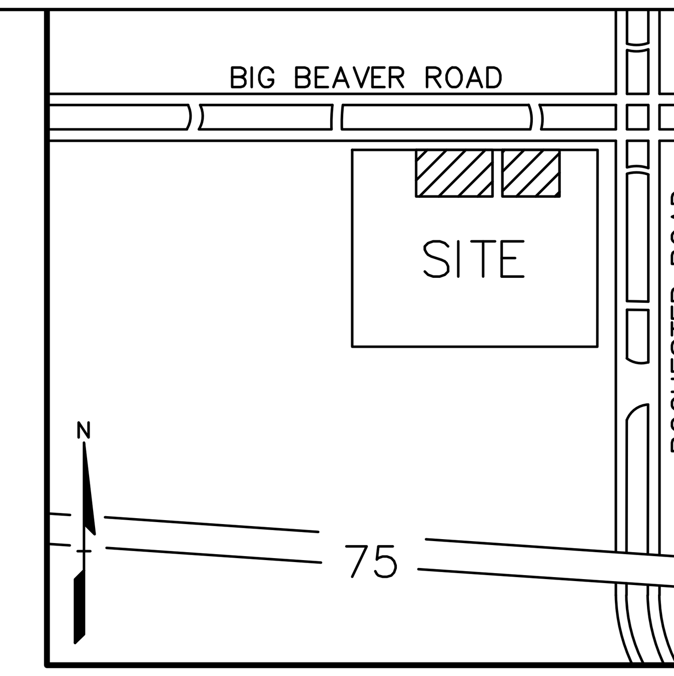
TREES TO BE PRESERVED SHALL BE IDENTIFIED WITH FLAGGING PRIOR TO THE TREE CLEARING OPERATIONS.

PROVIDE FENCE AROUND CRITICAL ROOT ZONE OF TREE.

FENCE SHALL BE PLACED IN A CIRCLE WITH A RADIUS OF 1' PER 1" DIAMETER OF THE TREE MEASURED AT 4.5' ABOVE GROUND.

TREE PROTECTION DETAIL
NOT TO SCALE

N

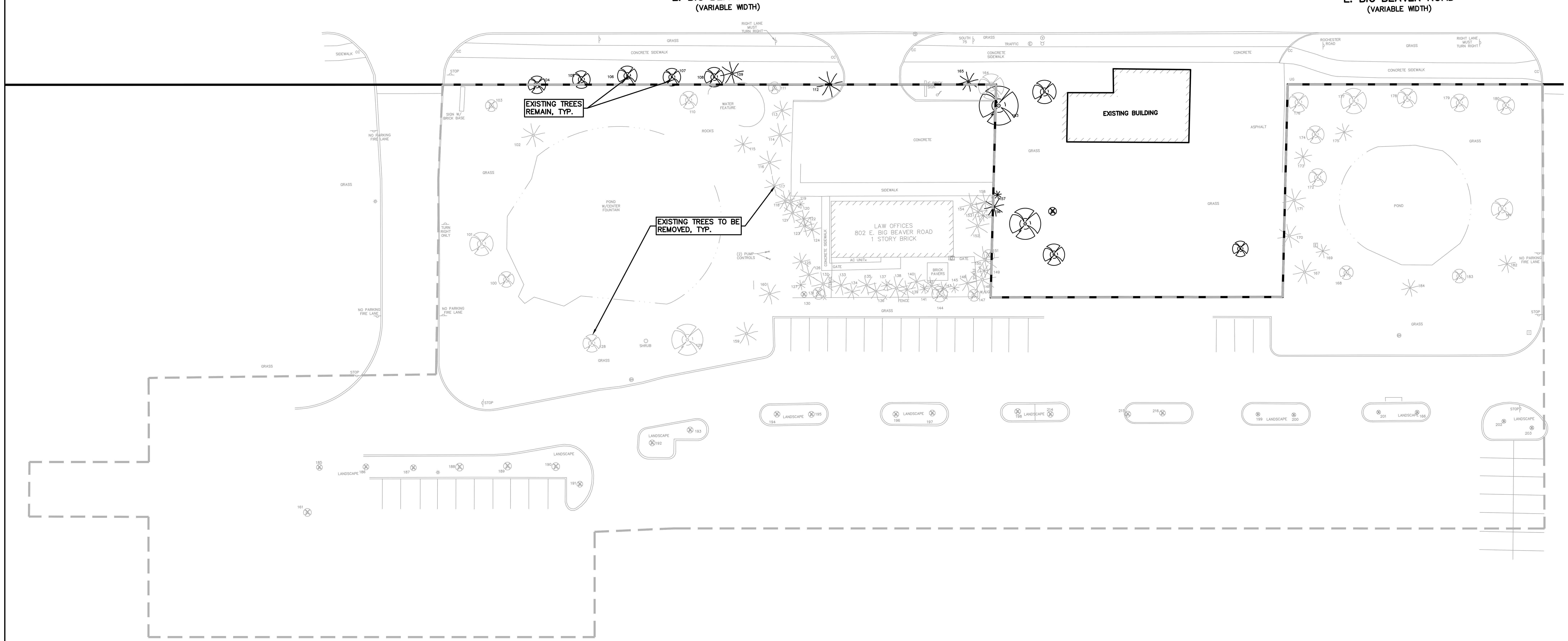


LOCATION MAP – NOT TO SCALE

KEY:

= EXISTING TREES TO REMAIN

= EXISTING TREES TO BE REMOVED

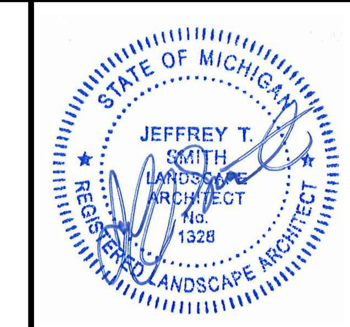


NOT FOR CONSTRUCTION

XREF: S:PROJECTS\2016\2016028\DWG\16028–TOPOBASE.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X–BASE–16028.DWG
XREF: S:PROJECTS\2016\2016028\DWG\SITE PLANS\X–TBLK–16028.DWG

R□□ISIONS

No.	BY	CHK	D□SCRIPTION	D□T□
01	□TS	□TS	R□□IS□ P□R R□□I□W COMM□NTS	10□2□□16



C□□TION□□
TH□ LOC□TIONS □ND □L□□□TIONS OF □□ISTING □ND□RGRO□ND □TILITI□S □S SHOWN ON THIS DR□WING □R□ ONLY □PPRO□IM□T□. NO G□□R□NT□□ IS □ITH□R □□PR□SS□D OR IMPLI□D □S TO TH□ COMPL□T□N□SS OR □CC□R□CY TH□R□OF. TH□ CONTR□CTOR SH□LL B□ □□CL□SI□□LY R□SPONSIBL□ FOR D□T□RMINING TH□ □□□CT □TILITY LOC□TIONS □ND □L□□□TIONS PRIOR TO TH□ ST□RT OF CONSTR□CTION.

THIS DR□WING □ND D□SIGN □R□ TH□ PROP□RTY OF P□□□INC. TH□Y □R□ S□BMITT□D ON TH□ CONDITION TH□T TH□Y □R□ NOT TO B□ □S□D R□PROD□C□D OR COPI□D IN WHOL□ OR IN P□RT OR □S□D FOR F□RNISHING INFORM□TION TO OTH□RS WITHO□T TH□ PRIOR WRITT□N CONS□NT OF P□□□INC. □LL COMMON L□W RIGHTS OF COPYRIGHT □ND OTH□RWIS□ □R□ H□R□BY SP□CIFIC□LLY R□S□R□□D. © 2016 P□□□INC.

CONSTR□CTION CONTR□CTOR □GR□□S TH□T IN □CCORD□NC□ WITH G□N□R□LLY □CC□PT□D CONSTR□CTION PR□CTIC□S CONSTR□CTION CONTR□CTOR WILL B□ R□□□IR□D TO □SS□M□ SOL□ □ND COMPL□T□ R□SPONSIBILITY FOR □OB SIT□ CONDITIONS D□RING TH□ CO□RS□ OF CONSTR□CTION OF TH□ PRO□□CT INCL□DING S□F□TY OF □LL P□RSONS □ND PROP□RTY TH□T THIS R□□□IR□M□NT SH□LL B□ M□D□ TO □PPLY CONTIN□O□SLY □ND NOT B□ LIMIT□D TO NORM□L WORKING HO□RS □ND CONSTR□CTION CONTR□CTOR F□RTH□R □GR□□S TO D□F□ND□ IND□MNIFY □ND HOLD D□SIGN PROF□SSION□L H□RML□SS FROM □NY □ND □LL LI□BILITY R□□L OR □LL□G□D IN CONN□CTION WITH TH□ P□RFORM□NC□ OF WORK ON THIS PRO□□CT □□C□PTING LI□BILITY □RISING FROM TH□ SOL□ N□GLIG□NC□ OF TH□ D□SIGN PROF□SSION□L.

3 FULL WORKING DAYS BEFORE YOU DIG CALL
811
Know what□s □elow
Call □efore you dig
MISS DIG System, Inc.
1□□00□□□2□□1□1 www.missdig.net
□TOLL FR□□□

P□□□Inc.
2□□0 Rochester Ct□Ste 100
Troy□MI □□0□□□1□□2
t□2□□.6□9.9090
f□2□□.6□9.10□□
www.peainc.com

RAMCO GERSHENSON, INC.
□1500 NORTHW□ST□RN HIGHW□Y S□IT□ □00
F□RMINGTON HILLS□MI □□□□□

TREE PRESERVATION PLAN
TROY MARKET PLACE ADDITIONS
P□RT OF TH□ N□ 1/□ OF S□CTION 2□ T. 2N.□R. 11□.□
CITY OF TROY□O□KL□ND CO□NTY□MICHIG□N

D□S.	RLS/TMK	DN.	TMK/□C	S□R.	TS	P.M.	RLS

S:\PROJECTS\2016\2016–028 TROY MARKETPLACE–DNH\Dwg\2016–028L\SITE PLAN\(T–1.0) TREE PRESERVATION–16028.dwg

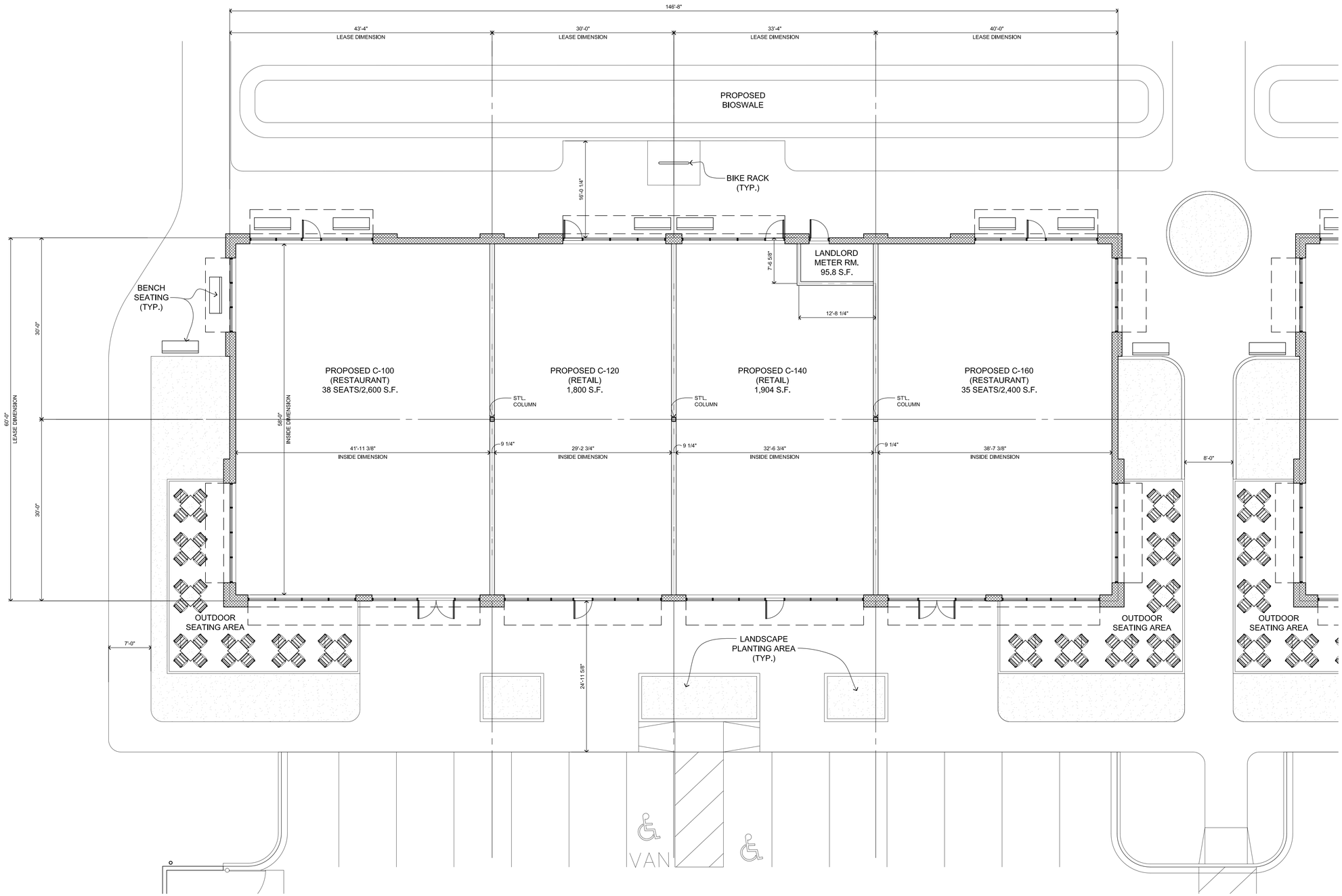
ORIGIN□L ISS□□ D□T□□
S□PT. 9□2016

P□□ □OB NO. 2016□02□

SC□L□□1" □ □0□

DR□WING N□MB□R□
T□1.0

NOTE :
THIS DRAWING IS TO BE USED FOR LEASING PURPOSES ONLY, REFER TO CONSTRUCTION PLANS AND FIELD VERIFICATION TO CONFIRM ACTUAL DIMENSIONS AND LOCATIONS FOR DOORWAYS, MASONRY OPENINGS, COLUMNS, WALLS, MECHANICAL & ELECTRICAL METERS, AND TRASH ENCLOSURES.



Floor Plan - Retail C

8,800 S.F.

