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PLANNING COMMISSION
MEETING AGENDA
REGULAR MEETING

Carlton Faison, Chairman, Tom Krent, Vice Chairman
Ollie Apahidean, Karen Crusse, Barbara Fowler,
Michael W. Hutson, David Lambert, Sadek Rahman and John J. Tagle

November 12, 2019 **7:00 P.M.** **Council Chambers**

1. ROLL CALL

2. APPROVAL OF AGENDA

3. APPROVAL OF MINUTES – October 22, 2019

4. PUBLIC COMMENT – For Items Not on the Agenda

SPECIAL USE

5. PUBLIC HEARING - SPECIAL USE AND PRELIMINARY SITE PLAN REVIEW (File Number SU JPLN2019-0008) – Proposed Courtyard Hotel, East side of New King, west of Crooks, 5550 New King (PIN 88-20-08-276-006), Section 8, Currently Zoned OM (Office Mixed Use) Zoning District

PRELIMINARY SITE PLAN REVIEW

6. PRELIMINARY SITE PLAN REVIEW (SP JPLN2019-0032) - Proposed GFA Long Lake Multifamily Development, West side of Dequindre, north of Long Lake (PIN 88-20-12-476-070), Section 12, Currently Zoned NN (Neighborhood Node "J") and EP (Environmental Protection) Districts

7. PUBLIC COMMENT – Items on Current Agenda

8. 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.*

Chair Faison called the Regular meeting of the Troy City Planning Commission to order at 7:00 p.m. on October 22, 2019 in the Council Chamber of the Troy City Hall.

1. ROLL CALL

Present:
Ollie Apahidean
Karen Crusse
Carlton M. Faison
Barbara Fowler
Michael W. Hutson
Tom Krent
David Lambert
Sadek Rahman

Absent:
John J. Tagle

Also Present:
R. Brent Savidant, Community Development Director
Ben Carlisle, Carlisle Wortman Associates
Lori Grigg Bluhm, City Attorney
Jackie Ferencz, Planning Department Administrative Assistant
Kathy L. Czarnecki, Recording Secretary

2. APPROVAL OF AGENDA

Resolution # PC-2019-10-071
Moved by: Krent
Support by: Apahidean

RESOLVED, To approve the Agenda as prepared.

Yes: All present (8)
Absent: Tagle

MOTION CARRIED

3. APPROVAL OF MINUTES

Resolution # PC-2019-10-072
Moved by: Lambert
Support by: Fowler

RESOLVED, To approve the minutes of the October 8, 2019 Regular meeting as submitted.

Yes: All present (8)
Absent: Tagle

MOTION CARRIED

4. PUBLIC COMMENT – Items not on the Agenda

There was no one present who wished to speak.

PRELIMINARY SITE PLAN REVIEW

5. PRELIMINARY SITE PLAN REVIEW (SP JPLN2019-0031) – Proposed GFA Hopedale Site Condominium, 7 units/lots, North of Hopedale, West of John R, South of Square Lake (88-20-11-277-024), Section 11, Currently Zoned R-1C (One Family Residential) Zoning District

Mr. Carlisle reviewed the Preliminary Site Plan application. Mr. Carlisle said the proposed development is permitted by right and meets all requirements of the Zoning Ordinance. He addressed the stub street extension of Viking to Hopedale, the mitigation of trees and elevations. Mr. Carlisle recommended Preliminary Site Plan approval.

Applicant Gary Abitheira addressed the various elevations inclusive of a custom ranch option, building materials and price ranges.

Mr. Savidant announced the Planning Department received correspondence from Dr. Kay-Uwe and Ulrike Wagner of 5564 Viking in opposition addressing concerns with non-preservation of existing green space.

Chair Faison opened the floor for public comment.

- Andreas Gebauer, 5548 Viking; voiced concerns with extension of Viking, vehicular lights from side-entry garages.
- Mircea Costeiu, 5563 Viking; voiced concerns with potential increased traffic, home values.
- Paul Krebs, 1896 Hopedale; voiced concerns with parking along Hopedale, extension of Viking in relation to his property, property maintenance.
- Ulrike Wagner, 5564 Viking; asked to dedicate existing green space to the neighborhood.

Chair Faison closed the floor for public comment.

Mr. Abitheira brought to the Board's attention a notation on the site plan with reference to the detention basin. He said if an alternate off-site location for the detention basin is available, the plan would allow for an additional lot/unit.

There was discussion on:
- Elevations; side entry garages.
- Stormwater detention basin; Site Plan notation to convert to additional lot/unit.
- Traffic concerns.
- Stub street; designed for future development.
- Existing green space; potential to dedicate as neighborhood park.

Resolution # PC-2019-10-073
Moved by: Krent
Support by: Lambert

RESOLVED, That Preliminary Site Condominium Approval, pursuant to Article 8 and Section 10.02 of the Zoning Ordinance, as requested for GFA Hopedale Site Condominium, 7 units/lots, North of Hopedale, West of John R, South of Square Lake (88-20-11-277-024), Section 11, Currently Zoned R-1C (One Family Residential) District, be granted, and that the Planning Commission supports utilization of the stormwater detention convertible area as an additional lot/unit totaling eight (8) lots/units, subject to engineering approval.

Yes: All present (8)
Absent: Tagle

MOTION CARRIED

6. PUBLIC HEARING – CONDITIONAL REZONING (CR JPLN2019-001) – Proposed MNK Troy 1, LLC Conditional Rezoning, East side of Rochester, South of Shallowdale (88-20-14-152-001 and 88-20-14-301-031), Section 14, From R-1C (One Family Residential), RT (One Family Attached Residential) and EP (Environmental Protection) Zoning Districts to RT (One Family Attached Residential) and EP (Environmental Protection) Zoning Districts

Mr. Carlisle reviewed the Conditional Rezoning application. He addressed the history of the parcels as relates to zoning and land use policies, noting for the past 20 years the zoning classification for Rochester Road is medium density residential. Mr. Carlisle compared what could be developed by right versus what could be developed with the proposed conditional rezoning.

Mr. Carlisle addressed site plan issues; 1) the proposed EP zoned portion cannot be counted toward the overall lot density, reducing the maximum number of units to 27; 2) the proposed setbacks differ from setbacks shown on conceptual plan; and 3) the minimum landscape requirement is 20%, not 15% as proposed.

Mr. Carlisle recommended to postpone the application so the applicant can address site plan issues and take into consideration comments from both the Planning Commission and public.

John Thompson of Professional Engineering Associates (PEA) was present.

PUBLIC HEARING OPENED

- Jon Hughes, 4495 Harold; voiced opposition. He addressed concerns with a reduction of the EP-zoned portion and its effect on his property.

- Jim McCauley, 4435 Harold; representative of Shallowbrook Homeowners' Association. Mr. McCauley addressed concerns with the reduction of the negotiated EP zoned area, EP density as relates to the number of proposed lots, reduction of open space, retention/detention plans and deficiencies in the application. He asked the Board's consideration in postponing the item to allow the applicant to address the impact on homeowners as relates to the negotiated buffer in place since 2002.

PUBLIC HEARING CLOSED

There was discussion on:
- Intent of EP zoned area to serve as buffer to residential from more intense uses.
- Proposed reduction of EP zoned area and open space.
- Consideration of homeowners who purchased homes with understanding of EP zoned protected area.
- Conditional Rezoning process; recommending body to City Council.

Mr. Thompson said the applicant is amenable to addressing concerns expressed this evening at the public hearing and take into consideration comments of the Planning Commission. He said the intent is to provide significant buffer and open space that correlates to the original agreement. Mr. Thompson said development of the property as currently zoned almost makes the property undevelopable.

Resolution # PC-2019-10-074
Moved by: Hutson
Support by: Rahman

RESOLVED, That the Planning Commission hereby postpones this item to provide the applicant an opportunity to clarify their application, based on issues identified in the report and comments by the Planning Commission. Furthermore, postponement will provide the applicant an opportunity to consider public comments from residents and input from the Planning Commission.

Yes: All present (8)
Absent: Tagle

MOTION CARRIED

OTHER BUSINESS

7. POTENTIAL TEXT AMENDMENTS – (a) Transitions; (b) Increasing Square Footage Cap in a Cluster Development

Mr. Savidant addressed item 7. (b) *Increasing Square Footage Cap in a Cluster Development*. He said the proposed text would increase the maximum square footage of a home from 1,500 square feet to 1,700 square feet as an incentive to develop homes desirable to empty-nesters.

After a brief discussion, the Board agreed to move forward with the proposed text amendment and schedule a Public Hearing.

Mr. Carlisle addressed item 7. (a) *Transitions*. Mr. Carlisle said the proposed text amendment relates only to Neighborhood Nodes. He addressed the proposed amendment as relates to development height, setback and greenbelt provisions for any non-single-family development in Neighborhood Nodes.

Discussion followed on:

- Revising text to clarify the minimum 20-foot landscaped greenbelt is within the twenty (20) foot building setback for parcels abutting single family residential.

The Board agreed to move forward with the proposed text amendment and schedule a Public Hearing.

8. PUBLIC COMMENT

There was no one present who wished to speak.

9. PLANNING COMMISSION COMMENT

There were general Planning Commission comments.

Mr. Apahidean said tonight might be his final Planning Commission meeting dependent on the outcome of the upcoming election.

The Regular meeting of the Planning Commission adjourned at 9:05 p.m.

Respectfully submitted,

_____

Carlton Faison, Chair

_____

Kathy L. Czarnecki, Recording Secretary

C:\Users\bob\Documents\Kathy\COT Planning Commission Minutes\2019\2019 10 22 Regular Meeting_Draft.doc

DATE: November 6, 2019

TO: Planning Commission

FROM: R. Brent Savidant, Planning Director

SUBJECT: PUBLIC HEARING - SPECIAL USE AND PRELIMINARY SITE PLAN REVIEW (File Number SU JPLN2019-0008) – Proposed Courtyard Hotel, East side of New King, west of Crooks, 5550 New King (PIN 88-20-08-276-006), Currently Zoned OM (Office Mixed Use) Zoning District

The petitioner Troy Elite Hospitality, LLC submitted the above referenced Special Use and Preliminary Site Plan application for the proposed 5-story, 138 room Courtyard. The 2.83-acre site is currently vacant and zoned OM.

The subject site is part of an overall 6.1 acre parcel that is controlled by a Conditional Rezoning application that was approved by City Council on October 8, 2012 (see attached). The portion of the site fronting on Crooks is zoned CB and has been developed with a stand-alone Panera Bread restaurant, a two-story mixed use building with drive through, and a vacant site on the corner of Crooks and Corporate (to be developed as a restaurant building). The Agreement states the following: “The OM parcel (designated as Phase II) will be limited to and developed as either an office building or a hotel as presented in the approval package”.

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.
3. Traffic Impact Study, Prepared by Rowe Professional Services, dated July 19, 2019.
4. Traffic Impact Study, Prepared by Rowe Professional Services, dated August 14, 2019.
5. Memorandum prepared by OHM, dated August 28, 2019.
6. Memorandum prepared by OHM, dated October 1, 2019.
7. Conditional Rezoning Agreement, approved by City Council on October 8, 2012.

PROPOSED RESOLUTION

PUBLIC HEARING - SPECIAL USE AND PRELIMINARY SITE PLAN REVIEW (File Number SU JPLN2019-0008) – Proposed Courtyard Hotel, East side of New King, west of Crooks, 5550 New King (PIN 88-20-08-276-006), Section 8, Currently Zoned OM (Office Mixed Use) Zoning District

Resolution # PC-2019-11-
Moved by:
Seconded by:

RESOLVED, That Special Use Approval and Preliminary Site Plan Approval, pursuant to Articles 8 and 9 of the Zoning Ordinance, as requested for the proposed Courtyard Hotel, located on the east side of New King, west of Crooks, 5550 New King, Section 8, Currently Zoned OM (Office Mixed Use) District, be granted, subject to applicant the following:

_____) or

(denied, for the following reasons: _____) or

(postponed, for the following reasons: _____)

Yes:
No:

MOTION CARRIED/FAILED

G:\SPECIAL USE\SU JPLN2019-0008 COURTYARD HOTEL\Proposed PC Resolution 11 12 2019.docc

GIS Online

1,189 0 595 1,189 Feet

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

GIS Online

1,189 0 595 1,189 Feet

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

Carlisle | Wortman
ASSOCIATES, INC.
117 NORTH FIRST STREET SUITE 70 ANN ARBOR, MI 48104 734.662.2200 734.662.1935 FAX

Date: November 5, 2019

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

Applicant: Steller Development

Project Name: Courtyard

Plan Date: September 24, 19

Location: Crooks Road

Zoning: OM, Office Mixed Use

Action Requested: Preliminary Site Plan and Special Use Approval

PROJECT AND SITE DESCRIPTION

In 2012, the City conditionally rezoned the entire 6.1-acre site from PUD to CB, Commercial Business, and OM., Office Mixed Use. The parcel is located at the corner of Crooks Road, Corporate Drive, and New King Drive. The conditional rezoning permitted the site to be developed in multiple phases.

The first phase of the development, rezoned to CB, is the front part of the site that is adjacent to Crooks. Phase 1 development includes a Panera and two-story mixed use building with drive-through. Phase 2 is located at the rear of the site, adjacent to New King Drive was conditionally rezoned to OM. Phase 2 was conceptually approved for an office or hotel use, with the requirement that site development go through site plan and special use review. Phase 3, the pad at the hard corner of Corporate Drive and Crooks, was rezoned to CB, and was approved as a restaurant. Phase 3 will require a future site plan review by the Planning Commission.

The Planning Commission is only considering a site plan and Special Use review for Phase 2. For Phase 2, the applicant is requesting special use and preliminary site plan approval for a five (5) story, 64-feet, one hundred and thirty-eight (138) room, Courtyard Hotel. The hotel will include direct access off New King and Corporate Drive.

Figure 1. *– Subject site aerial photo*

Size of subject property:
1.54 acres (Phase 2 portion of site)

Current use of subject property:
Vacant

Proposed use of subject site:
5-story hotel

Current Zoning:
The property is currently zoned OM, Office Mixed Use

Surrounding Property Details:

Direction	Zoning	Use
North	RC, Research Center	Office
South	OM, Office Mixed Use	Office
East	OM, Office Mixed Use	Vacant, former Met Hotel
West	RC, Research Center	Office

According to the Troy Master Plan – Future Land Use map, this area "*Located at the intersection of two main arterial roads with a direct access ramp to I-75, North Troy is strategically located to serve as a major employment hub for Oakland County. North Troy currently is home to over 5,000 primarily daytime employees; in addition, there are over 2,000 households within one mile of the area. However, the area is dominated by single-use office buildings with limited interconnections, and few amenities for these workers and nearby residents.*

Preparing North Troy for the next generation of growth will require a broader and more creative real estate strategy that will tap into regional trends and market opportunities in order to create a more vibrant, attractive, and flexible work environment. A compatible and vibrant mix of uses will create a life and vibrancy, provide interconnections and a relationship with the adjacent neighborhoods, reduce automobile trips, and enhance walkability by providing destinations."

Adding a compatible and vibrant use to the existing office fabric is consistent with the Master Plan.

NATURAL RESOURCES

The site was previously developed. Currently the site has been improved with buildings and prepared to accommodate the new development.

Items to be Addressed: *None*

BUILDING LOCATION AND SITE ARRANGEMENT

The proposed building is situated adjacent to New King Road with the front entrance oriented towards the the shared Phase 1 and 2 parking lot. The site includes pedestrian and vehicular connections to Phase 1 and future Phase 3 of the development. The hotel will include direct access off New King and Corporate Drive.

Items to be Addressed: *None*

AREA, WIDTH, HEIGHT, SETBACKS

OM, Office Mixed Use bulk requirements are set forth in section 4.17.

Table 1. *– Site requirements and proposed dimensions*

	Required	Building Site	Complies
Front (New King Drive)	10 feet	10.0 feet	Complies
Open Space	20%	28.5%	Complies
Building Coverage	40%	13.6%	Complies
Building Height	5 stories (75 feet)	5 story, 64.5 feet	Complies

The site plan complies will all bulk requirements.

Items to be Addressed: *None*

PARKING

Parking Calculations:

The parking calculations provided are included in ***Table 2.,*** below.

Table 2. – *Required and provided parking*

	Required	Provided
Hotel: One (1) space for each room, plus one (1) space per one (1) employee on the largest typical shift	133 Rooms + 5 total employees = 138 spaces	138 spaces (with shared parking)
Barrier Free	5	5
Bicycle Parking	2	3
Loading	1	0
Total	**138 automobile + 2 bicycle**	**138 automobile + 3 bicycle**

The 138 spaces include shared parking with the rest of the development. The parking has been reviewed by the Traffic Engineer Consultant, OHM, who notes that shared parking is sufficient. The loading space is a requirement that can be waived by Planning Commission.

Items to be Addressed**:** *None, if Planning Commission grants loading space deviation.*

TRAFFIC

The applicant completed a traffic study for the entire development which includes:

- 133 room hotel
- 8,500 sq/ft of office
- 2,176 sq/ft of medial office
- 2,000 sq/ft coffee shop with drive-through
- 4,400 sq/ft Panera bread with drive-through
- 4,500 sq/ft sit down restaurant

The traffic study concludes that 478 cars during the AM peak hour and 323 cars during the PM peak hour:

	AM Peak Hour			PM Peak Hour			Week Day
	In	**Out**	**Total**	**In**	**Out**	**Total**	
Total Trips	254	224	478	162	161	323	5,028

The trip generation will be distributed as follows:

AM Peak Hour
47% from and 24% to the north
16% from and 46% to the south
32% from and 17% to the east
5% from and 13% to the west

PM Peak Hour
21% from and 46% to the north
41% from and 24% to the south
23% from and 26% to the east
15% from and 4% to the west

Based on existing level of services, the traffic study concludes that the applicant should construct a left turn lane at the intersection of Corporate Drive and Crooks Drive to mitigate additional and significant traffic delays caused by their development.

OHM has reviewed the traffic study and concludes:

OHM accepts the findings of the traffic impact study. The study shows that there are lengthy delays at the Crooks Road/I-75 off-ramp/Corporate Drive intersection and the development will significantly add to the delays at this intersection. The suggested eastbound left turn lane with 200' of storage on Corporate Drive will improve intersection operations to an acceptable level of service.

Items to be Addressed**:** *Work with Engineering to provide required traffic improvements as noted in traffic study.*

SITE ACCESS AND CIRCULATION

Vehicular access:

The hotel will include direct access off New King and Corporate Drive.

Pedestrian access:

There are direct pedestrian connections from both New King Road and a pedestrian spine that connects to the development that is adjacent to Crooks Road.

Items to be Addressed: *None*

LIGHTING

The applicant has provided a lighting (photometric) plan and lighting fixture details. The applicant is proposing a three (3) flagpole lights, 15 bollard lights, and two (2) two-head pole and one (1) one-headed pole lights. The photometrics comply with ordinance requirements.

Items to be Addressed: *None*

LANDSCAPING

The application includes a landscape plan and calculations.

	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.	New King Road 550 LF = 19 trees 10 trees	19 trees	Compliant
Site landscaping: A minimum of twenty percent (15%) of the site area shall be comprised of hardscape and landscape material.	20%	28.5%	Compliant
Parking Lot Landscaping: 1 tree for every 8 parking spaces. Trees may be located adjacent to parking lot with planning commission approval.	138 spaces = 19 trees	19 trees	Compliant

Parking Lot Screening: Screen 7 spaces facing New King Road	Alternative landscape plantings	Deciduous trees planted every 10 feet and shrub screening	Compliant

The applicant proposes a retaining wall and handrail between the sidewalk on New King and the building courtyard. The height of the wall varies in height. A profile of the retaining wall is shown on the plans.

***Items to be Addressed**: None*

FLOOR PLANS AND ELEVATIONS

The applicant has submitted floor plans and elevations. Materials include a mix of "wall plank" panels, and fiber cement board. As set forth in Section 8.06.B. Development shall incorporate the following recognized best architectural building design practices:

1) Foster a lasting impact on the community through the provision of high-quality design, construction, and detailing.
2) Provide high quality, durable materials, such as but not limited to stone, brick, glass, and metal. E.I.F.S. or material equivalent shall only be used as an accent material.
3) Develop buildings with creativity that includes balanced compositions and forms.
4) Design roofs that are appropriate to the architectural style of the building and create an appropriate visual exterior mass of the building given the context of the site.
5) For commercial buildings, incorporate clearly defined, highly visible customer entrances using features such as canopies, porticos, arcades, arches, wing walls, ground plane elements, and/or landscape planters.
6) Include community amenities that add value to the development such as patio/ seating areas, water features, art work or sculpture, clock towers, pedestrian plazas with park benches or other features located in areas accessible to the public.

The applicant should bring to the meeting the building materials samples, and a color rendering or a 3-D model to evaluate the overall architecture program. The Planning Commission shall discuss the materials and elevations based upon the additional information provided at the meeting.

***Items to be Addressed:** Provide building material samples and a color rendering or a 3-D model to evaluate the overall architecture program.*

STANDARDS FOR APPROVAL

Hotels are permitted subject to Special Use approval. For any Special Use, according to Section 9.02.D, the Planning Commission shall *"…review the request, supplementary materials either in support or opposition thereto, as well as the Planning Department's report, at a Public Hearing established for that purpose, and shall either grant or deny the request, table action on the request, or grant the request subject to specific conditions."*

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

1. *Compatibility with Adjacent Uses. The Special Use shall be designed and constructed in a manner harmonious with the character of adjacent property and the surrounding area. In determining whether a Special Use will be harmonious and not create a significant detrimental impact, as compared to the impacts of permitted uses.*

2. *Compatibility with the Master Plan. The proposed Special Use shall be compatible and in accordance with the goals and objectives of the City of Troy Master Plan and any associated sub-area and corridor plans.*

3. *Traffic Impact. The proposed Special Use shall be located and designed in a manner which will minimize the impact of traffic, taking into consideration: pedestrian access and safety; vehicle trip generation (i.e. volumes); types of traffic, access location, and design, circulation and parking design; street and bridge capacity and, traffic operations at nearby intersections and access points. Efforts shall be made to ensure that multiple transportation modes are safely and effectively accommodated in an effort to provide alternate modes of access and alleviate vehicular traffic congestion.*

4. *Impact on Public Services. The proposed Special Use shall be adequately served by essential public facilities and services, such as: streets, pedestrian or bicycle facilities, police and fire protection, drainage systems, refuse disposal, water and sewage facilities, and schools. Such services shall be provided and accommodated without an unreasonable public burden.*

5. *Compliance with Zoning Ordinance Standards. The proposed Special Use shall be designed, constructed, operated and maintained to meet the stated intent of the zoning districts and shall comply with all applicable ordinance standards.*

6. *Impact on the Overall Environment. The proposed Special Use shall not unreasonably impact the quality of natural features and the environment in comparison to the impacts associated with typical permitted uses.*

7. *Special Use Approval Specific Requirements. The general standards and requirements of this Section are basic to all uses authorized by Special Use Approval. The specific and detailed requirements relating to particular uses and area requirements must be also satisfied for those uses.*

The site was conceptually approved in 2012 for an office or a hotel use, as per the Conditional Rezoning Agreement. The Planning Commission desires to review each lodging use on a case-by-case basis to ensure the architectural and material quality is consistent with the stated intention of the Master Plan and Zoning Ordinance; that such use does not oversaturate the

market especially considering the difficulty in retrofitting hotels for future uses; and ensure that a hotel development does potentially negatively impact adjacent properties.

Overall we find that the Special Use Standards have been met:

- The site is master planned as North Troy, which calls for inclusion of a "compatible and vibrant mix of uses will create a life and vibrancy, provide interconnections and a relationship with the adjacent neighborhoods, reduce automobile trips, and enhance walkability by providing destinations." Adding a compatible and vibrant use to the existing office fabric is consistent with the Master Plan.
- The adjacent uses are office, which is compatible with hotel uses.
- The applicant has submitted a traffic study which notes needed improvements.

RECOMMENDATION

Overall, we support the hotel use and find that it meets the Special Use standards. In addition to comments received at the public hearing, the Planning Commission discussion should include:

1. *Loading space deviation*
2. *Material use and elevations*

We recommend approval of the site plan and Special Use with the following items to be addressed by the applicant:

1. *Work with engineering department to provide required traffic improvements as noted in traffic study.*
2. *Any changes to building material use and elevations.*

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

CARLISLE/WORTMAN ASSOC., INC.
Lauren Carlson
Planner

COURTYARD

TROY PLAZA

CITY OF TROY, OAKLAND COUNTY, MICHIGAN

SITE PLANS

APPLICANT

TROY ELITE HOSPITALITY, LLC
2600 AUBURN ROAD, SUITE 240
AUBURN HILLS, MI 48326

CONTACT: JIMMY ASMAR
PHONE: (248) 419-5555

ARCHITECT

TSA HOSPITALITY
1420 WASHINGTON BLVD., #430
DETROIT, MI 48226

CONTACT: BENJAMIN BERR
PHONE: (313) 974-6456

CIVIL ENGINEER

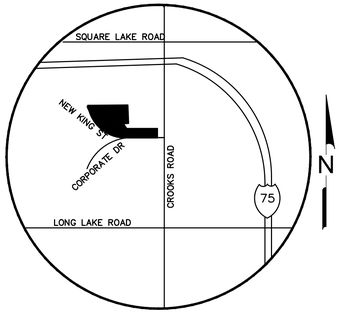
STELLAR DEVELOPMENT, LLC
2600 AUBURN ROAD, SUITE 160
AUBURN HILLS, MI 48326

CONTACT: ANDREW ANDRE, P.E.
PHONE: (248) 419-5550

STANDARD LEGEND		
DESCRIPTION	PROPOSED	EXISTING
BUILDING		
STORM SEWER	— — 12" — —	12"
SANITARY SEWER	S	S
WATER	W	W
GAS LINE	G	G
ELECTRIC LINE	E	E
TELEPHONE LINE	T	T
MANHOLE	●	○
CATCH BASIN	◕ ◪	⊘ ⊘
ENDSECTION		
FIRE HYDRANT		
GATE VALVE & WELL		⊗
UTILITY POLE		
UTILITY RISER		☒
SIGN		
LIGHT POLE		☼
CURB & GUTTER		
FENCE		
SILT FENCE		
TREE – DECIDUOUS	AS NOTED ON PLANS	
TREE LINE		
SPOT ELEVATION	+ 100.00	x 100.00
CONTOUR LINE	100	100
SECTION CORNER		
FOUND PROPERTY IRON		○
SET PROPERTY IRON		●
GAS METER		◎
ELECTRICAL METER		◐
TELEPHONE RISER		TPED
MAILBOX		⊞
SOIL BORING LOCATION		⊕

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

THE LOCATION OF ALL UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE BASED ON RECORDS PROVIDED BY THE UTILITY OWNERS AND VISIBLE EVIDENCE OBTAINED IN THE FIELD. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED TO THE COMPLETENESS OR ACCURACY THEREOF.



LOCATION MAP
NOT TO SCALE

DRAWING INDEX

C1.0	COVER SHEET
C2.0	SURVEY PLAN
C3.0	OVERALL SITE LAYOUT PLAN
C3.1	SITE LAYOUT AND PAVING PLAN
C3.2	SITE PHOTOMETRIC PLAN
C3.3	CONCEPTUAL RESTAURANT AREA PLAN
C4.0	GRADING PLAN
C4.1	GRADING SECTION
C5.0	UTILITY PLAN
C6.0	SITE DETAILS
L1.0	LANDSCAPE PLAN AND DETAILS

PLANS PREPARED BY TSA ARCHITECTS
COURTYARD

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A-102	SECOND LEVEL FLOOR PLAN
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A-202	EXTERIOR ELEVATIONS

ANDREW ANDRE, P.E.
MICHIGAN PE 47380
(SEAL PERTAINS TO PLANS AS PREPARED BY STELLAR DEVELOPMENT, LLC)

FURNISHED DESCRIPTION

CHICAGO TITLE INSURANCE COMPANY
COMMITMENT NO. 171000605 REV #1
EFFECTIVE DATE 01-03-19 (AS MARKED ON TITLE COMMITMENT)

THE LAND REFERRED TO IN THIS COMMITMENT IS DESCRIBED AS FOLLOWS:
LAND SITUATED IN THE CITY OF TROY, COUNTY OF OAKLAND, STATE OF MICHIGAN, DESCRIBED AS:

PARCEL 1
A PARCEL OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 8, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN DESCRIBED AS: COMMENCING AT THE EAST 1/4 CORNER OF SECTION 8, THENCE NORTH 02 DEGREES 30 MINUTES 26 SECONDS WEST 715.45 FEET ALONG THE EAST LINE OF SECTION 8; THENCE SOUTH 87 DEGREES 29 MINUTES 34 SECONDS WEST 350.00 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 02 DEGREES 30 MINUTES 26 SECONDS EAST 170.00 FEET; THENCE SOUTH 87 DEGREES 29 MINUTES 34 SECONDS WEST 8.50 FEET; THENCE SOUTH 02 DEGREES 30 MINUTES 26 SECONDS EAST 192.00 FEET; THENCE SOUTH 87 DEGREES 29 MINUTES 34 SECONDS WEST 129.49 FEET; THENCE SOUTH 02 DEGREES 30 MINUTES 26 SECONDS EAST 62.15 FEET; THENCE SOUTH 19 DEGREES 21 MINUTES 58 SECONDS EAST 39.85 FEET; THENCE 412.77 FEET ALONG THE ARC OF A CURVE TO THE RIGHT ALSO BEING THE EASTERLY RIGHT OF WAY LINE OF NEW KING STREET (70 FEET WIDE), HAVING A RADIUS OF 352.68 FEET A CHORD BEARING AND DISTANCE OF NORTH 36 DEGREES 02 MINUTES 17 SECONDS WEST 389.61 FEET; THENCE NORTH 02 DEGREES 30 MINUTES 26 SECONDS WEST 137.51 FEET; THENCE NORTH 87 DEGREES 29 MINUTES 34 SECONDS EAST 341.65 FEET TO THE POINT OF BEGINNING.

PARCEL 2
A PARCEL OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 8, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE EAST 1/4 CORNER OF SECTION 8; THENCE NORTH 02 DEGREES 30 MINUTES 26 SECONDS WEST 225.27 FEET ALONG THE EAST LINE OF SECTION 8; THENCE SOUTH 87 DEGREES 29 MINUTES 34 SECONDS WEST 90.00 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 87 DEGREES 29 MINUTES 34 SECONDS WEST 248.90 FEET ALONG THE NORTHERLY RIGHT OF WAY LINE OF CORPORATE DRIVE (120 FEET WIDE); THENCE 130.18 FEET ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 352.68 FEET CHORD BEARING AND DISTANCE OF NORTH 80 DEGREES 08 MINUTES 30 SECONDS WEST 129.44 FEET; THENCE NORTH 19 DEGREES 21 MINUTES 58 DEGREES WEST 39.85 FEET; THENCE NORTH 02 DEGREES 30 MINUTES 26 SECONDS WEST 62.15 FEET; THENCE NORTH 87 DEGREES 29 MINUTES 34 SECONDS EAST 398.00 FEET; THENCE SOUTH 02 DEGREES 30 MINUTES 26 SECONDS EAST 128.18 FEET TO THE POINT OF BEGINNING.

SCHEDULE "B" EXCEPTIONS

CHICAGO TITLE INSURANCE COMPNAY
COMMITMENT NO. 171000605 REV #1
EFFECTIVE DATE 01-03-19 (AS MARKED ON TITLE COMMITMENT)

(N) EASEMENT FOR PUBLIC UTILITIES GRANTED TO THE CITY OF TROY AS SET FORTH IN INSTRUMENT RECORDED IN LIBER 10107, PAGE 225. AS SHOWN

(Q) EASEMENT FOR WATER MAIN GRANTED TO THE CITY OFTROY AS SET FORTH IN INSTRUMENT RECORDED IN LIBER 11493, PAGE 510. AS SHOWN

(P) TERMS, CONDITIONS, AND PROVISIONS WHICH ARE RECITED IN CONDITIONAL REZONING AGREEMENT AS RECORDED IN LIBER 46278, PAGE 97. AS SHOWN

(Q) EASEMENTS AND THE TERMS, CONDITIONS, AND PROVISIONS THEREOF WHICH ARE RECITED IN RECIPROCAL EASEMENTAGREEMENT AS RECORDED IN LIBER 51970, PAGE 498. BLANKET EASEMENT

FLOODPLAIN INFORMATION

CITY OF TROY
OAKLAND COUNTY, MICHIGAN
MAP NUMBER: 26125 C0531F
EFFECTIVE DATE: 9-29-2006
FLOOD ZONE: X
AREA OF MINIMAL FLOOD HAZARD (PER FIRM)

ZONING INFORMATION

ZONED- OM (OFFICE MIXED USE)
SETBACKS-
FRONT:- 10'
REAR:- 30'
SIDE:- 20' MIN. TOTAL OF 60'

BENCHMARKS

B.M. #1 - ARROW ON HYD. ON N. SIDE OF CORPORATE DR. ON SOUTH SIDE OF OF PROPERTY
ELEV. 804.32 NAVD 88

B.M. #2 -SET BM ON FND IRON ON NW COR OF PROPERTY ON EAST SIDE OF KING ROAD
ELEV. 816.74 NAVD 88

UTILITY NOTE

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

UTILITY CONTACTS

TELEPHONE
AT&T
421 EAST GRAND RIVER
HOWELL, MI. 48843
(517) 548-6911

GAS
CONSUMERS ENERGY
1030 FEATHERSTONE
PONTIAC, MI 48342
(248) 858-4511

ZONING
CITY OF TROY
ZONING & PLANNING
500 WEST BIG BEAVER RD
TROY, MICHIGAN 48084
(248) 524-3300

WATER/SEWER
CITY OF TROY
DPW
4693 ROCHSTER RD
TROY, MICHIGAN 48085
(248) 524-3392

ELECTRIC
DTE
NW PLANNING AND DESIGN
37849 INTERCHANGE DR.
FARMINGTON HILLS, MI 48335
(248) 427-2987

STELLAR DEVELOPMENT, LLC
2600 AUBURN ROAD, SUITE 160
AUBURN HILLS, MI 48326
PH: 810-444-7815

PREPARED UNDER DIRECTION:
ANDREW ANDRE, P.E.
MI PE# 47380
STELLAR DEVELOPMENT, LLC

APPLICANT:
TROY ELITE HOSPITALITY, LLC
2600 AUBURN ROAD, SUITE 240
AUBURN HILLS, MI 48326
PH 248-419-5550
FX 248-553-4218

COURTYARD
BY MARRIOTT

COURTYARD
TROY PLAZA
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

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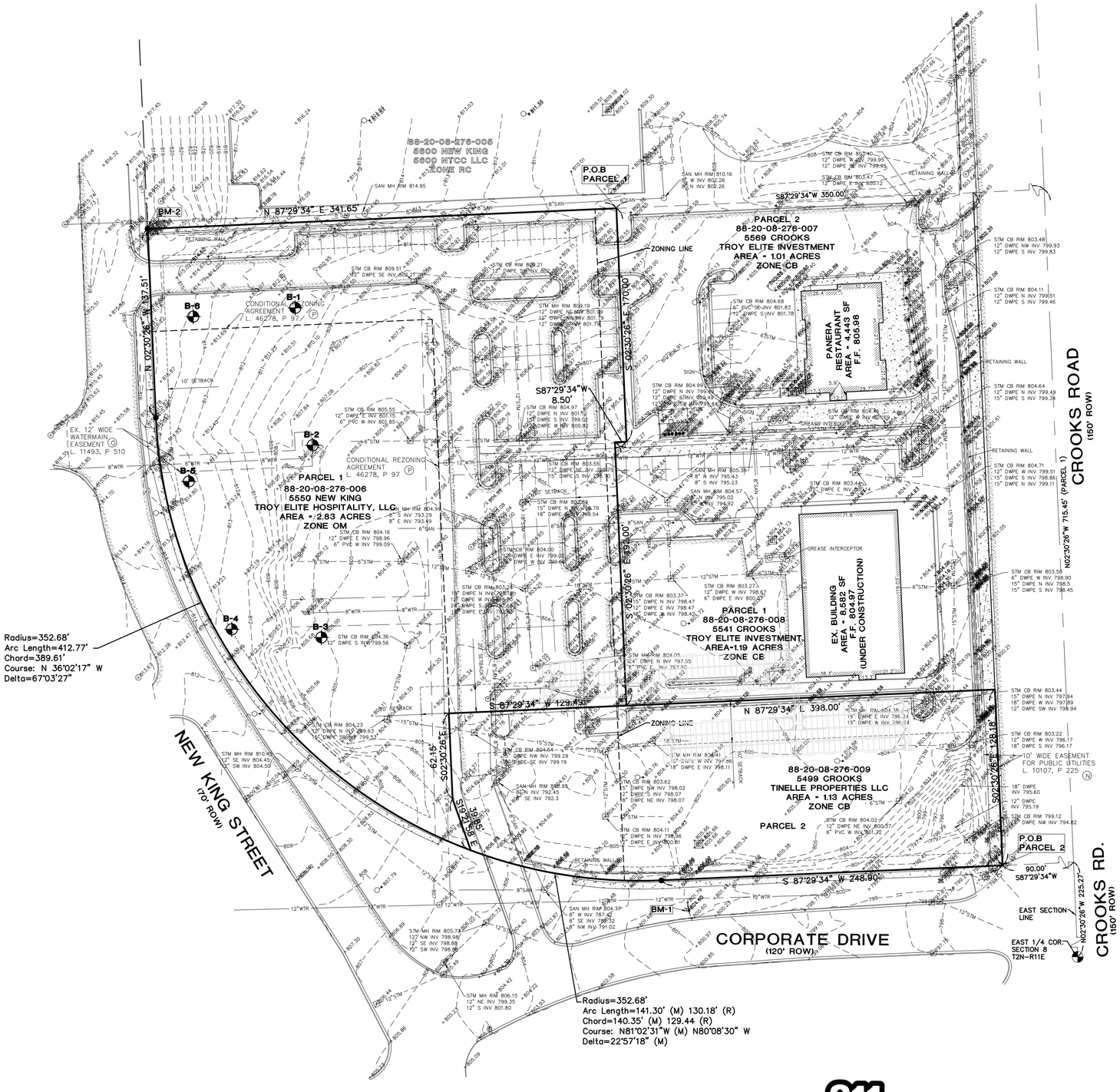
ISSUED FOR	DATE
PRELIM SPA	02/18/19
PRELIM SPA	05/09/19
PRELIM SPA	09/24/19

DATE :
DRAWN : ACA
CHECKED : ACA
SCALE : NO SCALE
JOB NO :
SHEET TITLE :
COVER SHEET

SHEET
C1.0



Know what's below. Call before you dig.