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

REVISED: 15 SEPT. 16
REVISED: 21 SEPT. 16
SUBMITTED FOR SITE
PLAN REVIEW: 23 SEPT. 16
SUBMITTED FOR SITE PLAN
REVIEW: 25 OCT. 16

project:

Proposed Retail C

Troy Market Place

SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK CRANE
ARCHITECT
No. 54160
LICENSED ARCHITECT

drawing:

Conceptual
Floor Plan

DO NOT SCALE DRAWING

issue date: 07 SEPT. 16
drawn: KL
checked: MD
approved: MD

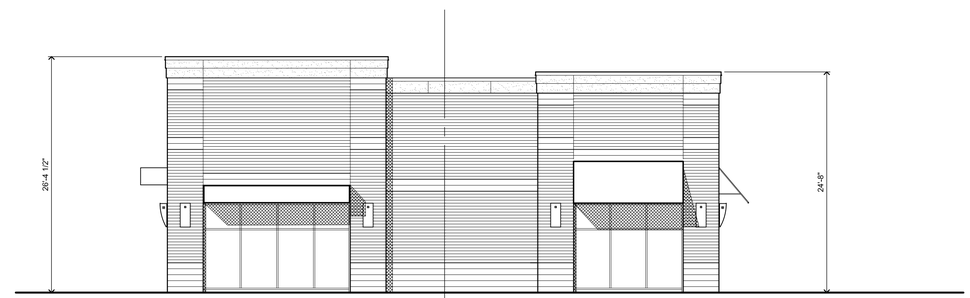
file number: 16036

sheet:

A-1

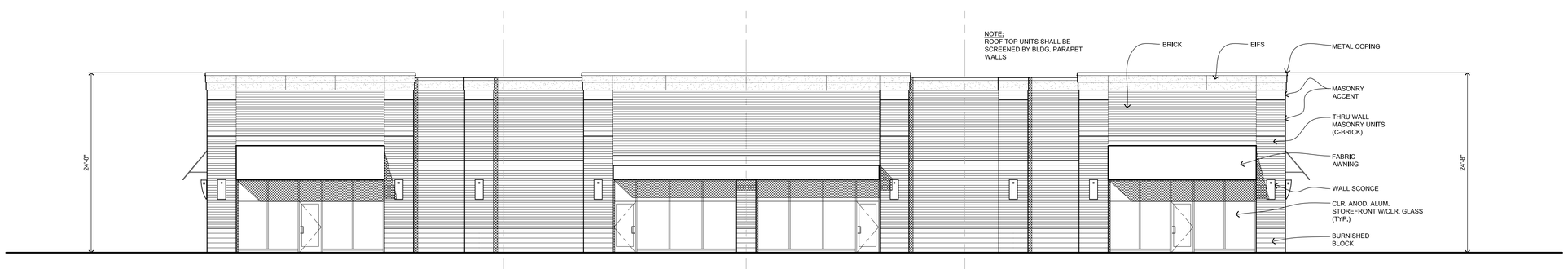
West Elevation

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



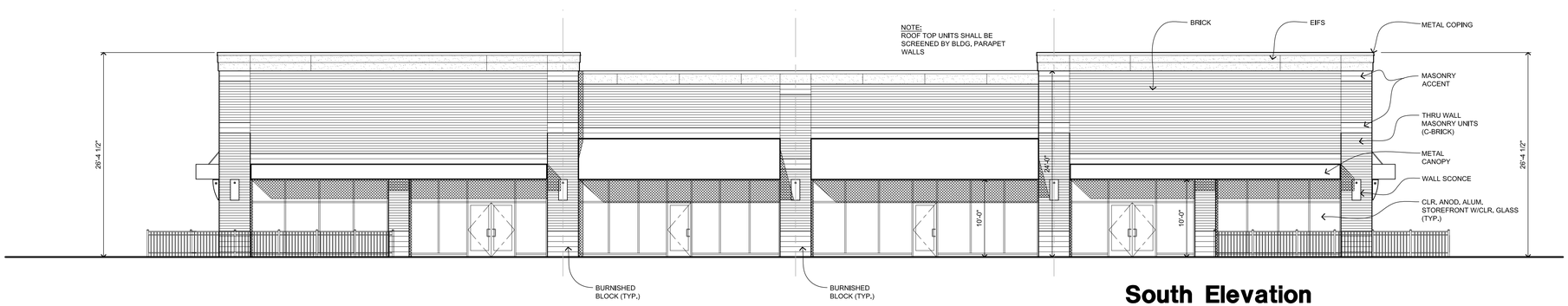
East Elevation

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



North Elevation

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



South Elevation

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

REVISED: 15 SEPT. 16
SUBMITTED FOR SITE PLAN REVIEW: 23 SEPT. 16
REVISION: 21 OCT. 16
SUBMITTED FOR SITE PLAN REVIEW: 25 OCT. 16

project:

Proposed Retail C

Troy Market Place

SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK CRANE
ARCHITECT
No. 54160
LICENSED ARCHITECT

drawing:

Conceptual Building Elevations

DO NOT SCALE DRAWING

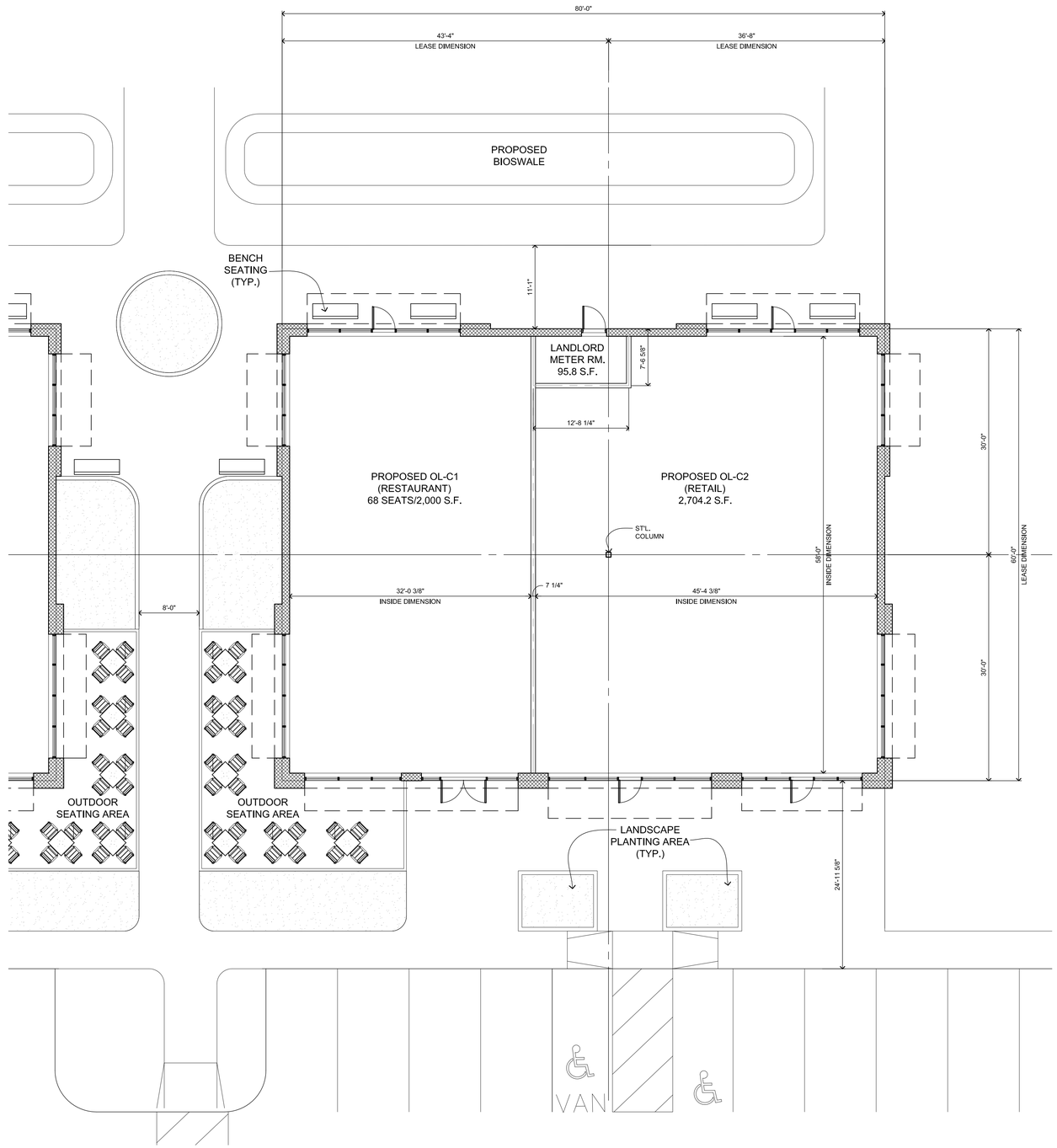
issue date: 07 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

sheet:

A-2

NOTE :
THIS DRAWING IS TO BE USED FOR LEASING PURPOSES ONLY, REFER TO CONSTRUCTION PLANS AND FIELD VERIFICATION TO CONFIRM ACTUAL DIMENSIONS AND LOCATIONS FOR DOORWAYS, MASONRY OPENINGS, COLUMNS, WALLS, MECHANICAL & ELECTRICAL METERS, AND TRASH ENCLOSURES.



Floor Plan - Outparcel C

4,800 S.F. Scale: 1/8"=1'-0"

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

REVISED: 15 SEPT. 16
REVISED: 21 SEPT. 16
SUBMITTED FOR SITE
PLAN REVIEW: 23 SEPT. 16
SUBMITTED FOR SITE PLAN
REVIEW: 25 OCT. 16

project:

Proposed Outparcel C

Troy Market Place

SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK CRANE
ARCHITECT
No. 54160
LICENSED ARCHITECT

drawing:

Conceptual
Floor Plan

DO NOT SCALE DRAWING

issue date: 09 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

sheet:

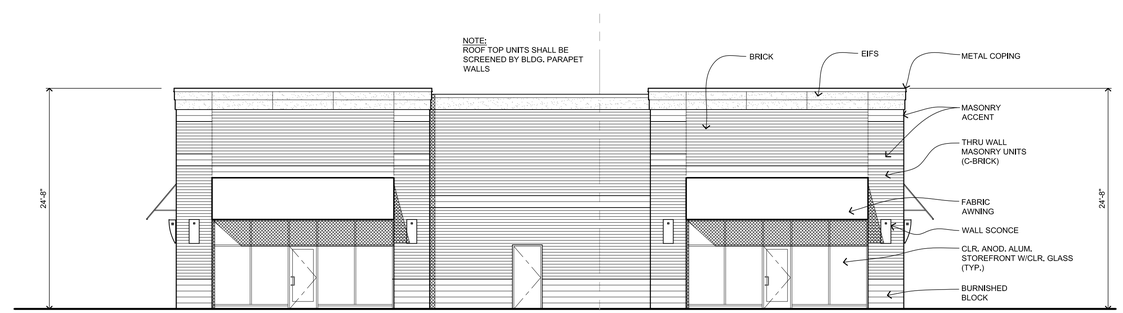
A-3

West Elevation

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

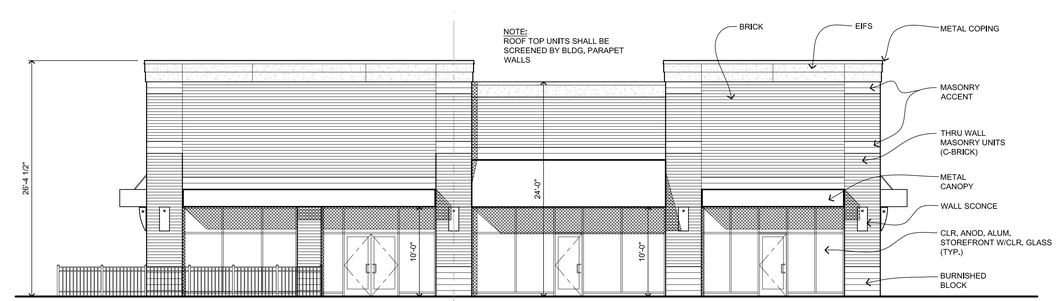
East Elevation

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



North Elevation

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



South Elevation

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

REVISED: 15 SEPT. 16
SUBMITTED FOR SITE
PLAN REVIEW: 23 SEPT. 16
REVISION: 21 OCT. 16
SUBMITTED FOR SITE PLAN
REVIEW: 25 SEPT. 16

project:

Proposed Outparcel C

Troy Market Place

SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK DRANE
ARCHITECT
No. 34160
LICENSED ARCHITECT

drawing:

Conceptual Building Elevations

DO NOT SCALE DRAWING

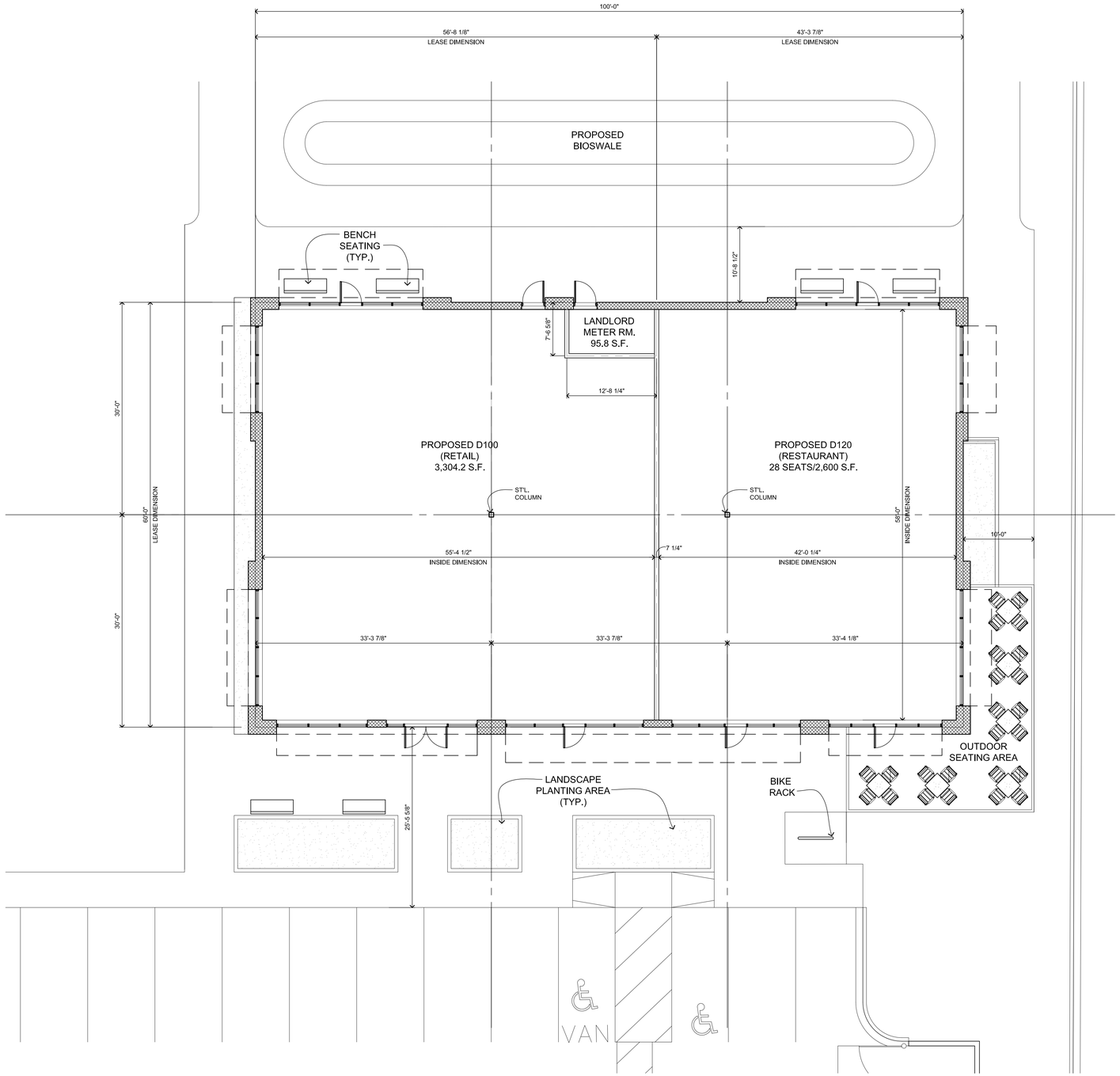
issue date: 07 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

sheet:

A-4

NOTE :
THIS DRAWING IS TO BE USED FOR LEASING PURPOSES ONLY, REFER TO CONSTRUCTION PLANS AND FIELD VERIFICATION TO CONFIRM ACTUAL DIMENSIONS AND LOCATIONS FOR DOORWAYS, MASONRY OPENINGS, COLUMNS, WALLS, MECHANICAL & ELECTRICAL METERS, AND TRASH ENCLOSURES.



Floor Plan - Retail D

6,000 S.F. Scale: 1/8"=1'-0"

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:
REVISED: 15 SEPT. 16
REVISED: 21 SEPT. 16
SUBMITTED FOR SITE
PLAN REVIEW: 23 SEPT. 16
SUBMITTED FOR SITE PLAN
REVIEW: 25 OCT. 16

project:

Proposed Retail D
Troy Market Place
SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK DRANE
ARCHITECT
No. 34160
LICENSED ARCHITECT

drawing:

Conceptual
Floor Plan

DO NOT SCALE DRAWING

issue date: 12 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

sheet:

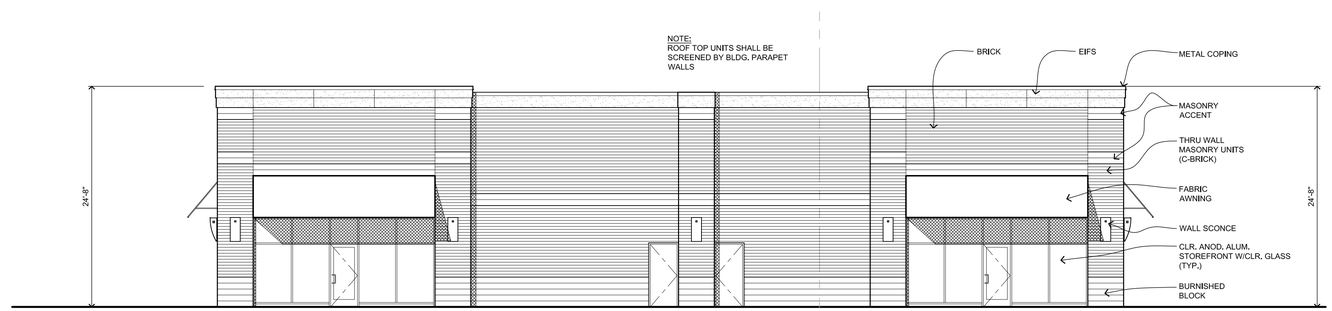
A-5

West Elevation

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

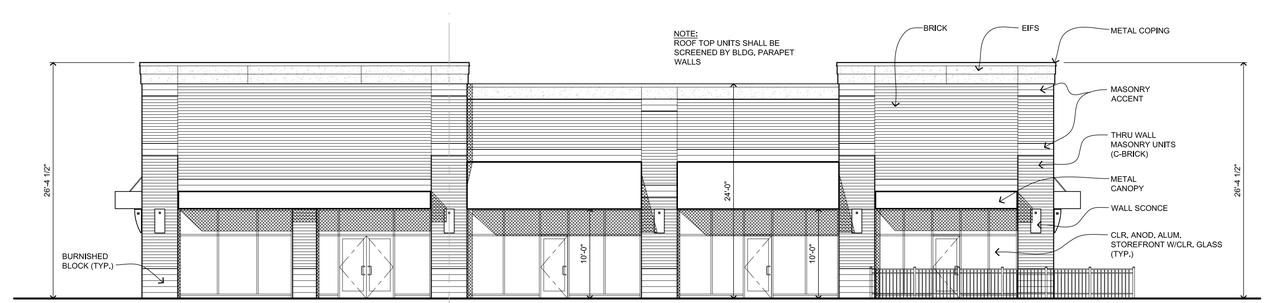
East Elevation

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



North Elevation

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



South Elevation

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

REVISED: 15 SEPT. 16
SUBMITTED FOR SITE PLAN REVIEW: 23 SEPT. 16
REVISION: 21 OCT. 16
SUBMITTED FOR SITE PLAN REVIEW: 25 OCT. 16

project:

Proposed Retail D

Troy Market Place

SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK DRANE
ARCHITECT
No. 34160
LICENSED ARCHITECT

drawing:

Conceptual Building Elevations

DO NOT SCALE DRAWING

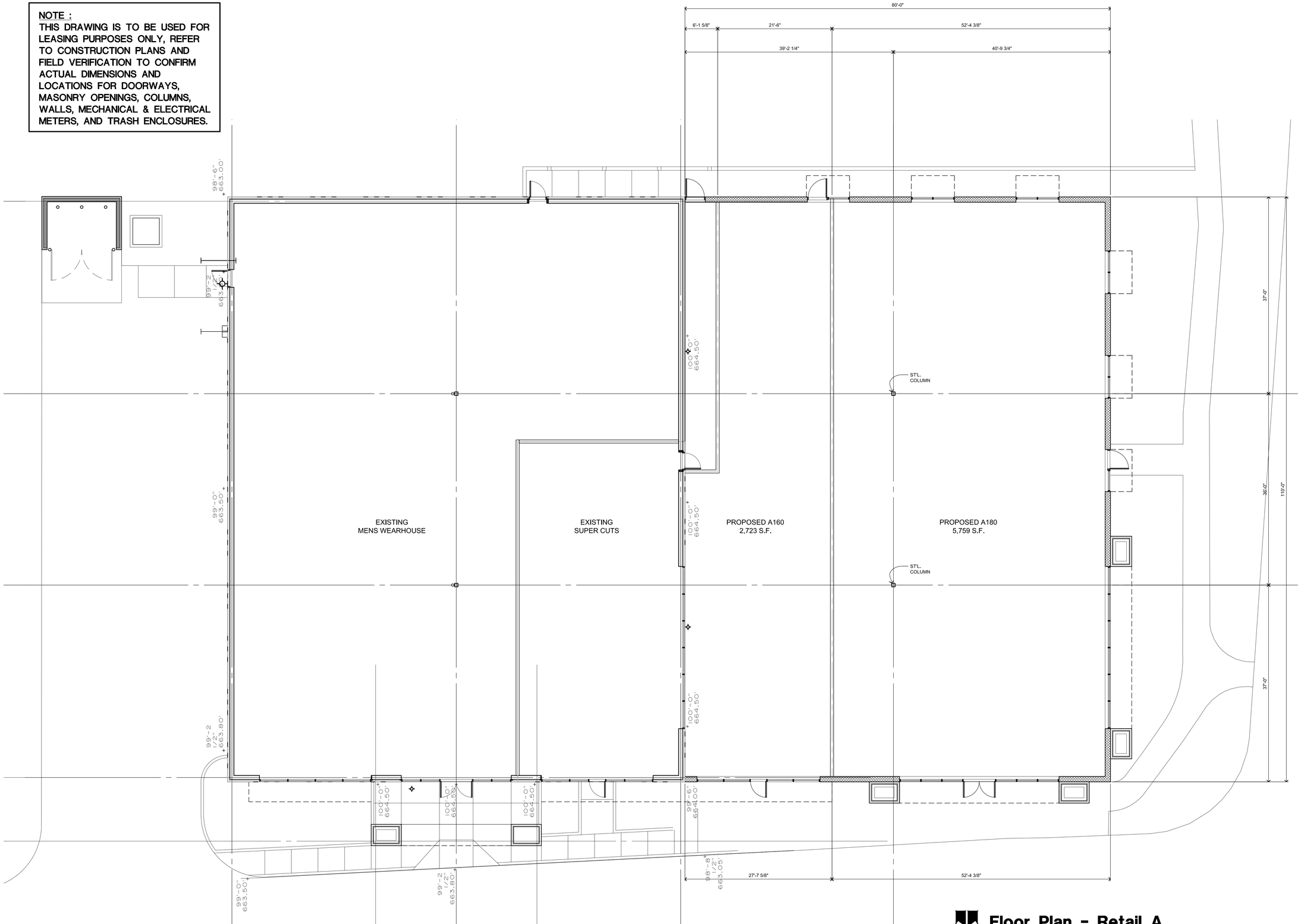
issue date: 12 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

sheet:

A-6

NOTE :
THIS DRAWING IS TO BE USED FOR LEASING PURPOSES ONLY, REFER TO CONSTRUCTION PLANS AND FIELD VERIFICATION TO CONFIRM ACTUAL DIMENSIONS AND LOCATIONS FOR DOORWAYS, MASONRY OPENINGS, COLUMNS, WALLS, MECHANICAL & ELECTRICAL METERS, AND TRASH ENCLOSURES.



Floor Plan - Retail A

8,800 S.F. Scale: 1/8"=1'-0"

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:
REVISED: 21 SEPT. 16
SUBMITTED FOR SITE
PLAN REVIEW: 23 SEPT. 16
REVISED: 21 OCT. 16
SUBMITTED FOR SITE PLAN
REVIEW: 25 OCT. 16

project:

Proposed Retail A
Troy Market Place
SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK CRANE
ARCHITECT
No. 34160
LICENSED ARCHITECT

drawing:

Conceptual
Floor Plan

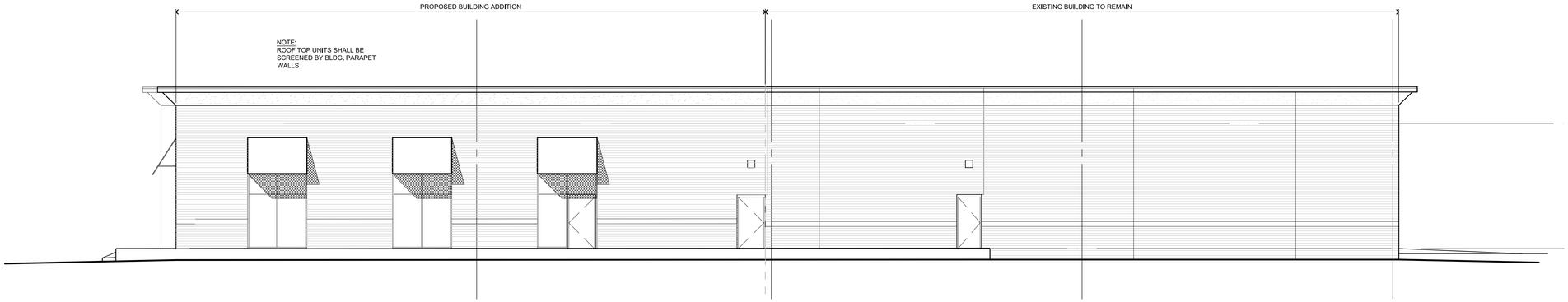
DO NOT SCALE DRAWING

issue date: 07 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

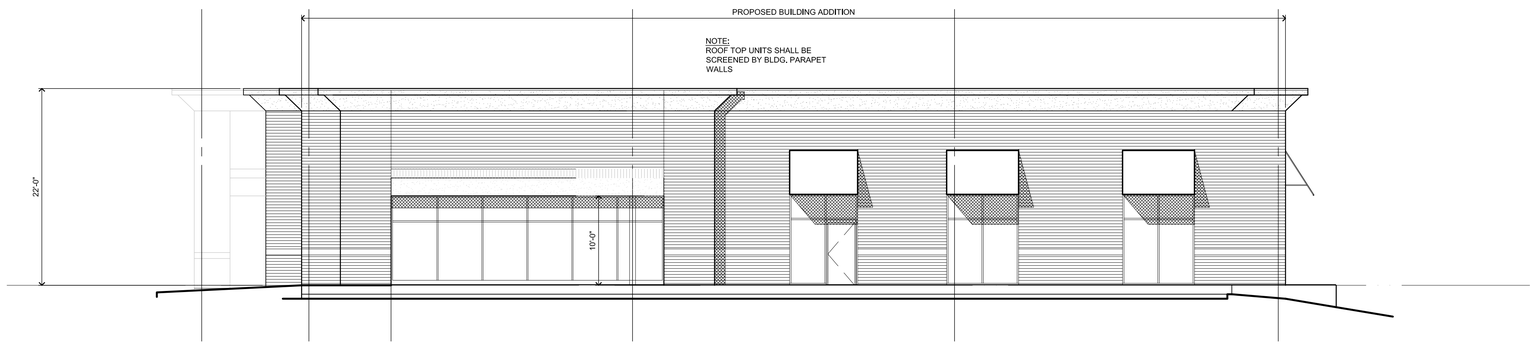
sheet:

A-7



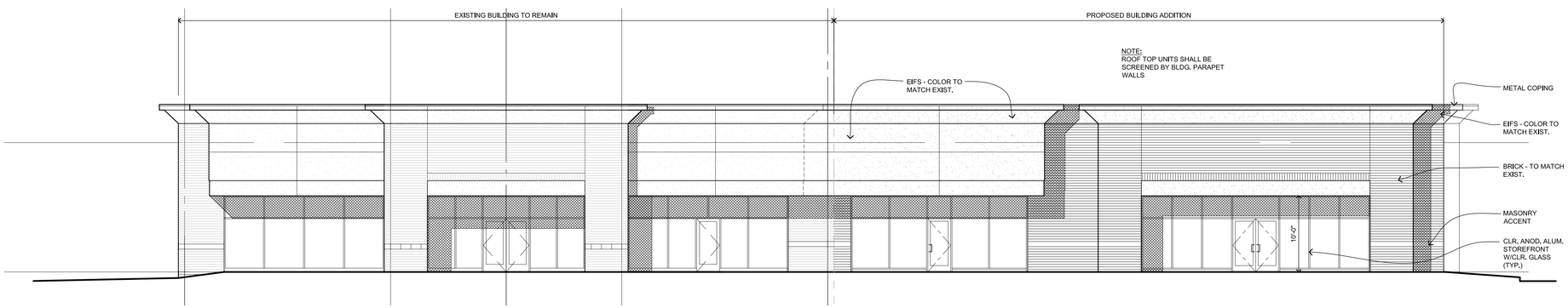
East Elevation

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



South Elevation

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



West Elevation

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

REVISED: 22 SEPT. 16
SUBMITTED FOR SITE
PLAN REVIEW: 23 SEPT. 16
REVISED: 21 OCT. 16
SUBMITTED FOR SITE PLAN
REVIEW: 25 OCT. 16

project:

Proposed Retail A
Troy Market Place
SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK CRANE
ARCHITECT
No. 34160
LICENSED ARCHITECT

drawing:

Conceptual
Building
Elevations

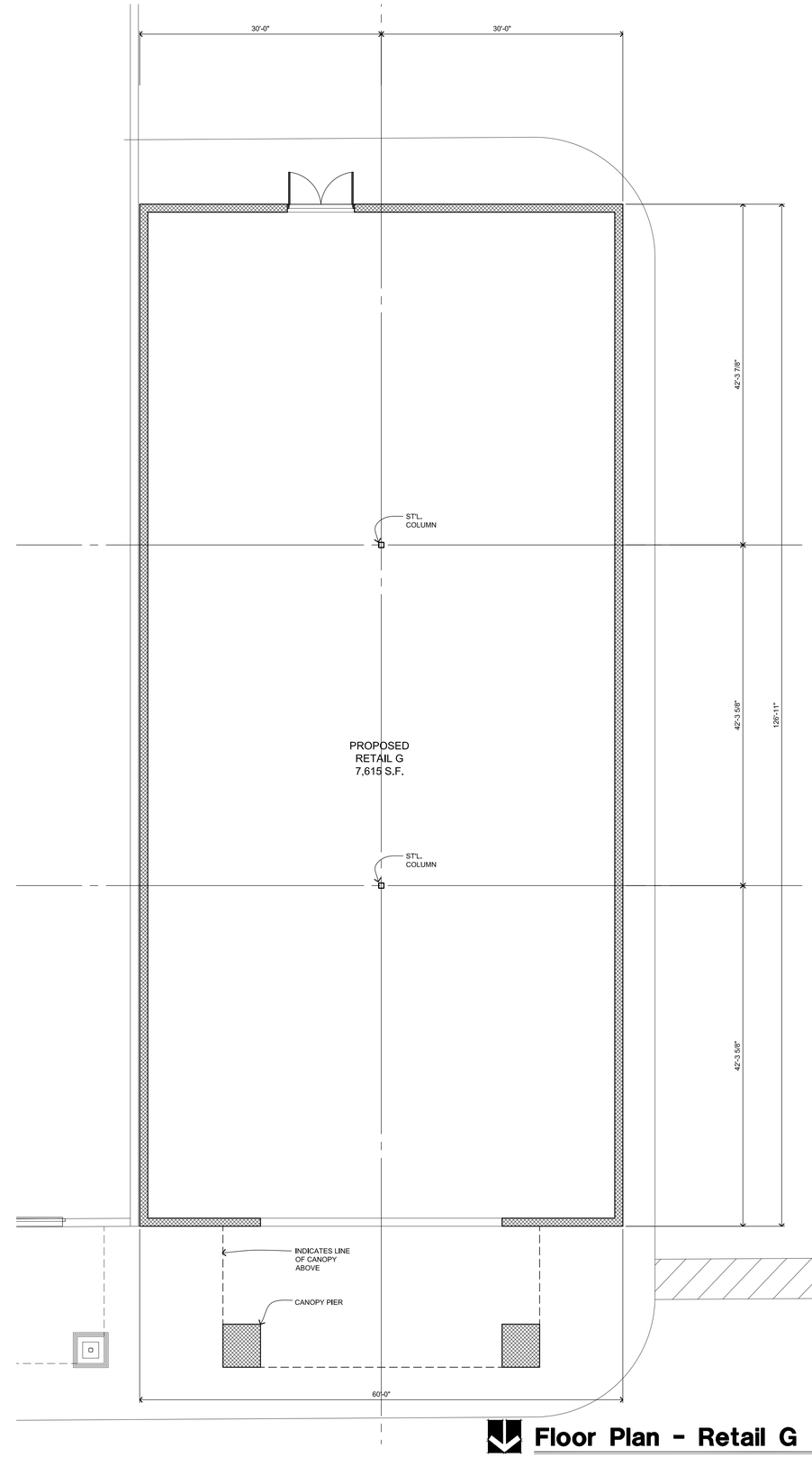
DO NOT SCALE DRAWING

issue date: 13 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

sheet:

A-8



NOTE :
THIS DRAWING IS TO BE USED FOR LEASING PURPOSES ONLY, REFER TO CONSTRUCTION PLANS AND FIELD VERIFICATION TO CONFIRM ACTUAL DIMENSIONS AND LOCATIONS FOR DOORWAYS, MASONRY OPENINGS, COLUMNS, WALLS, MECHANICAL & ELECTRICAL METERS, AND TRASH ENCLOSURES.

Floor Plan - Retail G

7,615 S.F.

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

SUBMITTED FOR SITE
PLAN REVIEW: 23 SEPT. 16
SUBMITTED FOR SITE PLAN
REVIEW: 25 OCT. 16

project:

Proposed Retail G

Troy Market Place

SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK DRANE
ARCHITECT
No. 34160
LICENSED ARCHITECT

drawing:

Conceptual
Floor Plan

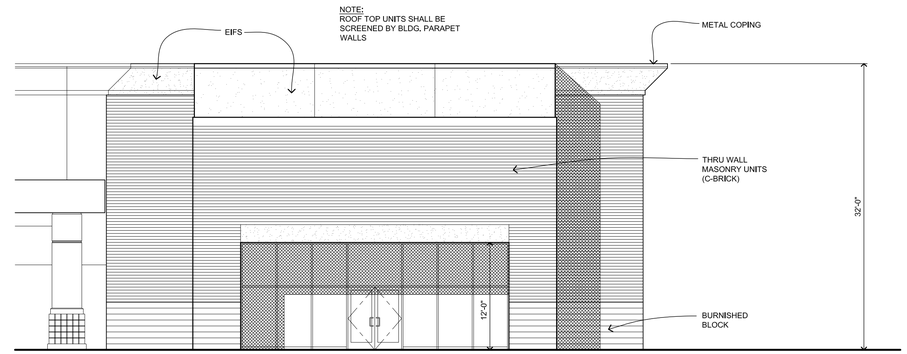
DO NOT SCALE DRAWING

issue date: 13 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

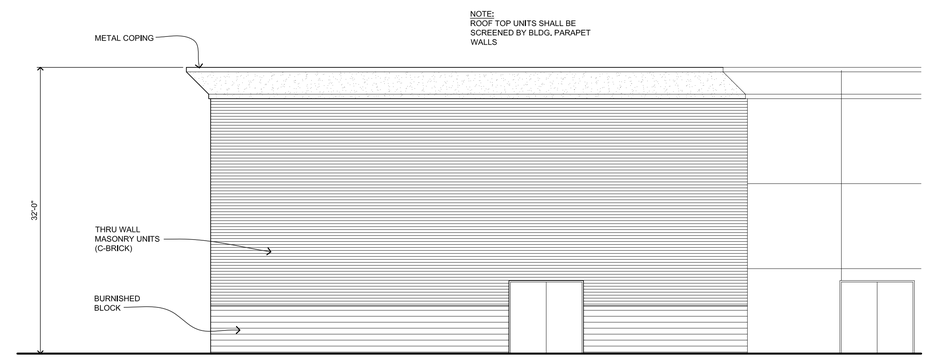
sheet:

A-9



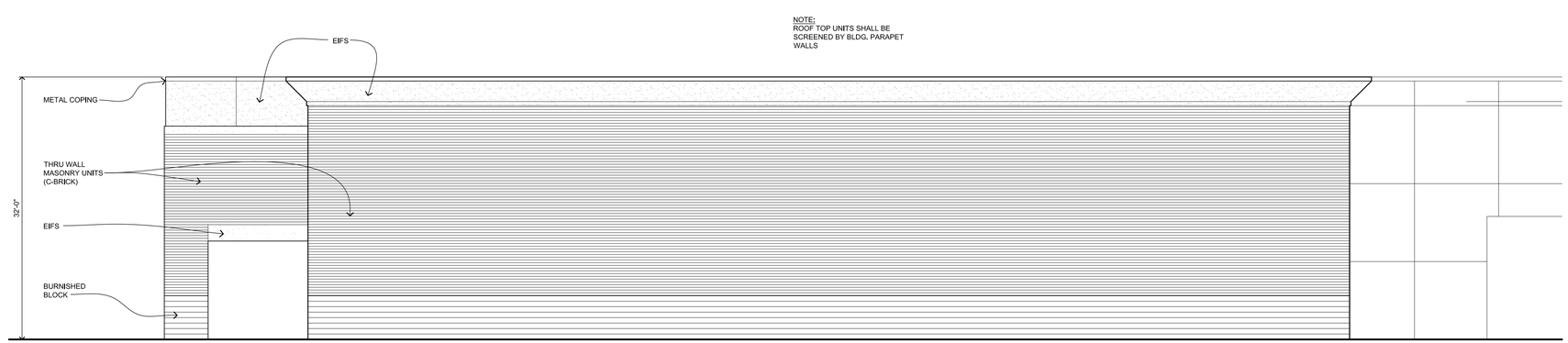
North Elevation

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



South Elevation

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



West Elevation

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

SUBMITTED FOR SITE
PLAN REVIEW: 23 SEPT. 16
REVISION: 21 OCT. 16
SUBMITTED FOR SITE PLAN
REVIEW: 25 OCT. 16

project:

Proposed Retail G

Troy Market Place

SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK DRANE
ARCHITECT
No. 34160
LICENSED ARCHITECT

drawing:

Conceptual Building Elevations

DO NOT SCALE DRAWING

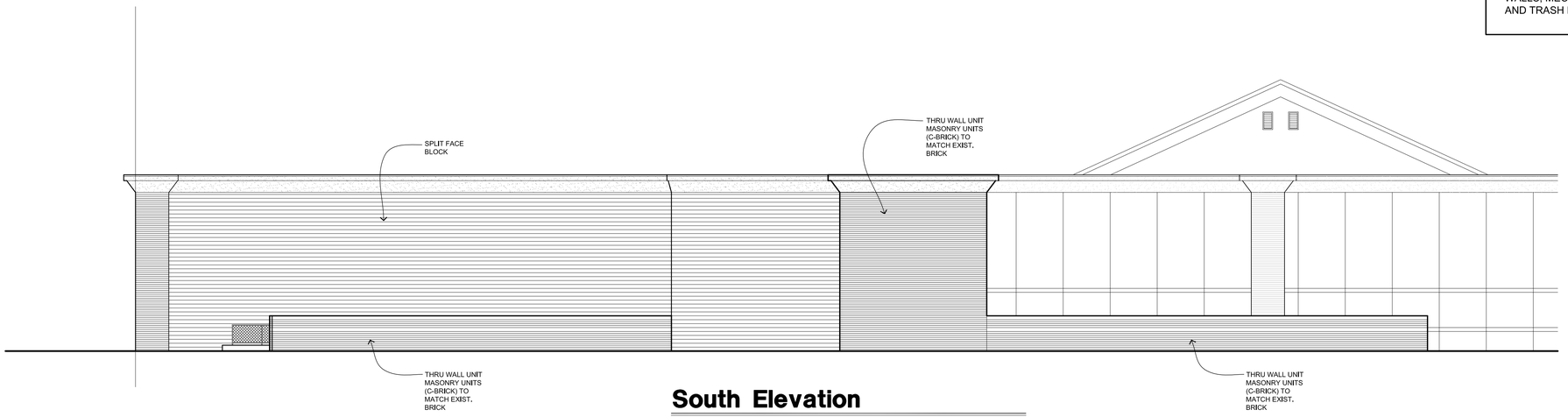
issue date: 12 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

sheet:

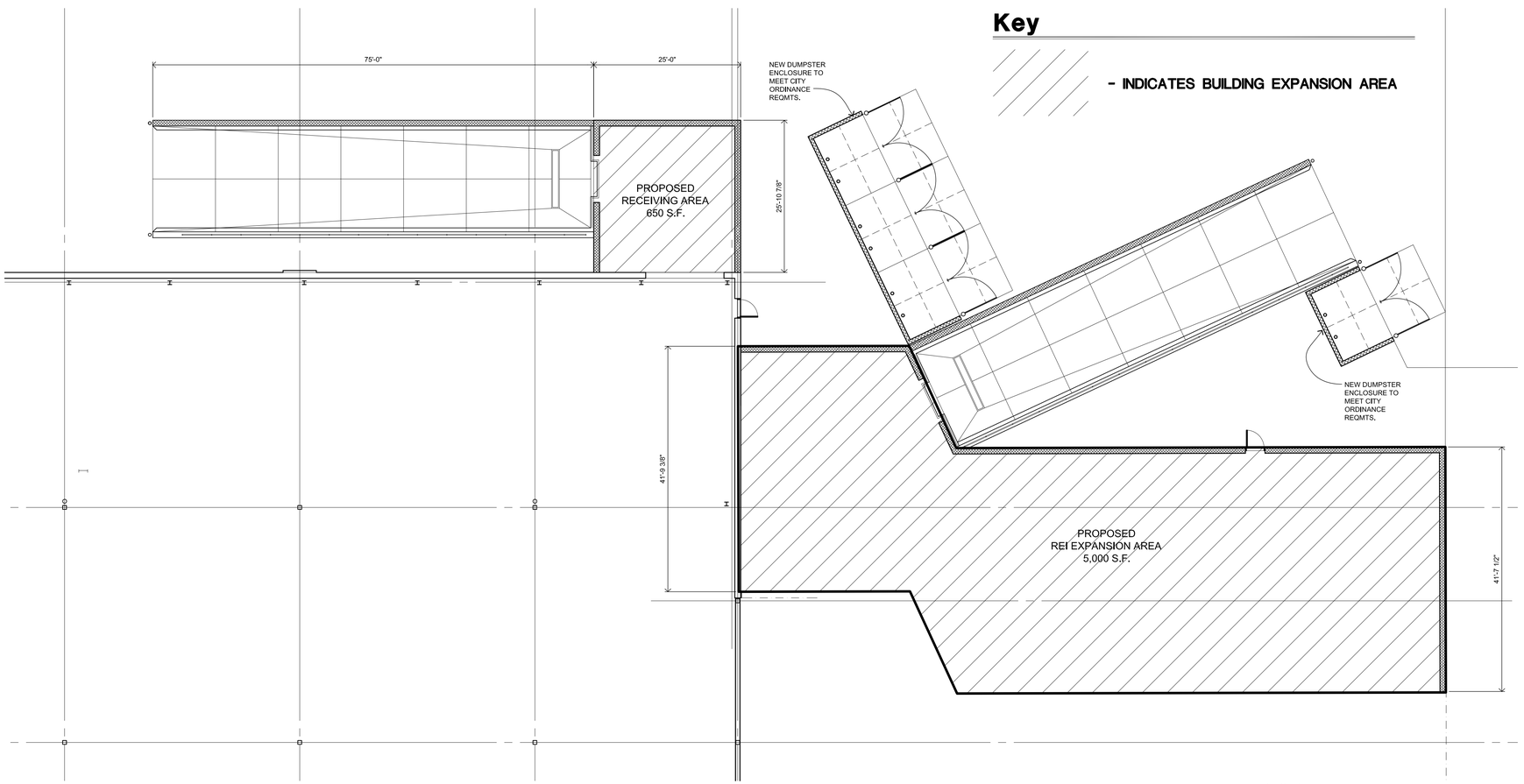
A-10

NOTE :
THIS DRAWING IS TO BE USED FOR LEASING PURPOSES ONLY, REFER TO CONSTRUCTION PLANS AND FIELD VERIFICATION TO CONFIRM ACTUAL DIMENSIONS AND LOCATIONS FOR DOORWAYS, MASONRY OPENINGS, COLUMNS, WALLS, MECHANICAL & ELECTRICAL METERS, AND TRASH ENCLOSURES.