0' 40' 80' 120'

SCALE: 1" = 40'

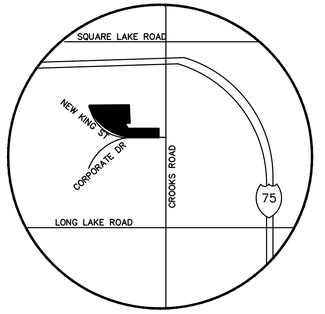
SURVEY PROVIDED BY:

D&M SITE INC.

Surveying • Inspection • Testing • Engineering

401 BALSAM STREET PO BOX 159, CARROLLTON, MICHIGAN 48724

PHONE (989) 752-6500 • FAX (989) 752-6600



LOCATION MAP

NOT TO SCALE

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BENCHMARKS

B.M. #1 - ARROW ON HYD. ON N. SIDE OF CORPORATE DR. ON SOUTH SIDE OF OF PROPERTY
ELEV. 804.32 NAVD 88

B.M. #2 -SET BM ON FND IRON ON NW COR OF PROPERTY ON EAST SIDE OF KING ROAD
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OAKLAND COUNTY, MICHIGAN
MAP NUMBER:26125 C0531F
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AREA OF MINIMAL FLOOD HAZARD (PER FIRM)

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(248) 524-3392

ELECTRIC
DTE
NW PLANNING AND DESIGN
37849 INTERCHANGE DR.
FARMINTGON HILLS, MI 48335
(248) 427-2987

CERTIFICATION

TO: CHICAGO TITLE INSURANCE COMPANY, TRANSWORLD TITLE COMPANY, LLC. AND TROY ELITE HOSPITALITY, LLC, A MICHIGAN LIMITED LIABILITY COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 5, 6, 7(A), 7(B), 8, 9, 10, 11, 13, 14, 16, 17 AND 18 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON 12-18-18.

DATE OF PLAT OR MAP: 09/19/2017

BRIAN D FERGUSON/PS #26434
401 BALSAM ROAD P.O. 159
CARROLLTON, MI 48724
PHONE: (989) 752-6500

BRIAN D FERGUSON LAND SURVEYOR NO. 26434 PROFESSIONAL SURVEYOR STATE OF MICHIGAN

SURVEY LEGEND

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

FURNISHED DESCRIPTION

CHICAGO TITLE INSURANCE COMPANY
COMMITMENT NO. 171000605 REV #1
EFFECTIVE DATE 01-03-19 (AS MARKED ON TITLE COMMITMENT)

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A PARCEL OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 8, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN DESCRIBED AS: COMMENCING AT THE EAST 1/4 CORNER OF SECTION 8, THENCE NORTH 02 DEGREES 30 MINUTES 26 SECONDS WEST 715.45 FEET ALONG THE EAST LINE OF SECTION 8; THENCE SOUTH 87 DEGREES 29 MINUTES 34 SECONDS WEST 350.00 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 02 DEGREES 30 MINUTES 26 SECONDS EAST 170.00 FEET; THENCE SOUTH 87 DEGREES 29 MINUTES 34 SECONDS WEST 8.50 FEET; THENCE SOUTH 02 DEGREES 30 MINUTES 26 SECONDS EAST 192.00 FEET; THENCE SOUTH 87 DEGREES 29 MINUTES 34 SECONDS WEST 129.49 FEET; THENCE SOUTH 02 DEGREES 30 MINUTES 26 SECONDS EAST 62.15 FEET; THENCE SOUTH 19 DEGREES 21 MINUTES 58 SECONDS EAST 39.85 FEET; THENCE 412.77 FEET ALONG THE ARC OF A CURVE TO THE RIGHT ALSO BEING THE EASTERLY RIGHT OF WAY LINE OF NEW KING STREET (70 FEET WIDE), HAVING A RADIUS OF 352.68 FEET A CHORD BEARING AND DISTANCE OF NORTH 36 DEGREES 02 MINUTES 17 SECONDS WEST 389.61 FEET; THENCE NORTH 02 DEGREES 30 MINUTES 26 SECONDS WEST 137.51 FEET; THENCE NORTH 87 DEGREES 29 MINUTES 34 SECONDS EAST 341.65 FEET TO THE POINT OF BEGINNING.

PARCEL 2
A PARCEL OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 8, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE EAST 1/4 CORNER OF SECTION 8; THENCE NORTH 02 DEGREES 30 MINUTES 26 SECONDS WEST 225.27 FEET ALONG THE EAST LINE OF SECTION 8; THENCE SOUTH 87 DEGREES 29 MINUTES 34 SECONDS WEST 90.00 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 87 DEGREES 29 MINUTES 34 SECONDS WEST 248.90 FEET ALONG THE NORTHERLY RIGHT OF WAY LINE OF CORPORATE DRIVE (120 FEET WIDE); THENCE 130.18 FEET ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 352.68 FEET CHORD BEARING AND DISTANCE OF NORTH 80 DEGREES 08 MINUTES 30 SECONDS WEST 129.44 FEET; THENCE NORTH 19 DEGREES 21 MINUTES 58 DEGREES WEST 39.85 FEET; THENCE NORTH 02 DEGREES 30 MINUTES 26 SECONDS WEST 62.15 FEET; THENCE NORTH 87 DEGREES 29 MINUTES 34 SECONDS EAST 398.00 FEET; THENCE SOUTH 02 DEGREES 30 MINUTES 26 SECONDS EAST 128.18 FEET TO THE POINT OF BEGINNING.

ZONING INFORMATION

ZONED- CB (COMMUNITY BUSINESS)
SETBACKS-
FRONT:- 10'
REAR:- 30'
SIDE:- 20' MIN. TOTAL OF 40'

ZONED- OM (OFFICE MIXED USE)
SETBACKS-
FRONT:- 10'
REAR:- 30'
SIDE:- 20' MIN. TOTAL OF 60'

STELLAR DEVELOPMENT, LLC
2600 AUBURN ROAD, SUITE 160
AUBURN HILLS, MI 48326
PH: 810-444-7815

PREPARED UNDER DIRECTION:
ANDREW ANDRE, P.E.
MI PE# 47380
STELLAR DEVELOPMENT, LLC

APPLICANT:
TROY ELITE HOSPITALITY, LLC
2600 AUBURN ROAD, SUITE 240
AUBURN HILLS, MI 48326
PH 248-419-5550
FX 248-553-4218

COURTYARD BY MARRIOTT

COURTYARD

TROY PLAZA

CITY OF TROY, OAKLAND COUNTY, MICHIGAN

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THIS SURVEY, CITY PLAT AND SURVEY AS PREPARED UNDER MY DIRECTION AND SUPERVISION, IS TO THE BEST OF MY KNOWLEDGE AND BELIEF, IN COMPLIANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCES. I FURTHER STATE THAT ALL MONUMENTS SHOWN HEREON EXIST AS DESCRIBED, AND THAT THE MONUMENTS AND LOT CORNERS WILL BE SET IN ACCORDANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCE. ALL DIMENSIONAL AND OTHER DETAILS ARE CORRECT. THIS SURVEY IS CLOSED TO AN ERROR OF NOT LESS THAN 1 FOOT IN 10,000 FEET AND CONFORMS WITH THE ACCURACY REQUIREMENTS OF THE CURRENT ORDINANCE OF THE CITY OF TROY.

ISSUED FOR	DATE
PRELIM SPA	02/18/19
PRELIM SPA	05/09/19
PRELIM SPA	09/24/19

DATE :

DRAWN : ACA

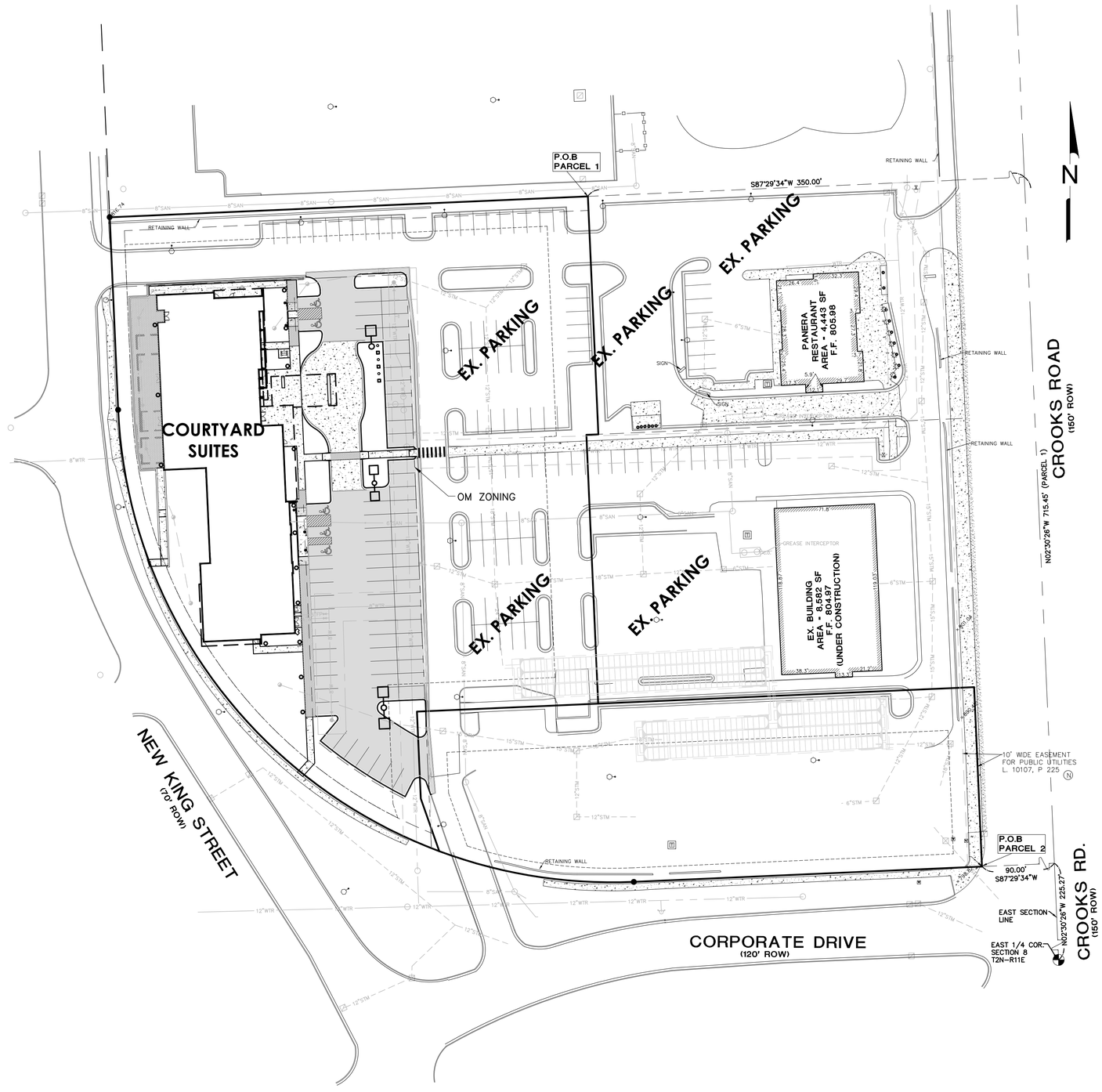
CHECKED : ACA

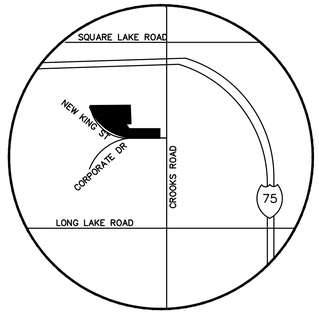
SCALE : 1"=40'

JOB NO :

SHEET TITLE :
SURVEY PLAN

SHEET
C2.0





LOCATION MAP
NOT TO SCALE

PAVEMENT INFORMATION

BITUMINOUS PAVEMENT

CONCRETE PAVEMENT

STAMPED CONC. PAVEMENT / PAVERS

UTILITY NARRATIVES

STORM MANAGEMENT
THE SURFACE WATER RUNOFF WILL BE COLLECTED VIA CATCH BASINS AND ROUTED TO THE EXISTING STORM SYSTEM THAT WAS INSTALLED AS PART OF THE FIRST PHASE OF THE DEVELOPMENT. AN UNDERGROUND ADS STORMTECH SYSTEM WAS SIZED FOR THE OVERALL DEVELOPMENT AND WAS INSTALLED UNDER THE PARKING LOT DURING THE INITIAL PHASE.

WATER SYSTEM
THERE IS AN EXISTING WATER THAT WAS INSTALLED AS PART OF THE INITIAL PHASE OF THE DEVELOPMENT. THE WATER MAIN IS LOCATED ALONG THE EASTERN SIDE OF THE HOTEL AREA AND WILL PROVIDE FOR CONNECTION AND EXTENSION TO THE PROPERTY. THE WATER MAIN WILL SERVICE THE HOTEL FOR BOTH DOMESTIC SERVICE AND FIRE SUPPRESSION SERVICES. THERE IS SOME MODIFICATION TO THE EXISTING SYSTEM THAT WILL BE REQUIRED.

SANITARY SEWER
EXISTING SANITARY SEWER LEAD HAS BEEN PROVIDED ALONG THE EXISTING ACCESS DRIVE. CONNECTION TO THE EXISTING SYSTEM WILL BE PROVIDED.

GENERAL NOTES

1. REFER TO ARCHITECTURAL PLANS TO VERIFY BUILDING DIMENSIONS.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL PERMITS AND POST ALL BONDS PRIOR TO CONSTRUCTION, OR ENSURE THAT ALL REQUIRED PERMITS AND BONDS HAVE BEEN OBTAINED PRIOR TO CONSTRUCTION.
3. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION BY CALLING MISS-DIG AT 1-800-482-7171 AT LEAST 3 WORKING DAYS PRIOR TO EXCAVATION.
4. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH LIKE MATERIAL. THE EXACT LOCATION OF EXISTING UTILITIES SHALL BE LOCATED BY HAND DIGGING.
5. DIMENSIONS ARE TO FACE OF CURB, OUTSIDE FACE OF BUILDING, EDGE OF PAVEMENT, CENTER OF STRUCTURE OR OTHERWISE INDICATED.
6. ALL PAVING MATERIALS AND OPERATIONS SHALL BE IN CONFORMANCE WITH THE CITY OF TROY AND MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION.
7. PARKING STALL SPACES TO BE 4" SOLID WHITE PAINT STRIPES. HANDICAP PARKING TO BE 4" SOLID BLUE PAINT STRIPES W/ BARRIER FREE STRIPPING OF 4" SOLID BLUE @ 2' O.C. ON 45° ANGLE.
8. ALL WORK SHALL CONFORM TO THE CURRENT CITY OF TROY STANDARDS AND SPECIFICATIONS.

THE LOCATION OF ALL UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE BASED ON RECORDS PROVIDED BY THE UTILITY OWNERS AND VISIBLE EVIDENCE OBTAINED IN THE FIELD. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED TO THE COMPLETENESS OR ACCURACY THEREOF.

Know what's below.
Call before you dig.

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

STELLAR DEVELOPMENT, LLC
2600 AUBURN ROAD, SUITE 160
AUBURN HILLS, MI 48326
PH: 810-444-7815

PREPARED UNDER DIRECTION:
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MI PE# 47380
STELLAR DEVELOPMENT, LLC

APPLICANT:
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AUBURN HILLS, MI 48326
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COURTYARD BY MARRIOTT

COURTYARD
TROY PLAZA
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

THESE PLANS AND SPECIFICATIONS AND COPIES THEREOF FURNISHED BY S.D. STELLAR DEVELOPMENT, LLC AND ARE NOT TO BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT, WITHOUT THE WRITTEN AUTHORIZATION OF S.D. STELLAR DEVELOPMENT, LLC. VISUAL CONTACT WITH THESE PLANS AND SPECIFICATIONS SHALL CONSTITUTE PRIMA FACIE EVIDENCE OF ACCEPTANCE OF THESE RESTRICTIONS. ANY REUSE WITHOUT WRITTEN VERIFICATION OR ADAPTATION BY S.D. STELLAR DEVELOPMENT, LLC FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT USER'S SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO S.D. STELLAR DEVELOPMENT, LLC. ALL PLANS, DESIGNS, DRAWINGS AND SPECIFICATIONS ARE COPYRIGHTED AND PROPERTY OF S.D. STELLAR DEVELOPMENT, LLC.

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DATE :
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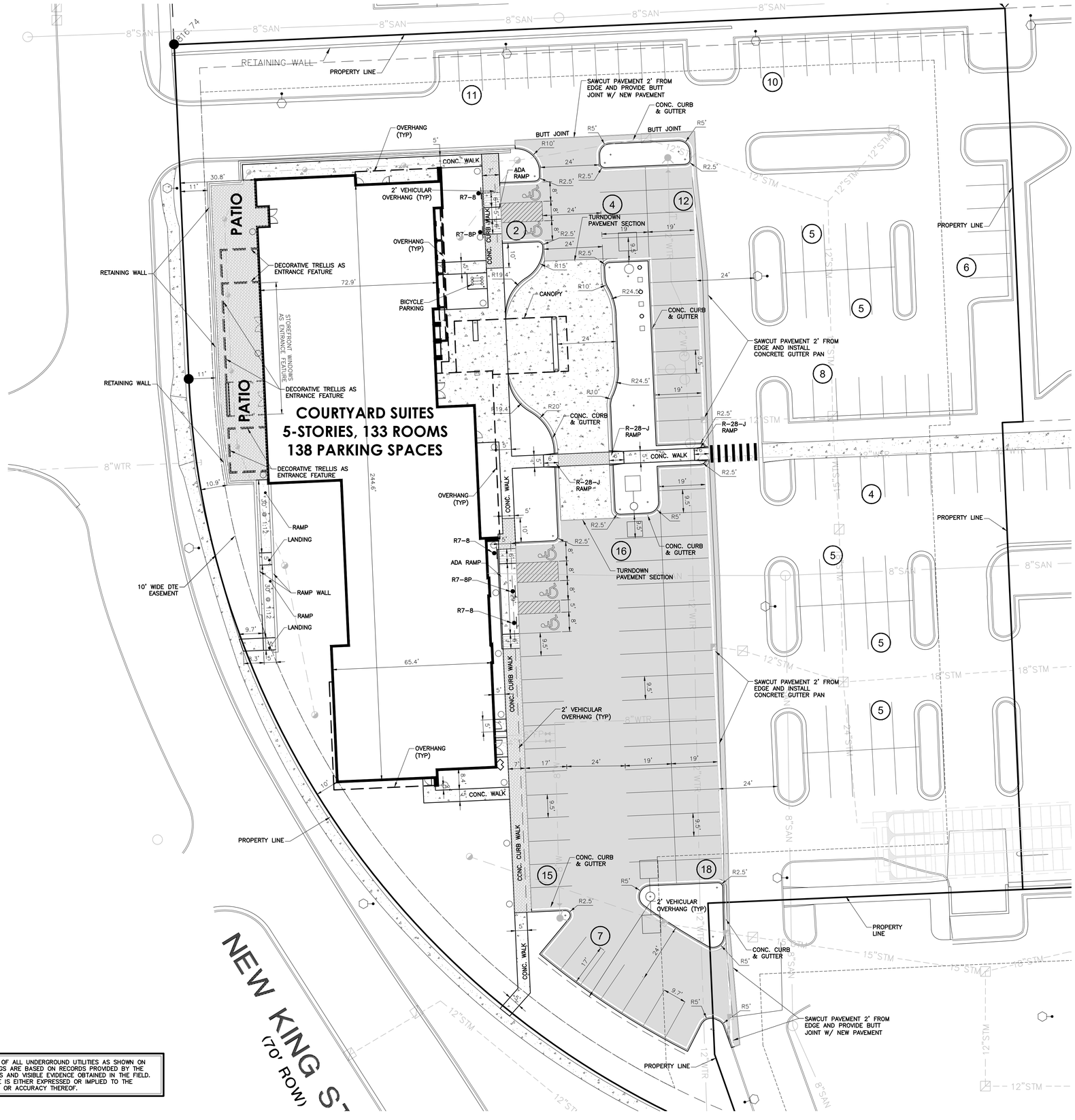
JOB NO :

SHEET TITLE :
OVERALL SITE LAYOUT PLAN

SHEET
C3.0



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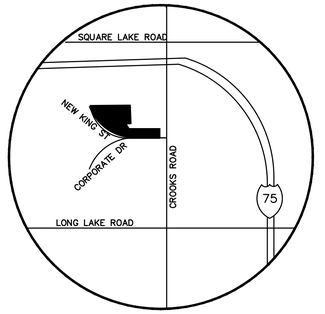

LOCATION MAP

NOT TO SCALE

GENERAL NOTES

1. REFER TO ARCHITECTURAL PLANS TO VERIFY BUILDING DIMENSIONS.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL PERMITS AND POST ALL BONDS PRIOR TO CONSTRUCTION, OR ENSURE THAT ALL REQUIRED PERMITS AND BONDS HAVE BEEN OBTAINED PRIOR TO CONSTRUCTION.
3. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION BY CALLING MISS-DIG AT 1-800-482-7171 AT LEAST 3 WORKING DAYS PRIOR TO EXCAVATION.
4. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH LIKE MATERIAL. THE EXACT LOCATION OF EXISTING UTILITIES SHALL BE LOCATED BY HAND DIGGING.
5. DIMENSIONS ARE TO FACE OF CURB, OUTSIDE FACE OF BUILDING, EDGE OF PAVEMENT, CENTER OF STRUCTURE OR OTHERWISE INDICATED.
6. ALL PAVING MATERIALS AND OPERATIONS SHALL BE IN CONFORMANCE WITH THE CITY OF TROY AND MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION.
7. PARKING STALL SPACES TO BE 4" SOLID WHITE PAINT STRIPES. HANDICAP PARKING TO BE 4" SOLID BLUE PAINT STRIPES W/ BARRIER FREE STRIPPING OF 4" SOLID BLUE @ 2' O.C. ON 45° ANGLE.
8. ALL WORK SHALL CONFORM TO THE CURRENT CITY OF TROY STANDARDS AND SPECIFICATIONS.

PAVEMENT INFORMATION

BITUMINOUS PAVEMENT

CONCRETE PAVEMENT

STAMPED CONC. PAVEMENT / PAVERS

SITE INFORMATION

ZONING:
CONDITIONAL REZONING
OFFICE MIXED USE (OM)
OM ZONING AREA = 67,027 S.F. = 1.54 ACRES

LAND USE:
PROPOSED LAND USE IS COMMERCIAL HOTEL DEVELOPMENT

PARKING DATA:
REQUIRED
1 SPACE PER ROOM + 1 PER EMPLOYEE IN LARGEST SHIFT
ROOMS = 133
EMPLOYEES = 5
REQUIRED = 138

PROVIDED
STANDARD SPACES = 133
HANDICAP SPACES = 5
TOTAL = 138 SPACES

BUILDING AND LANDSCAPE COVERAGE:
PROPERTY = 2.83 ACRES = 123,275 S.F.
BUILDING AREA FOOTPRINT = 16,758 S.F.
BUILDING COVERAGE = 16,758 / 123,275 = 13.6%
BUILDING COVERAGE PERMITTED = 40%

OM ZONING AREA = 67,027 S.F.
BUILDING ZONING COVERAGE = 16,758 / 67,027 = 25.0%
LANDSCAPE AREA = 19,087 S.F.
LANDSCAPE ZONING COVERAGE = 19,087 / 67,027 = 28.5%

TRAFFIC CONTROL SIGN TABLE	
DESCRIPTION	MMUTCD
STOP	R1-1
NO LEFT TURN	R3-2
HANDICAP	R7-8
HANDICAP (VAN)	R7-8P
NO PARKING FIRE LANE	R8-31

ALL TRAFFIC SIGNAGE SHALL COMPLY WITH THE CURRENT MMUTCD STANDARDS

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

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

STELLAR DEVELOPMENT, LLC
2600 AUBURN ROAD, SUITE 160
AUBURN HILLS, MI 48326
PH: 810-444-7815

PREPARED UNDER DIRECTION:
ANDREW ANDRE, P.E.
MI PE# 47380
STELLAR DEVELOPMENT, LLC

APPLICANT:
TROY ELITE HOSPITALITY, LLC
2600 AUBURN ROAD, SUITE 240
AUBURN HILLS, MI 48326
PH 248-419-5550
FX 248-553-4218

COURTYARD
BY MARRIOTT

COURTYARD
TROY PLAZA
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

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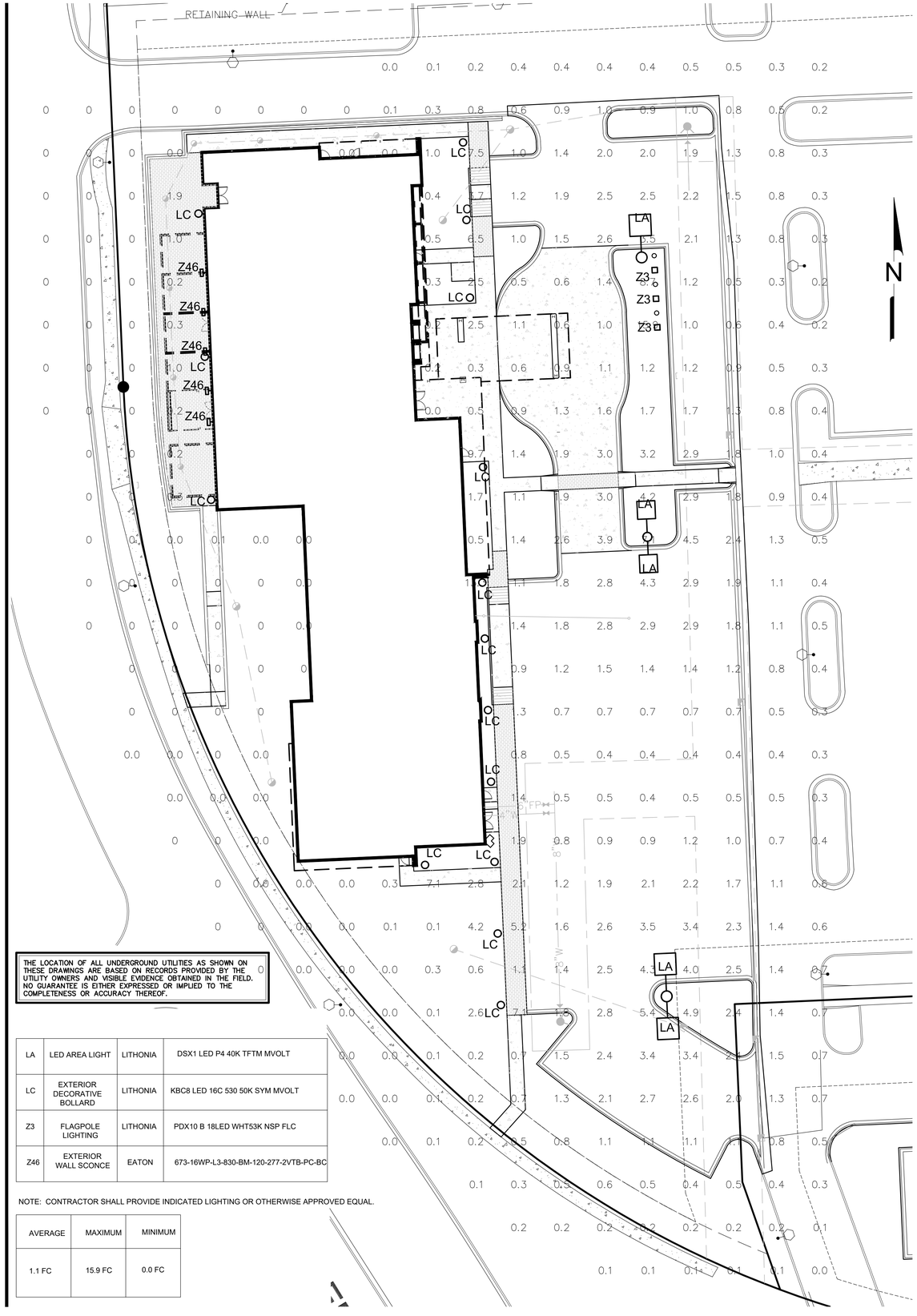
ISSUED FOR	DATE
PRELIM SPA	02/18/19
PRELIM SPA	05/09/19
PRELIM SPA	09/24/19

DATE :
DRAWN : ACA
CHECKED : ACA
SCALE : 1"=20'
JOB NO :

SHEET TITLE :
SITE LAYOUT AND PAVING PLAN

SHEET
C3.1



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LA	LED AREA LIGHT	LITHONIA	DSX1 LED P4 40K TFTM MVOLT
LC	EXTERIOR DECORATIVE BOLLARD	LITHONIA	KBC8 LED 16C 530 50K SYM MVOLT
Z3	FLAGPOLE LIGHTING	LITHONIA	PDX10 B 18LED WHT53K NSP FLC
Z46	EXTERIOR WALL SCONCE	EATON	673-16WP-L3-830-BM-120-277-2VTB-PC-BC

NOTE: CONTRACTOR SHALL PROVIDE INDICATED LIGHTING OR OTHERWISE APPROVED EQUAL.

AVERAGE	MAXIMUM	MINIMUM
1.1 FC	15.9 FC	0.0 FC

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

0' 20' 40' 60'

SCALE: 1" = 20'

PARADOX 10

19W LED

10" Architectural In-Grade

IP67

Suitable For Wet Locations

CATALOG NUMBER

NOTES

TYPE

DESCRIPTION

Hydrel's Paradox Series sealed modular in-grade luminaires are multi-purpose units designed for up lighting architectural and landscape features. These units can be flush mounted into a variety of substrates including concrete or tile, or landscape materials, and are ideal when aperture size or luminaire depth is a priority.

Specifications

L:	18" 457 mm
W:	12" 305 mm
H:	12" 305 mm

ORDERING INFORMATION EXAMPLE: PDX10 B 18LED WHT30K MVOLT NSP FLC 345

Model#	Drive Material#	LED Type#	LED Color#	Voltage#	Light Distribution#
PDX10	SS Stainless Steel BSS* Brushed Stainless Steel B Bronze	18LED 18 Chip LED array	WHT30K 3000K CCT WHT41K 4100K CCT WHT53K 5300K CCT AMBPC Phosphor Converted Amber BLU Blue GRN Green RED Red	MVOLT (120 - 277V)	NSP Narrow Spot MFL Medium Flood FL Wide Flood WFL Wide Flood VWFL* Very Wide Flood (no optics) HSP Horizontal Spot HFL Horizontal Flood

Lens#	Conduit Entries*	Accessories	Options	Listing
FLC Flat Lens Clear FLCAS* Flat Lens Clear, Anti-Slip FLCSR** Flat Lens Frosted, Slip Resistant	345 Two 3/4" NPT Slits (Standard) 25SP Two 25mm Slits	Internal IHL Internal Honeycomb Louver FRF Frosted Filter External RG Decorative Rock Guard	LDIM 0-10V Dimming	IEC* International Electrotechnical Commission

*Required Categories
Notes
1 Not available with Decorative Rock Guard.
2 FRF filter needed with VWFL
3 Meets ADA requirements for coefficient of friction.
4 Only for use in SDHC applications.

HYDREL

9144 Deering Avenue, Second Floor • Chatsworth, CA 91311
Phone: 866.533.9901 • www.hydrel.com

©2009-2017 Acuity Brands Lighting, Inc.
Rev. 03/27/17
PDX10_LED_MONO

Shaper

DESCRIPTION

673-WP Luminous wall source features 6 standard finishes, 2 decorative trim bar options and is ADA compliant.

Catalog #	Type
Project	
Comments	Date
Prepared by	

SPECIFICATION FEATURES

Material
Painted solid aluminum with a 1/8" matte white extruded acrylic panel. Open bottom and enclosed top. Luminous top and bottom for LED

Finishes
ALP (Aluminum Paint)
MW (Matte White)
MB (Matte Black)
GRM (Graphite Metallic)
DP (Dark Platinum)
BM (Bronze Metallic)
CC (Custom Color – Specify)
For Custom Color contact factory for quotation.

LED
18" L3:2000 nominal lumens at max 20W
29" L3:2000 nominal lumens at max 20W
25" L4:2000 nominal lumens at max 29W

Driver
LED system coupled with electrical driver to deliver optimal performance. Electronic drivers are available for 120-277V applications. A 0-10V dimming control is available (Standard) on all models

Standard integral class 2 driver 29W max., 0-10V dimming.

Options
Two Horizontal Trim Bars (2HTB)
Two Vertical Trim Bars (2VTB)
Remote Battery Pack (RBP)
5' Max Distance - Must be Interior Mounted

Compliance
U.L. and C.U.L. listed for wet location. ADA compliant, except with proud trim options.

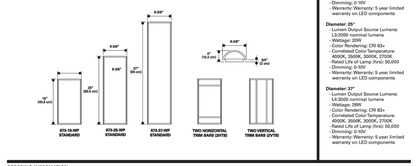
673-WP SERIES

Diameter: 18"
- Lumen Output Source Lumens: L3:2000 nominal lumens
- Wattage: 20W
- Color Rendering: CRI 83+
- Correlated Color Temperature: 4000K, 3500K, 3000K, 2700K
- Rated Life of Lamp (hrs): 50,000
- Dimming: 0-10V
- Warranty: Warranty: 5 year limited warranty on LED components

Diameter: 25"
- Lumen Output Source Lumens: L3:2000 nominal lumens
- Wattage: 20W
- Color Rendering: CRI 83+
- Correlated Color Temperature: 4000K, 3500K, 3000K, 2700K
- Rated Life of Lamp (hrs): 50,000
- Dimming: 0-10V
- Warranty: Warranty: 5 year limited warranty on LED components

Diameter: 33"
- Lumen Output Source Lumens: L4:3000 nominal lumens
- Wattage: 29W
- Color Rendering: CRI 83+
- Correlated Color Temperature: 4000K, 3500K, 3000K, 2700K
- Rated Life of Lamp (hrs): 50,000
- Dimming: 0-10V
- Warranty: Warranty: 5 year limited warranty on LED components

DIMENSIONS



ORDERING INFORMATION
Picture Number: 673-16-WP-L3/827-UNV-ALP

Series	Size	Mounting Type	LED Lamp			LED Voltage	Finish	Options
			16"	25"	33"			
673 = Luminous Half Cylinder	16=16" 25=25" 33=33"	WP=Exterior Wall	L3/827 L3/835 L3/830 L3/840	L3/827 L3/835 L3/830 L3/840	L4/827 L4/835 L4/830 L4/840	UNV (120-277V)	ALP=Aluminum Paint MW=Matte White MB=Matte Black DP=Dark Platinum GRM=Graphite Metallic BM=Bronze Metallic CC=Custom Color - Contact factory for quotation	2VTB=Two vertical Trim Bars 2HTB=Two Horizontal Trim Bars RBP= Remote Battery Pack (5' Max Distance) Battery Must Be Remote Mounted In An Interior Location

673-WP SERIES EXTERIOR WALL

EATON
Powering Business Worldwide

Eaton
1000 E. Colfax Avenue
Aurora, CO 80031
1-800-553-7715
www.eaton.com/lighting

Specifications are subject to change and to change without notice.

P552908EN
12/13/16 Pg 1 of Pg 1

D-Series Size 1

LED Area Luminaire

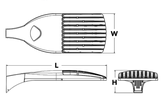
d*series

Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements

Specifications

EPA: 1.01 ft² (0.09 m²)
Length: 33" (83.8 cm)
Width: 13" (33.0 cm)
Height: 7-1/2" (19.1 cm)
Weight (max): 27 lbs (12.2 kg)



A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is A+ Certified when ordered with DTL® controls marked by a shaded background. DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability!
- This luminaire is part of an A+ Certified solution for ROAM® or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a shaded background.