South Elevation

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



Key

- INDICATES BUILDING EXPANSION AREA

Floor Plan - Retail G

7,615 S.F.

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:
SUBMITTED FOR SITE PLAN REVIEW: 23 SEPT. 16
SUBMITTED FOR SITE PLAN REVIEW: 25 OCT. 16

project:

Proposed REI Expansion & Truckwell Relocation
Troy Market Place
SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY ARCHITECTS
32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404
PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK DRANE
ARCHITECT
No. 54160
LICENSED ARCHITECT

drawing:

Conceptual Floor Plan & Building Elevation

DO NOT SCALE DRAWING

issue date: 15 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

sheet:

A-11

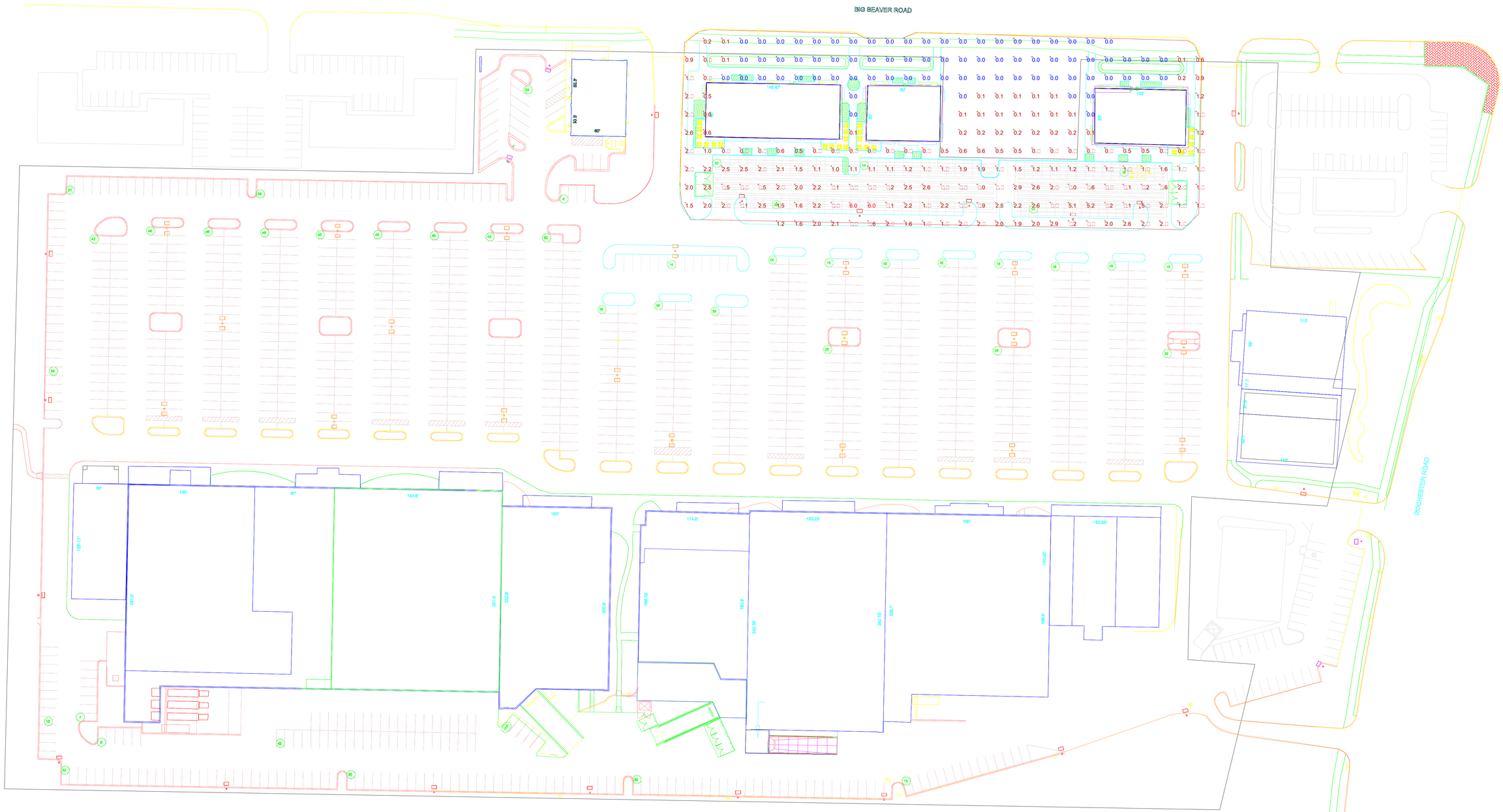
FI□T□R□ NOT□□
Calculations are only for proposed fi□tures. □□isting fi□tures on site are not a part of these calculations.

Schedule

Sym□ol	La□el	□uantity	Manufactur er	Catalog Num□er	Description	Lamp	Num□er Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
	□	20	Cree Inc	OS□ □ □□5M□S 5□K	Cree OS□ Series □rea Luminaire□Type □ Medium□ S Input Power Designator□ 5□00K	Si□teen type MT□G2 5□00K L□Ds	1	OS□ □ □□ 5M□S 5□K□PL0□50 2□001.ies	206□□	0.96	□□□9
	B	19	Cree Inc	OS□ □ □□□M□S 5□K CONFIG□R□D FROM OS□ □ □□ □M□S □DK	CONFIG□R□D FROM Cree OS□ Series □rea Luminaire□ Type III Medium□S Input Power Designator□□000K	CONFIG□R□D FROM Si□teen type MD□ □000K L□Ds	1	OS□ □ □□ □M□S 5□K□CONFIG □R□D.ies	229□2□□9	0.96	22□
	C	0	Cree Inc	OS□ □ □□□M□S 5□K CONFIG□R□D FROM OS□ □ □□ □M□S □DK	CONFIG□R□D FROM Cree OS□ Series □rea Luminaire□ Type I□ Medium□S Input Power Designator□□000K	CONFIG□R□D FROM Si□teen type MD□ □000K L□Ds	1	OS□ □ □□ □M□S 5□K□CONFIG □R□D.ies	22□06	0.96	□□6
	D	□	Cree Inc	OS□ □ □□□M□S 5□K CONFIG□R□D FROM OS□ □ □□ □M□S □DK	CONFIG□R□D FROM Cree OS□ Series □rea Luminaire□ Type I□ Medium□S Input Power Designator□□000K	CONFIG□R□D FROM Si□teen type MD□ □000K L□Ds	1	OS□ □ □□ □M□S 5□K□CONFIG □R□D.ies	22□06	0.96	22□

Statistics

Description	Sym□ol	□□g	Ma□	Min	Ma□/Min	□□g/Min
New Proposed Parking	+	1.□fc	6.0 fc	0.0 fc	N/□	N/□



Plan □iew
Scale: 1" = 50'

Troy MarketPlace
Ramco Gershen Properties Trust
16 Mile/Rochester Road
Cree Calculations Shown at 50K Burn Hours

Designer

Date
9/21/2016
Scale
Not to Scale
Drawing No.

Summary

OSQ Series

OSQ™ LED Area/Flood Luminaire – Large

Troy Marketplace Add Type "B"

Product Description

The OSQ™ Area/Flood luminaire blends extreme optical control, advanced thermal management and modern, clean aesthetics. Built to last, the housing is rugged cast aluminum with an integral, weathertight LED driver compartment. Versatile mounting configurations offer simple installation. Its slim, low-profile design minimizes wind load requirements and blends seamlessly into the site providing even, quality illumination. 'S' and 'T' Input power designators are a suitable upgrade for HID applications up to 750 Watts. 'U' Input power designator is a suitable upgrade for HID applications up to 1000 Watts.

Applications: Parking lots, walkways, campuses, auto dealerships, office complexes, and internal roadways

Performance Summary

NanoOptic® Precision Delivery Grid™ optic

Made in the U.S.A. of U.S. and imported parts

Initial Delivered Lumens: Up to 28,285

Efficacy: Up to 135 LPW

CRI: Minimum 70 CRI (4000K & 5700K; 3000K asymmetric optics); 80 CRI (3000K symmetric optics)

CCT: 3000K (+/- 300K), 4000K (+/- 300K), 5700K (+/- 500K)

Limited Warranty[1]: 10 years on luminaire/10 years on Colorfast DeltaGuard® finish

[1] See http://lighting.cree.com/warranty for warranty terms

Accessories

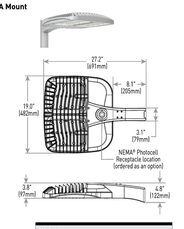
Field-Installed	
Backlight Shield OSQ-BLSLF – Front facing optics OSQ-BLSLR – Rotated optics	**Hand-Held Remote** XA-SENSREM – For successful implementation of the programmable multi-level option, a minimum of one hand-held remote is required

Ordering Information

Fully assembled luminaire is composed of two components that must be ordered separately:
Example: **Mount:** OSQ-AA5V + **Luminaire:** OSQ-A-NM-2ME-5-40K-UL-5V

Mount (Luminaire must be ordered separately)		
OSQ-		
OSQ-AA Adjustable Arm **OSQ-DA** Direct Arm	**Color Options:** **SV** Silver **BK** Black	**BZ** Bronze **WH** White

DA Mount



Weight
28.5 lbs. (13kg)

Mounted on 27' Straight Square Steel Pole to Match Existing Site - 3' Base (30' Max Height)

Luminaire (Mount must be ordered separately)								
OSQ	**A**	**NM**						
Product	**Version**	**Mounting**	**Optic**	**Input Power Designator**	**CCT**	**Voltage**	**Color Options**	**Options**
OSQ	**A**	**NM** No Mount	**Asymmetric** **2ME*** Type II Medium **3ME*** Type III Medium **4ME*** Type III Medium **Symmetric** **5ME** Type V Medium **5SH** Type V Short **WSN** Wide Sign **15D** 15° Flood **25D** 25° Flood **40D** 40° Flood **60D** 60° Flood	**S** 223W **U** 215W **T** 177W **U** 215W	**30K** 3000K **40K** 4000K **57K** 5700K	**UL** Universal 120-277V **UN** Universal 347-480V **5V** 5V	**BK** Black **BZ** Bronze **SV** Silver **WH** White	**DIM 0-10V Dimming** - Control by others - Refer to Dimming spec sheet for details - Can't exceed wattage of specified input power designator **F Fuse** - When code dictates fusing, use time delay fuse **ML Multi-Level** - Refer to ML spec sheet for details - High: 100%, Low: 30% - Available with UL voltage only - Intended for downlight applications at 0° tilt **PML Programmable Multi-Level, 20-40' Mounting Height** - Refer to PML spec sheet for details - Available with UL voltage only - Intended for downlight applications at 0° tilt **PML2 Programmable Multi-Level, 10-30' Mounting Height** - Refer to PML spec sheet for details - Available with UL voltage only - Intended for downlight applications at 0° tilt **Q9 Field Adjustable Output** - Refer to Field Adjustable Output spec sheet for details **R NEMA® Photocell Receptacle** - Intended for downlight applications with maximum 45° tilt - 3-pin receptacle per ANSI C136.10 - Photocell and shorting cap by others **RL Rotate Left** - LED and optic are rotated to the left **RR Rotate Right** - LED and optic are rotated to the right

* Available with Backlight Shield when ordered with field-installed accessory (see table above)

Rev. Date: V8 05/23/2016

Product Specifications

CONSTRUCTION & MATERIALS

- Slim, low profile design minimizes wind load requirements
- Luminaire housing is rugged die cast aluminum with an integral, weathertight LED driver compartment and high performance heat sink
- Convenient interlocking mounting method on direct arm mount. Mounting adaptor is rugged die cast aluminum and mounts to 3-6" (76-152mm) square or round pole, secured by two 5/16-18 UNC bolts spaced on 2" (51mm) centers
- Mounting for the adjustable arm mount adaptor is rugged die cast aluminum and mounts to 2" (51mm) IP, 2.375" (60mm) O.D. tenon
- Adjustable arm mount can be adjusted 180° in 2.5° increments
- Designed for uplight and downlight applications
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Silver, bronze, black, and white are available
- **Weight:** 28.5 lbs. (13kg)

ELECTRICAL SYSTEM

- **Input Voltage:** 120-277V or 347-480V, 50/60Hz, Class 1 drivers
- **Power Factor:** > 0.9 at full load
- **Total Harmonic Distortion:** < 20% at full load
- Integral 10kV surge suppression protection standard
- To address inrush current, slow blow fuse or type C/D breaker should be used
- **10V Source Current:** 0.15mA

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Enclosure rated IP66 per IEC 60529 when ordered without R option
- Consult factory for CE Certified products
- Certified to ANSI C136.31-2001, 3G bridge and overpass vibration standards
- 10kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2
- Meets FCC Part 15, Subpart B, Class A standards for conducted and radiated emissions
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- Meets Buy American requirements within ARRA
- DLC qualified when ordered with asymmetric optics, S input power designator and 40K or 57K. Please refer to www.designlights.org/QPL for most current information
- RoHS compliant. Consult factory for additional details

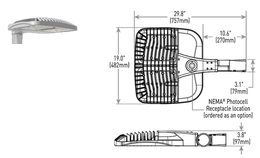
Electrical Data*							
Input Power Designator	Optic	System Watts 120-480V	Total Current				
			120V	208V	240V	277V	347V	480V
S	Asymmetric	223	1.94	1.13	0.99	0.85	0.65	0.47
T	Symmetric	171	1.45	0.85	0.74	0.64	0.50	0.36
U	All	215	1.83	1.08	0.93	0.81	0.62	0.45

* Electrical data at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%.