To learn more about A+, visit www.acuitybrands.com/aplus.

1. See ordering tree for details.
2. A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire. Sold Separately: Link to Roam; Link to DTL DLL

A+ Capable options indicated by this color background.

Ordering Information

EXAMPLE: DSX1 LED P7 40K T3M MVOLT SPA DDBXD

DSX1LED

Series	LEDs	Color temperature	Distribution	Voltage	Mounting
DSX1 LED	Forward optics P1 P4 P7 P2 P5 P8 P3 P6 P9 Rotated optics P1F P7F P2F P8F P3F P9F	30K 3000 K 40K 4000 K 50K 5000 K AMBPC Amber phosphor converted	T1S Type I short T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium T5VS Type V very short T5S Type V short T5M Type V medium T5W Type V wide BLC Backlight control[1] LCCO Left corner cutoff[1] RCCO Right corner cutoff[1]	MVOLT[2] 120[3] 208[3] 240[3] 277[3] 347[3] 480[3,4]	Shipped included SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor[5] RPUMBA Round pole universal mounting adaptor[5] Shipped separately KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish)[5]

Control options		Other options	Finish (required)
Shipped installed NLTAIR2 nLight AIR generation 2 enabled[6] PER NEMA twist-lock receptacle only (controls ordered separate)[7,8] PER5 Five-wire receptacle only (controls ordered separate)[7,8] PE7T Seven-wire receptacle only (controls ordered separate)[7,8] DMG 0-10V dimming wires] out back of housing for external control (leads exit fixture) DS Dual switching[7,8,9] PIR Bi-level, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc[7,8,9,10] PIRH Bi-level, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 5fc[7,8,9,10] PIRHN Network, Bi-level motion/ambient sensor[6] PIR1FCSV Bi-level, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc[7,8,9,10] PIR1FC3V Bi-level, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc, 3V[7,8,9,10] BL30 Bi-level switched dimming, 30% [7,8,9] BL50 Bi-level switched dimming, 50% [7,8,9] PNMTD20 Part night, dim till dawn[7,8] PNMT5D3 Part night, dim 5 hrs[7,8] PNMT5D2 Part night, dim 4 hrs[7,8] PNMT7D5 Part night, dim 7 hrs[7,8] FAO Field adjustable output[8]	Shipped installed HS House-side shield[11] SF Single fuse (120, 277, 347V)[3] DF Double fuse (208, 240, 480V)[3] L90 Left rotated optics[7] R90 Right rotated optics[7] Shipped separately BS Bird spikes[12] EGS External glare shield[12]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white Stripping[7] SDDBI Dark bronze SDWHI White SDBL Black SDNA Natural aluminum SDSG Sensis green SDBR Bright red SDBLUE Dark blue SDYLW Yellow

Accessories

(Ordered and shipped separately)

MRAB U Anchor bolts for KBC8 LED[13]

NOTES
1 Only available in the 13C, ASY version.
2 Only available in the 16C, SYM version.
3 Only available with HID AMBLW version.
4 Not available with ELCW.
5 Use KMA8 to order one any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options), or photocontrol (PE option).
6 Not available with 347V. Not available with fusing. Not available with HID AMBLW.
7 Single fuse (SF) requires 120, 277, or 347 voltage option. Double fuse (DF) requires 208 or 240 voltage option.
8 NRAB U not available with LHMA option.
9 Striping is available only in the colors listed.

LITHONIA LIGHTING

One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • www.lithonia.com
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DSX1-LED
Rev. 03/21/18
Page 1 of 7

KBC8 LED

LED Specification Bollard

Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements

Specifications

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

Introduction

The KBC8 Bollard is a stylish, fully integrated LED solution for walkways. It features a sleek, modern design and is carefully engineered to provide long-lasting, energy-efficient lighting with a variety of optical and control options for customized performance.

With an expected service life of over 20 years of nighttime use and up to 70% in energy savings over comparable 100W metal halide luminaires, the KBC8 Bollard is a reliable, low-maintenance lighting solution that produces sites that are exceptionally illuminated.

Ordering Information

EXAMPLE: KBC8 LED 16C 700 40K SYM MVOLT DDBXD

KBC8 LED

Series	LEDs	Drive current	Color temperature	Bird deflectors	Voltage	Control options	Other options	Finish (required)	
KBC8 LED	Asymmetric 13C 13 LEDs Symmetric 16C 16 LEDs	350 350 mA 450 450 mA[1] 530 530 mA 700 700 mA	30K 3000 K 40K 4000 K 50K 5000 K AMBPC Amber phosphor converted AMBLW Amber limited wavelength[2]	ASY Asymmetric SYM Symmetric	MVOLT[3] 120[4] 208[4] 240[4] 277[4] 347[4]	PE Photoelectric, button type DMG 0-10V dimming driver (no controls) ELCW Emergency battery backup[5]	Shipped installed SF Single fuse (120, 277, 347V)[4] DF Double fuse (208, 240, 480V)[4] HS24 24" overall height HS30 30" overall height HS36 36" overall height FG Ground-fault friction outlet LHA8 Without anchor bolts (1 hole base) LHBA 4 bolt wrench base without anchor bolts[6]	DWHXD White DNAXD Natural aluminum DDBXD Dark bronze DBLXD Black DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white	Stripping[7] SDDBI Dark bronze SDWHI White SDBL Black SDNA Natural aluminum SDSG Sensis green SDBR Bright red SDBLUE Dark blue SDYLW Yellow

NOTES
1 Only available in the 16C, ASY version.
2 Only available with HID AMBLW version.
3 Not available with ELCW.
4 Only available with HID AMBLW version.
5 Use KMA8 to order one any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options), or photocontrol (PE option).
6 Not available with 347V. Not available with fusing. Not available with HID AMBLW.
7 Single fuse (SF) requires 120, 277, or 347 voltage option. Double fuse (DF) requires 208 or 240 voltage option.
8 NRAB U not available with LHMA option.
9 Striping is available only in the colors listed.

LITHONIA LIGHTING

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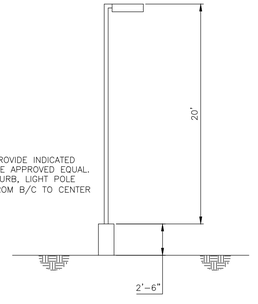
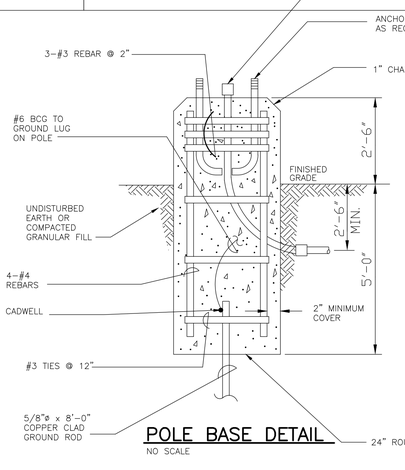
NOTE:
1. CONTRACTOR SHALL PROVIDE INDICATED LIGHTING OR OTHERWISE APPROVED EQUAL.
2. WHEN ADJACENT TO CURB, LIGHT POLE BASES ARE 3'-FEET FROM B/C TO CENTER OF BASE.



LIGHT POLE AND LAMP DETAIL

NO SCALE



POLE BASE DETAIL

NO SCALE

STELLAR DEVELOPMENT, LLC
2600 AUBURN ROAD, SUITE 160
AUBURN HILLS, MI 48326
PH: 810-444-7815

PREPARED UNDER DIRECTION:
ANDREW ANDRE, P.E.
MI PE# 47380
STELLAR DEVELOPMENT, LLC

APPLICANT:
TROY ELITE HOSPITALITY, LLC
2600 AUBURN ROAD, SUITE 240
AUBURN HILLS, MI 48326
PH 248-419-5550
FX 248-553-4218

COURTYARD BY MARRIOTT

COURTYARD
TROY PLAZA
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

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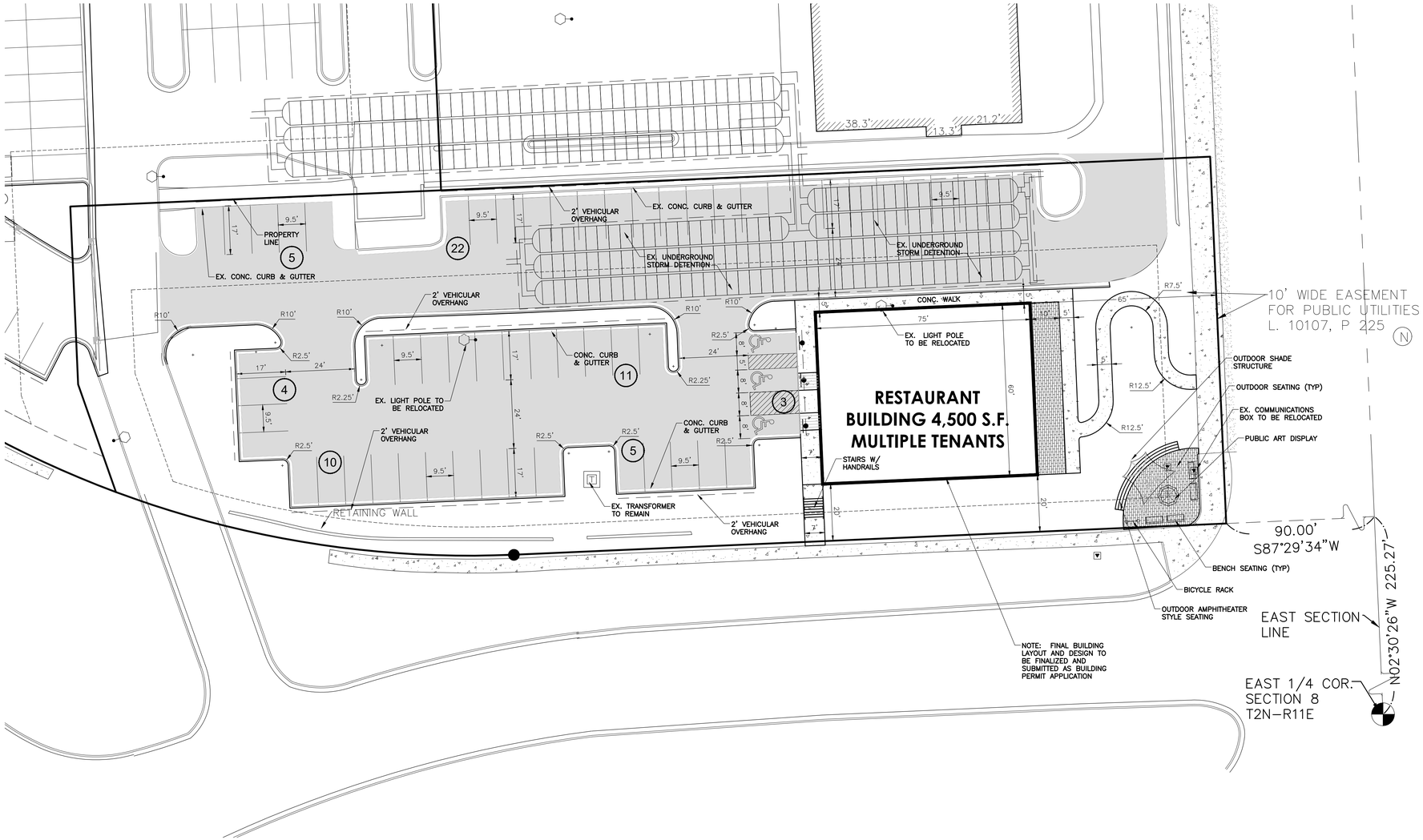
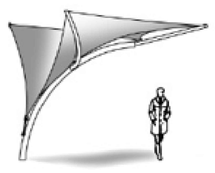
ISSUED FOR	DATE
PRELIM SPA	02/18/19
PRELIM SPA	05/09/19
PRELIM SPA	09/24/19

DATE :
DRAWN : ACA
CHECKED : ACA
SCALE : 1"=20'
JOB NO :

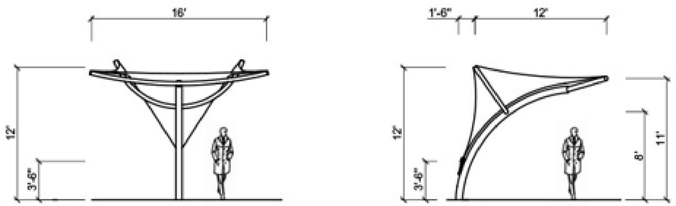
SHEET TITLE :
SITE PHOTOMETRIC PLAN

SHEET
C3.2





SMALL TORNADO®



SHADE STRUCTURE DETAIL
NO SCALE

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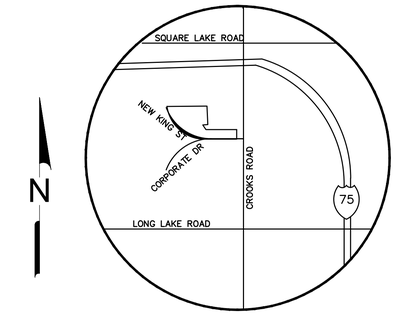

LOCATION MAP
NOT TO SCALE

GENERAL NOTES

1. REFER TO ARCHITECTURAL PLANS TO VERIFY BUILDING DIMENSIONS.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL PERMITS AND POST ALL BONDS PRIOR TO CONSTRUCTION, OR ENSURE THAT ALL REQUIRED PERMITS AND BONDS HAVE BEEN OBTAINED PRIOR TO CONSTRUCTION.
3. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION BY CALLING MISS-DIG AT 1-800-482-7171 AT LEAST 3 WORKING DAYS PRIOR TO EXCAVATION.
4. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH LIKE MATERIAL. THE EXACT LOCATION OF EXISTING UTILITIES SHALL BE LOCATED BY HAND DIGGING.
5. DIMENSIONS ARE TO FACE OF CURB, OUTSIDE FACE OF BUILDING, EDGE OF PAVEMENT, CENTER OF STRUCTURE OR OTHERWISE INDICATED.
6. ALL PAVING MATERIALS AND OPERATIONS SHALL BE IN CONFORMANCE WITH THE CITY OF TROY AND MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION.
7. PARKING STALL SPACES TO BE 4" SOLID WHITE PAINT STRIPES. HANDICAP PARKING TO BE 4" SOLID BLUE PAINT STRIPES W/ BARRIER FREE STRIPPING OF 4" SOLID BLUE @ 2' O.C. ON 45° ANGLE.
8. ALL WORK SHALL CONFORM TO THE CURRENT CITY OF TROY STANDARDS AND SPECIFICATIONS.

PAVEMENT INFORMATION

- BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- STAMPED CONC. PAVEMENT / PAVERS

NOTE:
PLAN IS FOR CONCEPTUAL PURPOSES ONLY. THE FINAL BUILDING DESIGN HAS NOT BEEN COMPLETED AND WILL REQUIRE MODIFICATIONS TO THE SITE PLAN.

Know what's below. Call before you dig.

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

STELLAR DEVELOPMENT, LLC
2600 AUBURN ROAD, SUITE 160
AUBURN HILLS, MI 48326
PH: 810-444-7815

PREPARED UNDER DIRECTION:
ANDREW ANDRE, P.E.
MI PE# 47380
STELLAR DEVELOPMENT, LLC

APPLICANT:
TROY ELITE HOSPITALITY, LLC
2600 AUBURN ROAD, SUITE 240
AUBURN HILLS, MI 48326
PH 248-419-5550
FX 248-553-4218

COURTYARD BY MARRIOTT

COURTYARD
TROY PLAZA
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

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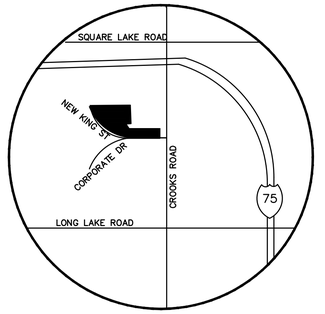
ISSUED FOR	DATE
CITY REVIEW	11/05/19

DATE :
DRAWN : ACA
CHECKED : ACA
SCALE : 1"=20'
JOB NO :

SHEET TITLE :
CONCEPTUAL RESTAURANT AREA PLAN

SHEET
C3.3



LOCATION MAP

NOT TO SCALE

BENCHMARKS
B.M. #1 - ARROW ON HYD. ON N. SIDE OF CORPORATE DR. ON SOUTH SIDE OF OF PROPERTY ELEV. 804.32 NAVD 88
B.M. #2 -SET BM ON FND IRON ON NW COR OF PROPERTY ON EAST SIDE OF KING ROAD ELEV. 816.74 NAVD 88

GRADING NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF TROY AND MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS.
2. SPOT ELEVATIONS INDICATE TOP OF PAVEMENT UNLESS OTHERWISE INDICATED:
   TC = TOP OF CURB
   TP = TOP OF PAVEMENT
3. CURB AND GUTTER LEGEND
   - (S) = STANDARD CURB AND GUTTER
   - (R) = REVERSE SLOPE CURB AND GUTTER
   - (T) = 5' TRANSITION FROM STANDARD TO REVERSE
   - (E) = CURB END TRANSITION
   - (G) = GUTTER PAN
4. REFER TO LANDSCAPE PLAN FOR LANDSCAPE TREATMENT AND PLACEMENT.

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COURTYARD
BY MARRIOTT

COURTYARD
TROY PLAZA
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

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PRELIM SPA	05/09/19
PRELIM SPA	09/24/19

DATE :
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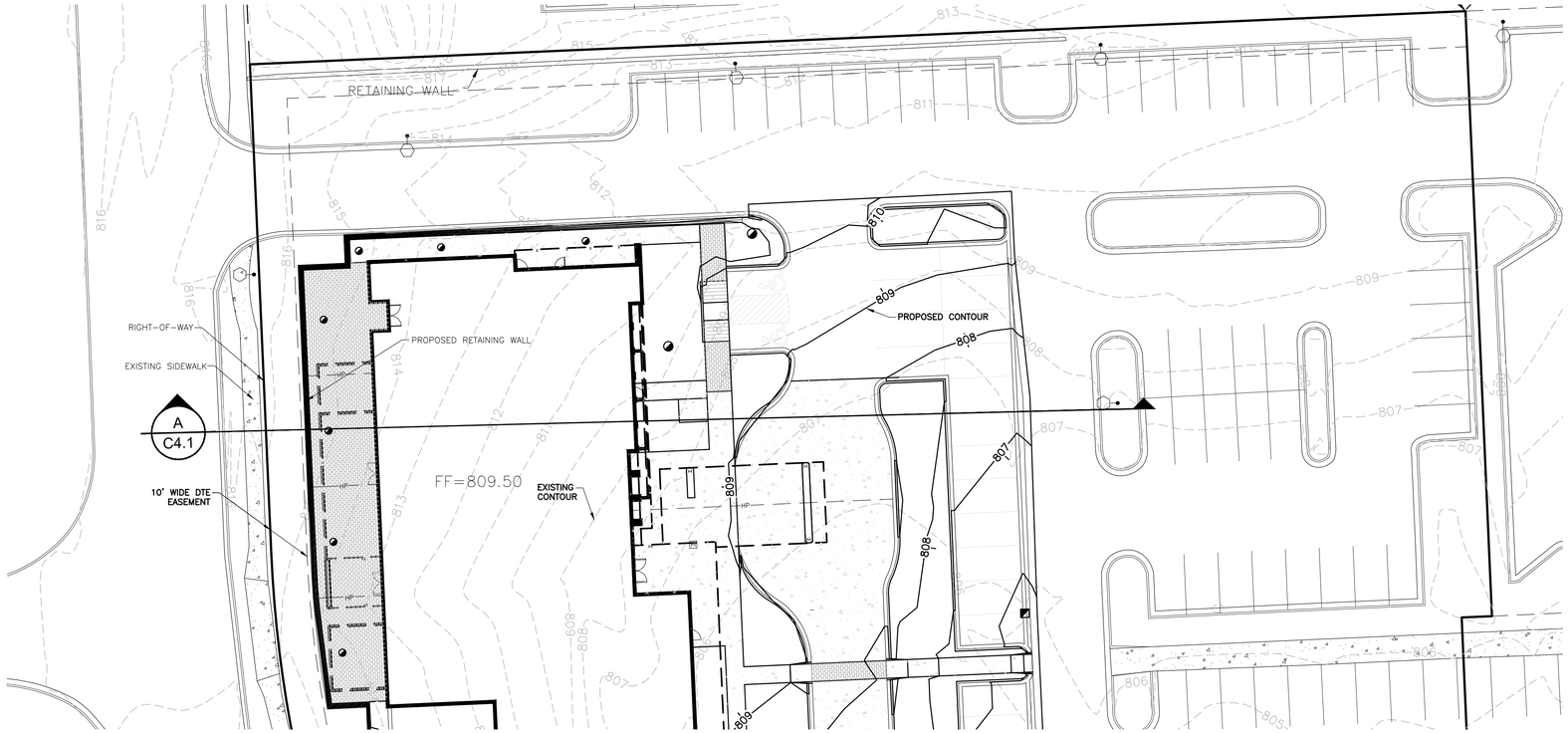
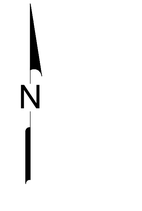
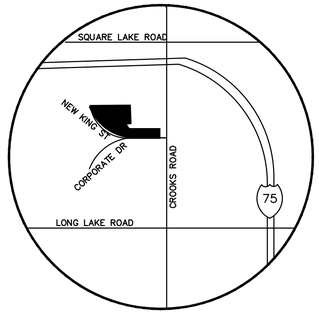
SCALE : 1"=20'
JOB NO :

SHEET TITLE :
GRADING PLAN

SHEET
C4.0







LOCATION MAP
NOT TO SCALE

BENCHMARKS

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ELEV. 816.74 NAVD 88

811
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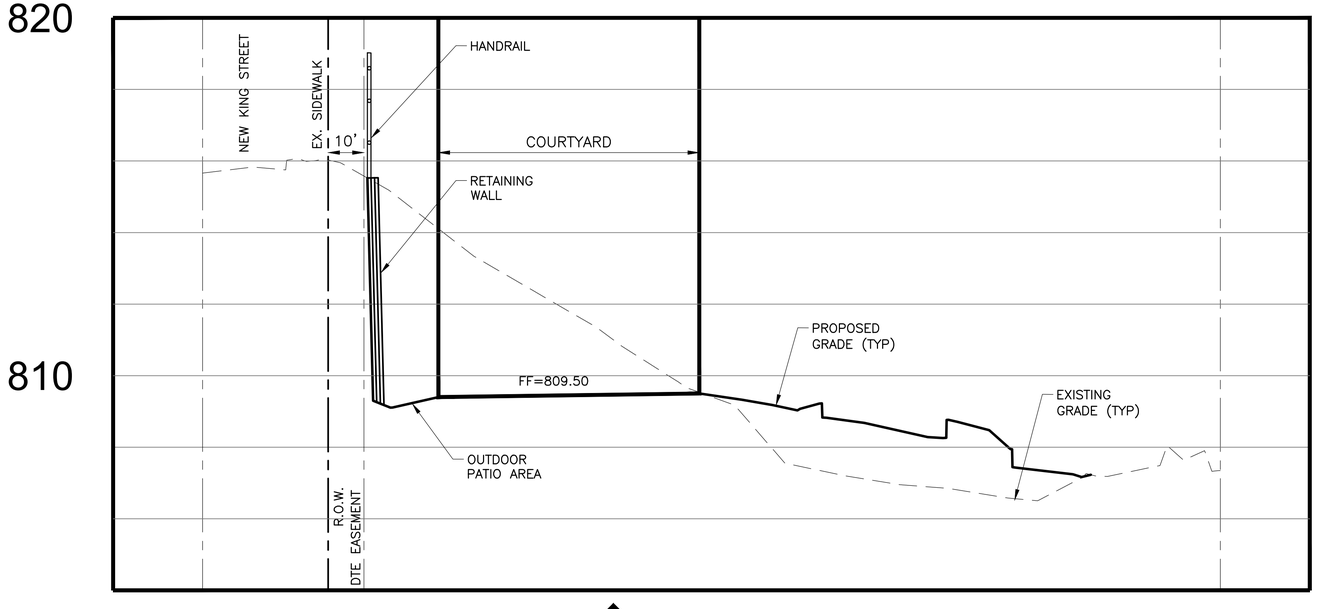
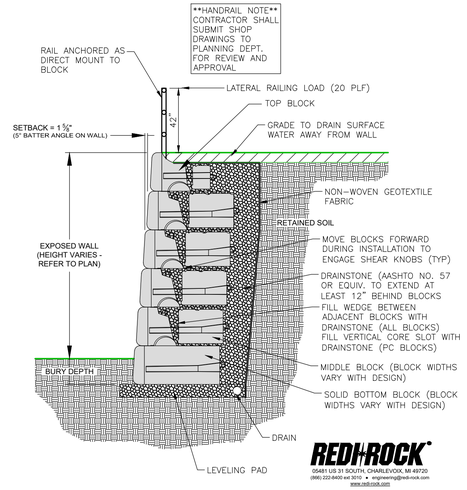


A
C4.1
SECTION
SCALE: 1"=20' HOR / 1"=2' VERT



NOTES:
1. RETAINING WALL INSTALLER SHALL PROVIDE ENGINEERING CALCULATIONS AND PLANS FOR SHOP DRAWING REVIEW PRIOR TO INSTALLATION.
2. WHEN SITE CONDITIONS REQUIRE, WRAP DRAINAGE TILE IN 3/4" AGGREGATE AND FILTER FABRIC WITH DRAINAGE COMPOSITE OR AGGREGATE BACK DRAIN SYSTEM

NOTE: NEAR VERTICAL SETBACK WALL

RETAINING WALL DETAIL
NO SCALE

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PH: 810-444-7815

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MI PE# 47380
STELLAR DEVELOPMENT, LLC

APPLICANT:
TROY ELITE HOSPITALITY, LLC
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AUBURN HILLS, MI 48326
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COURTYARD
BY MARRIOTT

COURTYARD
TROY PLAZA
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

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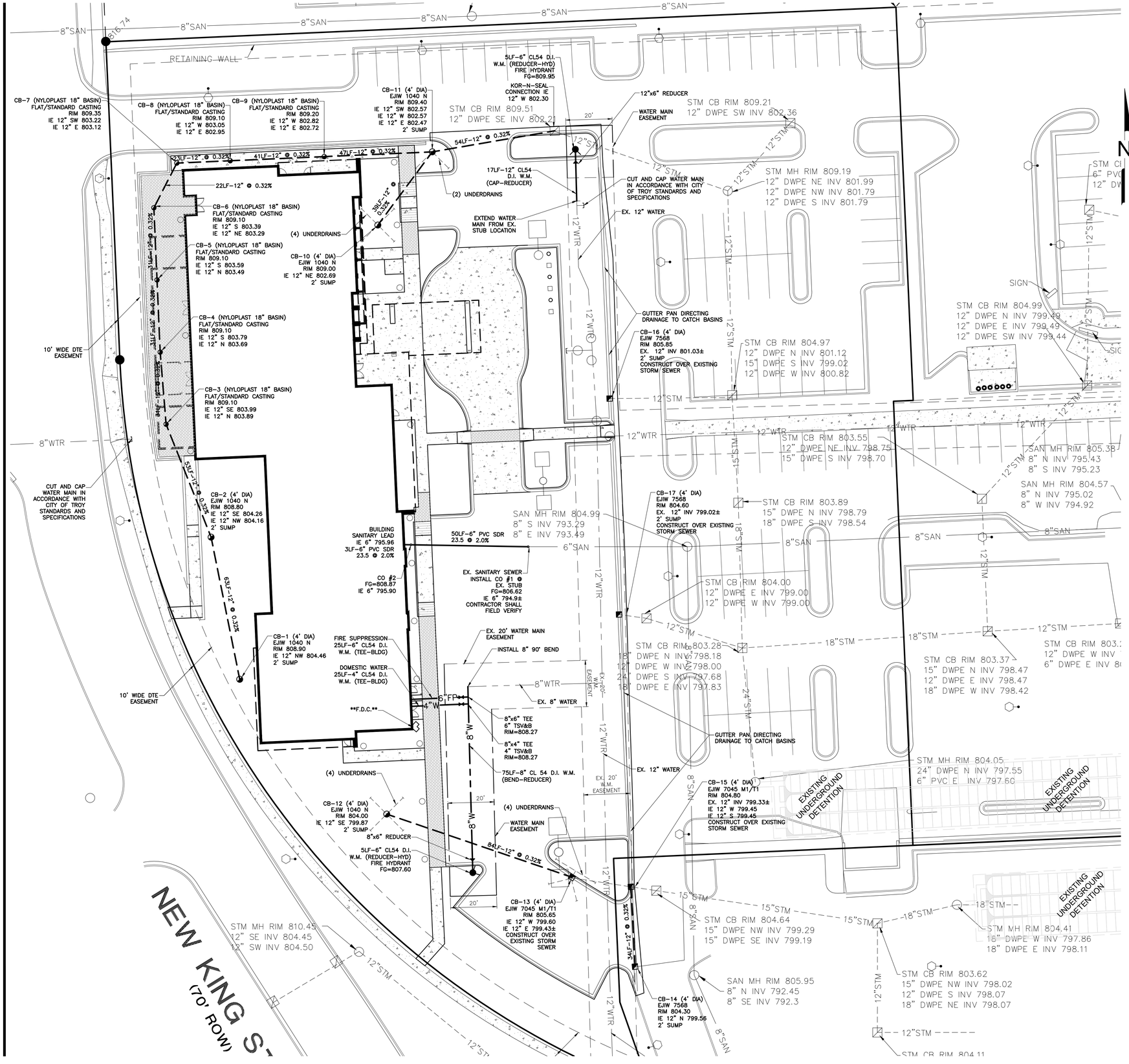
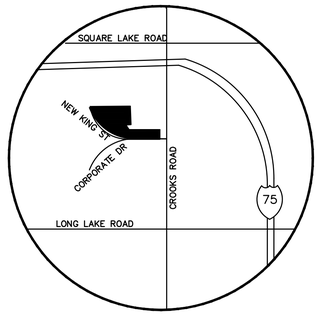
GRADING SECTION

SHEET
C4.1





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WATER USE CALCULATIONS

USAGE	AREA		UNIT FACTOR	R.E.U.
Hotel	133	rooms	0.38 units per room	50.54
				50.54
			Rounded=	*51.00*

POPULATION EQUIVALENT = 3.5 Persons per R.E.U.
POPULATION = 178.5 Persons
AVERAGE FLOW RATE = 90 Gallons per capita per day
AVERAGE FLOW = 16,065 GPD = 0.016065 MGD
PEAK FACTOR = 18 + SQRT(P) / 4 + SQRT (P) = 4.17
TOTAL DESIGN MAXIMUM FLOW = 66,921 GPD = 0.06692 MGD

SANITARY USE CALCULATIONS

USAGE	AREA		UNIT FACTOR	R.E.U.
Hotel	133	rooms	0.38 units per room	50.54
				50.54
			Rounded=	*51.00*

POPULATION EQUIVALENT = 3.5 Persons per R.E.U.
POPULATION = 178.5 Persons
AVERAGE FLOW RATE = 90 Gallons per capita per day
AVERAGE FLOW = 16,065 GPD = 0.024 CFS
PEAK FACTOR = 18 + SQRT(P) / 4 + SQRT (P) = 4.17
PEAK FLOW = 66,920.94 GPD = 0.100 CFS 6"@2.00%(cfs) = 1.03

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COURTYARD BY MARRIOTT

COURTYARD
TROY PLAZA
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

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PRELIM SPA	05/09/19
PRELIM SPA	09/24/19

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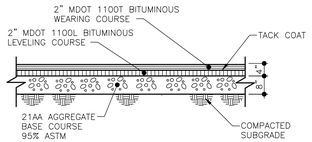
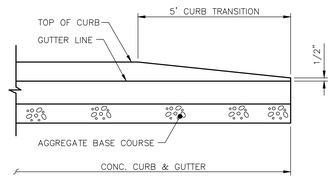
CHECKED : ACA
SCALE : 1"=20'
JOB NO :
SHEET TITLE :
UTILITY PLAN

SHEET
C5.0

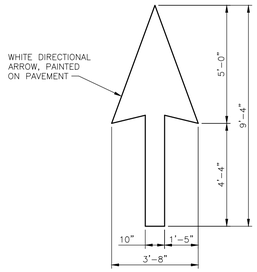


NOTE: A GEOTECHNICAL REPORT WITH PAVEMENT DESIGN RECOMMENDATIONS WAS NOT AVAILABLE, THEREFORE THE PAVEMENT SECTION REPRESENTS THE MINIMUM STANDARDS RECOMMENDED.

BITUMINOUS PAVEMENT
NO SCALE



TYPICAL CURB END TRANSITION
NO SCALE



STRAIGHT DIRECTIONAL ARROW
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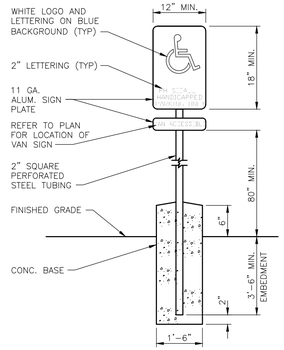
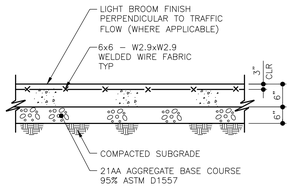


TYPICAL HANDICAP SIGN
NO SCALE



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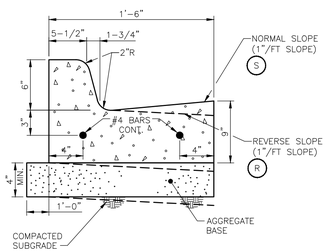
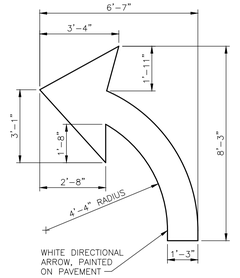
CONCRETE SHALL BE 3500 PSI

CONCRETE PAVEMENT
NO SCALE



CONC. CURB & GUTTER
NO SCALE



TURN DIRECTIONAL ARROW
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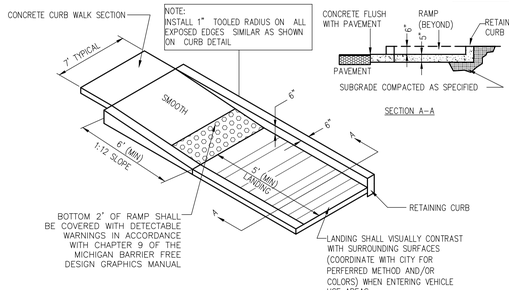
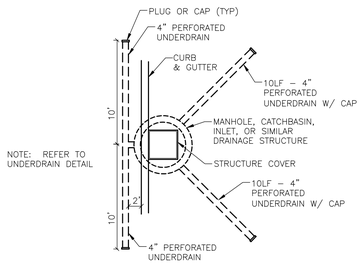
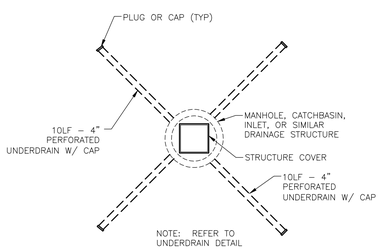


BARRIER FREE RAMP
NO SCALE



NOTE: REFER TO UNDERDRAIN DETAIL

TYP CURB CATCH BASIN UNDERDRAIN
NO SCALE



TYP CURB CATCH BASIN UNDERDRAIN
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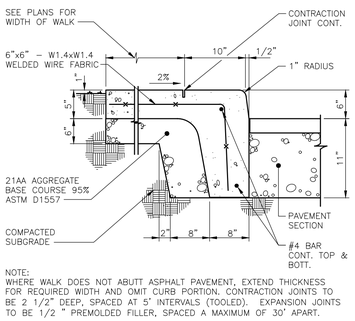
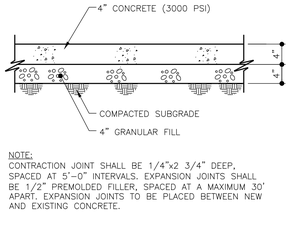


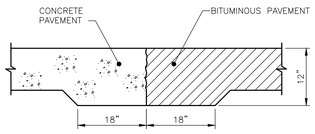
NOTE:
WHERE WALK DOES NOT ABUTT ASPHALT PAVEMENT, EXTEND THICKNESS FOR REQUIRED WIDTH AND OMIT CURB PORTION. CONTRACTION JOINTS TO BE 2 1/2" DEEP, SPACED AT 5' INTERVALS (TOOLED). EXPANSION JOINTS TO BE 1/2 " PREMOLDED FILLER, SPACED A MAXIMUM OF 30' APART.

CONCRETE CURB WALK
NO SCALE

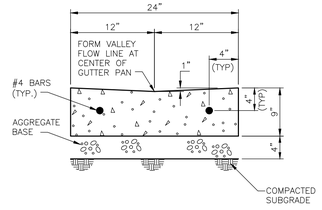


NOTE:
CONTRACTION JOINT SHALL BE 1/4"x2 3/4" DEEP, SPACED AT 5'-0" INTERVALS. EXPANSION JOINTS SHALL BE 1/2" PREMOLDED FILLER, SPACED AT A MAXIMUM 30' APART. EXPANSION JOINTS TO BE PLACED BETWEEN NEW AND EXISTING CONCRETE.

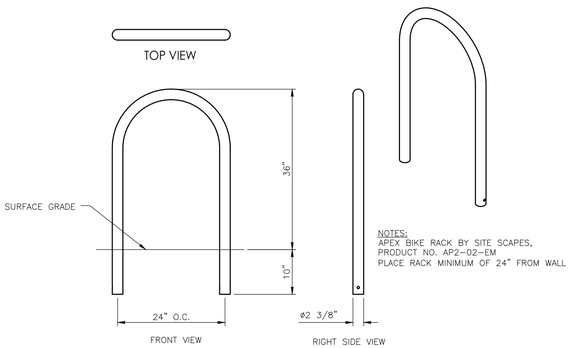
CONCRETE WALK
NO SCALE



TURNDOWN PAVEMENT SECTION
NO SCALE



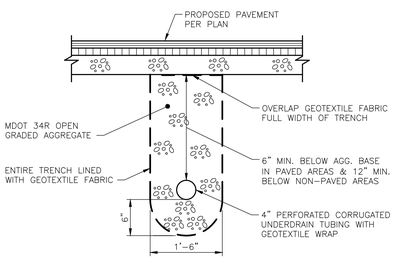
GUTTER PAN
NO SCALE



NOTES:
APEX BIKE RACK BY SITE SCAPES, PRODUCT NO. AP2-02-EM
PLACE RACK MINIMUM OF 24" FROM WALL

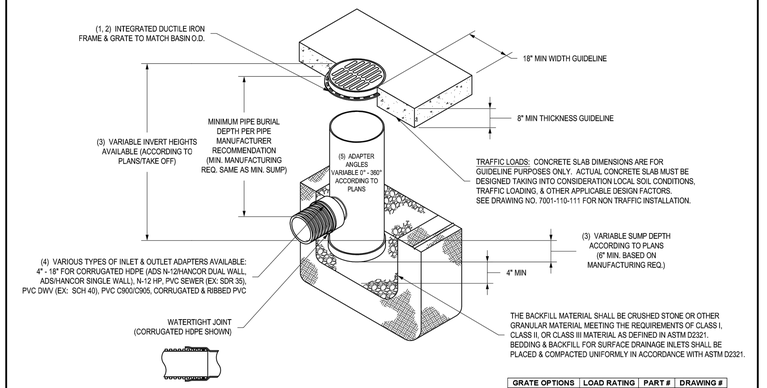
BIKE RACK
NO SCALE

MATERIAL LIST:
1. TUBING– ø 2 3/8"x.154" WALL STEEL TUBING



UNDERDRAIN
NO SCALE

NYLOPLAST 18" DRAIN BASIN: 2818AG _ _ X



GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN	MEETS H-10	1899CGP	7001-110-212
STANDARD	MEETS H-20	1899CGS	7001-110-213
SOLID COVER	MEETS H-20	1899CGC	7001-110-214
DOME	N/A	1899CGD	7001-110-215
DROP IN GRATE	LIGHT DUTY	1801DI	7001-110-074

1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-60-05.
2 - FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-005.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER.
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.

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DRAWN BY	EBC	MATERIAL	
DATE	04-03-06		
REVISED BY	NMH	PROJECT NO./NAME	
DATE	03-14-16		
DWG SIZE	A	SCALE 1:30	SHEET 1 OF 1

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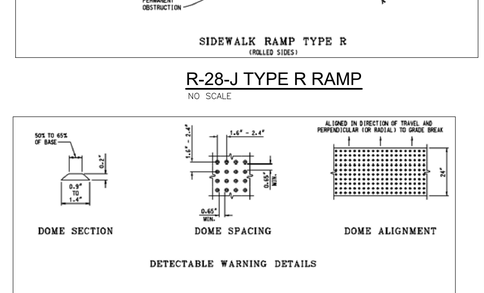
TITLE
18 IN DRAIN BASIN QUICK SPEC INSTALLATION DETAIL

DWG NO. 7001-110-191 REV E

* MAXIMUM TURNING SPACE SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.
** MAXIMUM RAMP CROSS SLOPE IS 2.0%. RUNNING SLOPE 5% – 7% (8.3% MAXIMUM). SEE NOTES.



SIDEWALK RAMP TYPE R
(ROLLED SIDES)

R-28-J TYPE R RAMP
NO SCALE

DETECTABLE WARNING DETAILS

NOTES:

DETAILS SPECIFIED ON THIS PLAN APPLY TO ALL CONSTRUCTION, RECONSTRUCTION, OR ALTERATION OF STREETS, CURBS, OR SIDEWALKS IN THE PUBLIC RIGHT OF WAY.

SIDEWALK RAMPS ARE TO BE LOCATED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

RAMPS SHALL BE PROVIDED AT ALL CORNERS OF AN INTERSECTION WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB. RAMPS SHALL ALSO BE PROVIDED AT MARKED AND/OR SIGNALIZED MID-BLOCK CROSSINGS.

SURFACE TEXTURE OF THE RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING, TRANSVERSE TO THE RUNNING SLOPE.

SIDEWALK SHALL BE RAMPED WHERE THE DRIVEWAY CURB IS EXTENDED ACROSS THE WALK.

CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP, WHERE CONDITIONS PERMIT, IT IS DESIRABLE THAT THE SLOPE OF THE RAMP BE IN ONLY ONE DIRECTION, PARALLEL TO THE DIRECTION OF TRAVEL.

RAMP WIDTH SHALL BE INCREASED, IF NECESSARY, TO ACCOMMODATE SIDEWALK SNOW REMOVAL EQUIPMENT NORMALLY USED BY THE MUNICIPALITY.

PROVIDE TURNING SPACES WHERE PEDESTRIAN TURNING MOVEMENTS ARE REQUIRED.

WHEN 5' MINIMUM WIDTHS ARE NOT FEASIBLE, RAMP WIDTH MAY BE REDUCED TO NOT LESS THAN 4' AND TURNING SPACES TO NOT LESS THAN 4' x 4'.

DETECTABLE WARNING SURFACE COVERAGE IS 24" MINIMUM IN THE DIRECTION OF RAMP/PATH TRAVEL AND THE FULL WIDTH OF THE RAMP/PATH OPENING EXCLUDING CURVED OR FLARED CURB TRANSITION AREAS. A BORDER OFFSET NOT GREATER THAN 2" MEASURED ALONG THE EDGES OF THE DETECTABLE WARNING IS ALLOWABLE. FOR RADIAL CURB THE OFFSET IS MEASURED FROM THE ENDS OF THE RADIUS.

FOR NEW ROADWAY CONSTRUCTION, THE RAMP CROSS SLOPE MAY NOT EXCEED 2.0%. FOR ALTERATIONS TO EXISTING ROADWAYS, THE CROSS SLOPE MAY BE TRANSITIONED TO MEET AN EXISTING ROADWAY GRADE. THE CROSS SLOPE TRANSITION SHALL BE APPLIED UNIFORMLY OVER THE FULL LENGTH OF THE RAMP.

THE MAXIMUM RUNNING SLOPE OF 8.3% IS RELATIVE TO A FLAT (0%) REFERENCE. HOWEVER, IT SHALL NOT REQUIRE ANY RAMP OR SERIES OF RAMPS TO EXCEED 15 FEET IN LENGTH.

DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH RAMPS. THE LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER THE LOCATION OF THE DRAINAGE STRUCTURE. WHERE EXISTING DRAINAGE STRUCTURES ARE LOCATED IN THE RAMP PATH OF TRAVEL, USE A MANUFACTURER'S ADA COMPLIANT GRATE. OPENINGS SHALL NOT BE GREATER THAN ½". ELONGATED OPENINGS SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

TRANSITION THE GUTTER PAN CROSS SECTION SUCH THAT THE COUNTER SLOPE IN THE DIRECTION OF RAMP TRAVEL IS NOT GREATER THAN 5.0%. MAINTAIN THE NORMAL GUTTER PAN CROSS SECTION ACROSS DRAINAGE STRUCTURES.

THE TOP OF THE JOINT FILLER FOR ALL RAMP TYPES SHALL BE FLUSH WITH THE ADJACENT CONCRETE.

CROSSWALK AND STOP LINE MARKINGS, IF USED, SHALL BE SO LOCATED AS TO STOP TRAFFIC SHORT OF RAMP CROSSINGS. SPECIFIC DETAILS FOR MARKING APPLICATIONS ARE GIVEN IN THE "MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES".

FLARED SIDES WITH A SLOPE OF 10% MAXIMUM, MEASURED ALONG THE ROADSIDE CURB LINE, SHALL BE PROVIDED WHERE AN UNOBSTRUCTED CIRCULATION PATH LATERALLY CROSSES THE SIDEWALK RAMP. FLARED SIDES ARE NOT REQUIRED WHERE THE RAMP IS BORDERED BY LANDSCAPING, UNPAVED SURFACE OR PERMANENT FIXED OBJECTS. WHERE THEY ARE NOT REQUIRED, FLARED SIDES CAN BE CONSIDERED IN ORDER TO AVOID SHARP CURB RETURNS AT RAMP OPENINGS.

DETECTABLE WARNING PLATES MUST BE INSTALLED USING FABRICATED OR FIELD CUT UNITS CAST AND/OR ANCHORED IN THE PAVEMENT TO RESIST SHIFTING OR WEAVING.

DETECTABLE WARNING
NO SCALE

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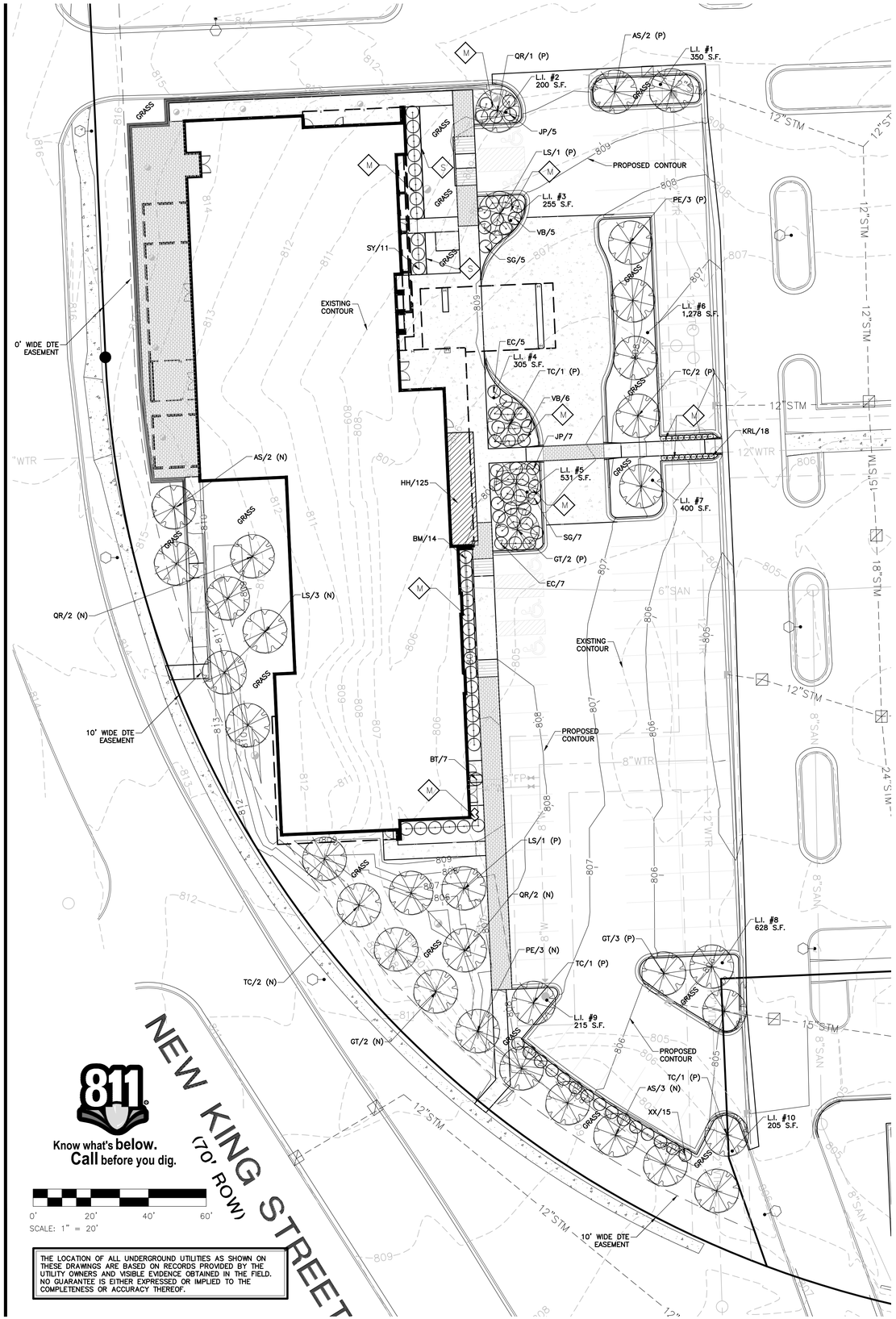
COURTYARD BY MARRIOTT

COURTYARD
TROY PLAZA
CITY OF TROY, OAKLAND COUNTY, MICHIGAN

ISSUED FOR	DATE
PRELIM SPA	02/18/19
PRELIM SPA	05/09/19
PRELIM SPA	09/24/19

DATE :
DRAWN : ACA
CHECKED : ACA
SCALE : NTS
JOB NO :
SHEET TITLE :
SITE DETAILS

SHEET
C6.0



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

0' 20' 40' 60'

SCALE: 1" = 20'

THE LOCATION OF ALL UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE BASED ON RECORDS PROVIDED BY THE UTILITY OWNERS AND VISIBLE EVIDENCE OBTAINED IN THE FIELD. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED TO THE COMPLETENESS OR ACCURACY THEREOF.

PLANTING SCHEDULE

QUANTITY	KEY	BOTANICAL NAME	COMMON NAME	SIZE
PERENNIAL PLANTINGS				
125	HH	HEMERCALUS HYPERION	HYPERION DAYLILY	2YD#2CONT
18	KRL	CALAMGROSTIS X ACUTIFOLIA 'KARL FORSTER'	KARL FORSTER'S REED GRASS	3 GAL CONT
DECIDUOUS TREES				
7	GT	GLEDITSIA T.I. 'SKYLINE'	SKYLINE HONEYLOCUST	2.5" B&B
7	TC	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LINDEN	2.5" B&B
7	AS	ACER SACCHARUM 'GREEN MOUNTAIN'	GREEN MOUNTAIN SUGAR MAPLE	2.5" B&B
5	QR	QUERCUS RUBRA	RED OAK	2.5" B&B
5	LS	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	2.5" B&B
6	PE	PLANTUS X EXCLAMATION	LONDON PLANETREE	2.5" B&B
SHRUBS				
11	VB	VIBURNUM DENTATUM 'BLUE MUFFIN'	BLUE MUFFIN ARROWWOOD VIBURNUM	24" B&B
12	SG	SPIRAEA JAPONICA 'GOLDFLAME'	GOLDFLAME SPIRAEA	24" B&B
12	EC	EUONYMUS ALATUS 'COMPACTUM'	DWARF BURNING BUSH	24" B&B
29	BM	BUXUS MICROPHYLLA JAPONICA 'WINTER GEM'	WINTER GEM BOXWOOD	24" B&B
7	BT	BERBERIS THUNBERGII ATROPURPUREA	CRIMSON PYGMY BARBERRY	24" B&B
12	JP	J. CHINENSIS 'PFITZERANA'	PFITZER JUNIPER	24" B&B
11	SY	TAXUS X.MEDIA 'SEBIAN'	SEBIAN YEW	24" B&B

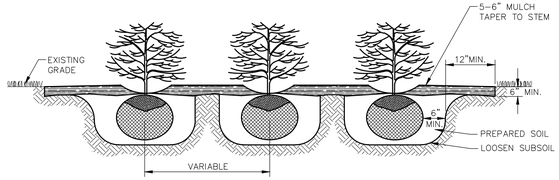
KEY NOTES

S — STEEL EDGING

M — SHREDDED BARK MULCH

GENERAL NOTES

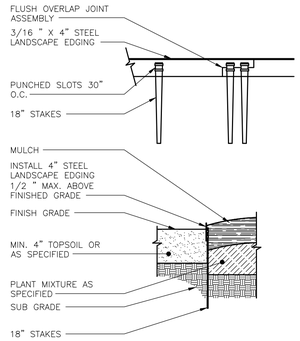
1. CONTRACTOR TO PROVIDE DESIGN AND INSTALLATION OF UNDERGROUND IRRIGATION SYSTEM IN ACCORDANCE WITH PROJECT SPECIFICATIONS AND REGULATORY AGENCY REQUIREMENTS. ALL LANDSCAPING AND GRASS AREAS TO BE IRRIGATED. IRRIGATION CONTROL PANEL SHALL BE LOCATED WITHIN THE HVAC ENCLOSURE.
2. ALL GREEN SPACES AND PLANTING AREAS SHALL BE IRRIGATED.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL PERMITS AND POST ALL BONDS PRIOR TO CONSTRUCTION.
4. REFER TO PLUMBING PLANS FOR LOCATION OF IRRIGATION METER.
5. ALL GRASS AREAS TO BE SODDED.
6. SPACE ALL SHRUBS AT 5-FEET ON CENTER UNLESS OTHERWISE INDICATED ON THE PLANS
7. ALL DISTURBED LAWN AREAS SHALL BE RESTORED TO AT LEAST PREVIOUS CONDITION IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
8. THE GENERAL CONTRACTOR SHALL INCLUDE TOPSOIL IN BASE BID. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE AMOUNT OF TOPSOIL AVAILABLE ON-SITE.



- FIRST AND SECOND WATERING AND CULTIVATION SHALL INCLUDE SHRUB BEDS.
- CUT 6" X 12" (MIN.) EDGING AROUND THE PERIMETER OF ALL SHRUB BEDS SHOWN ON THE PLANS. SPRAY A NON-PERSISTANT GLYPHOSATE HERBICIDE TO ENTIRE SHRUB BEDS PRIOR TO PLANTING AND BARK PLACEMENT.
- SHRUB BEDS ARE TO BE PAID FOR BY THE PAY ITEM 'SITE PREPARATION'.
- ALL PLANTS SHALL BE SET PLUMB AND HAVE THE BEST SIDE OF PLANT FACING THE MAIN VIEWING DIRECTION.

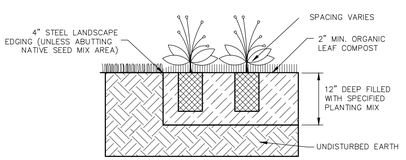
SHRUB BED DETAIL

SCALE: NONE



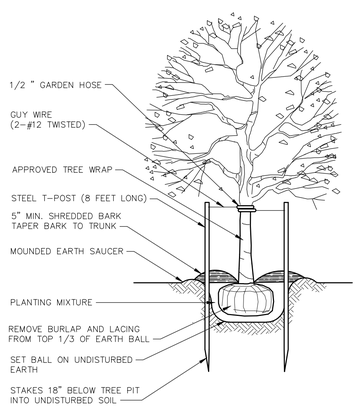
4" STEEL LANDSCAPE EDGE

NO SCALE



PERENNIAL PLANTING BED

SCALE: NONE



DECIDUOUS TREE PLANTING

SCALE: NONE

DESCRIPTION

THIS WORK SHALL CONSIST OF PROVIDING ALL NECESSARY MATERIALS, LABOR, EQUIPMENT, TOOLS AND SUPERVISION REQUIRED FOR THE EXECUTION AND GUARANTEE OF ALL PLANTINGS AND RELATED WORK AS SHOWN ON THE DRAWINGS.

PLANT MATERIALS SHALL CONFORM TO THE SIZES STATED ON THE PLANT LIST AND SHALL BE OF A MINIMUM SIZE OR LARGER. ALL MEASUREMENTS OF SPREAD, CALIPER, BALL SIZE, TRUNK CROWN RATIO, QUALITY DESIGNATIONS, ETC., SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "ANSI STANDARDS FOR NURSERY STOCK". PLANT MATERIAL SHALL BE NURSERY GROWN AND INSPECTED BY THE OWNER'S REPRESENTATIVE AT THE SITE PRIOR TO PLANTING. THE OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO REJECT ANY PLANT MATERIAL AT ANY TIME.

NURSERY STOCK SHALL BE PREPARED FOR SHIPMENT IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT ANSI SPECIFICATION Z60.1 AND SHALL BE ENCLOSED OR COVERED DURING TRANSPORTATION TO PREVENT DRYING.

SITE PREPARATION

THE CONTRACTOR SHALL VERIFY ALL EXISTING AND PROPOSED UTILITY LOCATIONS PRIOR TO CONSTRUCTION AND PROTECT AND REPAIR UTILITIES ENCOUNTERED DURING CONSTRUCTION WHETHER SHOWN ON THE PLANS OR NOT.

INDIVIDUAL HOLES SHALL BE CENTERED AT STAKED PLANT LOCATIONS. CONTRACTOR IS TO STAKE PRIOR TO PLACEMENT OF PLANT MATERIAL AND OBTAIN APPROVAL FROM THE OWNER'S REPRESENTATIVE. PLANTING HOLES SHALL BE DUG LARGE ENOUGH TO PERMIT PLACING PREPARED TOPSOIL 18" LATERALLY BEYOND THE ENDS OF THE ROOT BALLS FOR SHADE AND EVERGREEN TREES AND 6" LATERALLY FOR SHRUBS UNLESS OTHERWISE SPECIFIED.

EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE AT THE TIME THE HOLE IS DUG. THE PLANTING HOLE SHALL BE BACKFILLED WITH PREPARED TOPSOIL THE SAME DAY THEY ARE DUG.

TOPSOIL SHALL AT FERTILE, FRIABLE NATURAL TOPSOIL OF CLAY LOAM CHARACTER CONTAINING AT LEAST 5% BUT NOT MORE THAN 20% BY WEIGHT OF ORGANIC MATTER WITH A PH RANGE FROM 6.0 TO 7.0. TOPSOIL SHALL BE FREE OF CLAY LUMPS, COURSE SAND, STONES, PLANT ROOTS, STICKS OR OTHER FOREIGN MATTER.

CARE FOR PLANTS BEFORE PLANTING

PLANTS DESIGNATED "BB" SHALL BE BALLED AND BURLAPPED WITH FIRM NATURAL BALLS OF EARTH. CRACKED, LOOSENED OR BROKEN BALLS SHALL NOT BE PLANTED. THEY SHALL BE MARKED WITH SPRAY PAIN AND IMMEDIATELY REMOVED FROM THE JOB SITE. IMMEDIATELY FOLLOWING DELIVERY AT THE JOB SITE, ALL PLANTS THAT WILL NOT BE PLANTED THAT SAME DAY SHALL BE "HEELED IN" WITH SHREDDED BARK OR MOIST SOIL AND KEPT MOIST UNTIL PLANTED.

THE TRUNKS AND BRANCHES OF ALL TREES SHALL BE PROTECTED FROM INJURY OF ANY KIND DURING ALL OPERATIONS. THE OWNER'S REPRESENTATIVE SHALL REJECT ANY TREES THAT ARE INJURED.

PLANTING

THE CONTRACTOR IS RESPONSIBLE FOR PLANTING MATERIALS PLUMB. SET THE TOP OF THE ROOT BALL AT OR SLIGHTLY HIGHER THAN THE SURROUNDING GRADE. PLANTS SHALL BE FACED TO GIVE THE BEST APPEARANCE OR RELATIONSHIP TO ADJACENT STRUCTURES. NO FILLING WILL BE PERMITTED AROUND TRUNK OR STEMS. WHEN THE PLANT HAS BEEN PROPERLY SET, THE HOLE SHALL BE BACKFILLED TO 1/2 THE DEPTH OF THE BALL WITH PREPARED TOPSOIL MIXTURE, FIRMLY PACKED AND WATERED-IN AT TIME OF PLANTING. LOOSED AND REMOVE BURLAP AND LACING FROM UPPER 1/3 OF THE ROOT BALL. BACKFILL WITH PREPARED TOPSOIL, WHICH AFTER COMPACTION IS FLUSH WITH THE SURROUNDING GROUND.

MULCHING

ALL PLANT MATERIAL SHALL BE ENCIRCLED WITH A 5" MINIMUM COVERING OF NON-DYED SHREDDED BARK MULCH TO 6" OUTSIDE THE PLANTING HOLE, TAPERING MULCH TO 2" AROUND THE TRUNK OF ALL PLANTS. SUBMIT SAMPLE TO THE OWNER'S REPRESENTATIVE FOR APPROVAL BEFORE PLACEMENT. WOOD CHIPS SHALL NOT BE ALLOWED ON THIS JOB.

WRAPPING DECIDUOUS TREES

TREE WRAP SHALL COVER TRUNKS OF ALL DECIDUOUS TREES BEGINNING BELOW THE SOIL LINE JUST ABOVE THE ROOTS. TIE WITH TWINE IN 5 PLACES, INCLUDING THE TOP AND BOTTOM OF WRAPPING. MASKING TAPE OR WIRE WILL NOT BE ALLOWED.

BRACING AND GUYING

GUYING SHALL BE EMPLOYED TO PREVENT LEANING OR LOOSENING OF THE TREE FROM THE BALL. BRACING MATERIAL SHALL BE T-POSTS PAINTED GREEN. GUYING MATERIAL SHALL BE 12 GAUGE WIRE AND GARDEN HOSE 1/2 INCH DIAMETER. GUY WIRE SHALL BE ENCASED IN HOSE TO PREVENT DIRECT CONTACT WITH THE TREE. DECIDUOUS TREES SHALL BE BRACED OR GUYED IMMEDIATELY AFTER THE TREE WRAPPING IS COMPLETE.

STEEL LANDSCAPE EDGING

4" STEEL LANDSCAPE EDGING SHALL BE USED ON THIS PROJECT. ALUMINUM OR PLASTIC EDGING WILL NOT BE ALLOWED.

PRUNING

UPON COMPLETION, ALL PLANT MATERIAL MUST BE PRUNED. THE AMOUNT OF PRUNING SHALL BE LIMITED TO THE MINIMUM NECESSARY TO REMOVE DEAD OR INJURED BRANCHES AND TO COMPENSATE FOR THE LOSS OF ROOTS FROM TRANSPLANTING. ALL CUTS SHALL BE MADE FLUSH LEAVING NOT STUBS. PRUNING PAIN SHALL NOT BE USED.

FINISHING AND CLEANING UP

IMMEDIATELY UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL CLEAN UP THE AREA OF SURPLUS MATERIALS. THE CONTRACTOR SHALL REPAIR AND RE-ESTABLISH TURF IN RUTTED AREAS.

WARRANTY

THE LANDSCAPE INSTALLATION CONTRACTOR SHALL REPLACE ALL UNHEALTHY VEGETATION AND PLANTINGS WITHIN ONE (1) YEAR OF INITIAL PLANTING OR SUBSEQUENT PLANTING PERIOD.

LANDSCAPE REQUIREMENTS

PARKING LOT LANDSCAPING (P)
REQUIRED
1 TREE / 8 PARKING SPACES W/ ISLANDS 200 S.F. MINIMUM
REQUIRED PARKING SPACES = 138
138 / 8 = 17.2 = 18 TREES
PROVIDED = 18 TREES

GREENBELT LANDSCAPING
REQUIRED
1 TREE / 30 L.F. OF FRONTAGE ON PUBLIC R.O.W.

NEW KING STREET (N)
R.O.W. = 550.28'
REQUIRED = 550.28 / 30 = 18.3 = 19 TREES
PROVIDED = 19 TREES

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COURTYARD BY MARRIOTT

COURTYARD

TROY PLAZA

CITY OF TROY, OAKLAND COUNTY, MICHIGAN

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ISSUED FOR	DATE
PRELIM SPA	02/18/19
PRELIM SPA	05/09/19
PRELIM SPA	09/24/19
CITY REVIEW	11/05/19

DATE :

DRAWN : ACA

CHECKED : ACA

SCALE : 1"=20'

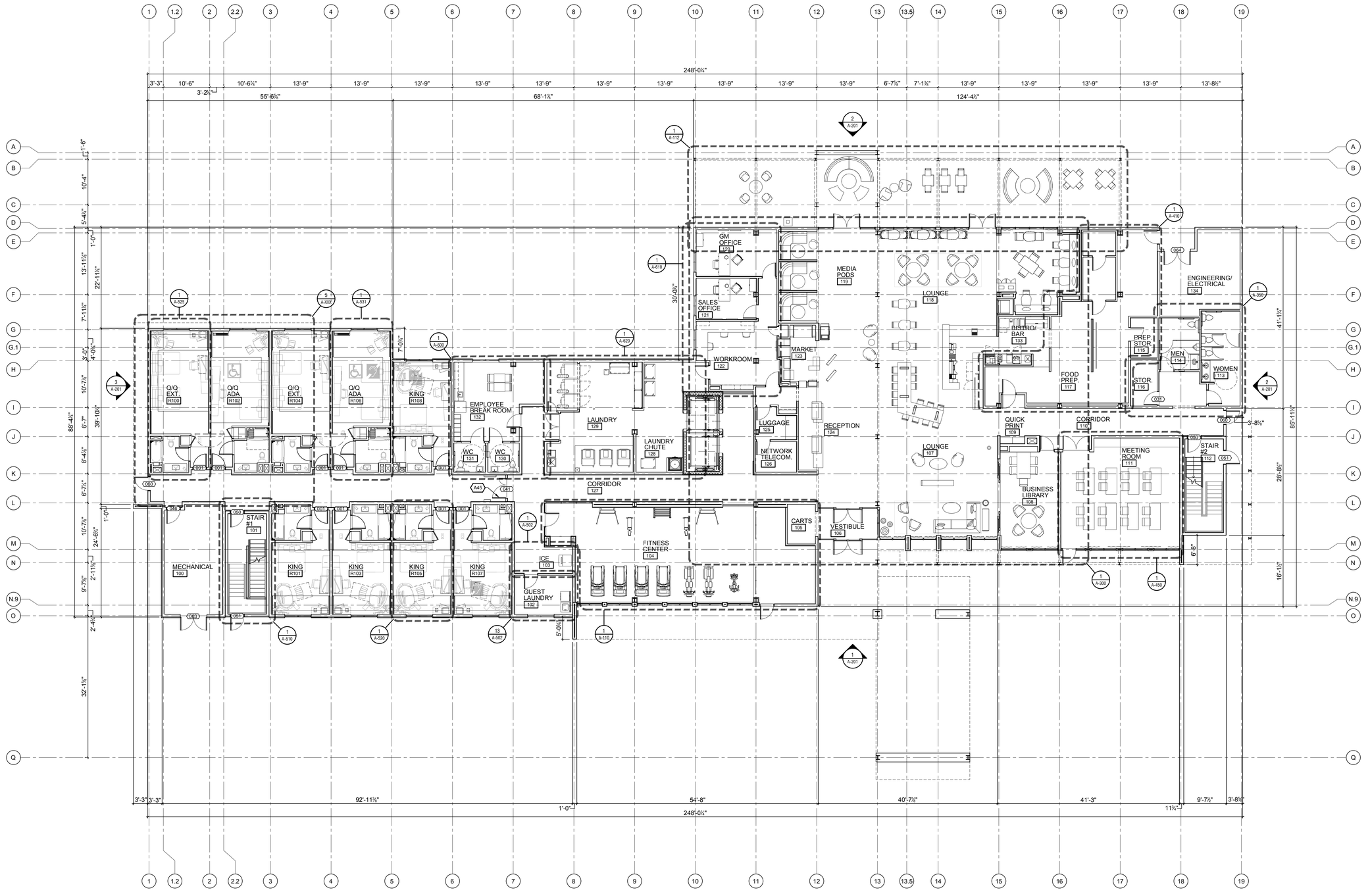
JOB NO :

SHEET TITLE :

LANDSCAPE PLAN AND DETAILS

SHEET

L1.0



1 FIRST LEVEL FLOOR PLAN
3/32" = 1'-0"

TRUE NORTH

PLAN NORTH

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COURTYARD® BY MARRIOTT

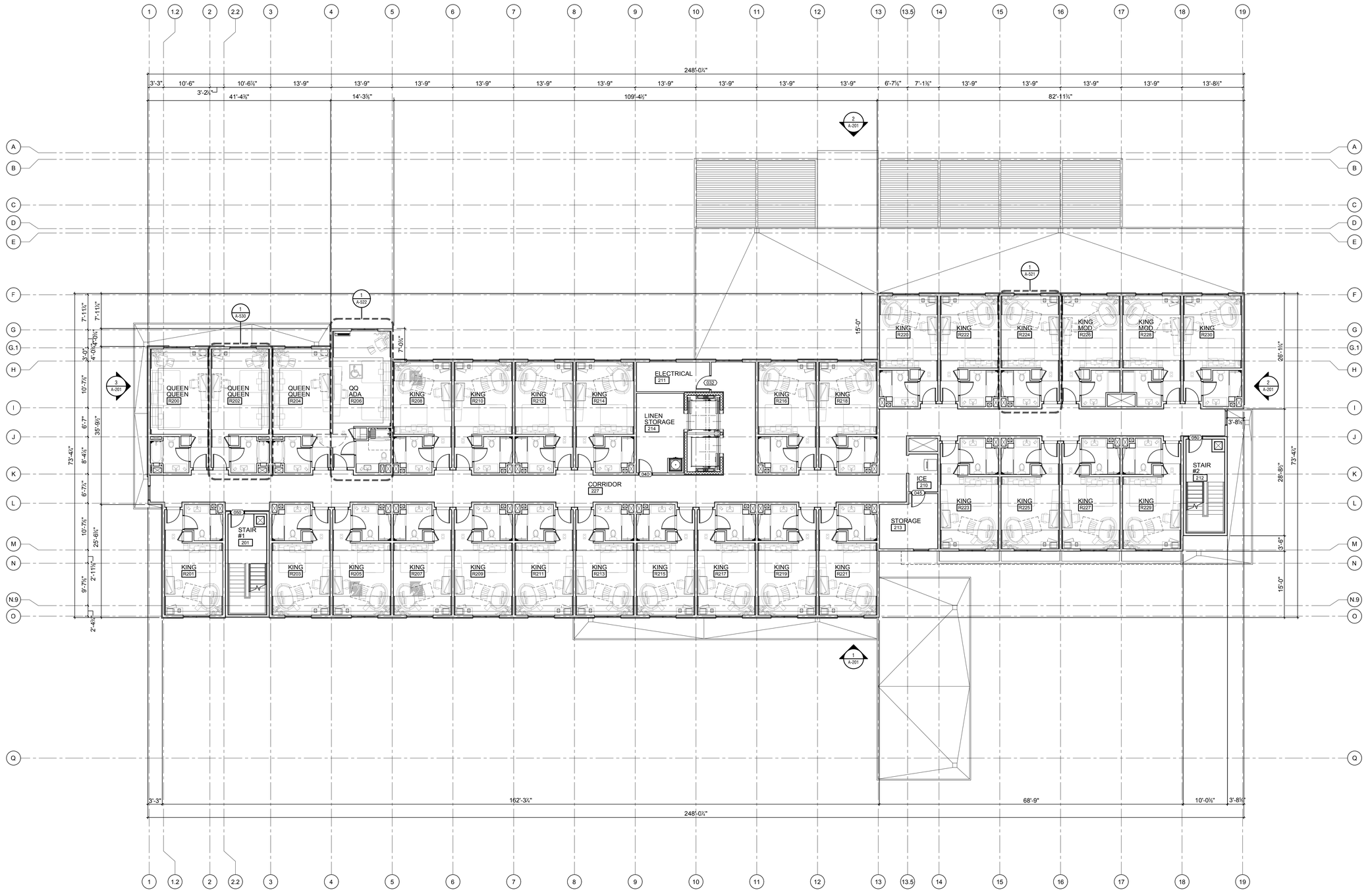
PROJECT
Courtyard by Marriott
5550 New King Drive
Troy, MI 48098