Recommended OSQ Series Lumen Maintenance Factors (LMF)[1]						
Ambient	Optic	Initial LMF	25K hr Projected[2] LMF	50K hr Projected[2] LMF	75K hr Projected[2] LMF	100K hr Calculated[3] LMF
5°C (41°F)	Asymmetric	1.04	0.99	0.93	0.89	0.84
	Symmetric	1.05	1.00	0.96[3]	0.92[3]	0.88[3]
10°C (50°F)	Asymmetric	1.03	0.98	0.92	0.88	0.83
	Symmetric	1.04	0.99	0.95[3]	0.91[3]	0.87[3]
15°C (59°F)	Asymmetric	1.02	0.97	0.92	0.87	0.82
	Symmetric	1.02	0.98	0.94[3]	0.90[3]	0.87[3]
20°C (68°F)	Asymmetric	1.01	0.96	0.91	0.86	0.82
	Symmetric	1.01	0.96	0.92[3]	0.88[3]	0.85[3]
25°C (77°F)	Asymmetric	1.00	0.95	0.90	0.85	0.81
	Symmetric	1.00	0.95	0.91[3]	0.88[3]	0.84[3]

[1] Lumen maintenance values at 25°C (77°F) are calculated per TM-21 based on LM-80 data and in-situ luminaire testing
[2] In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on time durations that are within six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip
[3] In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip

AA Mount

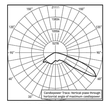


Weight
28.5 lbs. (13kg)

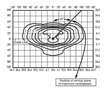
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: http://lighting.cree.com/products/outdoor/area/osq-series

2ME



CESTL Test Report #: PL07751-001A
OSQ-A-**-2ME-U-40K-UL
Initial Delivered Lumens: 26,966

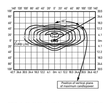


OSQ-A-**-2ME-U-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 27,706
Initial FC at grade

Type II Medium Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11
S	18,182	B3 U0 G2	21,696	B3 U0 G3	23,179	B3 U0 G3
U	26,258	B3 U0 G3	27,706	B3 U0 G3	28,285	B3 U0 G3

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingAddendum.pdf. Valid with no tilt

CESTL Test Report #: PL07750-001A
OSQ-A-**-2ME-U-57K-UL w/OSQ-BLSLF
Initial Delivered Lumens: 22,822



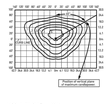
OSQ-A-**-2ME-U-40K-UL w/OSQ-BLSLF
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 21,984
Initial FC at grade

Type II Medium w/BLS Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11
S	15,584	B2 U0 G2	18,597	B3 U0 G2	19,867	B3 U0 G2
U	20,835	B3 U0 G3	21,984	B3 U0 G3	22,444	B3 U0 G3

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingAddendum.pdf. Valid with no tilt

3ME

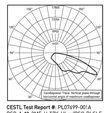
CESTL Test Report #: PL07698-001A
OSQ-A-**-3ME-U-40K-UL
Initial Delivered Lumens: 27,305



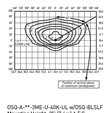
OSQ-A-**-3ME-U-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 27,706
Initial FC at grade

Type III Medium Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11
S	17,996	B3 U0 G3	21,475	B3 U0 G3	22,942	B3 U0 G3
U	26,258	B3 U0 G3	27,706	B3 U0 G3	28,285	B3 U0 G4

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingAddendum.pdf. Valid with no tilt



CESTL Test Report #: PL07699-001A
OSQ-A-**-3ME-U-57K-UL w/OSQ-BLSLF
Initial Delivered Lumens: 23,601



OSQ-A-**-3ME-U-40K-UL w/OSQ-BLSLF
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 22,587
Initial FC at grade

Type III Medium w/BLS Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11
S	15,299	B2 U0 G3	18,375	B2 U0 G3	19,631	B2 U0 G3
U	21,406	B2 U0 G3	22,587	B3 U0 G3	23,059	B3 U0 G3

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingAddendum.pdf. Valid with no tilt

Luminaire EPA

Fixed Arm Mount – OSQ-DA Weight: 28.5 lbs. (13kg)					
Single	2 @ 180°	2 @ 90°	3 @ 90°	3 @ 120°	4 @ 90°
0.80	1.61	1.26	2.06	1.68	2.52

Adjustable Arm Mount – OSQ-AA Weight: 28.5 lbs. (13kg)							
Single	2 @ 180°	2 @ 90°	3 @ 90°	3 @ 120°	3 @ 180°	4 @ 180°	4 @ 90°
Tenon Configuration (0°-80° Tilt); If used with Cree tenons, please add tenon EPA with Luminaire EPA							
PB-1A*, PT-1, PW-1A3**	PB-3A*, PB-2R2.375; PD-2AA(180); PT-2(180), PW-2A3**	PB-2A*, PD-2AA(90); PT-2(90)	PB-3A*, PD-3AA(90); PT-3(90)	PB-3A*, PT-3(120)	PB-3A*, PB-3R2.375	PB-4A*(180)	PB-4A*(90); PB-4R2.375; PD-4AA(90); PT-4(90)
0° Tilt							
0.80	1.61	1.26	2.06	1.68	3.33	4.66	2.52
10° Tilt							
0.81	1.61	1.62	2.42	2.32	4.40	6.08	3.24
20° Tilt							
1.24	1.61	2.04	2.84	3.13	5.68	7.80	4.08
30° Tilt							
1.44	1.64	2.44	3.24	3.97	6.88	9.40	4.88
45° Tilt							
2.20	2.20	3.00	3.80	5.07	8.55	11.64	6.00
60° Tilt							
2.63	2.63	3.43	4.23	5.73	9.84	13.36	6.86
70° Tilt							
2.82	2.82	3.62	4.42	5.73	10.41	14.12	7.24
80° Tilt							
2.93	2.93	3.73	4.53	5.73	10.74	14.56	7.46
Tenon Configuration (90° Tilt); If used with Cree tenons, please add tenon EPA with Luminaire EPA							
PB-1A*, PT-1, PW-1A3**	PB-3A*, PB-2R2.375; PD-2AA(180); PT-2(180), PW-2A3**	PB-2A*	PB-3A*	PB-3A*, PT-3(120)	PB-3A*, PB-3R2.375	PB-4A*(180)	PB-4A*(90); PB-4R2.375
90° Tilt							
2.95	2.95	4.84	6.52	5.73	10.81	14.64	11.19

* Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6") for single, double or triple luminaire orientation or 4 (4"), 5 (5"), or 6 (6") for quad luminaire orientation
** These EPA values must be multiplied by the following ratio: Fixture Mounting Height/Total Pole Height. Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6")

Tenon EPA

Part Number	EPA
PB-1A*	None
PB-2A*	0.82
PB-3A*	1.52
PB-4A*(180)	2.22
PB-4A*(90)	1.11
PB-2R2.375	0.92
PB-3R2.375	1.62
PB-4R2.375	2.32
PD Series Tenons	0.09
PT Series Tenons	0.13
PW-1A3**	0.47
PW-2A3**	0.94
WM-2	0.08
WM-4	0.25
WM-DM	None

* Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6") for single, double or triple luminaire orientation or 4 (4"), 5 (5"), or 6 (6") for quad luminaire orientation
** These EPA values must be multiplied by the following ratio: Fixture Mounting Height/Total Pole Height. Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6")

Tenons and Brackets[1] (must specify color)

Square Internal Mount Vertical Tenons (Steel)
- Mounts to 3-6" (76-152mm) square aluminum or steel poles

PB-1A* – Single
PB-2A* – 180° Twin
PB-3A* – 180° Triple
PB-4A*(90) – 90° Quad
PB-4A*(180) – 180° Quad

Square Internal Mount Horizontal Tenons (Aluminum)
- Mounts to 4" (102mm) square aluminum or steel poles

PD-2AA(90) – 90° Twin
PD-2AA(180) – 180° Twin
PD-3AA(90) – 90° Triple
PD-4AA(90) – 90° Quad

Wall Mount Brackets
- Mounts to wall or roof

WM-2 – Horizontal for OSQ-AA mount
WM-4 – L-Shape for OSQ-AA mount
WM-DM – Plate for OSQ-DA mount

Round External Mount Vertical Tenons (Steel)
- Mounts to 2.375" (60mm) O.D. round aluminum or steel poles or tenons

PB-2R2.375 – Twin
PB-3R2.375 – Triple
PB-4R2.375 – Quad

Round External Mount Horizontal Tenons (Aluminum)
- Mounts to 2.375" (60mm) O.D. round aluminum or steel poles or tenons
- Mounts to square pole with PB-1A* tenon

PT-1 – Single (Vertical)
PT-2(90) – 90° Twin
PT-2(180) – 180° Twin
PT-3(90) – 90° Triple
PT-4(90) – 90° Quad

Mid-Pole Bracket
- Mounts to square pole

PW-1A3** – Single
PW-2A3** – Double

Ground Mount Post
- For ground mounted flood luminaires

PGM-1 – for OSQ-AA mount

[1] Refer to the Bracket and Tenons spec sheet for more details

Direct Mount Configurations

Compatibility with OSQ-DA Direct Mount Bracket					
Input Power Designator	2 @ 90°	2 @ 180°	3 @ 90°	3 @ 120°	4 @ 90°
3" Square					
S, T, & U	N/A	✓	N/A	N/A	N/A
3" Round					
S, T, & U	N/A	✓	N/A	N/A	N/A
4" Square					
S, T, & U	✓	✓	✓	N/A	✓
4" Round					
S, T, & U	✓	✓	✓	✓	✓
5" Square					
S, T, & U	✓	✓	✓	N/A	✓
5" Round					
S, T, & U	✓	✓	✓	✓	✓
6" Square					
S, T, & U	✓	✓	✓	N/A	✓
6" Round					
S, T, & U	✓	✓	✓	✓	✓

© 2016 Cree, Inc. and/or one of its subsidiaries. All rights reserved. For informational purposes only. Content is subject to change. Patent www.cree.com/patents. Cree®, NanoOptic®, and ColorFast DeltaGuard® are registered trademarks, and the Cree logo, Precision Delivery Grid™ and OSQ™ are trademarks of Cree, Inc. The UL logo is a registered trademark of UL, LLC. NEMA® is a registered trademark of the National Electrical Manufacturers Association. The DLC QPL logo is a registered trademark of Northeast Energy Efficiency Partnerships, Inc.

Troy MarketPlace
Ramco Gershen Properties Trust
16 Mile/Rochester Road
Cree Calculations Shown at 50K Burn Hours

Designer

Date
9/21/2016
Scale
Not to Scale
Drawing No.

Summary

OSQ Series

OSQ™ LED Area/Flood Luminaire – Large

Troy Marketplace Add Type "B"

Product Description

The OSQ™ Area/Flood luminaire blends extreme optical control, advanced thermal management and modern, clean aesthetics. Built to last, the housing is rugged cast aluminum with an integral, weathertight LED driver compartment. Versatile mounting configurations offer simple installation. Its slim, low-profile design minimizes wind load requirements and blends seamlessly into the site providing even, quality illumination. 'S' and 'T' Input power designators are a suitable upgrade for HID applications up to 750 Watts. 'U' Input power designator is a suitable upgrade for HID applications up to 1000 Watts.

Applications: Parking lots, walkways, campuses, auto dealerships, office complexes, and internal roadways

Performance Summary

NanoOptic® Precision Delivery Grid™ optic

Made in the U.S.A. of U.S. and imported parts

Initial Delivered Lumens: Up to 28,285

Efficacy: Up to 135 LPW

CRI: Minimum 70 CRI (4000K & 5700K; 3000K asymmetric optics); 80 CRI (3000K symmetric optics)

CCT: 3000K (+/- 300K), 4000K (+/- 300K), 5700K (+/- 500K)

Limited Warranty[1]: 10 years on luminaire/10 years on Colorfast DeltaGuard® finish

[1] See http://lighting.cree.com/warranty for warranty terms

Accessories

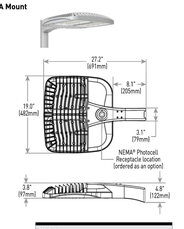
Field-Installed	
Backlight Shield OSQ-BLSLF – Front facing optics OSQ-BLSLR – Rotated optics	**Hand-Held Remote** XA-SENSREM – For successful implementation of the programmable multi-level option, a minimum of one hand-held remote is required

Ordering Information

Fully assembled luminaire is composed of two components that must be ordered separately:
Example: **Mount:** OSQ-AA5V + **Luminaire:** OSQ-A-NM-2ME-5-40K-UL-5V

Mount (Luminaire must be ordered separately)		
OSQ-		
OSQ-AA Adjustable Arm **OSQ-DA** Direct Arm	**Color Options:** **SV** Silver **BK** Black	**BZ** Bronze **WH** White

DA Mount



Weight
28.5 lbs. (13kg)

Mounted on 27' Straight Square Steel Pole to Match Existing Site - 3' Base (30' Max Height)

Luminaire (Mount must be ordered separately)								
OSQ	**A**	**NM**						
Product	**Version**	**Mounting**	**Optic**	**Input Power Designator**	**CCT**	**Voltage**	**Color Options**	**Options**
OSQ	**A**	**NM** No Mount	**Asymmetric** **2ME*** Type II Medium **3ME*** Type III Medium **4ME*** Type III Medium **Symmetric** **5ME** Type V Medium **5SH** Type V Short **WSN** Wide Sign **15D** 15° Flood **25D** 25° Flood **40D** 40° Flood **60D** 60° Flood	**S** 223W **U** 215W **T** 177W **U** 215W	**30K** 3000K **40K** 4000K **57K** 5700K	**UL** Universal 120-277V **UN** Universal 347-480V **5V** 5V	**BK** Black **BZ** Bronze **SV** Silver **WH** White	**DIM 0-10V Dimming** - Control by others - Refer to Dimming spec sheet for details - Can't exceed wattage of specified input power designator **F Fuse** - When code dictates fusing, use time delay fuse **ML Multi-Level** - Refer to ML spec sheet for details - High: 100%, Low: 30% - Available with UL voltage only - Intended for downlight applications at 0° tilt **PML Programmable Multi-Level, 20-40' Mounting Height** - Refer to PML spec sheet for details - Available with UL voltage only - Intended for downlight applications at 0° tilt **PML2 Programmable Multi-Level, 10-30' Mounting Height** - Refer to PML spec sheet for details - Available with UL voltage only - Intended for downlight applications at 0° tilt **Q9 Field Adjustable Output** - Refer to Field Adjustable Output spec sheet for details **R NEMA® Photocell Receptacle** - Intended for downlight applications with maximum 45° tilt - 3-pin receptacle per ANSI C136.10 - Photocell and shorting cap by others **RL Rotate Left** - LED and optic are rotated to the left **RR Rotate Right** - LED and optic are rotated to the right

* Available with Backlight Shield when ordered with field-installed accessory (see table above)

Rev. Date: V8 05/23/2016

Product Specifications

CONSTRUCTION & MATERIALS

- Slim, low profile design minimizes wind load requirements
- Luminaire housing is rugged die cast aluminum with an integral, weathertight LED driver compartment and high performance heat sink
- Convenient interlocking mounting method on direct arm mount. Mounting adaptor is rugged die cast aluminum and mounts to 3-6" (76-152mm) square or round pole, secured by two 5/16-18 UNC bolts spaced on 2" (51mm) centers
- Mounting for the adjustable arm mount adaptor is rugged die cast aluminum and mounts to 2" (51mm) IP, 2.375" (60mm) O.D. tenon
- Adjustable arm mount can be adjusted 180° in 2.5° increments
- Designed for uplight and downlight applications
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Silver, bronze, black, and white are available
- **Weight:** 28.5 lbs. (13kg)

ELECTRICAL SYSTEM

- **Input Voltage:** 120-277V or 347-480V, 50/60Hz, Class 1 drivers
- **Power Factor:** > 0.9 at full load
- **Total Harmonic Distortion:** < 20% at full load
- Integral 10kV surge suppression protection standard
- To address inrush current, slow blow fuse or type C/D breaker should be used
- **10V Source Current:** 0.15mA

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Enclosure rated IP66 per IEC 60529 when ordered without R option
- Consult factory for CE Certified products
- Certified to ANSI C136.31-2001, 3G bridge and overpass vibration standards
- 10kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2
- Meets FCC Part 15, Subpart B, Class A standards for conducted and radiated emissions
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- Meets Buy American requirements within ARRA
- DLC qualified when ordered with asymmetric optics, S input power designator and 40K or 57K. Please refer to www.designlights.org/QPL for most current information
- RoHS compliant. Consult factory for additional details

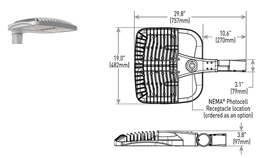
Electrical Data*							
Input Power Designator	Optic	System Watts 120-480V	Total Current				
			120V	208V	240V	277V	347V	480V
S	Asymmetric	223	1.94	1.13	0.99	0.85	0.65	0.47
T	Symmetric	171	1.45	0.85	0.74	0.64	0.50	0.36
U	All	215	1.83	1.08	0.93	0.81	0.62	0.45

* Electrical data at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%.