DRAWING
First Level Floor Plan

ISSUED FOR | DATE
DATE: 08/24/18
SITE PLAN APPROVAL

JOB #
proj_2018_21

SHEET #
A-101



TRUE NORTH

PLAN NORTH

1 SECOND LEVEL FLOOR PLAN
3/32" = 1'-0"

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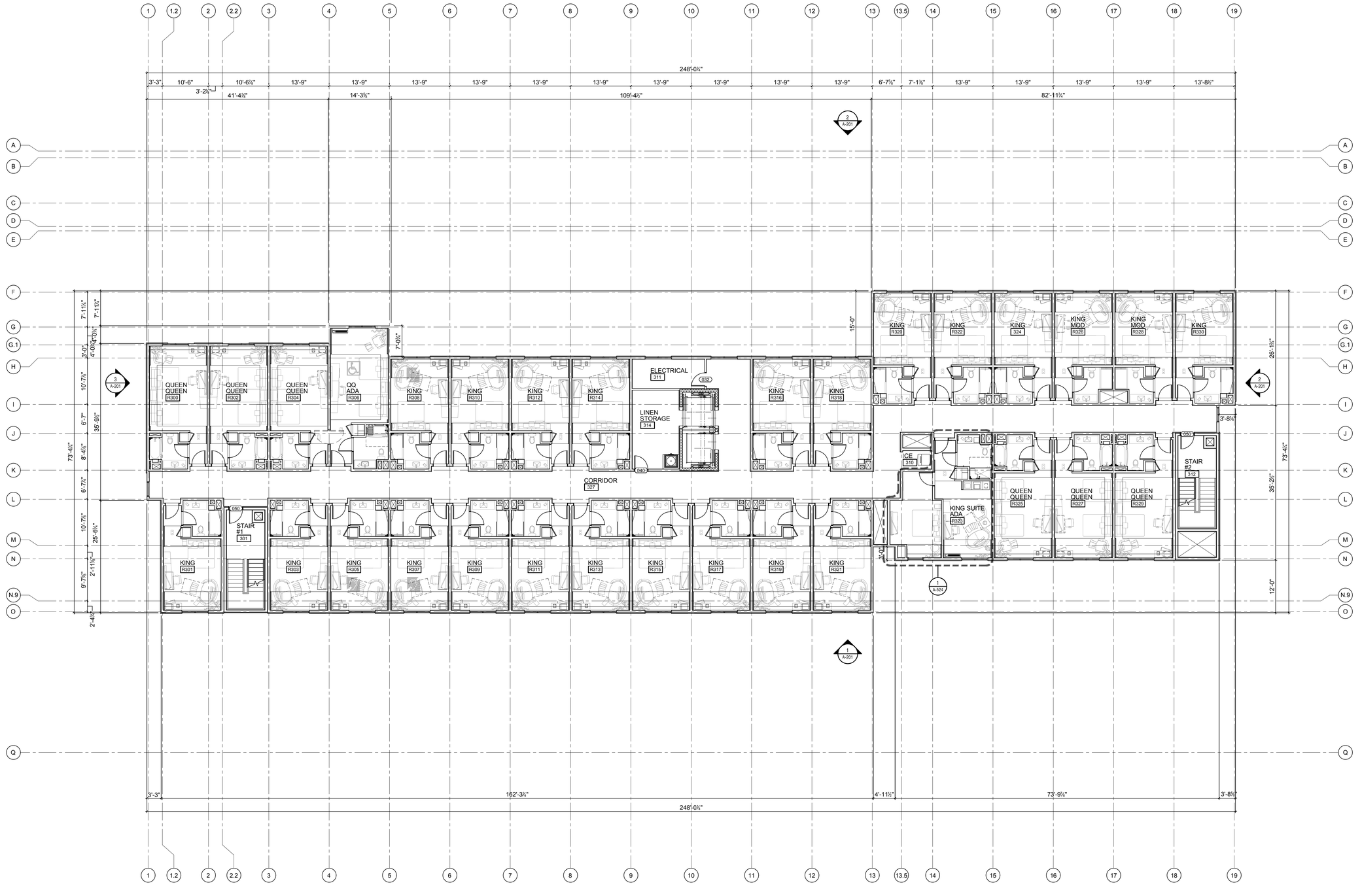
5550 New King Drive
Troy, MI 48098

DRAWING
Second Level Floor Plan

ISSUED FOR | DATE
SITE PLAN APPROVAL DATE: 08.31.18

JOB # proj_2018_21

SHEET # A-102



1 THIRD LEVEL FLOOR PLAN
3/32" = 1'-0"

TRUE NORTH

PLAN NORTH

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2600 Auburn Road, Suite 240
Auburn Hills, MI 48326

COURTYARD® BY MARRIOTT

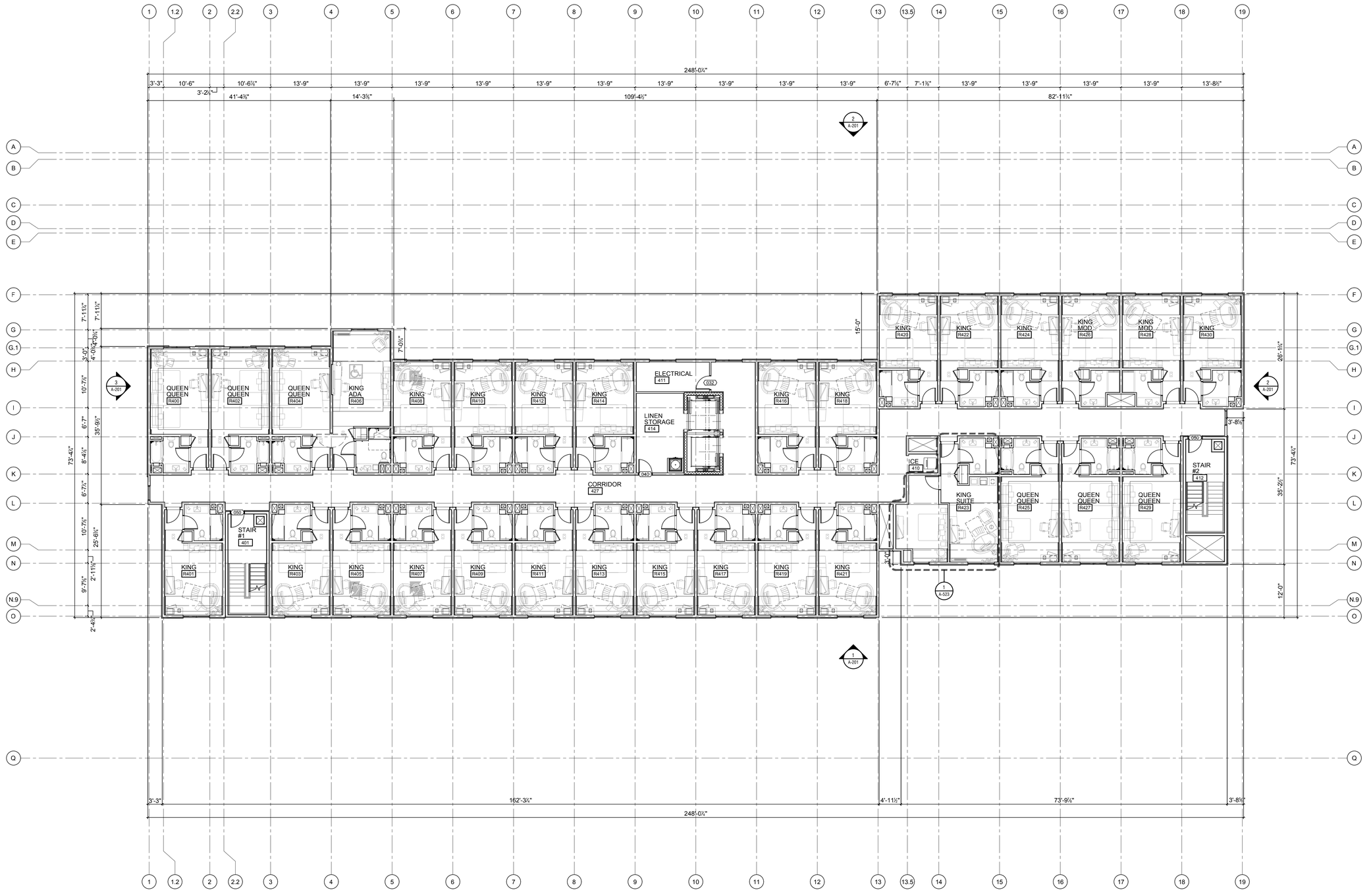
PROJECT
Courtyard by Marriott
5550 New King Drive
Troy, MI 48098

DRAWING
Third Level Floor Plan

ISSUED FOR | DATE
SITE PLAN APPROVAL DATE: 08.24.18

JOB # proj_2018_21

SHEET # A-103



TRUE NORTH

PLAN NORTH

1 FOURTH LEVEL FLOOR PLAN
3/32" = 1'-0"

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COURTYARD® BY MARRIOTT

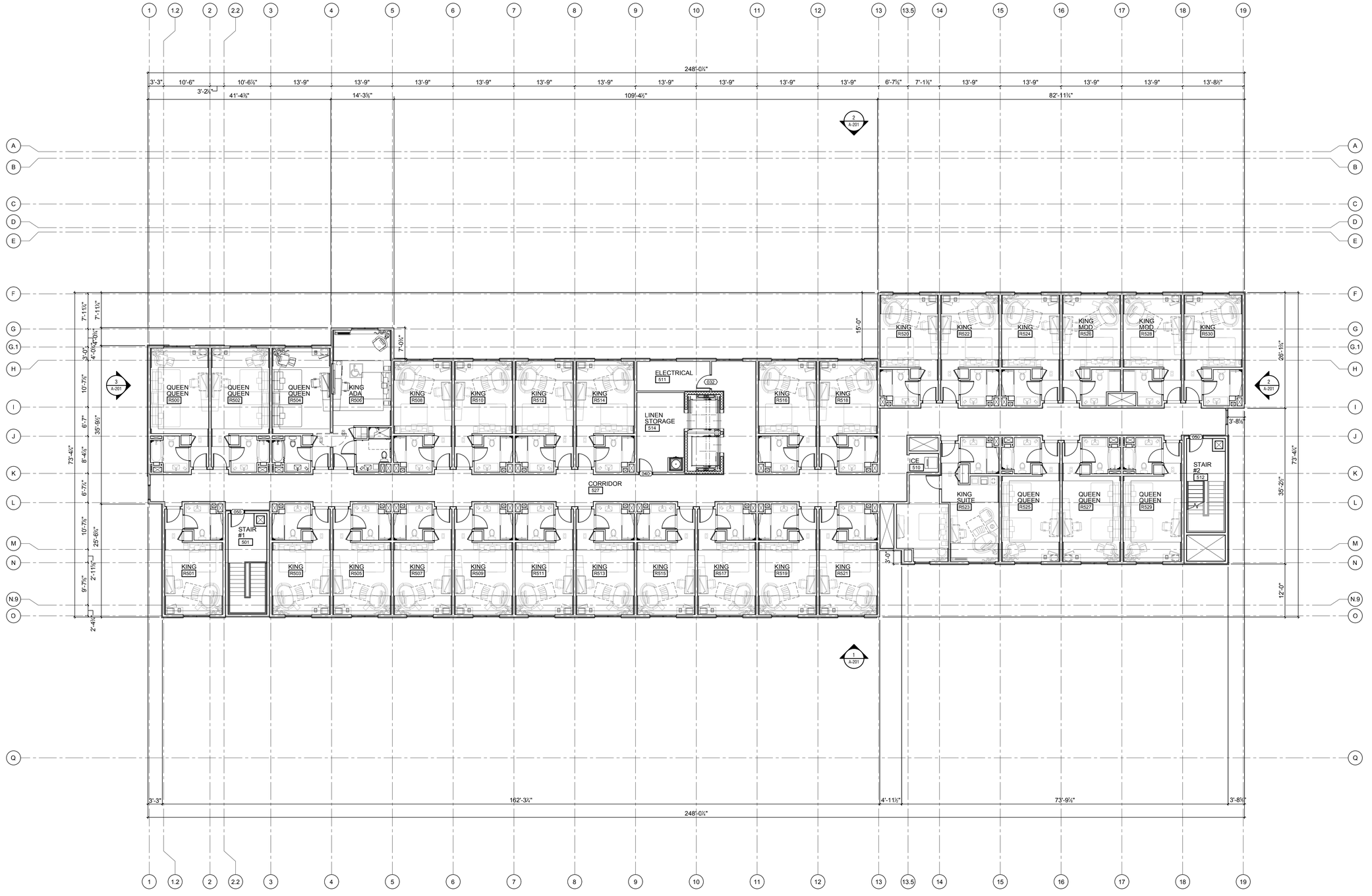
PROJECT
Courtyard by Marriott
5550 New King Drive
Troy, MI 48098

DRAWING
Fourth Level Floor Plan

ISSUED FOR | DATE
SITE PLAN APPROVAL | DATE: 09.26.18

JOB # proj_2018_21

SHEET # A-104



TRUE NORTH

PLAN NORTH

1 FIFTH LEVEL FLOOR PLAN

3/32" = 1'-0"

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COURTYARD® BY MARRIOTT

PROJECT
Courtyard by Marriott
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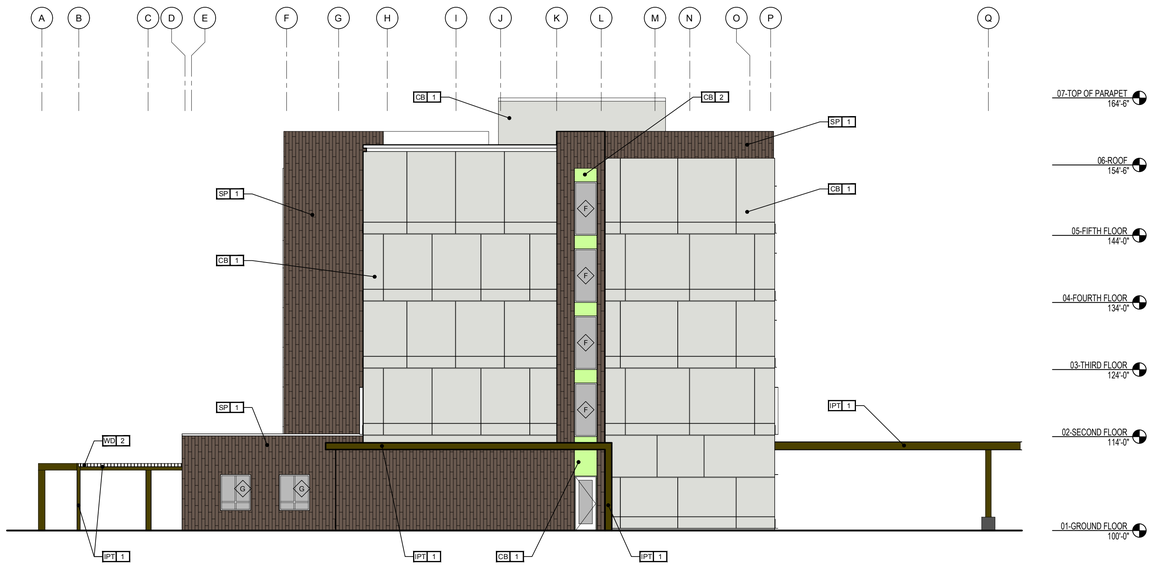
Troy, MI 48098

DRAWING
Fifth Level Floor Plan

ISSUED FOR | DATE
SITE PLAN APPROVAL | DATE: 09.26.18

JOB # proj_2018_21

SHEET # A-105



2 EXTERIOR ELEVATION - SOUTH
3/32" = 1'-0"

1 EXTERIOR ELEVATION - EAST
3/32" = 1'-0"

EXTERIOR FINISH KEY

- CB 1 — FIBER CEMENT BOARD - SHERWIN WILLIAMS 'SW 7666 FLEUR DE SEL'
- CB 2 — FIBER CEMENT BOARD - SHERWIN WILLIAMS 'SW 6719 GECKO'
- SP 1 — RIEDER OKO SKIN SLAT WALL PLANK PANELS - ANTHRACITE SMOOTH
- PT 1 — METAL EXPOSED - INTUMESCENT PAINT DARK BRONZE EGGSHELL
- MT 2 — METAL - DURANAR BONE WHITE
- MT 3 — METAL - DARK BRONZE SMOOTH
- MT 4 — METAL - BONE WHITE SMOOTH
- WD 1 — WOOD - CEILINGS PLUS 4" PLANX/MIRRA - SARANTE 'NATURAL WALNUT S38'
- WD 2 — WOOD - ASTROFLAME/ISOLATECT - CEDAR/SMOOTH FINISH STAINED TO MATCH WD1

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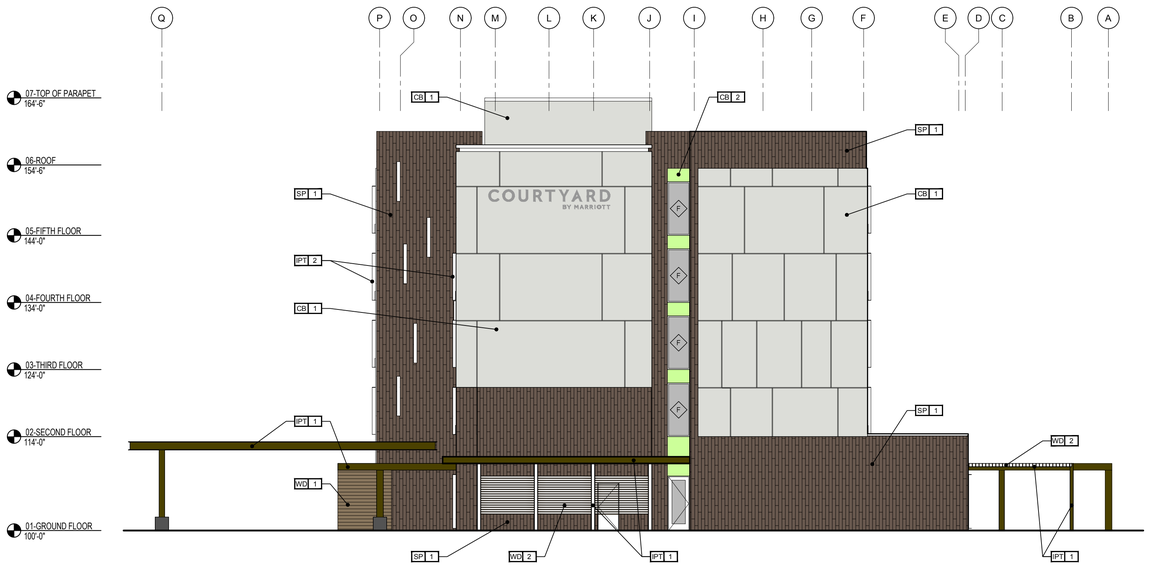
PROJECT
Courtyard by Marriott
5550 New King Drive
Troy, MI 48098

DRAWING
Exterior Elevations

ISSUED FOR | DATE
SITE PLAN APPROVAL — DATE: 08.24.18

JOB #
proj_2018_21

SHEET #
A-201



2 EXTERIOR ELEVATION - NORTH
3/32" = 1'-0"

1 EXTERIOR ELEVATION - WEST
3/32" = 1'-0"

EXTERIOR FINISH KEY

- CB 1 — FIBER CEMENT BOARD - SHERWIN WILLIAMS 'SW 7666 FLEUR DE SEL'
- CB 2 — FIBER CEMENT BOARD - SHERWIN WILLIAMS 'SW 6719 GECKO'
- SP 1 — RIEDER OKO SKIN SLAT WALL PLANK PANELS - ANTHRACITE SMOOTH
- PT 1 — METAL EXPOSED - INTUMESCENT PAINT DARK BRONZE EGGSHELL
- MT 2 — METAL - DURANAR BONE WHITE
- MT 3 — METAL - DARK BRONZE SMOOTH
- MT 4 — METAL - BONE WHITE SMOOTH
- WD 1 — WOOD - CEILINGS PLUS 4" PLANX/MIRRA - SARANTE 'NATURAL WALNUT S38'
- WD 2 — WOOD - ASTROFLAME/ISOLATECT - CEDAR/SMOOTH FINISH STAINED TO MATCH WD1

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DRAWING
Exterior Elevations

ISSUED FOR | DATE
DATE: 08.24.18
SITE PLAN APPROVAL

JOB #
proj_2018_21

SHEET #
A-202

THE THINK SHOP
ARCHITECTS

COURTYARD®
BY MARRIOTT

5550 NEW KING DRIVE,
TROY, MI 48098

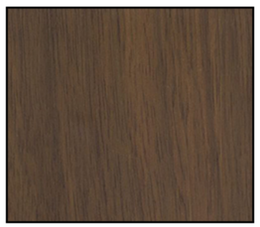
01 ALLURA - CEMENT BOARD
SMOOTH VERTICAL PANEL
“SNOW”

01ALT BRICK - BRICKTECH
“WINTERBOURNE”

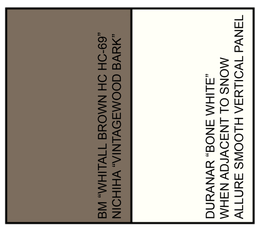
02 NICHIHA - CEMENT BOARD
VINTAGEWOOD
“BARK”

03 NICHIHA - CEMENT BOARD
ILLUMINATION SERIES
“GECKO”

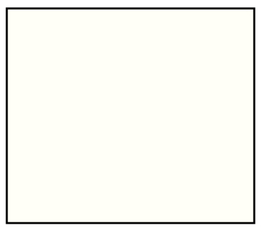
04 INTRUMESCENT PAINT -
AMMA 2605
“DARK BRONZE”



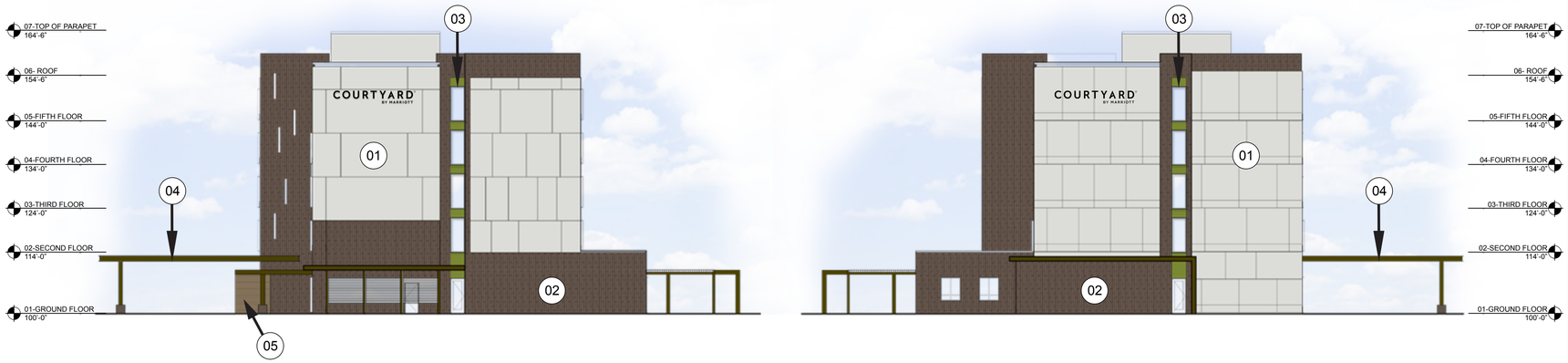
05 PLANX / MIRRA
4” PLANKS
“SARANTÉ NATURAL WALNUT”

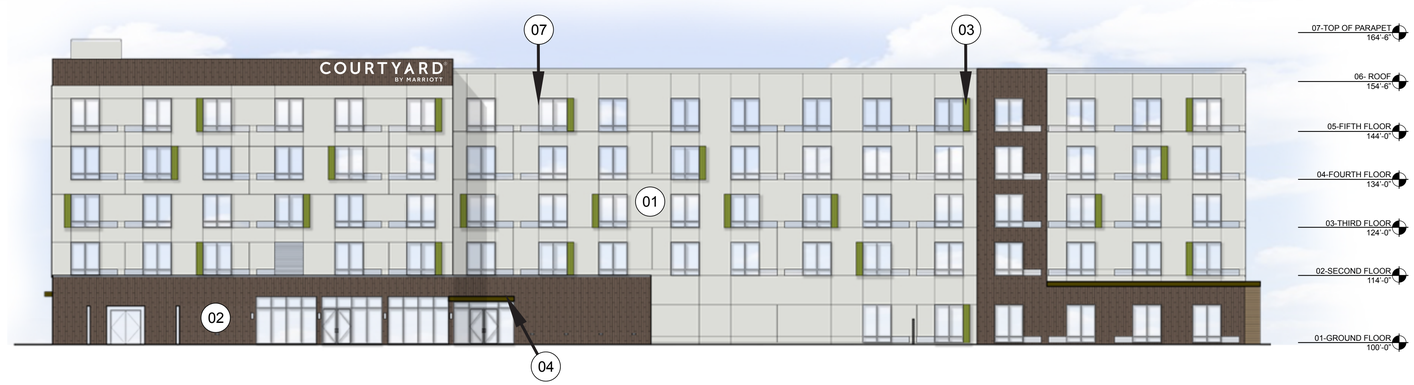


06 COPING
COLOR TO MARCH
ADJACENT WALL



07 PAC-CLAD -
CUSTOM FABRICATED METAL
METAL SHADOW BOXES AT WINDOWS
“DURANAR BONEWHITE”





THE THINK SHOP
ARCHITECTS

November 7, 2019

City of Troy
500 W. Big Beaver
Troy, MI 48084

Re: Courtyard by Marriott
5550 New King Drive
Troy, MI 48098

To whom it may concern;

The development is located at the northwest corner of the intersection at Crooks Road and Corporate Drive. The site is entered from New King Drive located to the West of the Property. Corporate offices dominate the area surrounding the site with commercial space located on Crooks Road. The proposed hotel is a 5-story Courtyard by Marriott that by appearance from the road sits 4 stories as the site drops at the entry level a full story. Included in the amenities is a recreational patio located adjacent to the building.

Courtyard by Marriott is a leader in meeting the needs of the modern business traveler. This hotel is no exception to the style and service its clients require. The building will provide amenities such as a fitness center, bistro, meeting rooms, and collaborative lobby spaces for its business guests in addition to a marketplace. The entire development comprises several retail locations that benefit the community as well as the guests of the hotel. Included are a Panera bread, Starbucks Coffee, an orthopedic and spine rehabilitation center as well as locations for small commercial spaces.

This Courtyard is of a contemporary aesthetic that blends itself into the context of the surrounding areas. Primarily constructed utilizing a low maintenance masonry/cement board/glazed façade, the building will then be finished with painted metal and composite wood detailing. The sleek design ties into the contextual fabric of the linear designed masonry glass office buildings that make up its surroundings. The light nature of the exterior colors blends the hotel into the context of the adjacent commercial buildings color palette.

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ROWE PROFESSIONAL SERVICES COMPANY

Large Firm Resources. Personal Attention.℠

Memorandum

To: Jimmy Asmar, Elite Hospitality, LLC

From: Michael J. Labadie, PE and Jill Bauer, PE, PTOE

Date: July 19, 2019

RE: Courtyard Troy, Traffic Impact Assessment and Shared Parking Analysis

---

ROWE Professional Services Company has completed our traffic impact assessment related to the proposed Courtyard Troy development to be located on the west side of Crooks Road, north of Corporate Drive/I-75 Ramps, in the City of Troy, Oakland County. The current site plan (included in the materials attached to this report) indicates a hotel with 133 rooms, 8,516 square feet of general office space, 2,176 square feet of medical office space, a 2,072-square-foot coffee shop with drive-through window, a 4,414-square-foot Panera bread shop with drive-through window, and a 4,500-square-foot sit-down restaurant with up to 106 seats. This traffic impact assessment has been completed in accordance with the requirements specified by the City of Troy and the Road Commission for Oakland County (RCOC).

Traffic Counts

The original turning movement traffic counts provided by your office for this study were collected during the weekday AM (7 to 9 a.m.) and PM (4 to 6 p.m.) peak periods on October 16, 2018 at the intersections of:

- Crooks Road and Corporate Drive/I-75 ramps;
- Corporate Drive and New King Drive; and
- Southbound Crooks Road and the northbound to southbound crossover north of Corporate Drive.

The existing turning movement traffic counts are shown in Figure 2 and are provided along with the intersection counts attached to this memorandum.

Background Traffic Scenario

Based on information provided by your office, the development is anticipated to be completed in 2020. A background growth rate of 1.5 percent per year was determined to be appropriate in the original study prepared for your development and was utilized again in forecasting normal yearly increases in traffic, which is unrelated to your proposed development.

The background traffic volumes are shown in Figure 3 attached to this memorandum.

Trip Generation

Using the information and methodologies specified in the latest version of *Trip Generation (10th Edition)* published by the Institute of Transportation Engineers (ITE), ROWE forecast the weekday AM and PM peak hour trips associated with the proposed development. The results of the trip generation forecasts for the proposed site are provided in Table 1.

Table 1
ITE Trip Generation for Proposed Courtyard Troy Development

Land Use	Land Use Code	Size	AM Peak Hour			PM Peak Hour			Week Day
			In	Out	Total	In	Out	Total	
Business Hotel	312	133 rooms	22	30	52	24	19	43	537
General Office Building	710	8,516 sq. ft.	29	5	34	2	9	11	97
Medical-Dental Office Building	720	2,176 sq. ft.	5	2	7	2	6	8	76
Shopping Center	820	3,232 sq. ft.	2	1	3	21	22	43	583
High-Turnover (Sit-Down) Restaurant	932	4,500 sq. ft.	25	20	45	27	17	44	505
Coffee/Donut Shop with Drive-Through Window	937	2,072 sq. ft.	94	90	184	45	45	90	1,700
Bead/Donut/Bagel Shop with Drive-Through Window	940	4,414 sq. ft.	77	76	153	41	43	84	1,530[1]
TOTAL TRIPS			**254**	**224**	**478**	**162**	**161**	**323**	**5,028**
Internal Capture, 6% AM, 22% PM			*15*	*15*	*30*	*35*	*35*	*70*	---
TOTAL EXTERNAL TRIPS			**239**	**209**	**448**	**127**	**126**	**253**	**5,028**
Shopping Center Pass-By Rate: 34% PM			---	---	---	*3*	*5*	*8*	---
High-Turnover (Sit Down) Restaurant Pass-By Rate: 43%			---	---	---	*7*	*6*	*13*	---
Fast-Food Restaurant with Drive-Through Window Pass-By Rate: 49% AM; 50% PM[2]			*80*	*79*	*159*	*38*	*36*	*74*	---
TOTAL NEW TRIPS			**159**	**130**	**289**	**79**	**79**	**158**	**5,028**

1. Daily trip information not provided for Land Use 940. Daily trips estimated to be ten times AM peak period (higher of both peak periods).
2. ITE's Trip Generation Handbook, 3rd Edition does not contain information on pass-by rates for Land Use 937: Coffee/Donut Shop with Drive-Through Window or Land Use 940: Coffee/Donut/Bagel Shop with Drive-Through Window. Information for Land Use 934: Fast-Food Restaurant with Drive-Through Window, a similar use, was substituted.

In large, multi-use developments (where there is a mixture of retail, office, and restaurant uses), not all the trips generated are from sources outside the boundaries of the development, but rather some trips are "internally captured" within the site. The methodology presented in Trip Generation Handbook, 3rd Edition was followed to determine an appropriate internal capture rate for the proposed development. The results of this analysis suggest a 6 percent AM peak hour and a 22 percent PM peak hour internal capture rate for the combination of the shopping center, restaurants, medical office, and general office land uses. With the inclusion of the internal capture reductions, the proposed development will generate 448 total trips during the AM peak hour (239 inbound and 209 outbound) and 253 total trips during the PM peak hour (127 inbound and 126 outbound).

Additionally, not all the traffic generated by the proposed development will be new traffic added onto the adjacent roadway network. As with most retail and restaurant facilities, a significant amount of the site-generated traffic is considered "pass-by" traffic. Pass-by trips are trips already present on the adjacent

roadway network, which are interrupted to visit the site. Pass-by trips are accounted for by reducing the number of forecast new trips to be added to the roadway network; however, actual driveway volumes are not reduced. Pass-by trips are normally expressed as a percentage of trips generated by the new development. These pass-by rates are published in the Institute of Transportation Engineer's Trip Generation Handbook, 3rd Edition (September 2017).

Trip Generation Handbook, 3rd Edition suggests a 34 percent PM peak hour pass-by rate for a shopping centers, a 43 percent pass-by rate for high-turnover (sit-down) restaurants, and a 49 percent AM and a 50 percent PM pass-by rate for fast-food restaurants. With the application of the pass-by trip factors, the site-generated trips can be classified as "pass-by" and "new" trips. The proposed development is expected to generate 448 total trips during the AM peak hour and 253 total trips during the PM peak hour. However, only 289 trips during the AM Peak hour and 158 trips during the PM peak hour will be new traffic not currently using the adjacent street network, whose primary purpose is to visit the new development.

Trip Distribution

The existing traffic volumes were used to develop a trip distribution model for the AM and PM peak hours for traffic generated by the proposed development. The existing traffic patterns indicate the following probable distribution for the proposed development:

AM Peak Hour	**PM Peak Hour**
47% from and 24% to the north	21% from and 46% to the north
16% from and 46% to the south	41% from and 24% to the south
32% from and 17% to the east	23% from and 26% to the east
5% from and 13% to the west	15% from and 4% to the west

The proposed trip distribution for the site is shown in Figure 4 attached to this memorandum. The background traffic volumes were combined with the site generated traffic volumes to obtain the total future traffic volumes, which are shown in Figure 5 attached to this memorandum.

Level of Service Analysis

Level of service (LOS) analyses for existing, background (no build), and total future conditions for the AM and PM peak hours were performed for the intersections of:

- Crooks Road and Corporate Drive/I-75 ramps;
- Corporate Drive and New King Drive; and
- Southbound Crooks Road and the northbound to southbound crossover north of Corporate Drive.

The three proposed site driveway intersections were analyzed under total future conditions.

According to the most recent edition (6th Edition) of the Highway Capacity Manual, level of service is a qualitative measure describing operational conditions of a traffic stream or intersection. Level of service ranges from A to F, with LOS A being the best. LOS D is generally considered to be acceptable. Tables 2 and 3 present the criteria for defining the various levels of service for unsignalized and signalized intersections, respectively.

The operational analysis of the Crooks Road study intersections was performed utilizing 2000 HCM intersection methodology, since the HCM 6th Edition methodology does not support analysis of shared lanes at signalized intersections, or more than three through lanes on an approach to an unsignalized intersection. Although Crooks Road and Corporate Drive are both boulevards, at their intersection direct left-turns are allowed, and there is only a single set of signal heads for each approach (typically at boulevard intersections

there are "near" and "far" heads, with different clearance intervals to ensure vehicles do not become "trapped" in the middle of the intersection). Due to this, the intersection of Crooks Road and Corporate Drive/I-75 ramps was modeled as a single intersection, rather than the typical dual-intersection boulevard configuration specified in Michigan Department of Transportation standards.

Table 2
Level of Service Criteria (Unsignalized Intersection)

Level of Service	Average Stopped Delay/Vehicle (seconds)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Note: LOS D is considered acceptable in urban/suburban areas.

Table 3
Level of Service Criteria (Signalized Intersection)

Level of Service	Average Stopped Delay/Vehicle (seconds)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Note: LOS D is considered acceptable in urban/suburban areas.

The results of the level of service analyses for the intersections listed above are summarized in Tables 4 through 12.

Signalized Intersection of Crooks Road and Corporate Drive/I-75 Ramps

The City of Troy's engineering consultant, OHM, had asked that the operational analysis of this intersection not be completed via accepted practice with the timing permit provided by the Road Commission for Oakland County, but rather perform field observations of timings during the peak periods and "average" the observed timings. However, the ongoing construction on I-75 in the vicinity of the project and the disruption to normal traffic patterns precluded this from being performed, and the timing permit information was utilized in the operational analysis.

The results of the existing level of service analysis for the signalized intersection of Crooks Road and Corporate Drive/I-75 ramps indicate that, under existing conditions, all approaches to the intersection operate at an LOS D or better during the AM peak hour, except for the westbound approach which operates at an LOS E. During the PM peak hour, all approaches to the intersection operate at an LOS D or better, except for the northbound and eastbound approaches which operate at an LOS E and LOS F, respectively. The overall intersection operates at an LOS D during the AM peak hour and at an LOS E during the PM peak hour.

With the addition of background traffic and accounting for possible SCATS optimization of the intersection signal timing, all approaches to the intersection would operate at an LOS D or better during both peak periods, except for the eastbound approach during the PM peak hour, which would continue to operate at an LOS F. The overall intersection would continue operate at an LOS D during the AM peak hour and at an LOS E during the PM peak hour.

With inclusion of the recommended background improvement of providing a dedicated eastbound left-turn lane with 200 feet of storage and accounting for possible SCATS optimization of the intersection signal timing, all approaches to the intersection would operate at an LOS D or better during both the AM and PM peak hours. The overall intersection would operate at an LOS D during both peak periods.

The intersection would continue to operate in a manner like the background with improvements scenario with the addition of site generated traffic.

The operational results for the intersection of Crooks Road and Corporate Drive/I-75 ramps are presented in Tables 4 and 5.

Table 4
AM Peak Hour
Level of Service Analysis for Crooks Road and Corporate Drive/I-75 Ramps

Approach	2018 Existing[1]	2020 Background[2]	2020 Background Improved[3]	2020 Total Future[4]
Northbound Crooks Road	D (39.9)	D (51.1)	D (51.1)	D (53.7)
Southbound Crooks Road	C (31.8)	D (36.0)	C (34.7)	D (37.5)
Eastbound Corporate Drive	D (53.3)	D (53.1)	D (52.7)	D (53.0)
Westbound I-75 Off-Ramp	*E (70.9)*	D (47.5)	D (47.4)	D (50.4)
Overall Intersection	**D (46.7)**	**D (42.8)**	**D (42.1)**	**D (44.9)**

(XX.X) Average seconds of delay per vehicle.
1. Operational results represent existing splits provided in timing permit.
2. Operational results represent SCATS optimization.
3. Includes background (no build) construction of an eastbound left-turn lane with 200 feet of storage.
4. Total future condition assumes background improvements.

Table 5
PM Peak Hour
Level of Service Analysis for Crooks Road and Corporate Drive/I-75 Ramps

Approach	2018 Existing[1]	2020 Background[2]	2020 Background Improved[3]	2020 Total Future[4]
Northbound Crooks Road	*E (61.9)*	D (51.0)	D (51.0)	D (54.4)
Southbound Crooks Road	C (28.4)	D (52.1)	D (42.1)	D (49.0)
Eastbound Corporate Drive	*F (177.4)*	*F (82.9)*	D (52.9)	D (54.4)
Westbound I-75 Off-Ramp	D (51.5)	D (52.5)	D (52.0)	D (54.2)
Overall Intersection	***E (70.3)***	***E (56.5)***	**D (49.6)**	**D (53.2)**

(XX.X) Average seconds of delay per vehicle.
1. Operational results represent existing splits provided in timing permit.
2. Operational results represent SCATS optimization.
3. Includes background (no build) construction of an eastbound left-turn lane with 200 feet of storage.
4. Total future condition assumes background improvements.

Unsignalized Intersection of Corporate Drive and New King Drive

The results of the existing level of service analysis for the unsignalized intersection of Corporate Drive and New King Drive indicate that, under existing conditions, all approaches to the intersection operate at an LOS C or better during the AM peak hour, and at an LOS B or better during the PM peak hour.

The intersection would continue to operate in a manner like the existing conditions with the addition of background traffic.

With the addition of site generated traffic to the intersection, all approaches to the intersection would operate at an LOS A during the AM peak hour, except for the southbound approach, which would operate at an LOS F. During the PM peak hour, all approaches to the intersection would operate at an LOS C or better.

Several mitigation measures were considered for the intersection of Corporate Drive and New King Drive to address the forecast poor operation of the intersection during the AM peak hour. The southbound New King Drive approach already has separate left-turn and right-turn lanes, additional lanes would not substantially improve the forecast operation of the intersection, and dual left-turn lanes would likely increase the sideswipe crash experience at the intersection given the intersection is located on a curve. Forecast volumes at the intersection would not be enough to warrant signalization, which would also be difficult to properly coordinate with the existing traffic signal at Crooks Road. Forecast volumes would also not be enough to warrant conversion to all-way stop control at the intersection, although this would result in acceptable operation at the intersection during both peak periods.

The operational results for the intersection of Corporate Drive and New King Drive are presented in Tables 6 and 7.

Table 6
AM Peak Hour
Level of Service Analysis for Corporate Drive and New King Drive

Approach	2018 Existing	2020 Background	2020 Total Future
Eastbound Corporate Drive	A (5.6)	A (5.7)	A (6.0)
Westbound Corporate Drive	A (-)	A (-)	A (-)
Southbound New King Drive	C (17.3)	C (18.1)	*F (55.7)*

(XX.X) Average seconds of delay per vehicle.
(-) Approach is unopposed and experiences no delay.

Table 7
PM Peak Hour
Level of Service Analysis for Corporate Drive and New King Drive

Approach	2018 Existing	2020 Background	2020 Total Future
Eastbound Corporate Drive	A (0.5)	A (0.5)	A (0.7)
Westbound Corporate Drive	A (-)	A (-)	A (-)
Southbound New King Drive	B (13.0)	B (13.3)	C (21.0)

(XX.X) Average seconds of delay per vehicle.
(-) Approach is unopposed and experiences no delay.

Unsignalized Intersection of Southbound Crooks Road and the Northbound to Southbound Crossover North of Corporate Drive

The results of the existing level of service analysis for the unsignalized intersection of southbound Crooks Road and the northbound to southbound crossover north of Corporate Drive indicate that, under existing conditions, all approaches to the intersection operate at an LOS C or better during the AM peak hour, and at an LOS B or better during the PM peak hour.

The intersection would continue to operate in a manner like the existing conditions with the addition of both background and site generated traffic. Therefore, the proposed development would have a minimal impact on the operation of this intersection.

The operational results for the intersection of southbound Crooks Road and the northbound to southbound crossover north of Corporate Drive are presented in Tables 8 and 9.

Table 8
AM Peak Hour
Level of Service Analysis for Southbound Crooks Road and the Northbound to Southbound Crossover North of Corporate Drive

Approach	2018 Existing	2020 Background	2020 Total Future
Southbound Crooks Road	A (-)	A (-)	A (-)
Westbound Crossover	C (16.6)	C (17.1)	C (18.9)

(XX.X) Average seconds of delay per vehicle.
(-) Approach is unopposed and experiences no delay.

Table 9
PM Peak Hour
Level of Service Analysis for Southbound Crooks Road and the Northbound to Southbound Crossover North of Corporate Drive

Approach	2018 Existing	2020 Background	2020 Total Future
Southbound Crooks Road	A (-)	A (-)	A (-)
Westbound Crossover	B (10.6)	B (10.7)	B (11.1)

(XX.X) Average seconds of delay per vehicle.
(-) Approach is unopposed and experiences no delay.

Unsignalized Intersection of Southbound Crooks Road and the East Site Driveway
The east site driveway will be located on the west side of Crooks Road approximately 520 feet north of Corporate Drive. The results of the level of service analysis for the unsignalized intersection of Crooks Road and the east site driveway indicate that, under total future conditions, the eastbound driveway approach would operate at an LOS C during the AM peak hour and at an LOS B during the PM peak hour. The southbound Crooks Road approach would operate at an LOS A during both peak periods.

The Road Commission for Oakland County standards for right-turn treatments at driveways was not evaluated for the proposed east site driveway, since there is already an existing continuous right-turn lane at the location of the proposed east site driveway. Left-turn warrants were not reviewed since Crooks Road is a boulevard at this location and direct left-turns into the driveway would not be possible.

The operational results for the intersection of Crooks Road and the east site driveway are presented in Table 10.

Table 10
AM and PM Peak Hours
Level of Service Analysis for Crooks Road and the East Site Driveway

Approach	2020 AM Peak Hour	2020 PM Peak Hour
Southbound Crooks Road	A (-)	A (-)
Eastbound (East) Site Driveway	C (20.6)	B (10.7)

(XX.X) Average seconds of delay per vehicle.
(-) Approach is unopposed and experiences no delay.

Unsignalized Intersection of Westbound Corporate Drive and the South Site Driveway
The south site driveway will be located on the north side of Corporate Drive approximately 360 feet west of Crooks Road. The results of the level of service analysis for the unsignalized intersection of Corporate Drive and the south site driveway indicate that, under total future conditions, the southbound driveway approach would operate at an LOS B during the AM peak hour and at an LOS A during the PM peak hour. The westbound Corporate Drive approach would operate at an LOS A during both peak periods.

The Road Commission for Oakland County standards for right-turn treatments at driveways was evaluated for the proposed south site driveway. Left-turn warrants were not reviewed since Corporate Drive is a boulevard at this location and direct left-turns into the driveway would not be possible. The Average Daily Traffic (ADT) on westbound Corporate Drive at the location of the proposed south site driveway would be approximately 3,900 vehicles per day. The peak hour right-turns would be 78. Based on this, only a right-

turn taper is required at the south site driveway. The RCOC turn lane warrant analysis sheets are included in the appendix materials attached to this letter.

The operational results for the intersection of Corporate Drive and the south site driveway are presented in Table 11.

Table 11
AM and PM Peak Hours
Level of Service Analysis for Corporate Drive and the South Site Driveway

Approach	2020 AM Peak Hour	2020 PM Peak Hour
Westbound Corporate Drive	A (-)	A (-)
Southbound (South) Site Driveway	B (13.3)	A (9.9)

(XX.X) Average seconds of delay per vehicle.
(-) Approach is unopposed and experiences no delay.

Unsignalized Intersection of New King Drive and the West Site Driveway
The west site driveway will be located on the east side of New King Drive approximately 650 feet north of Corporate Drive. The results of the level of service analysis for the unsignalized intersection of New King Drive and the west site driveway indicate that, under total future conditions, the westbound driveway approach would operate at an LOS B during both the AM and PM peak hours. The New King Drive approaches would operate at an LOS A during both peak periods.

The Road Commission for Oakland County standards for right-turn treatments at driveways was evaluated for the proposed west site driveway. Left-turn warrants were not reviewed since there is an existing center two-way left-turn lane on New King Drive at the proposed west side driveway location. The ADT on New King Drive at the location of the proposed west site driveway would also be estimated to be approximately 3,900 vehicles per day. The peak hour right-turns would be 36. Based on this, only a right-turn taper is required at the south site driveway. The RCOC turn lane warrant analysis sheets are included in the appendix materials attached to this letter.

The operational results for the intersection of New King Drive and the west site driveway are presented in Table 12.

Table 12
AM and PM Peak Hours
Level of Service Analysis for New King Drive and the West Site Driveway

Approach	2020 AM Peak Hour	2020 PM Peak Hour
Northbound New King Drive	A (-)	A (-)
Southbound New King Drive	A (0.0)	A (0.0)
Westbound (West) Site Driveway	B (12.0)	B (10.7)

(XX.X) Average seconds of delay per vehicle.
(-) Approach is unopposed and experiences no delay.

Shared Parking Analysis
A shared parking analysis was completed for the site in accordance with both Urban Land Institute (ULI) and City of Troy standards. The City of Troy allows for a shared parking analysis based on parking supply rates specified in the City Ordinance and ULI rates for hourly, daily, and monthly variations in parking

demand for the various land uses specified. Additionally, ULI rates for employees versus visitors were also utilized for the various land uses within the proposed site. Finally, as specified by the City of Troy engineering consultant OHM, a maximum occupancy of 95 percent of the 266 spaces on the site, or 252 spaces, would be allowed for the shared parking analysis.

This analysis was performed in order to determine the maximum possible size of a potential family restaurant located in the southeast quadrant of the site, based on the proposed parking supply. All the other uses and sizes on the site were assumed to be fixed (mix of retail, general office, medical office, hotel, and fast-food restaurants), and only the number of seats in a family-style restaurant would be varied in order to determine the maximum possible size for this restaurant.

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

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

The final step of the analysis was to determine the critical parking periods for the site. All hours of operation from 6 a.m. to midnight were analyzed for each month of the year (including an additional late December analysis). The result showed that the month of July has the highest peak demands of the year. Furthermore, the overall peak time of the day for the entire site was determined to be 12 p.m. (noon) for both weekdays and weekends. The overall peak period of the proposed site would be noon in July (both weekday and weekend were the same), resulting in a maximum demand of 252 required parking spaces. Detailed tables can be found in the attached ULI Shared Parking spreadsheets.

Based on the above analysis, the maximum possible size for a potential family-style restaurant on the site would be 106 seats.

Conclusions and Recommendations

The proposed Courtyard Troy development in the City of Troy consists of a hotel with 133 rooms, 8,516 sq. ft. of general office space, 2,176 sq. ft. of medical office space, a 2,072 sq. ft. coffee shop with drive-through window, a 4,414 sq. ft. Panera bread shop with drive-through window, and a 4,500 sq. ft. sit-down restaurant with up to 106 seats. The proposed development will have access to southbound Crooks Road, westbound Corporate Drive, and New King Drive via a single driveway on each roadway.

The proposed mixed-use development is forecast to generate 289 new trips during the AM peak hour (159 inbound and 130 outbound from the site) and 158 new trips during the PM peak hour (79 inbound and 79 outbound from the site).

An operational analysis was performed for the existing, background, and total future conditions for the intersections of:

- Crooks Road and Corporate Drive/I-75 ramps;

- Corporate Drive and New King Drive; and
- Southbound Crooks Road and the northbound to southbound crossover north of Corporate Drive.

The proposed site driveways to southbound Crooks Road, westbound Corporate Drive, and New King Drive were analyzed under total future conditions.

A review of Road Commission for Oakland County standards indicated that only a right-turn taper would be warranted on westbound Corporate Drive at the south site driveway.

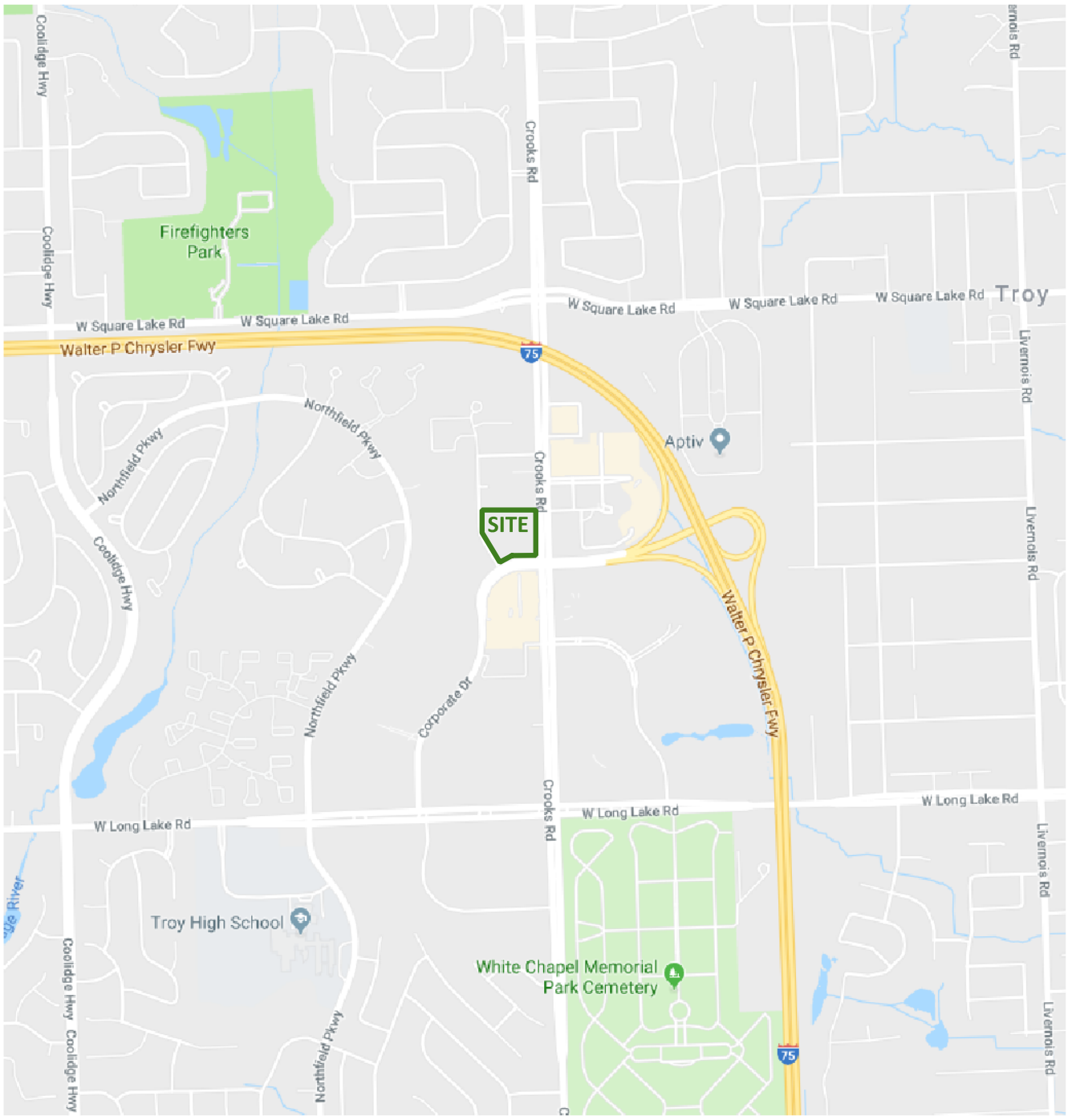
To address impacts from existing and background traffic volumes, it is recommended that an eastbound left-turn lane with 200 feet of storage be provided at the intersection of Corporate Drive with Crooks Road.

Poor operation of the intersection of Corporate Drive and New King Drive is forecast during the AM peak period under total future conditions. Several mitigation measures were considered; however, they would either not be warranted or substantially improve the operation of the intersection.

Based on a shared parking analysis completed for the site in accordance with City of Troy and ULI standards, a family-style restaurant with a maximum of 106 seats could be developed in the southeast portion of the site.

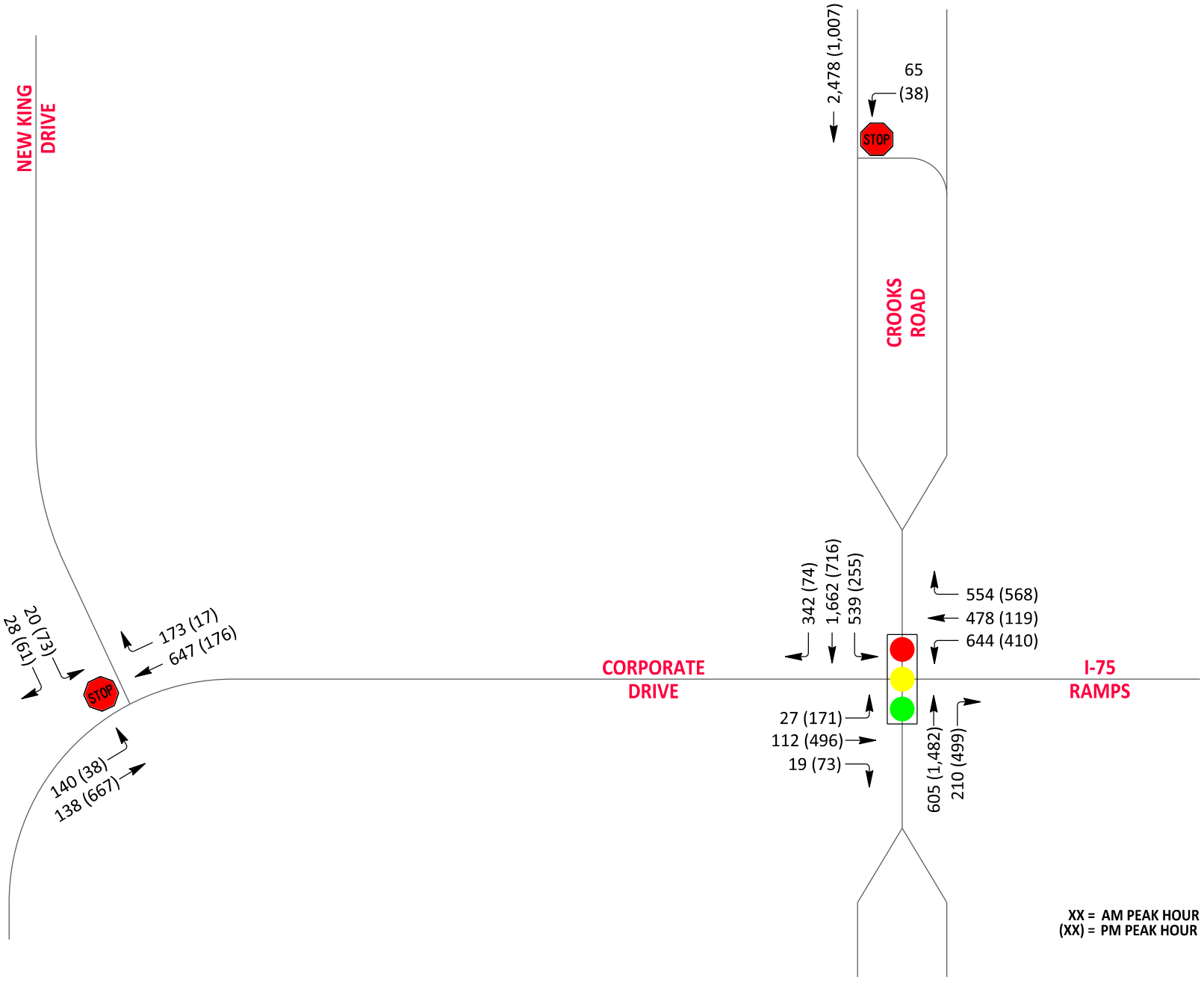
Attachments

REPORT FIGURES



ROWE PROFESSIONAL SERVICES COMPANY

SITE LOCATION MAP
FIGURE 1



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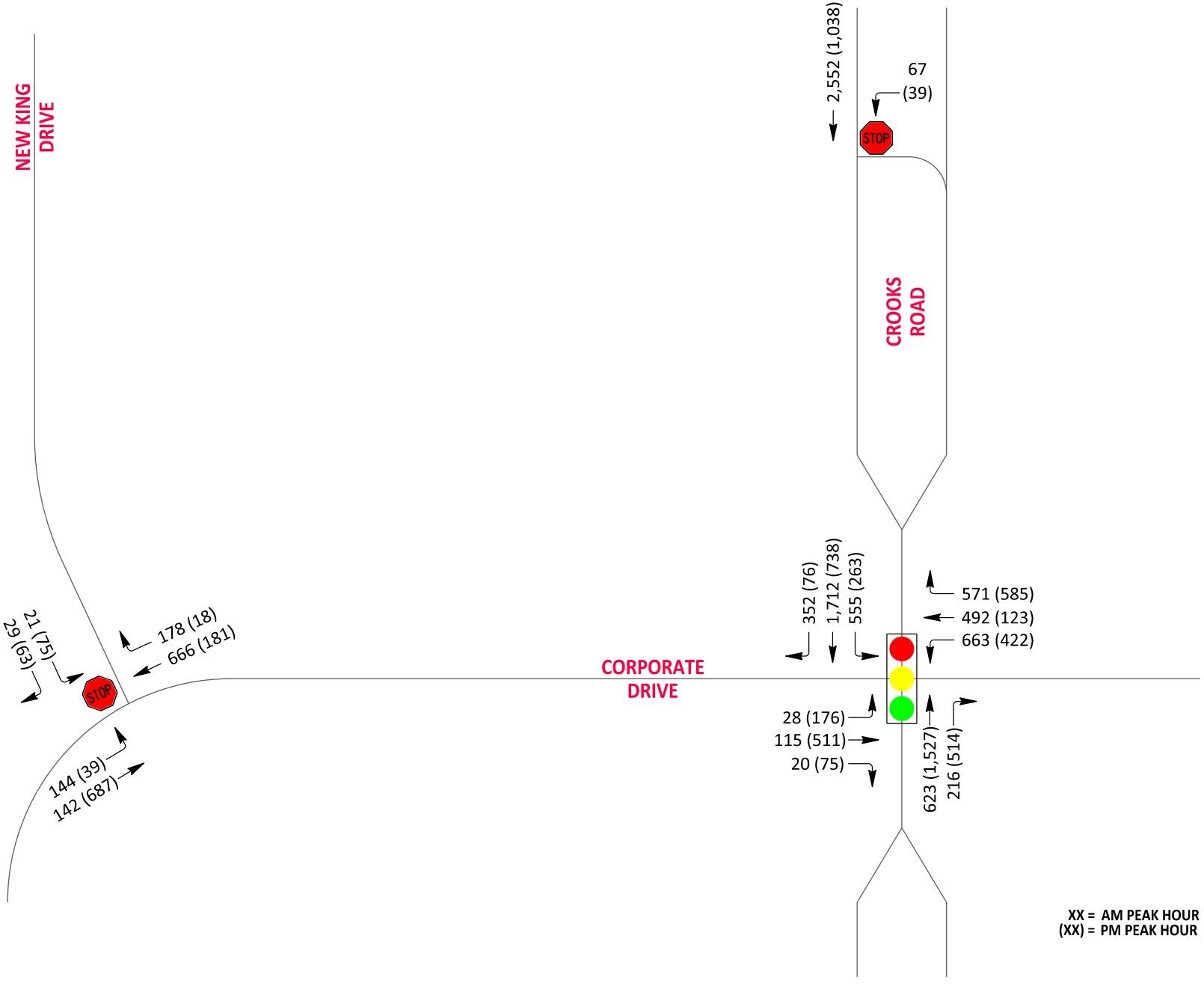
2018 EXISTING AM (PM) PEAK HOUR TRAFFIC VOLUMES

FIGURE 2



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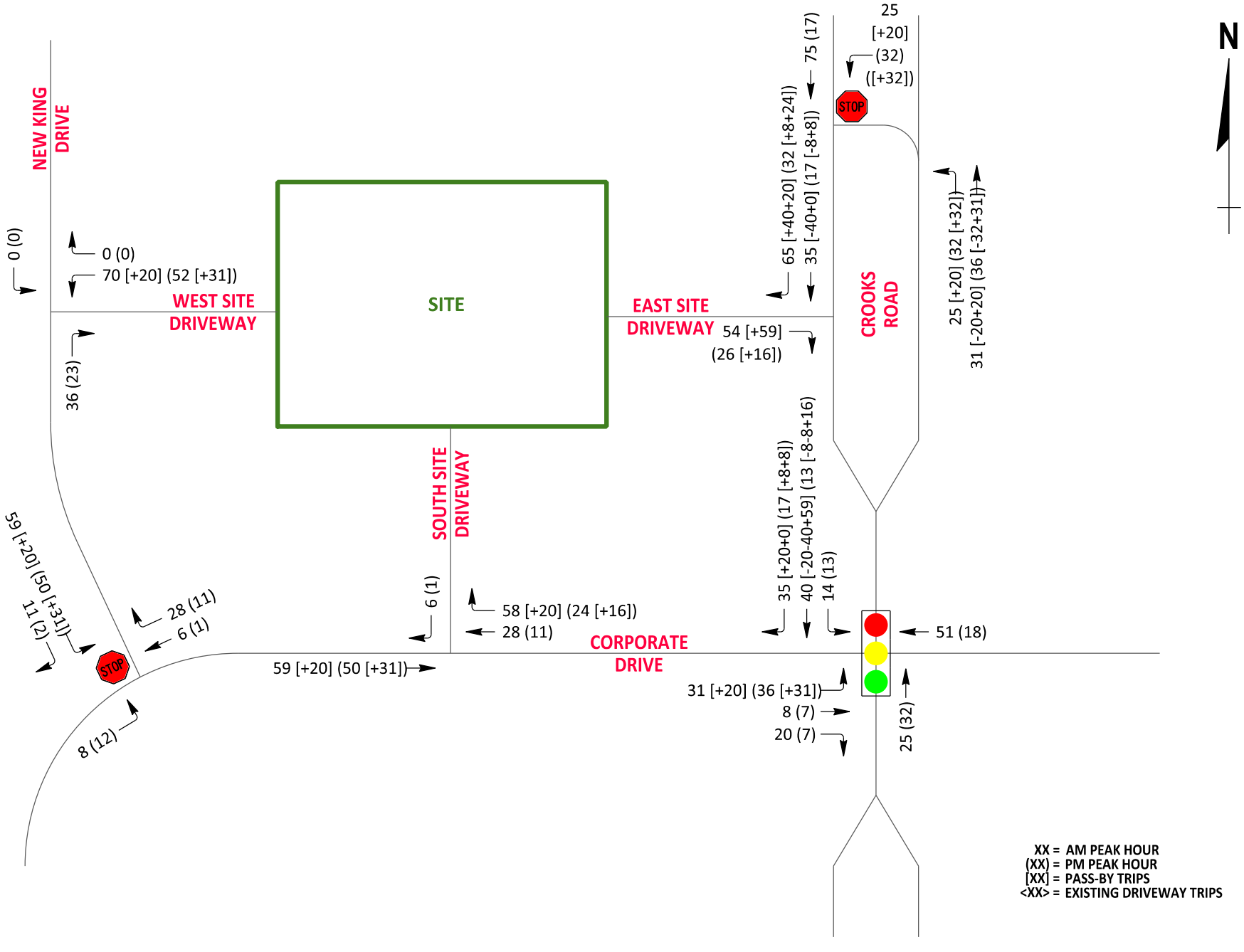
2020 BACKGROUND AM (PM) PEAK HOUR TRAFFIC VOLUMES

FIGURE 3



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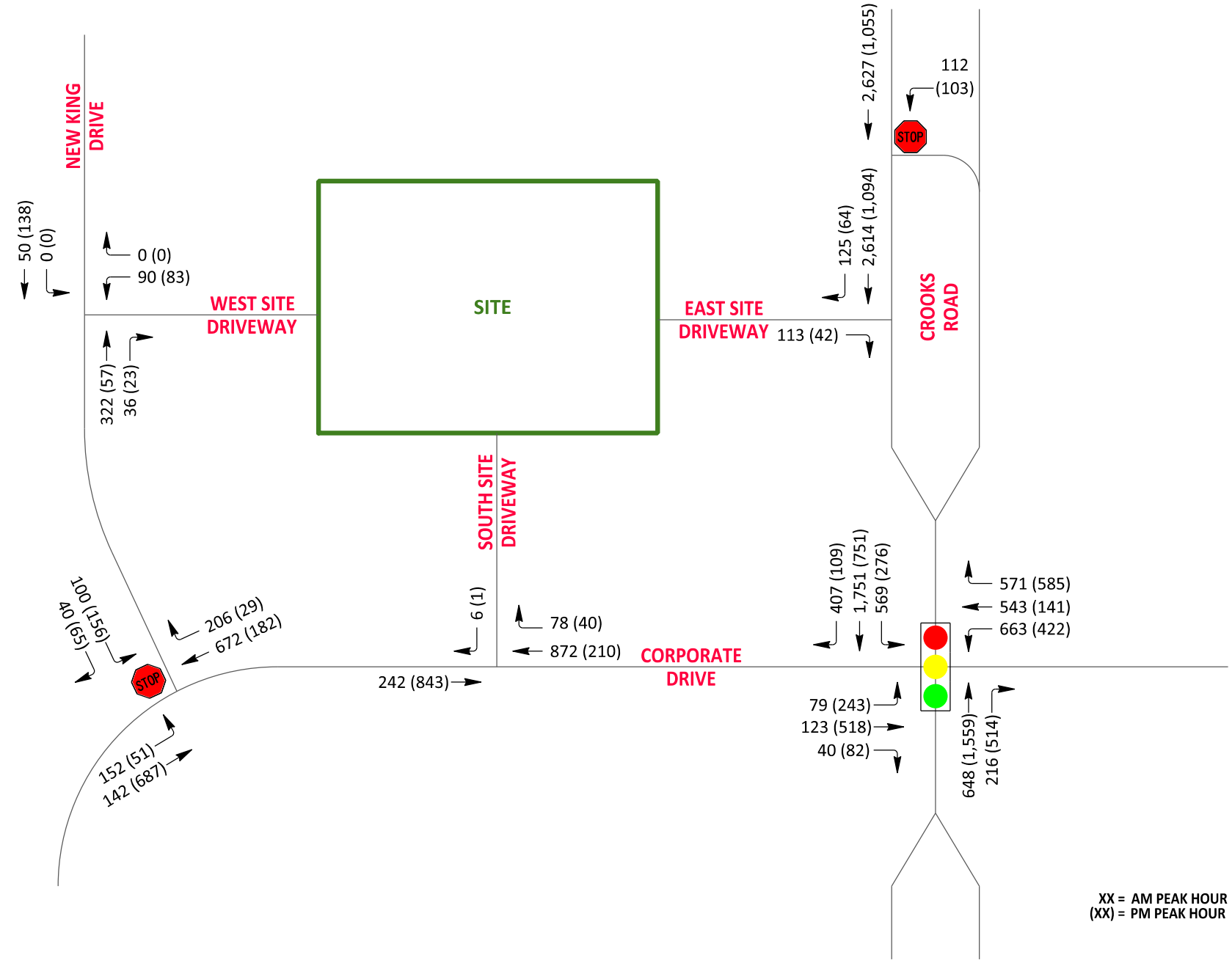
SITE GENERATED AM (PM) PEAK HOUR TRAFFIC VOLUMES

FIGURE 4



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2018 TOTAL FUTURE AM (PM) PEAK HOUR TRAFFIC VOLUMES

FIGURE 5

TRAFFIC COUNTS

Growth Rate: 1.5%

Buildout Year: 2020

Count Year: 2018

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Crooks Road & Corp\I-75 Ramp	A.M. Peak 10/16/18		PHF		0.76			0.92			0.95			0.95	
		2018	Existing	**27**	**112**	**19**	**644**	**478**	**554**	**0**	**605**	**210**	**539**	**1662**	**342**
		2020	Background	28	115	20	663	492	571	0	623	216	555	1712	352
A.M.		Total Background		**28**	**115**	**20**	**663**	**492**	**571**	**0**	**623**	**216**	**555**	**1712**	**352**
		Site Generated		51	8	20		51			25		14	39	55
		Total Future		**79**	**123**	**40**	**663**	**543**	**571**	**0**	**648**	**216**	**569**	**1751**	**407**

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Corp. Drive & New King Drive	A.M. Peak 10/16/18		PHF		0.88			0.95						0.75	
		2018	Existing	**140**	**138**			**647**	**173**				**20**		**28**
		2020	Background	144	142	0	0	666	178	0	0	0	21	0	29
		Total Background		**144**	**142**	**0**	**0**	**666**	**178**	**0**	**0**	**0**	**21**	**0**	**29**
		Site Generated		8				6	28				79		11
		Total Future		**152**	**142**	**0**	**0**	**672**	**206**	**0**	**0**	**0**	**100**	**0**	**40**

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
SB Crooks Rd & NB to SB X-Ovr	A.M. Peak 10/16/18		PHF					0.77						0.95	
		2018	Existing				**65**							**2478**	
		2020	Background	0	0	0	67	0	0	0	0	0	0	2552	0
		Total Background		**0**	**0**	**0**	**67**	**0**	**0**	**0**	**0**	**0**	**0**	**2552**	**0**
		Site Generated					45							75	
		Total Future		**0**	**0**	**0**	**112**	**0**	**0**	**0**	**0**	**0**	**0**	**2627**	**0**

Growth Rate: 1.5%

Buildout Year: 2020

Count Year: 2018

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Crooks Road & Corp\I-75 Ramp	P.M. Peak 10/16/18		PHF		0.93			0.95			0.95			0.95	
		2018	Existing	**171**	**496**	**73**	**410**	**119**	**568**	**0**	**1482**	**499**	**255**	**716**	**74**
		2020	Background	176	511	75	422	123	585	0	1527	514	263	738	76
P.M.		Total Background		**176**	**511**	**75**	**422**	**123**	**585**	**0**	**1527**	**514**	**263**	**738**	**76**
		Site Generated		67	7	7		18			32		13	13	33
		Total Future		**243**	**518**	**82**	**422**	**141**	**585**	**0**	**1559**	**514**	**276**	**751**	**109**

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Corp. Drive & New King Drive	P.M. Peak 10/16/18		PHF		0.89			0.80						0.68	
		2018	Existing	**38**	**667**			**176**	**17**				**73**		**61**
		2020	Background	39	687	0	0	181	18	0	0	0	75	0	63
		Total Background		**39**	**687**	**0**	**0**	**181**	**18**	**0**	**0**	**0**	**75**	**0**	**63**
		Site Generated		12				1	11				81		2
		Total Future		**51**	**687**	**0**	**0**	**182**	**29**	**0**	**0**	**0**	**156**	**0**	**65**

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
SB Crooks Rd & NB to SB X-Ovr	P.M. Peak 10/16/18		PHF					0.79						0.95	
		2018	Existing				**38**							**1007**	
		2020	Background	0	0	0	39	0	0	0	0	0	0	1038	0
		Total Background		**0**	**0**	**0**	**39**	**0**	**0**	**0**	**0**	**0**	**0**	**1038**	**0**
		Site Generated					64							17	
		Total Future		**0**	**0**	**0**	**103**	**0**	**0**	**0**	**0**	**0**	**0**	**1055**	**0**

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2600 Auburn Road
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(810) 444-7815

Crooks Road & Corporate Drive/I-75 Ramp
City Of Troy
Weather Condition; Clear
Board # 2

File Name : Crooks RD & Corporate Dr
Site Code : 0056
Start Date : 1/1/2000
Page No : 1