Recommended OSQ Series Lumen Maintenance Factors (LMF)[1]						
Ambient	Optic	Initial LMF	25K hr Projected[2] LMF	50K hr Projected[2] LMF	75K hr Projected[2] LMF	100K hr Calculated[3] LMF
5°C (41°F)	Asymmetric	1.04	0.99	0.93	0.89	0.84
	Symmetric	1.05	1.00	0.96[3]	0.92[3]	0.88[3]
10°C (50°F)	Asymmetric	1.03	0.98	0.92	0.88	0.83
	Symmetric	1.04	0.99	0.95[3]	0.91[3]	0.87[3]
15°C (59°F)	Asymmetric	1.02	0.97	0.92	0.87	0.82
	Symmetric	1.02	0.98	0.94[3]	0.90[3]	0.87[3]
20°C (68°F)	Asymmetric	1.01	0.96	0.91	0.86	0.82
	Symmetric	1.01	0.96	0.92[3]	0.88[3]	0.85[3]
25°C (77°F)	Asymmetric	1.00	0.95	0.90	0.85	0.81
	Symmetric	1.00	0.95	0.91[3]	0.88[3]	0.84[3]

[1] Lumen maintenance values at 25°C (77°F) are calculated per TM-21 based on LM-80 data and in-situ luminaire testing
[2] In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on time durations that are within six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip
[3] In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip

AA Mount

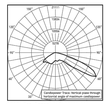


Weight
28.5 lbs. (13kg)

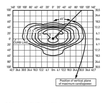
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: http://lighting.cree.com/products/outdoor/area/osq-series

2ME



CESTL Test Report #: PL07751-001A
OSQ-A-**-2ME-U-40K-UL
Initial Delivered Lumens: 26,966

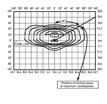


OSQ-A-**-2ME-U-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 27,706
Initial FC at grade

Type II Medium Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11
S	18,182	B3 U0 G2	21,696	B3 U0 G3	23,179	B3 U0 G3
U	26,258	B3 U0 G3	27,706	B3 U0 G3	28,285	B3 U0 G3

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingAddendum.pdf. Valid with no tilt

CESTL Test Report #: PL07750-001A
OSQ-A-**-2ME-U-57K-UL w/OSQ-BLSLF
Initial Delivered Lumens: 22,822



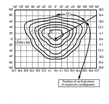
OSQ-A-**-2ME-U-40K-UL w/OSQ-BLSLF
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 21,984
Initial FC at grade

Type II Medium w/BLS Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11
S	15,584	B2 U0 G2	18,597	B3 U0 G2	19,867	B3 U0 G2
U	20,835	B3 U0 G3	21,984	B3 U0 G3	22,444	B3 U0 G3

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingAddendum.pdf. Valid with no tilt

3ME

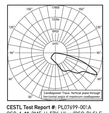
CESTL Test Report #: PL07698-001A
OSQ-A-**-3ME-U-40K-UL
Initial Delivered Lumens: 27,305



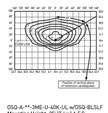
OSQ-A-**-3ME-U-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 27,706
Initial FC at grade

Type III Medium Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11
S	17,996	B3 U0 G3	21,475	B3 U0 G3	22,942	B3 U0 G3
U	26,258	B3 U0 G3	27,706	B3 U0 G3	28,285	B3 U0 G4

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingAddendum.pdf. Valid with no tilt



CESTL Test Report #: PL07699-001A
OSQ-A-**-3ME-U-57K-UL w/OSQ-BLSLF
Initial Delivered Lumens: 23,601



OSQ-A-**-3ME-U-40K-UL w/OSQ-BLSLF
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 22,587
Initial FC at grade

Type III Medium w/BLS Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11	Initial Delivered Lumens[1]	BUG Ratings[2] Per TM-15-11
S	15,299	B2 U0 G3	18,375	B2 U0 G3	19,631	B2 U0 G3
U	21,406	B2 U0 G3	22,587	B3 U0 G3	23,059	B3 U0 G3

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingAddendum.pdf. Valid with no tilt

Luminaire EPA

Fixed Arm Mount – OSQ-DA Weight: 28.5 lbs. (13kg)					
Single	2 @ 180°	2 @ 90°	3 @ 90°	3 @ 120°	4 @ 90°
0.80	1.61	1.26	2.06	1.68	2.52

Adjustable Arm Mount – OSQ-AA Weight: 28.5 lbs. (13kg)							
Single	2 @ 180°	2 @ 90°	3 @ 90°	3 @ 120°	3 @ 180°	4 @ 180°	4 @ 90°
Tenon Configuration (0°-80° Tilt); If used with Cree tenons, please add tenon EPA with Luminaire EPA							
PB-1A*, PT-1, PW-1A3**	PB-3A*, PB-2R2.375; PD-2AA(180); PT-2(180), PW-2A3**	PB-2A*, PD-2AA(90); PT-2(90)	PB-3A*, PD-3AA(90); PT-3(90)	PB-3A*, PT-3(120)	PB-3A*, PB-3R2.375	PB-4A*(180)	PB-4A*(90); PB-4R2.375; PD-4AA(90); PT-4(90)
0° Tilt							
0.80	1.61	1.26	2.06	1.68	3.33	4.66	2.52
10° Tilt							
0.81	1.61	1.62	2.42	2.32	4.40	6.08	3.24
20° Tilt							
1.24	1.61	2.04	2.84	3.13	5.68	7.80	4.08
30° Tilt							
1.44	1.64	2.44	3.24	3.97	6.88	9.40	4.88
45° Tilt							
2.20	2.20	3.00	3.80	5.07	8.55	11.64	6.00
60° Tilt							
2.63	2.63	3.43	4.23	5.73	9.84	13.36	6.86
70° Tilt							
2.82	2.82	3.62	4.42	5.73	10.41	14.12	7.24
80° Tilt							
2.93	2.93	3.73	4.53	5.73	10.74	14.56	7.46
Tenon Configuration (90° Tilt); If used with Cree tenons, please add tenon EPA with Luminaire EPA							
PB-1A*, PT-1, PW-1A3**	PB-3A*, PB-2R2.375; PD-2AA(180); PT-2(180), PW-2A3**	PB-2A*	PB-3A*	PB-3A*, PT-3(120)	PB-3A*, PB-3R2.375	PB-4A*(180)	PB-4A*(90); PB-4R2.375
90° Tilt							
2.95	2.95	4.84	6.52	5.73	10.81	14.64	11.19

* Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6") for single, double or triple luminaire orientation or 4 (4"), 5 (5"), or 6 (6") for quad luminaire orientation
** These EPA values must be multiplied by the following ratio: Fixture Mounting Height/Total Pole Height. Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6")

Tenon EPA

Part Number	EPA
PB-1A*	None
PB-2A*	0.82
PB-3A*	1.52
PB-4A*(180)	2.22
PB-4A*(90)	1.11
PB-2R2.375	0.92
PB-3R2.375	1.62
PB-4R2.375	2.32
PD Series Tenons	0.09
PT Series Tenons	0.13
PW-1A3**	0.47
PW-2A3**	0.94
WM-2	0.08
WM-4	0.25
WM-DM	None

* Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6") for single, double or triple luminaire orientation or 4 (4"), 5 (5"), or 6 (6") for quad luminaire orientation
** These EPA values must be multiplied by the following ratio: Fixture Mounting Height/Total Pole Height. Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6")

Tenons and Brackets[1] (must specify color)

Square Internal Mount Vertical Tenons (Steel)
- Mounts to 3-6" (76-152mm) square aluminum or steel poles

PB-1A* – Single
PB-2A* – 180° Twin
PB-3A* – 180° Triple
PB-4A*(90) – 90° Quad
PB-4A*(180) – 180° Quad

Square Internal Mount Horizontal Tenons (Aluminum)
- Mounts to 4" (102mm) square aluminum or steel poles

PD-2AA(90) – 90° Twin
PD-2AA(180) – 180° Twin
PD-3AA(90) – 90° Triple
PD-4AA(90) – 90° Quad

Wall Mount Brackets
- Mounts to wall or roof

WM-2 – Horizontal for OSQ-AA mount
WM-4 – L-Shape for OSQ-AA mount
WM-DM – Plate for OSQ-DA mount

Round External Mount Vertical Tenons (Steel)
- Mounts to 2.375" (60mm) O.D. round aluminum or steel poles or tenons

PB-2R2.375 – Twin
PB-3R2.375 – Triple
PB-4R2.375 – Quad

Round External Mount Horizontal Tenons (Aluminum)
- Mounts to 2.375" (60mm) O.D. round aluminum or steel poles or tenons
- Mounts to square pole with PB-1A* tenon

PT-1 – Single (Vertical)
PT-2(90) – 90° Twin
PT-2(180) – 180° Twin
PT-3(90) – 90° Triple
PT-4(90) – 90° Quad

Mid-Pole Bracket
- Mounts to square pole

PW-1A3** – Single
PW-2A3** – Double

Ground Mount Post
- For ground mounted flood luminaires

PGM-1 – for OSQ-AA mount

[1] Refer to the Bracket and Tenons spec sheet for more details

Direct Mount Configurations

Compatibility with OSQ-DA Direct Mount Bracket					
Input Power Designator	2 @ 90°	2 @ 180°	3 @ 90°	3 @ 120°	4 @ 90°
3" Square					
S, T, & U	N/A	✓	N/A	N/A	N/A
3" Round					
S, T, & U	N/A	✓	N/A	N/A	N/A
4" Square					
S, T, & U	✓	✓	✓	N/A	✓
4" Round					
S, T, & U	✓	✓	✓	✓	✓
5" Square					
S, T, & U	✓	✓	✓	N/A	✓
5" Round					
S, T, & U	✓	✓	✓	✓	✓
6" Square					
S, T, & U	✓	✓	✓	N/A	✓
6" Round					
S, T, & U	✓	✓	✓	✓	✓

© 2016 Cree, Inc. and/or one of its subsidiaries. All rights reserved. For informational purposes only. Content is subject to change. Patent www.cree.com/patents. Cree®, NanoOptic®, and ColorFast DeltaGuard® are registered trademarks, and the Cree logo, Precision Delivery Grid™ and OSQ™ are trademarks of Cree, Inc. The UL logo is a registered trademark of UL, LLC. NEMA® is a registered trademark of the National Electrical Manufacturers Association. The DLC QPL logo is a registered trademark of Northeast Energy Efficiency Partnerships, Inc.

Troy MarketPlace
Ramco Gershen Properties Trust
16 Mile/Rochester Road
Cree Calculations Shown at 50K Burn Hours

Designer

Date
9/21/2016
Scale
Not to Scale
Drawing No.

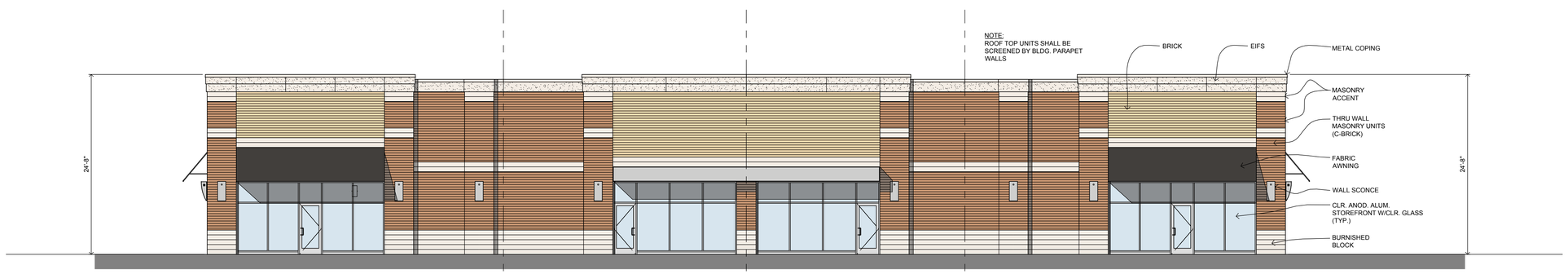
Summary

West Elevation

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

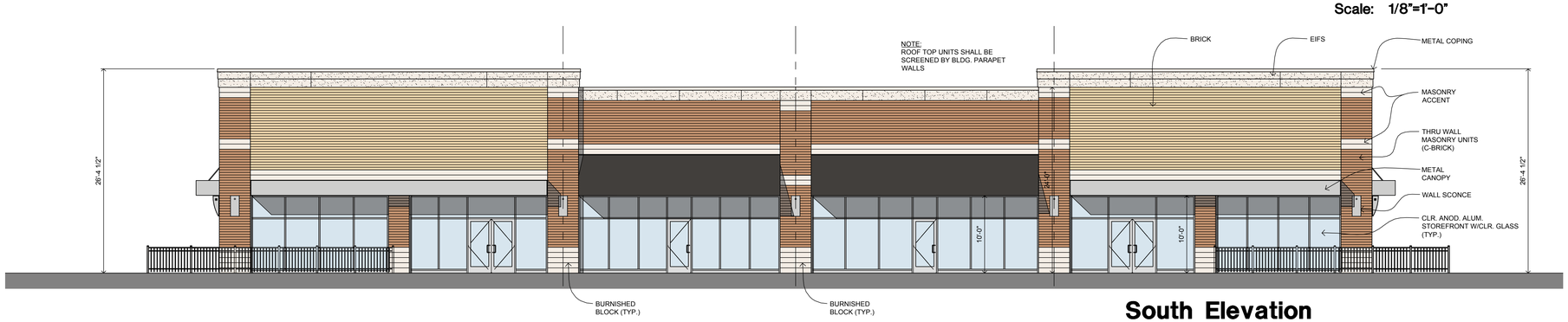
East Elevation

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



North Elevation

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



South Elevation

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

REVISED 15 SEPT. 16
SUBMITTED FOR SITE
PLAN REVIEW 23 SEPT. 16
REVISION 21 OCT. 16
SUBMITTED FOR SITE PLAN
REVIEW 25 OCT. 16

project:

Proposed Retail C

Troy Market Place

SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK DRANE
ARCHITECT
No. 34180
LICENSED ARCHITECT

drawing:

Conceptual Building Elevations

DO NOT SCALE DRAWING

issue date: 07 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

sheet:

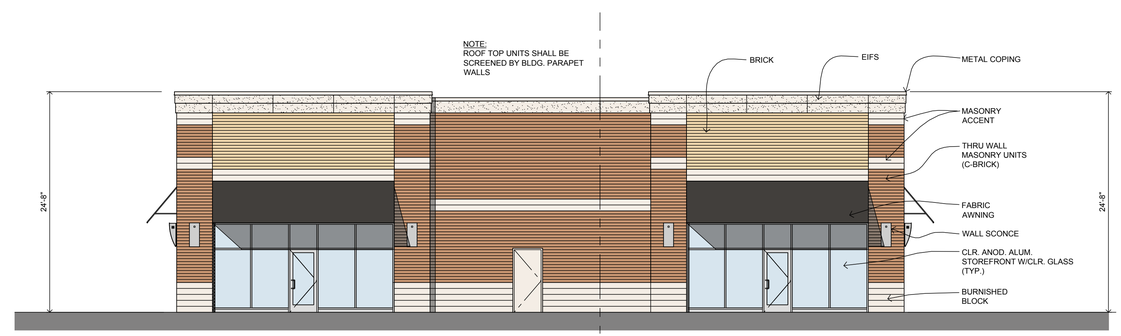
A-2

West Elevation

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

East Elevation

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



North Elevation

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

South Elevation

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

REVISED 19 SEPT. 16
SUBMITTED FOR SITE
PLAN REVIEW 23 SEPT. 16
REVISION 21 OCT. 16
SUBMITTED FOR SITE PLAN
REVIEW 29 SEPT. 16

project:

Proposed Outparcel C

Troy Market Place

SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK DRANE
ARCHITECT
No. 94180
LICENSED ARCHITECT

drawing:

Conceptual Building Elevations

DO NOT SCALE DRAWING

issue date: 07 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

sheet:

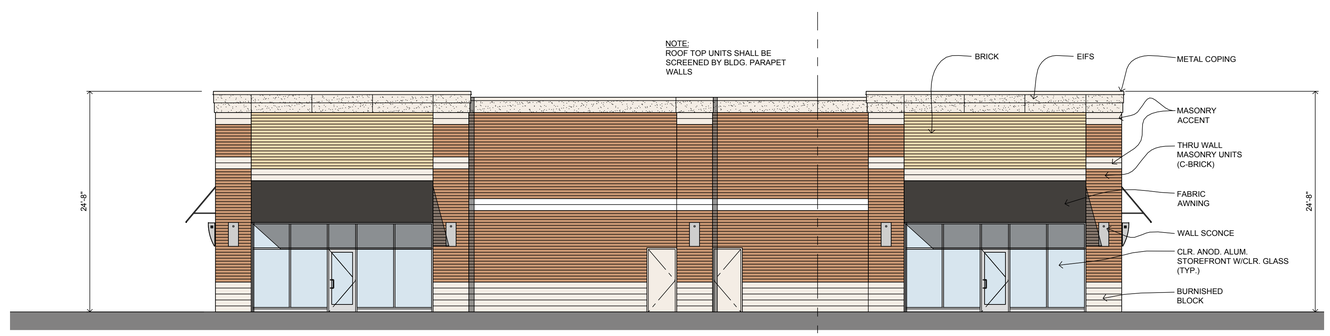
A-4

West Elevation

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

East Elevation

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



North Elevation

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

South Elevation

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

REVISED 15 SEPT. 16
SUBMITTED FOR SITE
PLAN REVIEW 23 SEPT. 16
REVISION 21 OCT. 16
SUBMITTED FOR SITE PLAN
REVIEW 25 OCT. 16

project:

Proposed Retail D

Troy Market Place

SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK DRANE
ARCHITECT
No. 34160
LICENSED ARCHITECT

drawing:

Conceptual Building Elevations

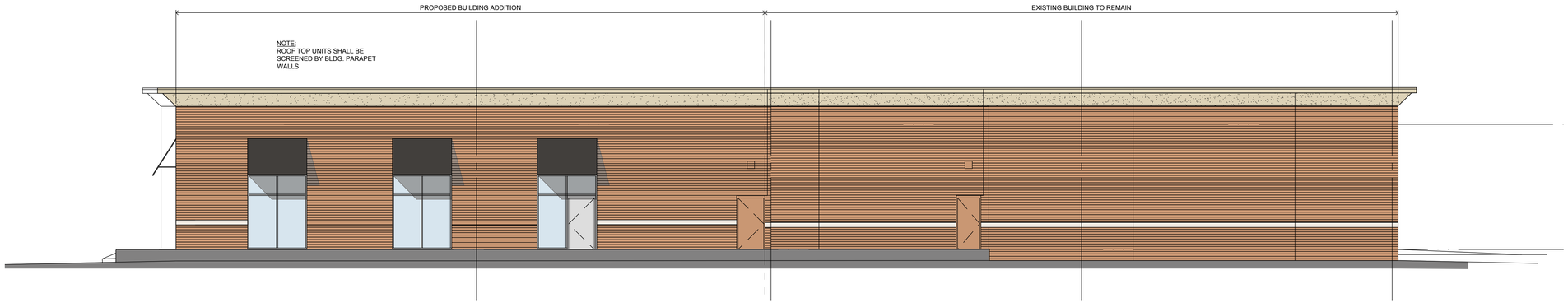
DO NOT SCALE DRAWING

issue date: 12 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

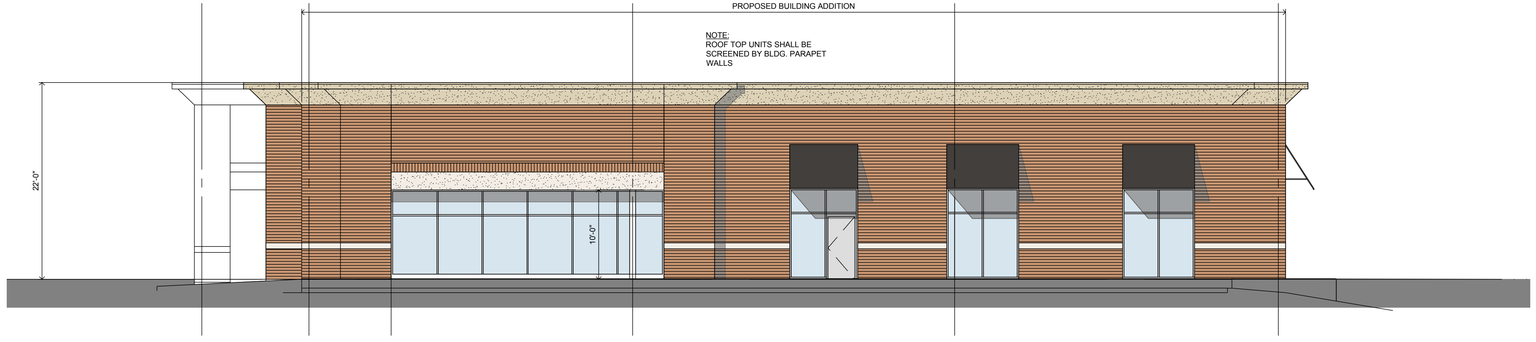
sheet:

A-6



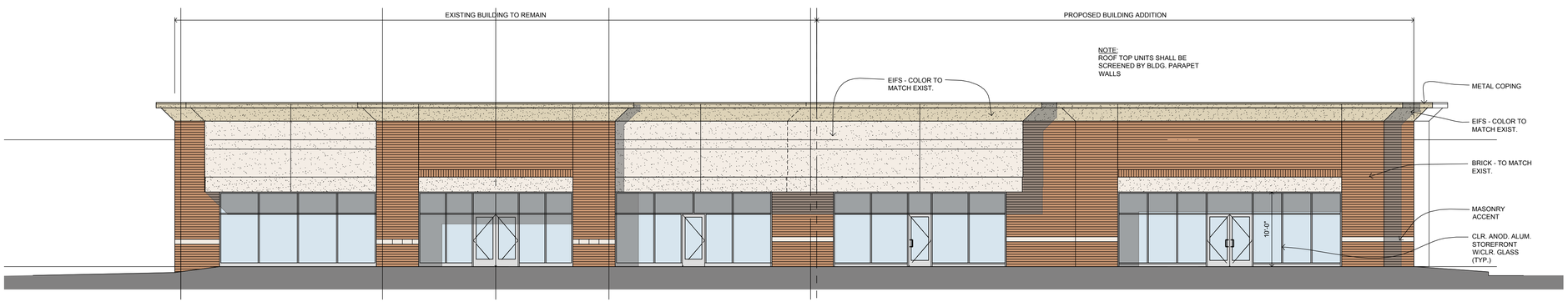
East Elevation

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



South Elevation

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



West Elevation

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

REVISED 22 SEPT. 16
SUBMITTED FOR SITE
PLAN REVIEW 23 SEPT. 16
REVISED 21 OCT. 16
SUBMITTED FOR SITE PLAN
REVIEW 25 OCT. 16

project:

Proposed Retail A
Troy Market Place
SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK CRANE
ARCHITECT
No. 34180
LICENSED ARCHITECT

drawing:

Conceptual
Building
Elevations

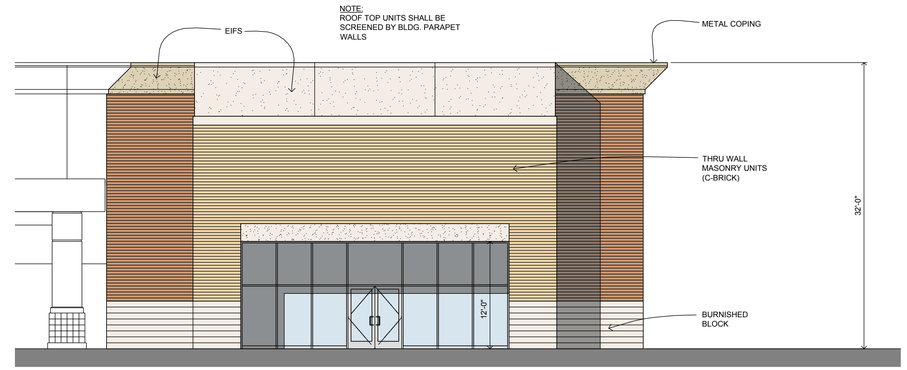
DO NOT SCALE DRAWING

issue date: 13 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

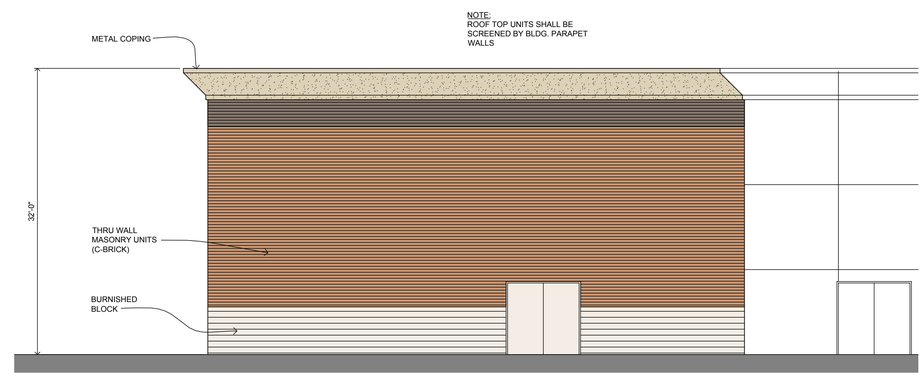
sheet:

A-8



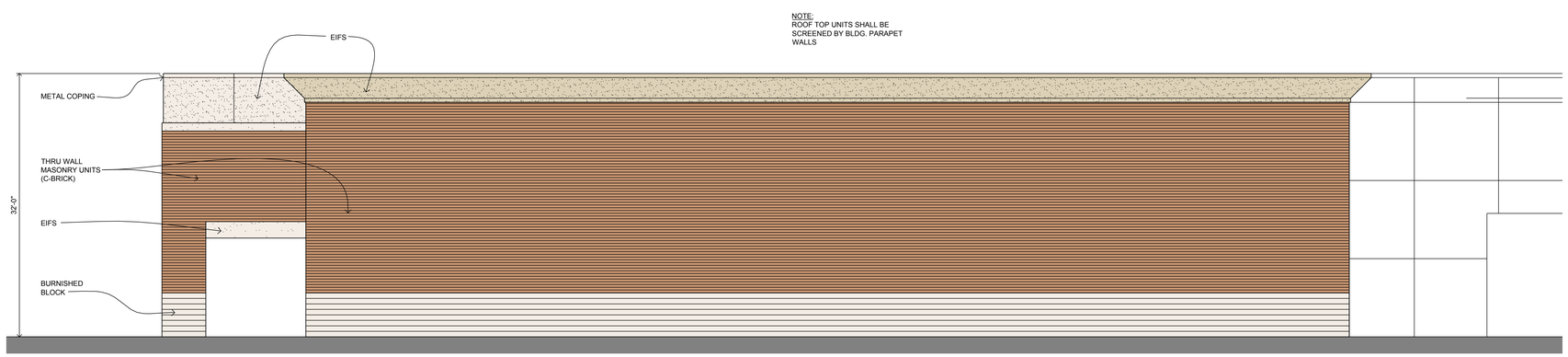
North Elevation

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



South Elevation

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



West Elevation

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

© COPYRIGHT 2015: ROGVOY ARCHITECTS, P.C.

issued for:

SUBMITTED FOR SITE
PLAN REVIEW 23 SEPT. 16
REVISION 21 OCT. 16
SUBMITTED FOR SITE PLAN
REVIEW 25 OCT. 16

project:

Proposed Retail G

Troy Market Place

SWC Big Beaver and Rochester Rd.
Troy, Michigan

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

STATE OF MICHIGAN
MARK DRANE
ARCHITECT
No. 34180
LICENSED ARCHITECT

drawing:

Conceptual
Building
Elevations

DO NOT SCALE DRAWING

issue date: 12 SEPT. 16
drawn: KL
checked: MD
approved: MD

file number: 16036

sheet:

A-10