Groups Printed- Unshifted

	Crooks Rd Southbound				I-75 Off Ramp Westbound				Crooks Road Northbound				Corporate Drive Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	113	365	123	0	133	102	135	0	26	94	0	0	4	21	4	0	1120
07:15 AM	103	353	125	0	124	114	165	0	33	96	0	0	4	32	6	0	1155
07:30 AM	74	424	142	0	142	130	180	0	60	153	0	0	5	38	9	0	1357
07:45 AM	66	439	143	0	150	118	190	0	43	144	0	0	5	29	6	0	1333
Total	356	1581	533	0	549	464	670	0	162	487	0	0	18	120	25	0	4965
08:00 AM	96	438	122	0	138	115	137	0	48	163	0	0	5	24	6	0	1292
08:15 AM	106	361	132	0	124	115	137	0	59	145	0	0	4	21	6	0	1210
08:30 AM	82	389	139	0	128	103	141	0	48	139	0	0	4	29	5	0	1207
08:45 AM	76	356	99	0	130	101	146	0	59	160	0	0	5	32	7	0	1171
Total	360	1544	492	0	520	434	561	0	214	607	0	0	18	106	24	0	4880
*** BREAK ***																	
04:00 PM	19	159	68	0	81	25	89	0	85	297	0	0	10	70	25	0	928
04:15 PM	21	172	78	0	129	35	76	0	97	339	0	0	15	105	30	0	1097
04:30 PM	17	188	65	0	129	27	113	0	91	370	0	0	16	110	43	0	1169
04:45 PM	22	180	70	0	140	25	107	0	138	366	0	0	18	123	45	0	1234
Total	79	699	281	0	479	112	385	0	411	1372	0	0	59	408	143	0	4428
05:00 PM	18	172	58	0	145	29	111	0	111	389	0	0	21	134	44	0	1232
05:15 PM	17	176	62	0	154	38	79	0	159	357	0	0	18	129	39	0	1228
05:30 PM	15	155	62	0	133	34	105	0	115	373	0	0	15	124	33	0	1164
05:45 PM	14	156	48	0	156	27	114	0	82	361	0	0	11	126	36	0	1131
Total	64	659	230	0	588	128	409	0	467	1480	0	0	65	513	152	0	4755
Grand Total	859	4483	1536	0	2136	1138	2025	0	1254	3946	0	0	160	1147	344	0	19028
Apprch %	12.5	65.2	22.3	0	40.3	21.5	38.2	0	24.1	75.9	0	0	9.7	69.5	20.8	0	
Total %	4.5	23.6	8.1	0	11.2	6	10.6	0	6.6	20.7	0	0	0.8	6	1.8	0	

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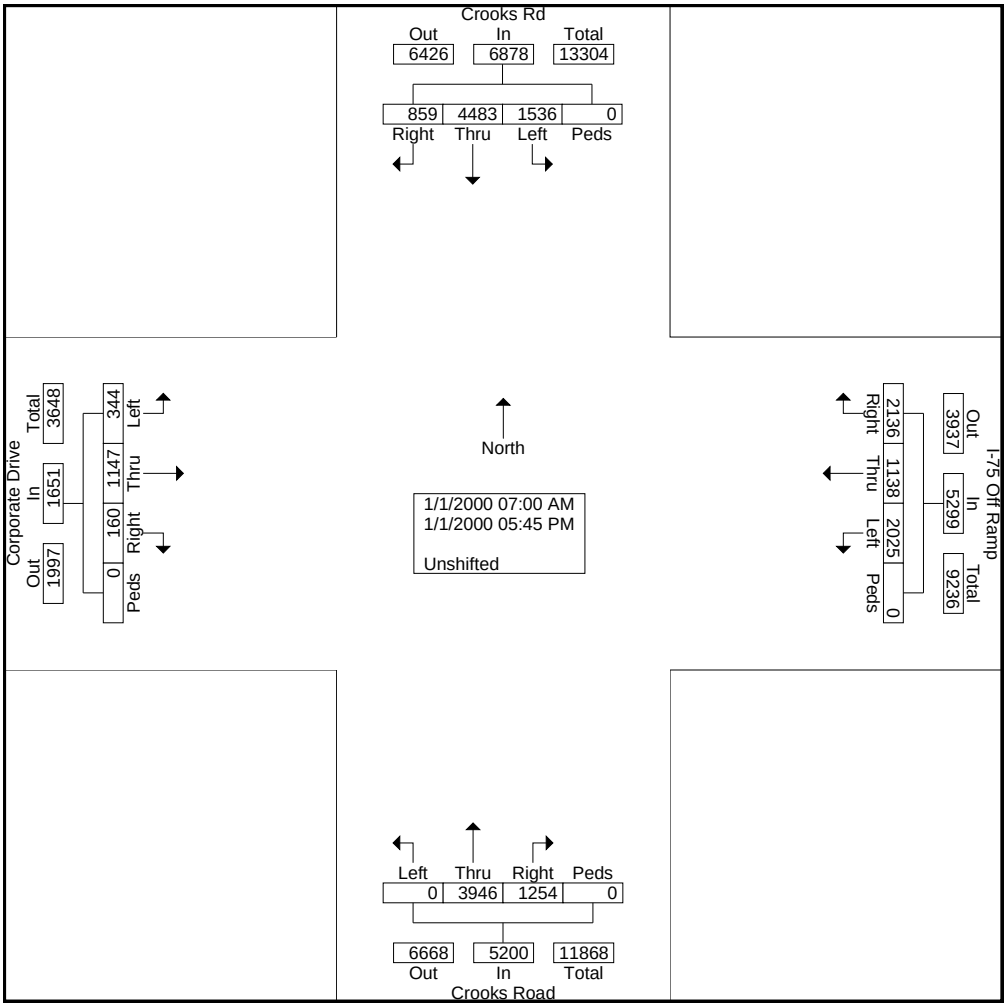

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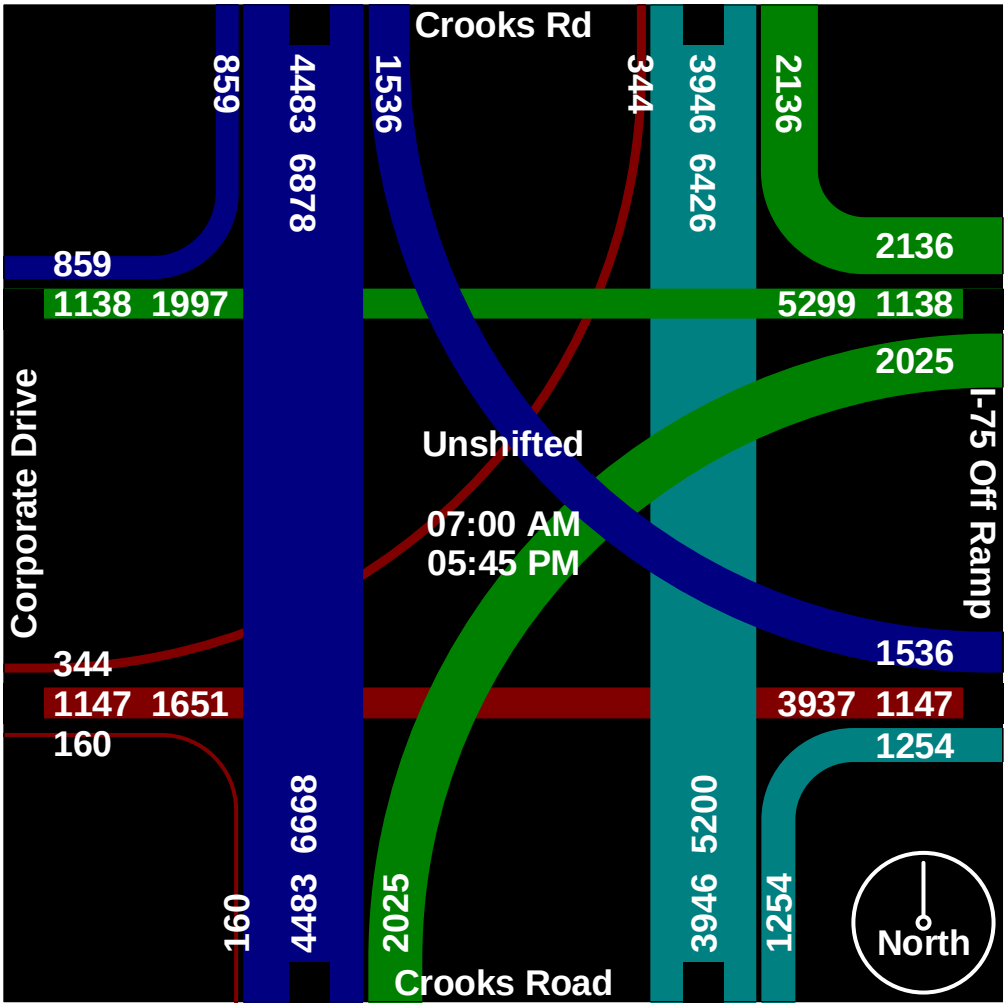

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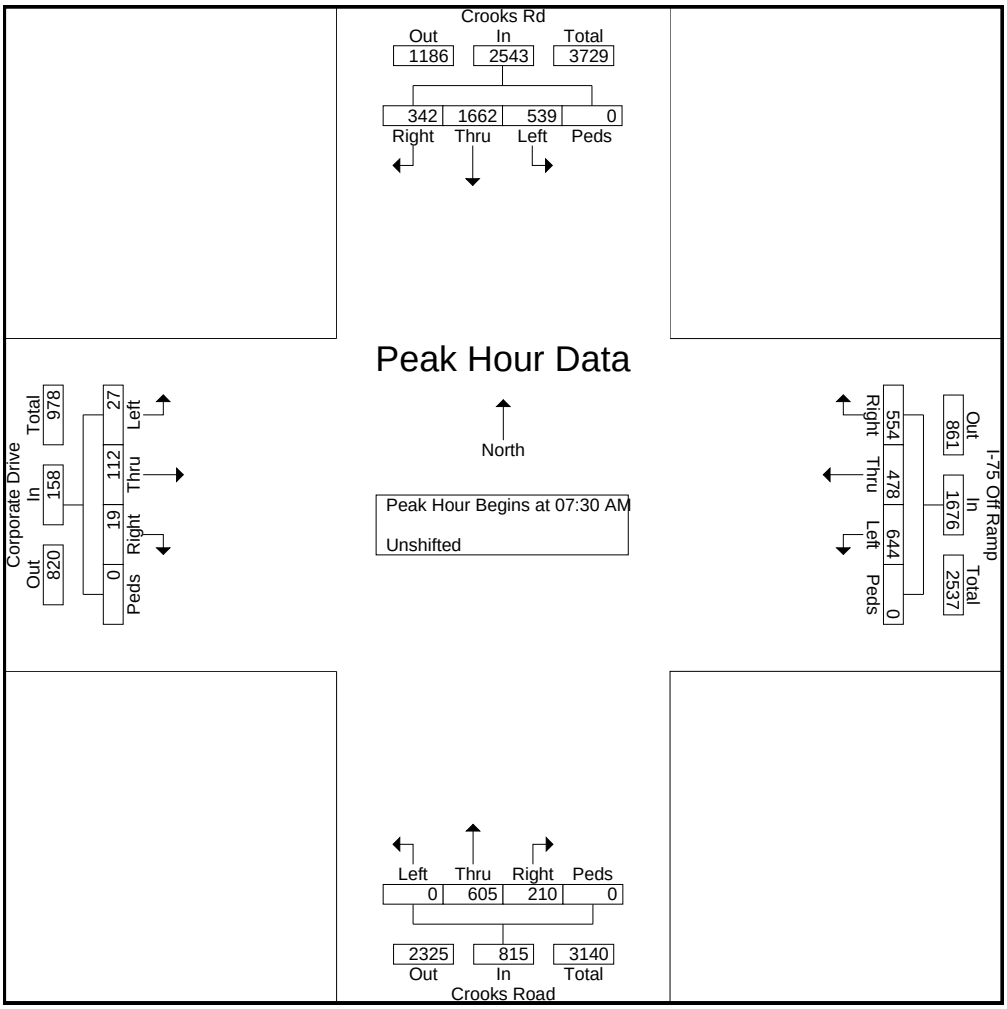
	Crooks Rd Southbound					I-75 Off Ramp Westbound					Crooks Road Northbound					Corporate Drive Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	74	424	142	0	640	142	130	180	0	452	60	153	0	0	213	5	38	9	0	52	1357
07:45 AM	66	439	143	0	648	150	118	190	0	458	43	144	0	0	187	5	29	6	0	40	1333
08:00 AM	96	438	122	0	656	138	115	137	0	390	48	163	0	0	211	5	24	6	0	35	1292
08:15 AM	106	361	132	0	599	124	115	137	0	376	59	145	0	0	204	4	21	6	0	31	1210
Total Volume	342	1662	539	0	2543	554	478	644	0	1676	210	605	0	0	815	19	112	27	0	158	5192
% App. Total	13.4	65.4	21.2	0		33.1	28.5	38.4	0		25.8	74.2	0	0		12	70.9	17.1	0		
PHF	.807	.946	.942	.000	.969	.923	.919	.847	.000	.915	.875	.928	.000	.000	.957	.950	.737	.750	.000	.760	.957



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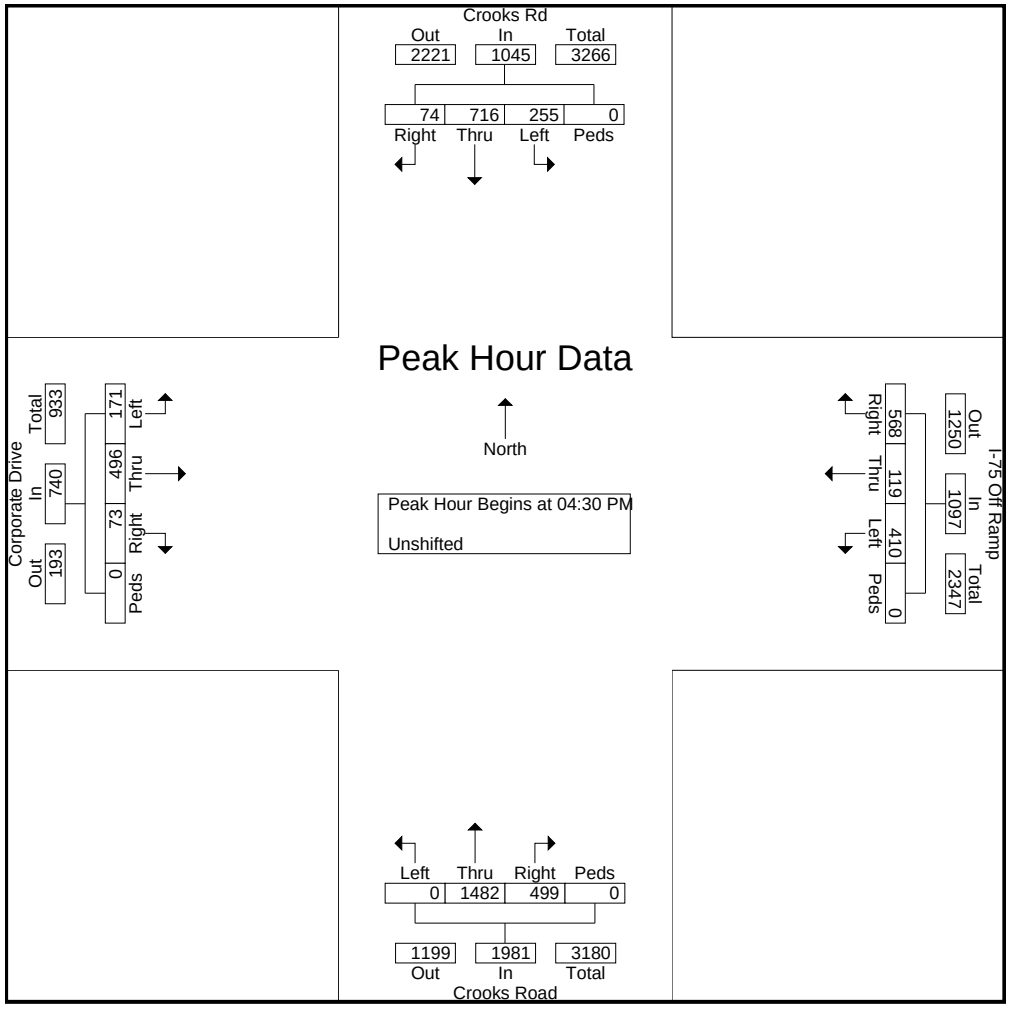
	Crooks Rd Southbound					I-75 Off Ramp Westbound					Crooks Road Northbound					Corporate Drive Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	17	188	65	0	270	129	27	113	0	269	91	370	0	0	461	16	110	43	0	169	1169
04:45 PM	22	180	70	0	272	140	25	107	0	272	138	366	0	0	504	18	123	45	0	186	1234
05:00 PM	18	172	58	0	248	145	29	111	0	285	111	389	0	0	500	21	134	44	0	199	1232
05:15 PM	17	176	62	0	255	154	38	79	0	271	159	357	0	0	516	18	129	39	0	186	1228
Total Volume	74	716	255	0	1045	568	119	410	0	1097	499	1482	0	0	1981	73	496	171	0	740	4863
% App. Total																					
PHF	.841	.952	.911	.000	.960	.922	.783	.907	.000	.962	.785	.952	.000	.000	.960	.869	.925	.950	.000	.930	.985



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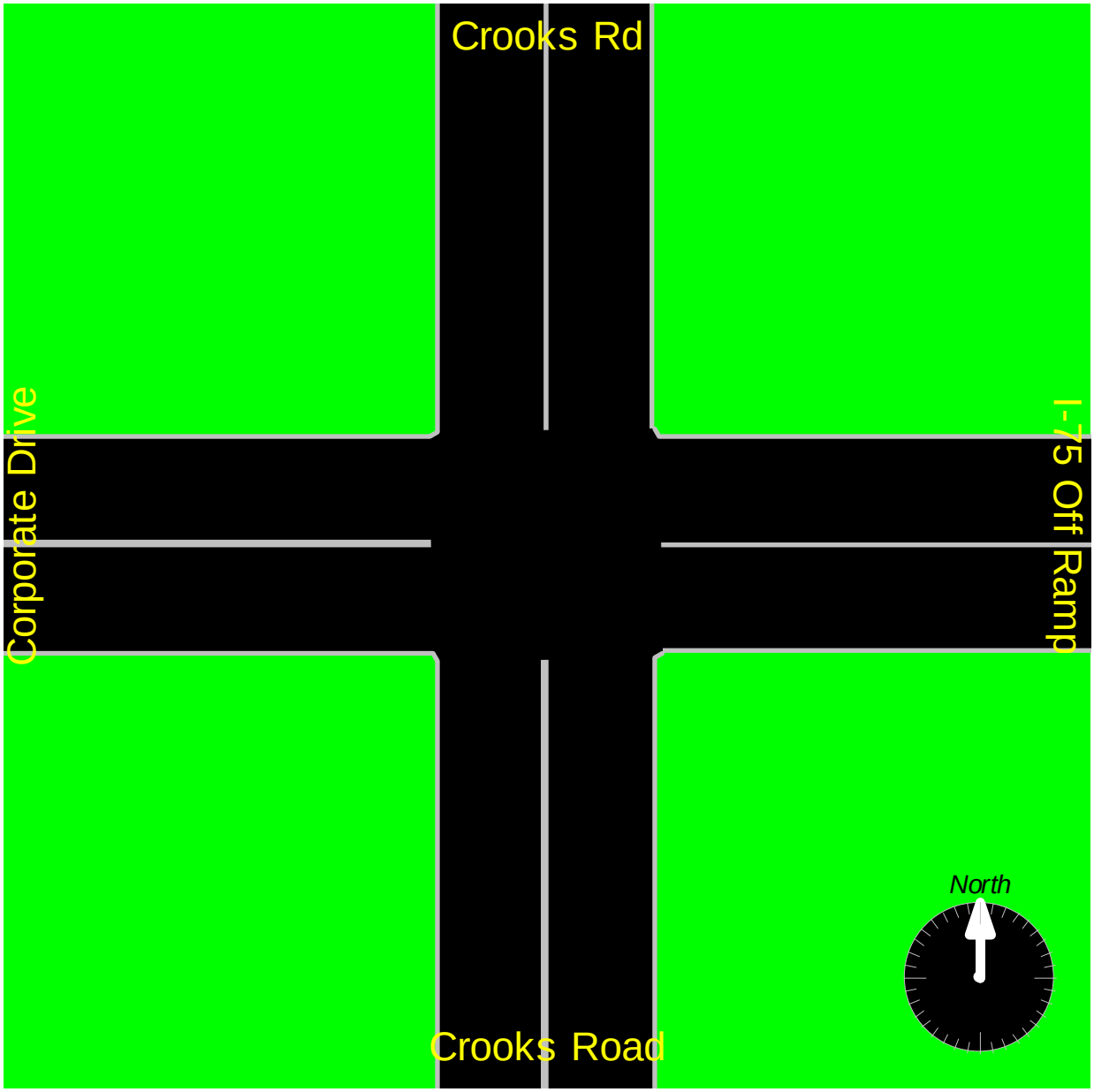
Start Date : 1/1/2000
Page No : 6



Stellar Development, LLC.

2600 Auburn Road
Auburn Hills, Michigan 481326
(810) 444-7815

Corporate Drive & New King Drive
City of Troy
Weather Condition; Clear
Board # 1

File Name : am corp
Site Code : 00000555
Start Date : 9/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1

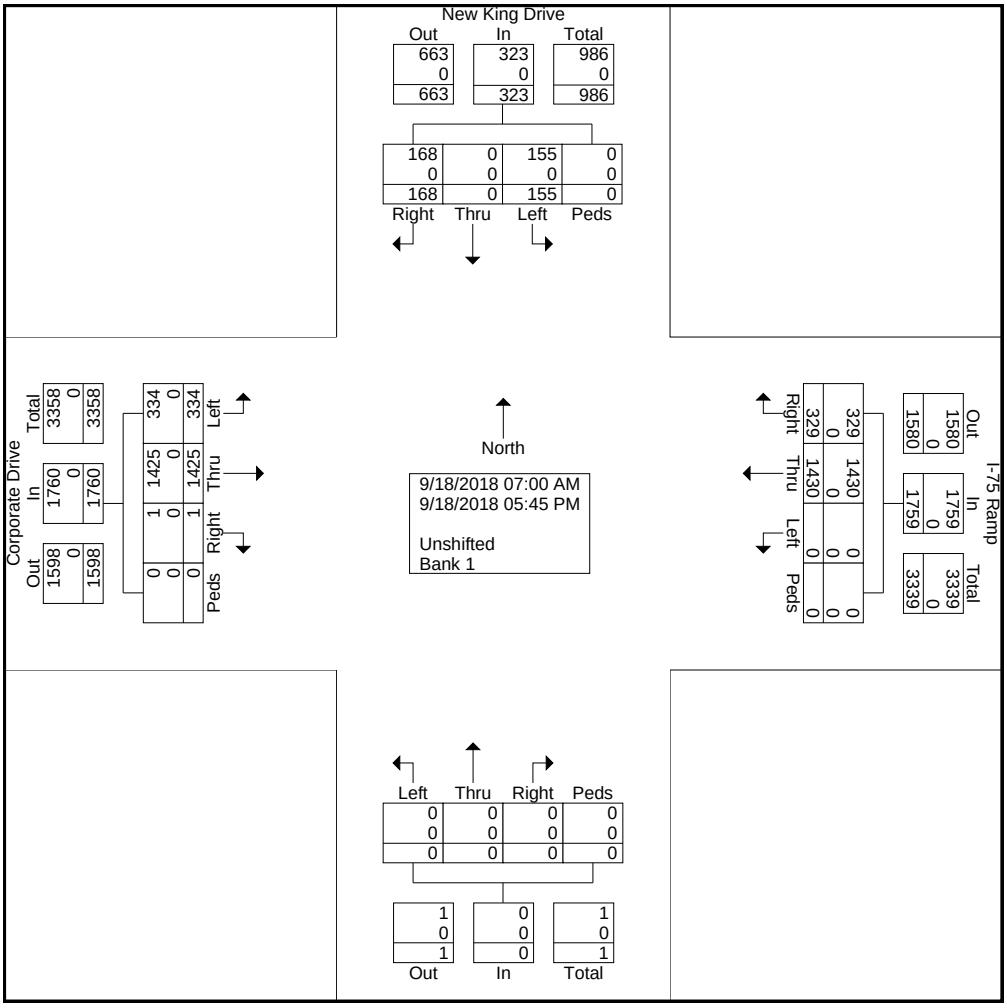
	New King Drive Southbound				I-75 Ramp Westbound				Northbound				Corporate Drive Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	3	0	4	0	23	98	0	0	0	0	0	0	0	29	27	0	184
07:15 AM	3	0	2	0	29	119	0	0	0	0	0	0	0	33	29	0	215
07:30 AM	6	0	4	0	37	139	0	0	0	0	0	0	0	41	38	0	265
07:45 AM	5	0	5	0	45	169	0	0	0	0	0	0	0	35	42	0	301
Total	17	0	15	0	134	525	0	0	0	0	0	0	0	138	136	0	965
08:00 AM	10	0	6	0	41	174	0	0	0	0	0	0	0	27	34	0	292
08:15 AM	7	0	4	0	64	158	0	0	0	0	0	0	1	39	38	0	311
08:30 AM	6	0	5	0	23	184	0	0	0	0	0	0	0	31	26	0	275
08:45 AM	4	0	6	0	26	160	0	0	0	0	0	0	0	34	31	0	261
Total	27	0	21	0	154	676	0	0	0	0	0	0	1	131	129	0	1139
*** BREAK ***																	
04:00 PM	10	0	0	0	7	19	0	0	0	0	0	0	0	98	6	0	140
04:15 PM	19	0	11	0	3	23	0	0	0	0	0	0	0	106	11	0	173
04:30 PM	17	0	14	0	5	17	0	0	0	0	0	0	0	131	8	0	192
04:45 PM	15	0	12	0	4	18	0	0	0	0	0	0	0	195	7	0	251
Total	61	0	37	0	19	77	0	0	0	0	0	0	0	530	32	0	756
05:00 PM	12	0	22	0	3	35	0	0	0	0	0	0	0	157	13	0	242
05:15 PM	8	0	16	0	5	37	0	0	0	0	0	0	0	177	12	0	255
05:30 PM	26	0	23	0	5	41	0	0	0	0	0	0	0	154	6	0	255
05:45 PM	17	0	21	0	9	39	0	0	0	0	0	0	0	138	6	0	230
Total	63	0	82	0	22	152	0	0	0	0	0	0	0	626	37	0	982
Grand Total	168	0	155	0	329	1430	0	0	0	0	0	0	1	1425	334	0	3842
Apprch %	52	0	48	0	18.7	81.3	0	0	0	0	0	0	0.1	81	19	0	
Total %	4.4	0	4	0	8.6	37.2	0	0	0	0	0	0	0	37.1	8.7	0	
Unshifted	168	0	155	0	329	1430	0	0	0	0	0	0	1	1425	334	0	3842
% Unshifted	100	0	100	0	100	100	0	0	0	0	0	0	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Stellar Development, LLC.

2600 Auburn Road
Auburn Hills, Michigan 481326
(810) 444-7815

Corporate Drive & New King Drive
City of Troy
Weather Condition; Clear
Board # 1

File Name : am corp
Site Code : 00000555
Start Date : 9/18/2018
Page No : 2



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File Name : am corp
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Start Date : 9/18/2018
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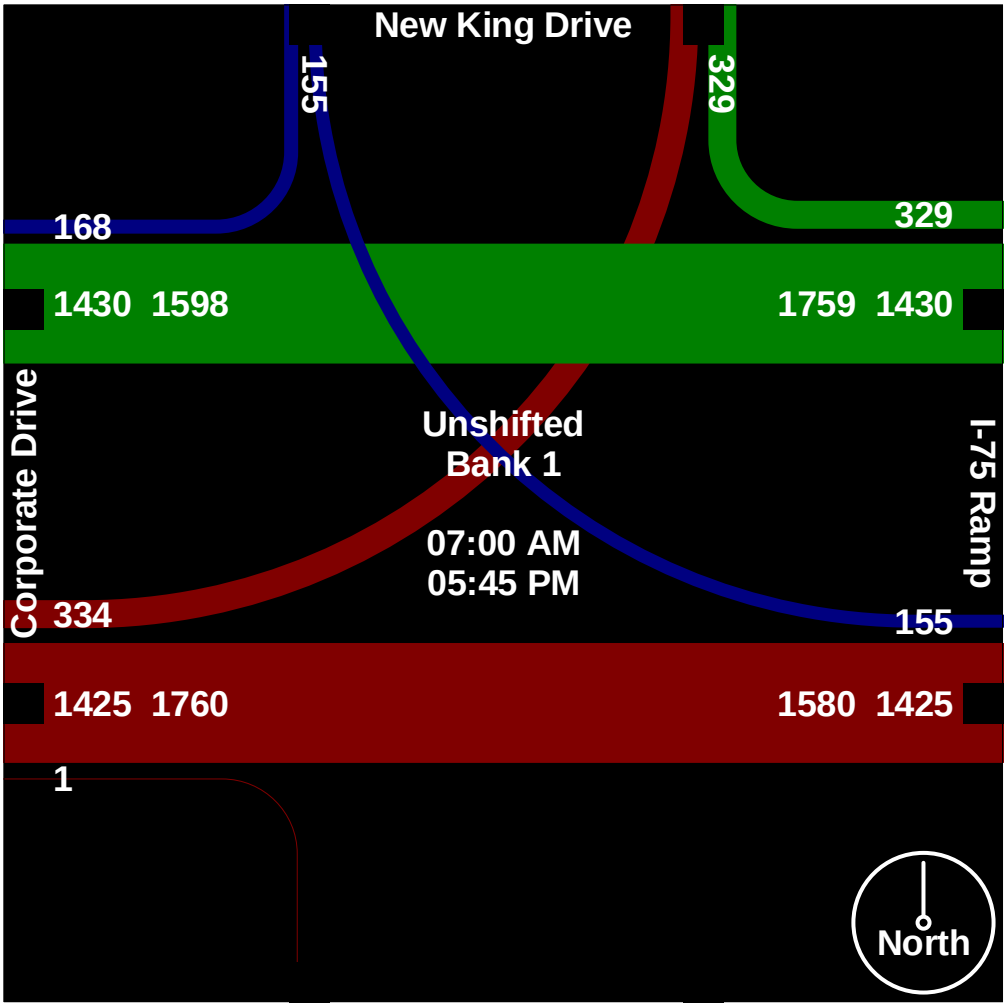

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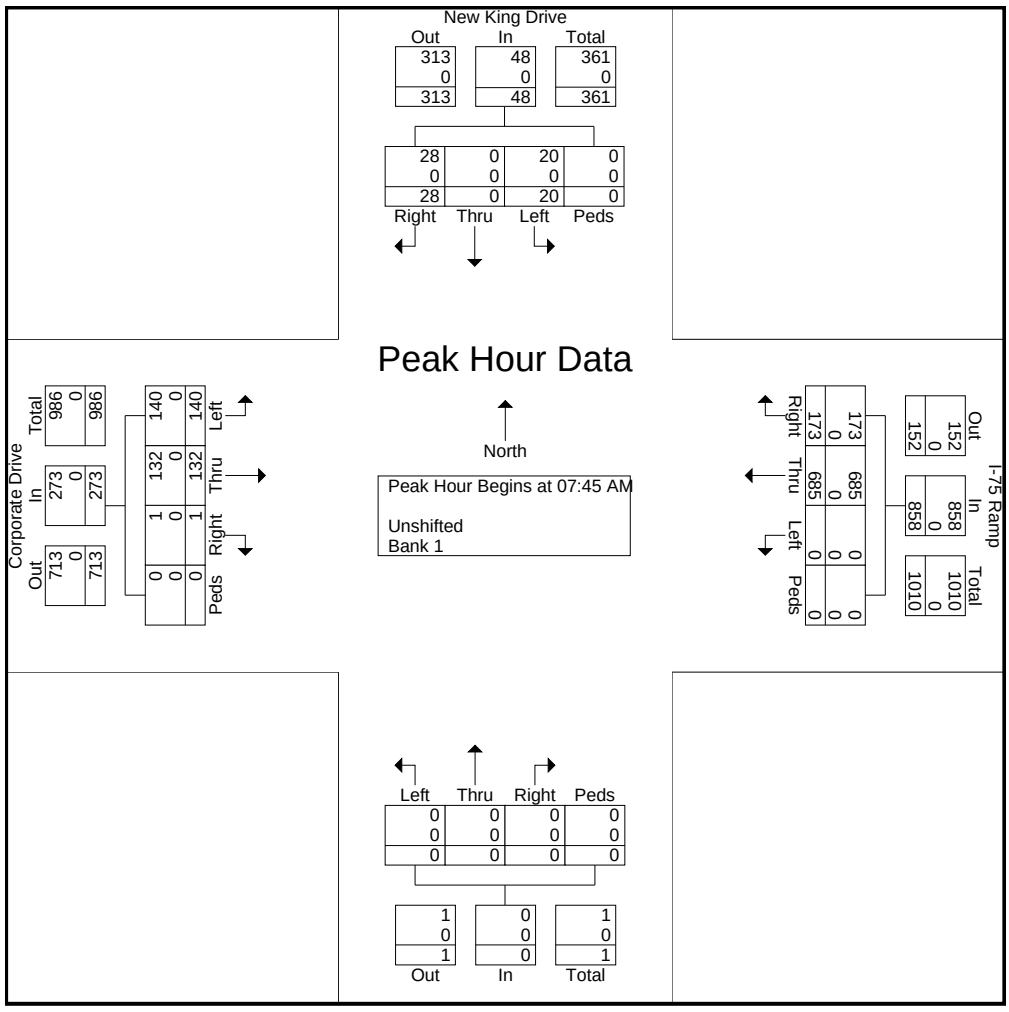
Corporate Drive & New King Drive
City of Troy
Weather Condition; Clear
Board # 1

File Name : am corp
Site Code : 00000555
Start Date : 9/18/2018
Page No : 4

	New King Drive Southbound					I-75 Ramp Westbound					Northbound					Corporate Drive Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	5	0	5	0	10	45	169	0	0	214	0	0	0	0	0	0	35	42	0	77	301
08:00 AM	10	0	6	0	16	41	174	0	0	215	0	0	0	0	0	0	27	34	0	61	292
08:15 AM	7	0	4	0	11	64	158	0	0	222	0	0	0	0	0	1	39	38	0	78	311
08:30 AM	6	0	5	0	11	23	184	0	0	207	0	0	0	0	0	0	31	26	0	57	275
Total Volume	28	0	20	0	48	173	685	0	0	858	0	0	0	0	0	1	132	140	0	273	1179
% App. Total	58.3	0	41.7	0		20.2	79.8	0	0		0	0	0	0		0.4	48.4	51.3	0		
PHF	.700	.000	.833	.000	.750	.676	.931	.000	.000	.966	.000	.000	.000	.000	.000	.250	.846	.833	.000	.875	.948
Unshifted	28	0	20	0	48	173	685	0	0	858	0	0	0	0	0	1	132	140	0	273	1179
% Unshifted	100	0	100	0	100	100	100	0	0	100	0	0	0	0	0	100	100	100	0	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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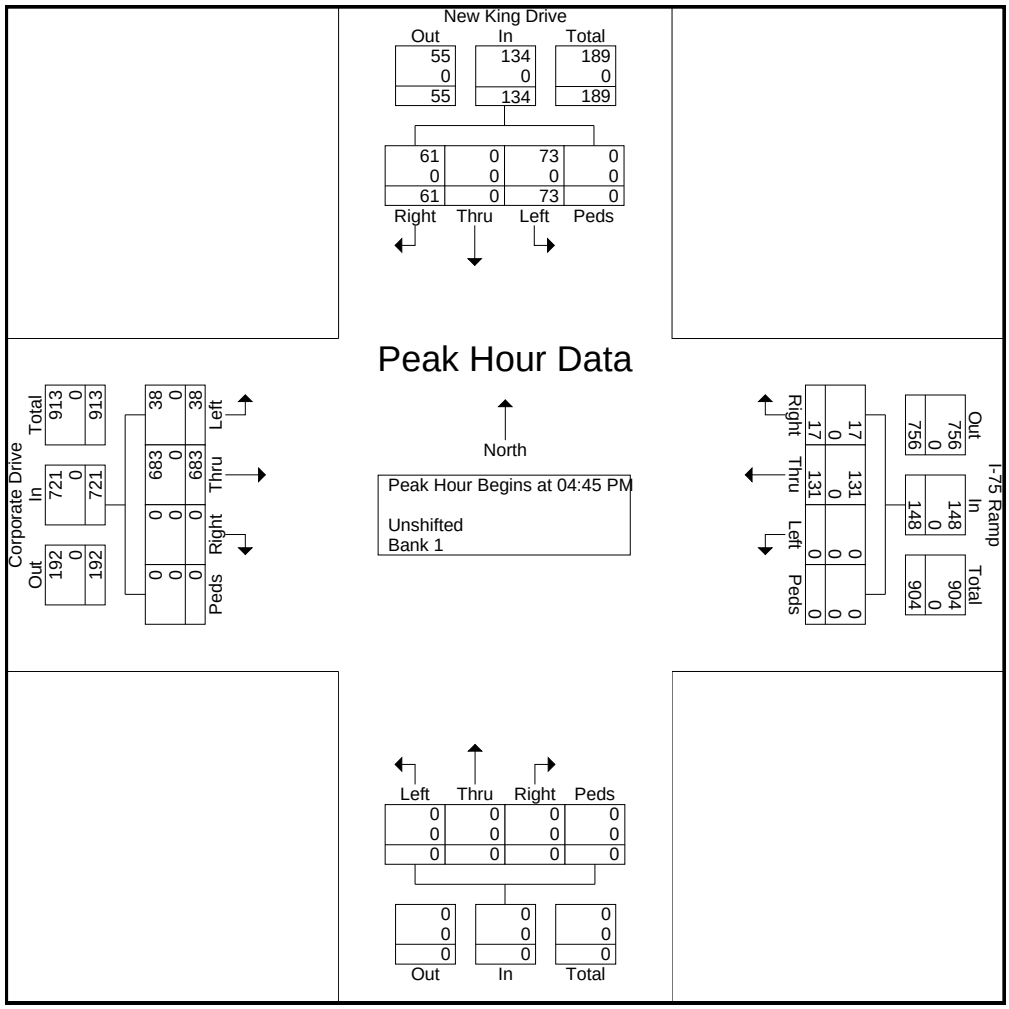
Corporate Drive & New King Drive
City of Troy
Weather Condition; Clear
Board # 1

File Name : am corp
Site Code : 00000555
Start Date : 9/18/2018
Page No : 5

	New King Drive Southbound					I-75 Ramp Westbound					Northbound					Corporate Drive Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	15	0	12	0	27	4	18	0	0	22	0	0	0	0	0	0	195	7	0	202	251
05:00 PM	12	0	22	0	34	3	35	0	0	38	0	0	0	0	0	0	157	13	0	170	242
05:15 PM	8	0	16	0	24	5	37	0	0	42	0	0	0	0	0	0	177	12	0	189	255
05:30 PM	26	0	23	0	49	5	41	0	0	46	0	0	0	0	0	0	154	6	0	160	255
Total Volume	61	0	73	0	134	17	131	0	0	148	0	0	0	0	0	0	683	38	0	721	1003
% App. Total	45.5	0	54.5	0		11.5	88.5	0	0		0	0	0	0		0	94.7	5.3	0		
PHF	.587	.000	.793	.000	.684	.850	.799	.000	.000	.804	.000	.000	.000	.000	.000	.000	.876	.731	.000	.892	.983
Unshifted	61	0	73	0	134	17	131	0	0	148	0	0	0	0	0	0	683	38	0	721	1003
% Unshifted	100	0	100	0	100	100	100	0	0	100	0	0	0	0	0	0	100	100	0	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Stellar Development, LLC.

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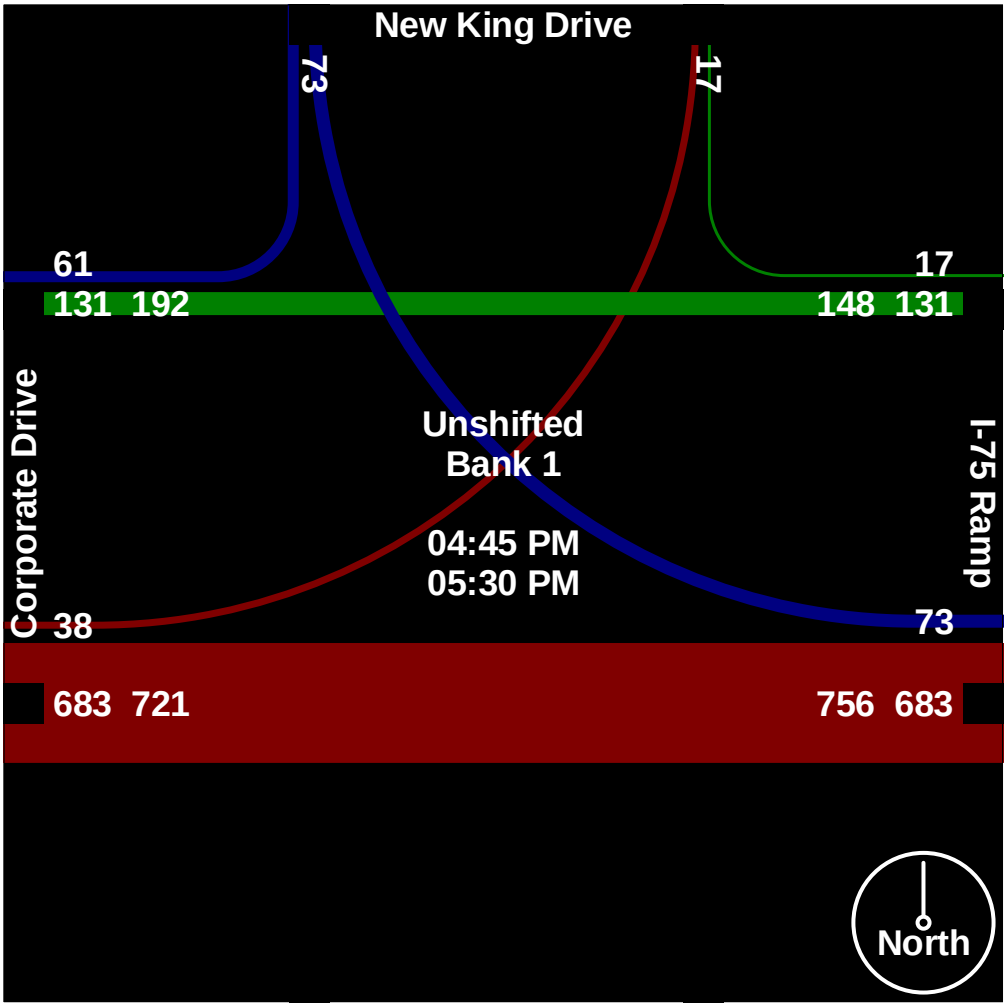
(810) 444-7815

Corporate Drive & New King Drive
City of Troy
Weather Condition; Clear
Board # 1

File Name : am corp
Site Code : 00000555
Start Date : 9/18/2018
Page No : 6



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Corporate Drive & New King Drive
City of Troy
Weather Condition; Clear
Board # 1

File Name : am corp
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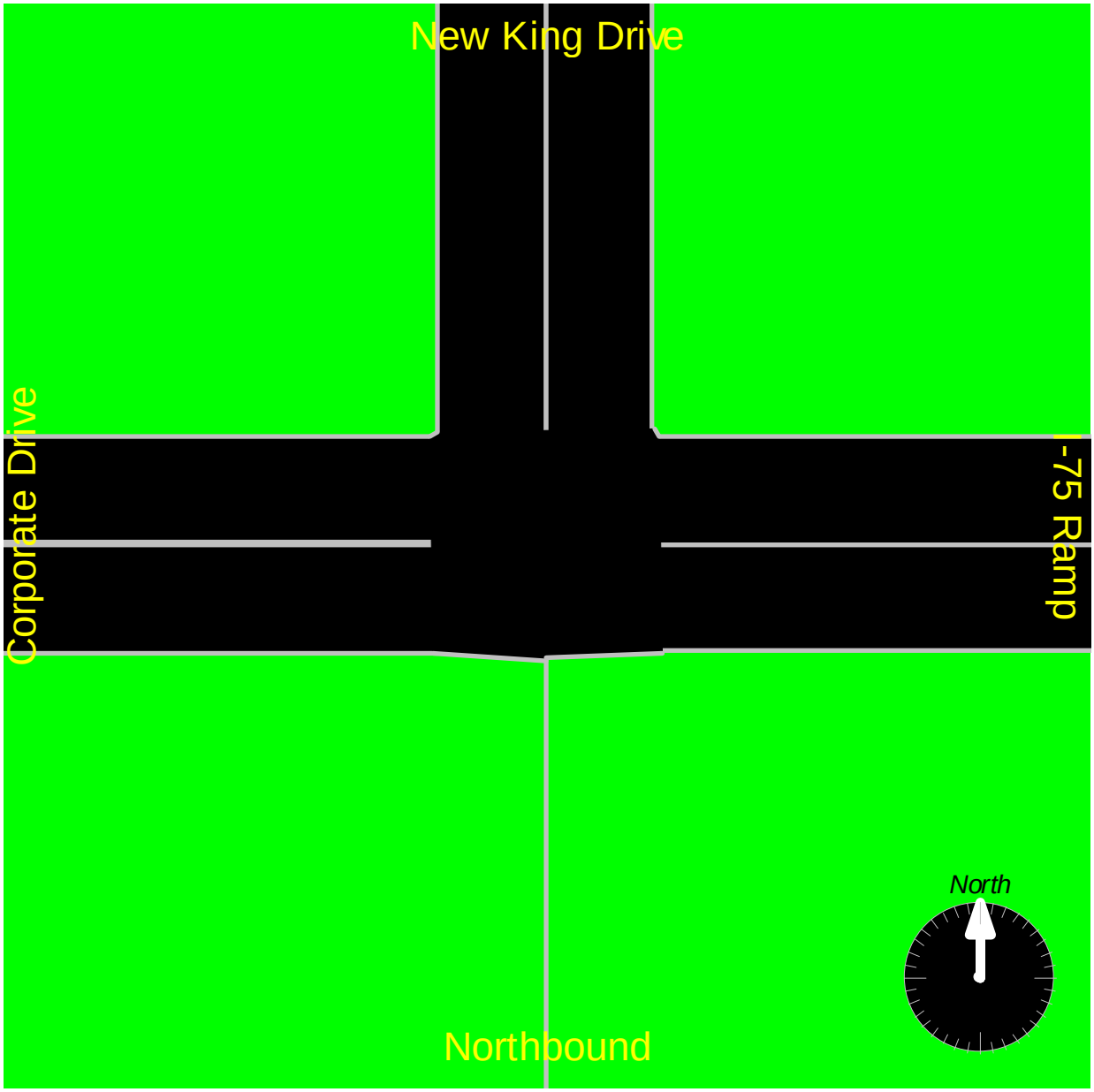
Start Date : 9/18/2018
Page No : 7



Stellar Development, LLC.

2600 Auburn Road
Auburn Hills, Michigan 481326
(810) 444-7815

SB Crooks Road@ NB X-Over N. of Corporate
City of Troy
Weather Condition Clear
Board # 3

File Name : Crooks RD & NB to SB X-Over, N of Corporate Drive
Site Code : 00000057
Start Date : 1/1/2000
Page No : 1

Groups Printed- Unshifted

	SB Crooks Rd Southbound				NB to SB X-Over Westbound				Northbound				Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	588	0	0	0	13	0	0	0	0	0	0	0	0	0	0	601
07:15 AM	0	569	0	0	0	12	0	0	0	0	0	0	0	0	0	0	581
07:30 AM	0	623	0	0	0	17	0	0	0	0	0	0	0	0	0	0	640
07:45 AM	0	621	0	0	0	21	0	0	0	0	0	0	0	0	0	0	642
Total	0	2401	0	0	0	63	0	0	0	0	0	0	0	0	0	0	2464
08:00 AM	0	638	0	0	0	16	0	0	0	0	0	0	0	0	0	0	654
08:15 AM	0	587	0	0	0	11	0	0	0	0	0	0	0	0	0	0	598
08:30 AM	0	588	0	0	0	17	0	0	0	0	0	0	0	0	0	0	605
08:45 AM	76	521	0	0	0	9	0	0	0	0	0	0	5	0	0	0	611
Total	76	2334	0	0	0	53	0	0	0	0	0	0	5	0	0	0	2468
*** BREAK ***																	
04:00 PM	0	234	0	0	0	11	0	0	0	0	0	0	0	0	0	0	245
04:15 PM	0	262	0	0	0	9	0	0	0	0	0	0	0	0	0	0	271
04:30 PM	0	255	0	0	0	7	0	0	0	0	0	0	0	0	0	0	262
04:45 PM	0	238	0	0	0	12	0	0	0	0	0	0	0	0	0	0	250
Total	0	989	0	0	0	39	0	0	0	0	0	0	0	0	0	0	1028
05:00 PM	0	248	0	0	0	10	0	0	0	0	0	0	0	0	0	0	258
05:15 PM	0	245	0	0	0	8	0	0	0	0	0	0	0	0	0	0	253
05:30 PM	0	225	0	0	0	7	0	0	0	0	0	0	0	0	0	0	232
05:45 PM	14	210	0	0	0	8	0	0	0	0	0	0	0	0	0	0	232
Total	14	928	0	0	0	33	0	0	0	0	0	0	0	0	0	0	975
Grand Total	90	6652	0	0	0	188	0	0	0	0	0	0	5	0	0	0	6935
Apprch %	1.3	98.7	0	0	0	100	0	0	0	0	0	0	100	0	0	0	
Total %	1.3	95.9	0	0	0	2.7	0	0	0	0	0	0	0.1	0	0	0	

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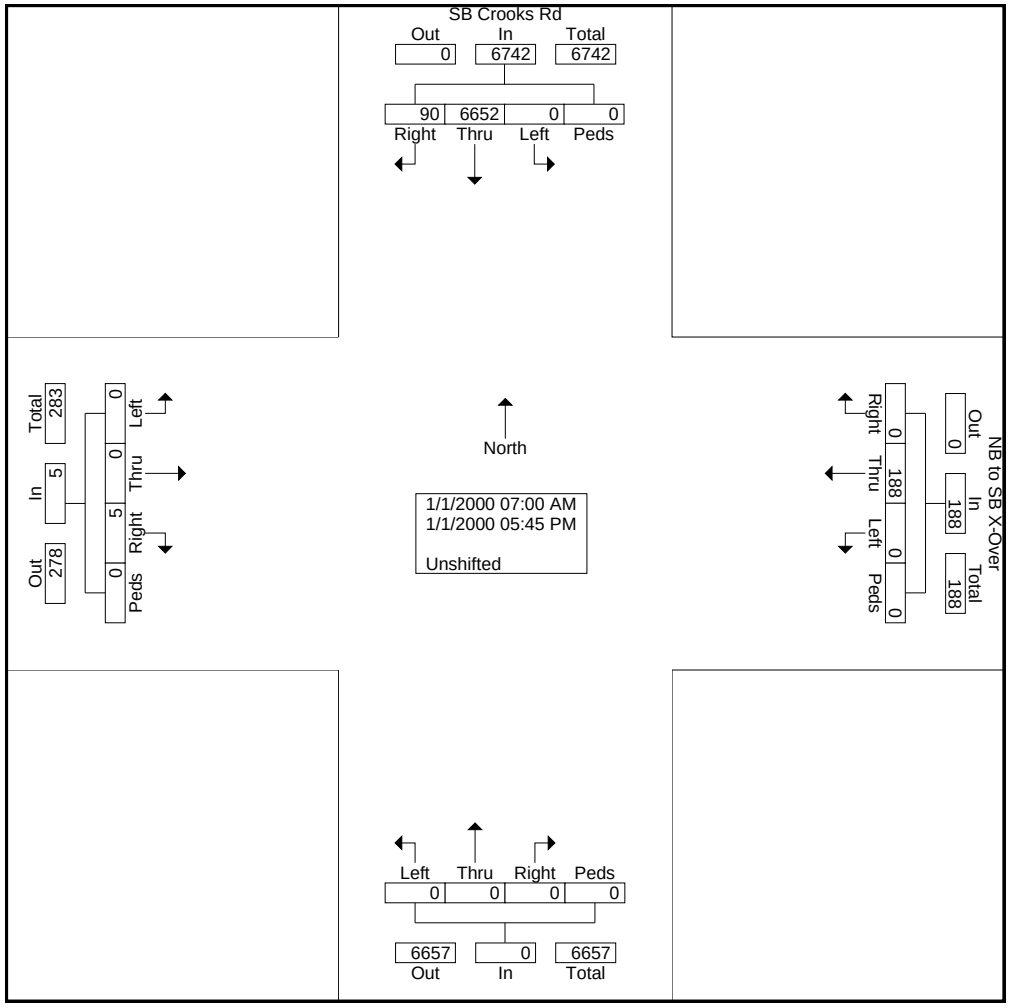
Auburn Hills, Michigan 481326
(810) 444-7815

SB Crooks Road@ NB X-Over N. of Corporate
City of Troy
Weather Condition Clear
Board # 3

File Name : Crooks RD & NB to SB X-Over, N of Corporate Drive
Site Code : 00000057
Start Date : 1/1/2000
Page No : 2



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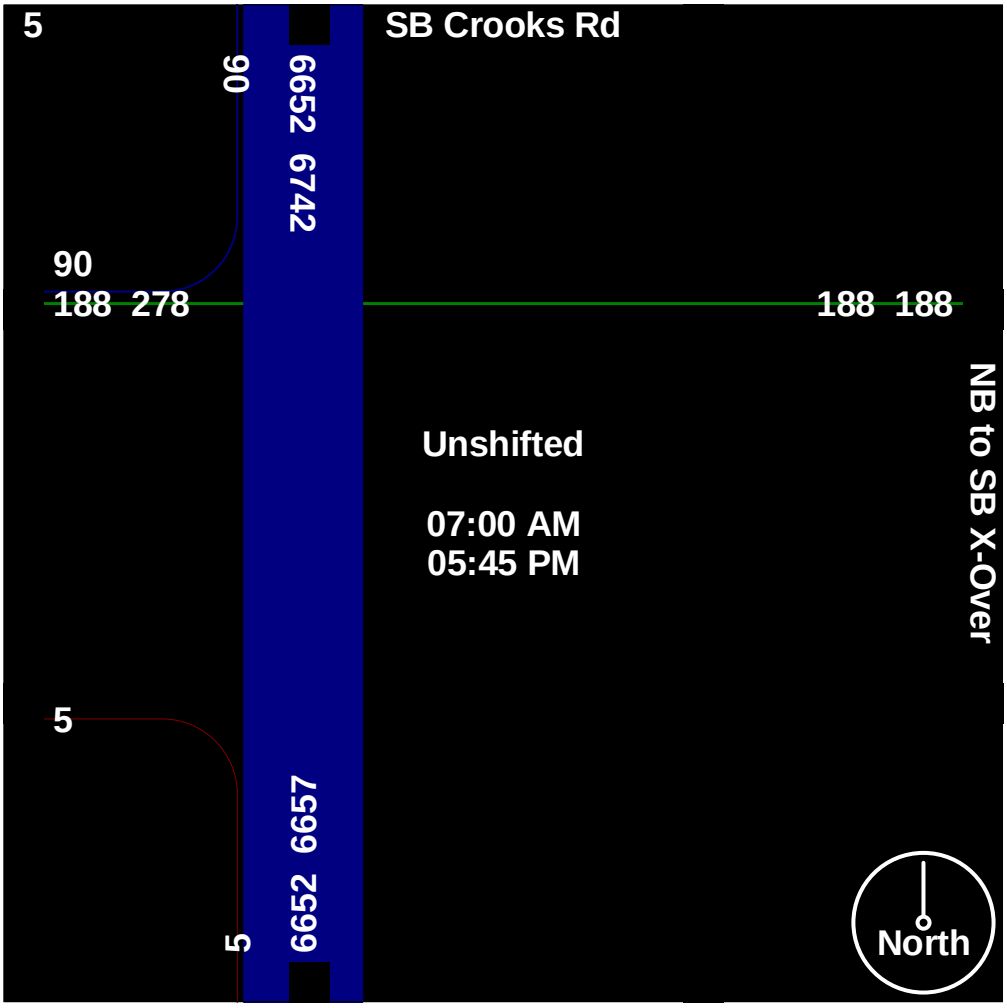
SB Crooks Road@ NB X-Over N. of Corporate
City of Troy
Weather Condition Clear
Board # 3

File Name : Crooks RD & NB to SB X-Over, N of Corporate Drive
Site Code : 00000057
Start Date : 1/1/2000
Page No : 3



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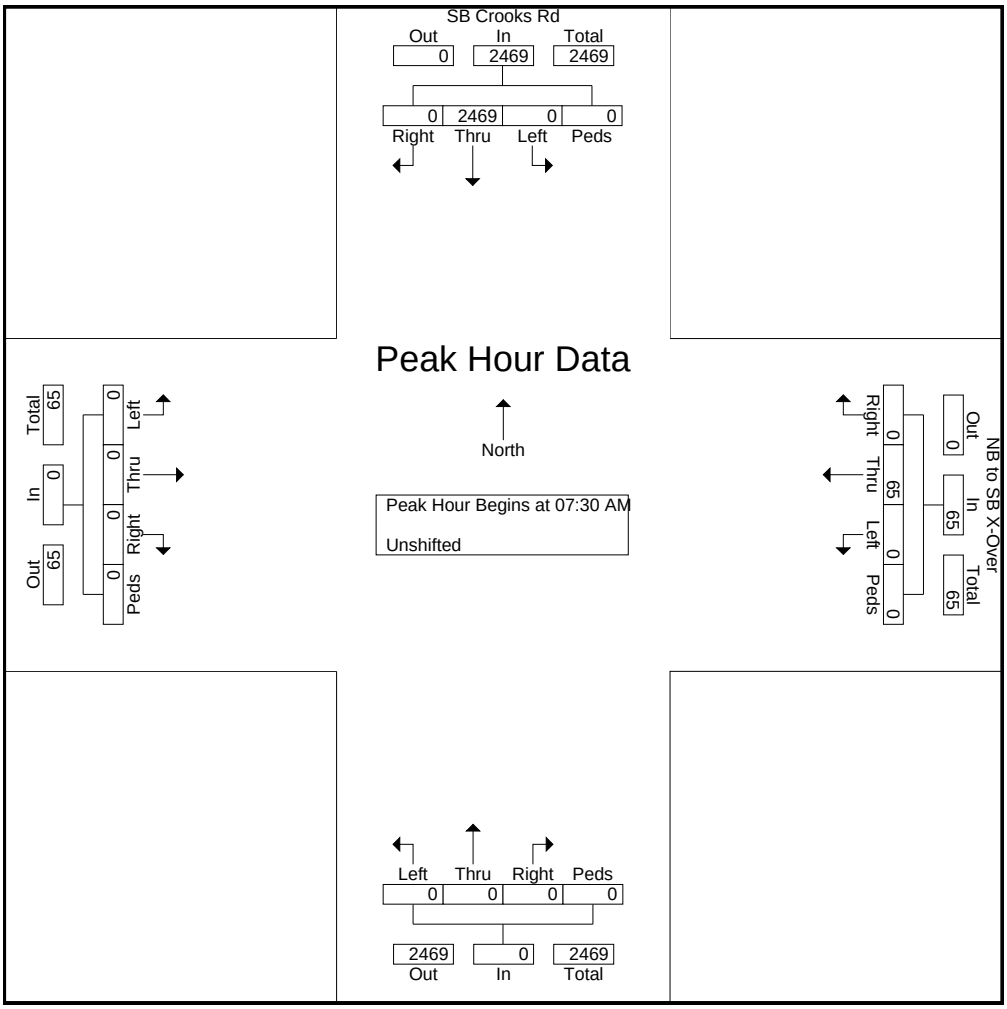
SB Crooks Road@ NB X-Over N. of Corporate
City of Troy
Weather Condition Clear
Board # 3

File Name : Crooks RD & NB to SB X-Over, N of Corporate Drive
Site Code : 00000057
Start Date : 1/1/2000
Page No : 4

	SB Crooks Rd Southbound					NB to SB X-Over Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	623	0	0	623	0	17	0	0	17	0	0	0	0	0	0	0	0	0	0	640
07:45 AM	0	621	0	0	621	0	21	0	0	21	0	0	0	0	0	0	0	0	0	0	642
08:00 AM	0	638	0	0	638	0	16	0	0	16	0	0	0	0	0	0	0	0	0	0	654
08:15 AM	0	587	0	0	587	0	11	0	0	11	0	0	0	0	0	0	0	0	0	0	598
Total Volume	0	2469	0	0	2469	0	65	0	0	65	0	0	0	0	0	0	0	0	0	0	2534
% App. Total	0	100	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.967	.000	.000	.967	.000	.774	.000	.000	.774	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.969



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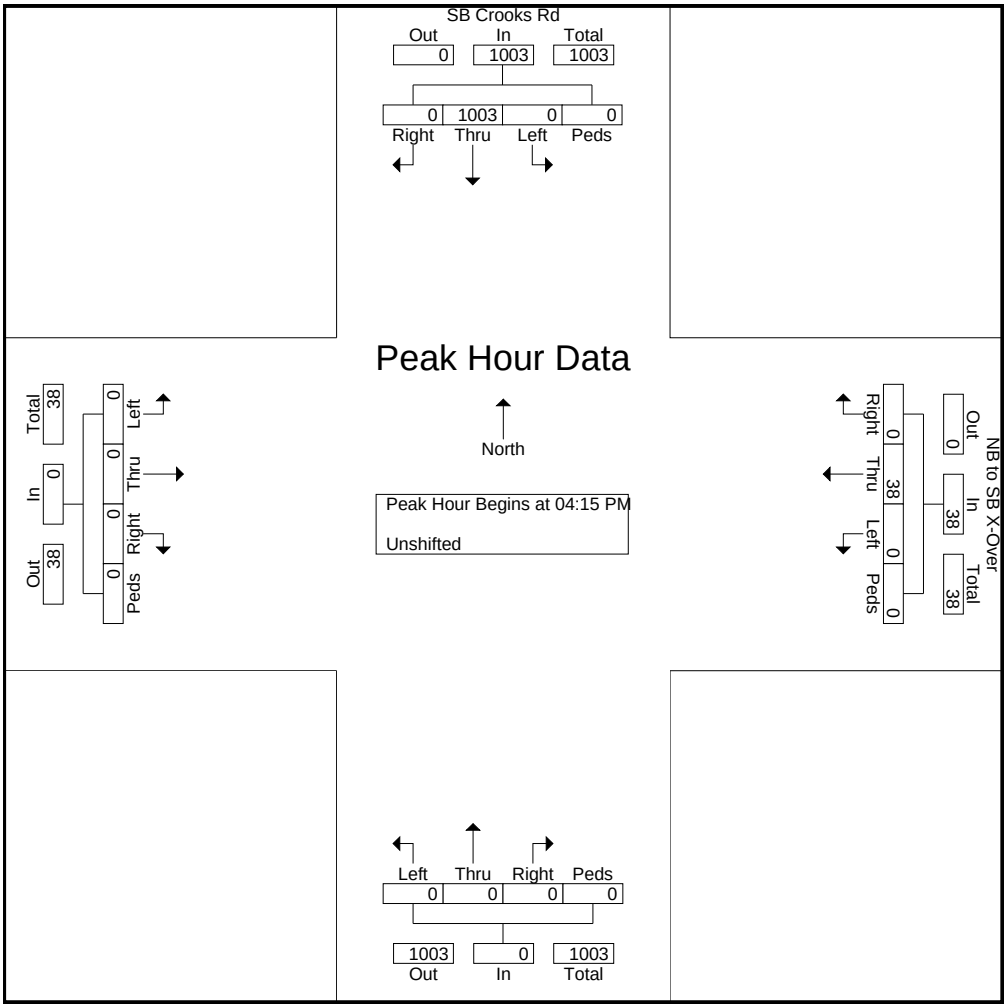
	SB Crooks Rd Southbound					NB to SB X-Over Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	262	0	0	262	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	271
04:30 PM	0	255	0	0	255	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	262
04:45 PM	0	238	0	0	238	0	12	0	0	12	0	0	0	0	0	0	0	0	0	0	250
05:00 PM	0	248	0	0	248	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	258
Total Volume	0	1003	0	0	1003	0	38	0	0	38	0	0	0	0	0	0	0	0	0	0	1041
% App. Total	0	100	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.957	.000	.000	.957	.000	.792	.000	.000	.792	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.960



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Site Code : 00000057
Start Date : 1/1/2000
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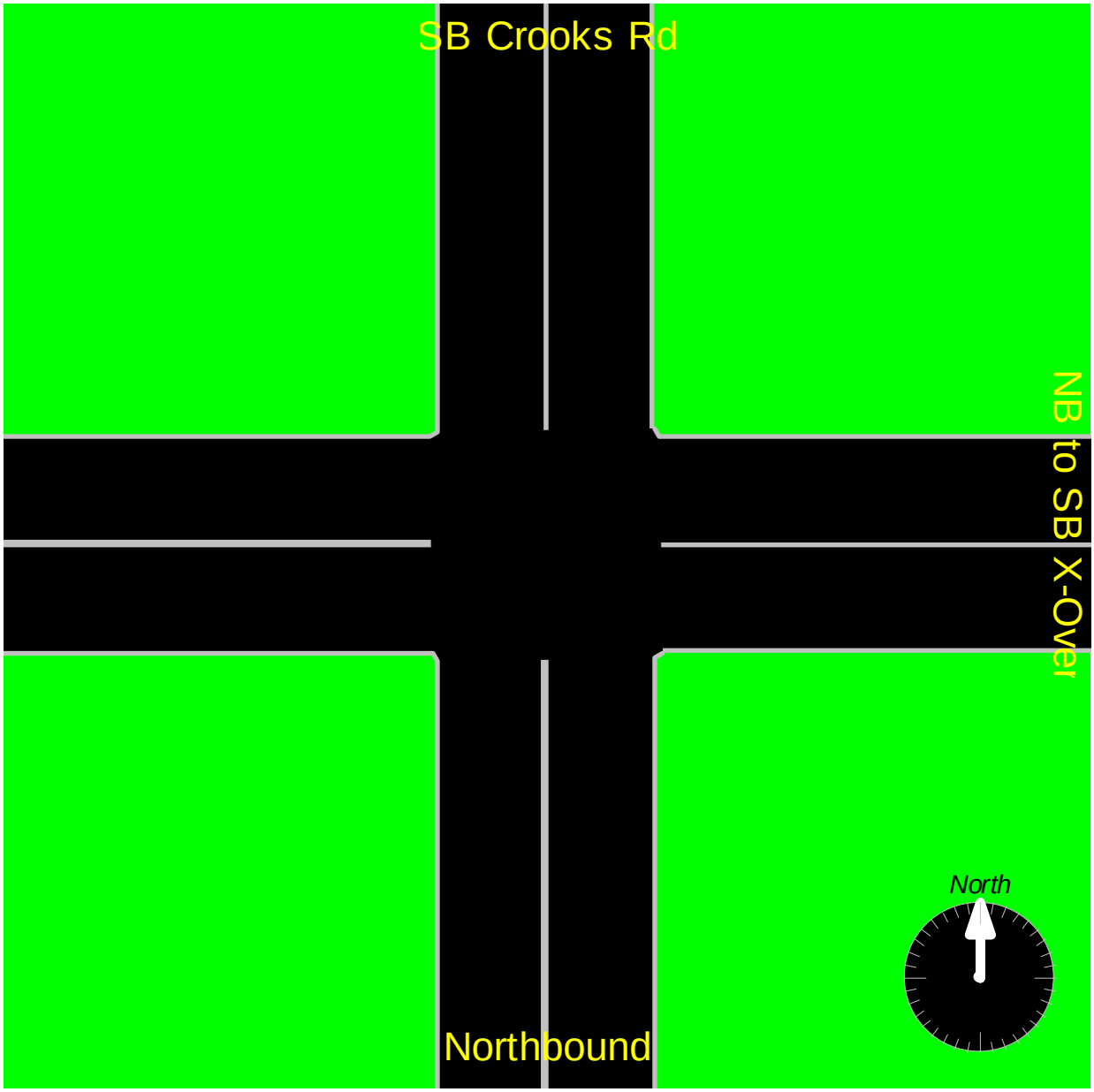
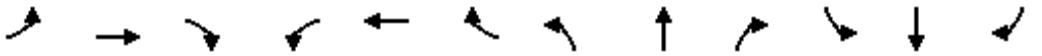


LEVEL OF SERVICE

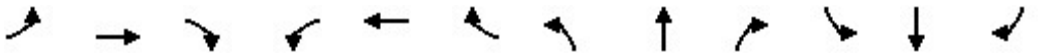
OUTPUT REPORTS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	112	19	644	478	554	0	605	210	539	1662	342
Future Volume (vph)	27	112	19	644	478	554	0	605	210	539	1662	342
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Lane Util. Factor		0.95	1.00	0.91	0.86	0.91		0.91	1.00	0.97	0.91	1.00
Frt		1.00	0.85	1.00	0.97	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3689	1667	1695	3232	1517		5353	1667	3614	5353	1667
Flt Permitted		0.99	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3689	1667	1695	3232	1517		5353	1667	3614	5353	1667
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	36	147	25	700	520	602	0	637	221	567	1749	360
RTOR Reduction (vph)	0	0	23	0	16	135	0	0	53	0	0	180
Lane Group Flow (vph)	0	183	2	469	922	280	0	637	168	567	1749	180
Turn Type	Split	NA	Perm	Split	NA	pm+ov		NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		8	8	1		2	8	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		11.0	11.0	32.9	32.9	58.0		23.2	56.1	25.1	55.1	55.1
Effective Green, g (s)		11.0	11.0	32.9	32.9	58.0		23.2	56.1	25.1	55.1	55.1
Actuated g/C Ratio		0.09	0.09	0.27	0.27	0.48		0.19	0.47	0.21	0.46	0.46
Clearance Time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	4.0	4.0
Lane Grp Cap (vph)		338	152	464	886	733		1034	779	755	2457	765
v/s Ratio Prot		c0.05		0.28	c0.29	0.08		0.12	0.06	0.16	c0.33	
v/s Ratio Perm			0.00			0.10			0.04			0.11
v/c Ratio		0.54	0.02	1.01	1.04	0.38		0.62	0.22	0.75	0.71	0.24
Uniform Delay, d1		52.1	49.6	43.5	43.5	19.6		44.3	18.9	44.5	26.1	19.7
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.8	0.0	44.5	41.3	0.3		2.7	0.1	6.8	1.8	0.7
Delay (s)		53.9	49.6	88.1	84.9	20.0		47.1	19.1	51.3	27.9	20.4
Level of Service		D	D	F	F	B		D	B	D	C	C
Approach Delay (s)		53.3			70.9			39.9			31.8	
Approach LOS		D			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	46.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.8
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

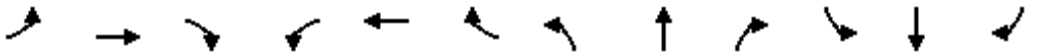
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	115	20	663	492	571	0	623	216	555	1712	352
Future Volume (vph)	28	115	20	663	492	571	0	623	216	555	1712	352
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Lane Util. Factor		0.95	1.00	0.91	0.86	0.91		0.91	1.00	0.97	0.91	1.00
Frt		1.00	0.85	1.00	0.97	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3689	1667	1695	3232	1517		5353	1667	3614	5353	1667
Flt Permitted		0.99	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3689	1667	1695	3232	1517		5353	1667	3614	5353	1667
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	151	26	721	535	621	0	656	227	584	1802	371
RTOR Reduction (vph)	0	0	24	0	16	152	0	0	54	0	0	178
Lane Group Flow (vph)	0	188	2	483	950	276	0	656	173	584	1802	193
Turn Type	Split	NA	Perm	Split	NA	pm+ov		NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		8	8	1		2	8	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		11.3	11.3	37.6	37.6	63.7		17.2	54.8	26.1	50.1	50.1
Effective Green, g (s)		11.3	11.3	37.6	37.6	63.7		17.2	54.8	26.1	50.1	50.1
Actuated g/C Ratio		0.09	0.09	0.31	0.31	0.53		0.14	0.46	0.22	0.42	0.42
Clearance Time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	4.0	4.0
Lane Grp Cap (vph)		347	156	531	1012	805		767	761	786	2234	695
v/s Ratio Prot		c0.05		0.28	c0.29	0.07		0.12	0.07	0.16	c0.34	
v/s Ratio Perm			0.00			0.11			0.03			0.12
v/c Ratio		0.54	0.02	0.91	0.94	0.34		0.86	0.23	0.74	0.81	0.28
Uniform Delay, d1		51.9	49.3	39.6	40.1	16.1		50.2	19.8	43.8	30.7	23.0
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.0	19.4	15.5	0.3		11.7	0.2	6.3	3.2	1.0
Delay (s)		53.6	49.3	59.0	55.6	16.4		61.9	19.9	50.1	33.9	24.0
Level of Service		D	D	E	E	B		E	B	D	C	C
Approach Delay (s)		53.1			47.5			51.1			36.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.8
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

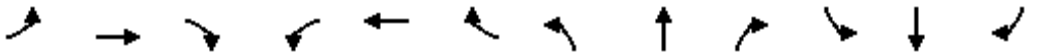
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	115	20	663	492	571	0	623	216	555	1712	352
Future Volume (vph)	28	115	20	663	492	571	0	623	216	555	1712	352
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.1	7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	0.91	0.86	0.91		0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3725	1667	1695	3232	1517		5353	1667	3614	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	3725	1667	1695	3232	1517		5353	1667	3614	5353	1667
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	151	26	721	535	621	0	656	227	584	1802	371
RTOR Reduction (vph)	0	0	24	0	16	150	0	0	54	0	0	176
Lane Group Flow (vph)	37	151	2	483	950	278	0	656	173	584	1802	195
Turn Type	Split	NA	Perm	Split	NA	pm+ov		NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		8	8	1		2	8	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	10.3	10.3	10.3	37.6	37.6	64.7		17.2	54.8	27.1	51.1	51.1
Effective Green, g (s)	10.3	10.3	10.3	37.6	37.6	64.7		17.2	54.8	27.1	51.1	51.1
Actuated g/C Ratio	0.09	0.09	0.09	0.31	0.31	0.54		0.14	0.46	0.23	0.43	0.43
Clearance Time (s)	7.1	7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	4.0	4.0
Lane Grp Cap (vph)	159	319	143	531	1012	817		767	761	816	2279	709
v/s Ratio Prot	0.02	c0.04		0.28	c0.29	0.08		0.12	0.07	0.16	c0.34	
v/s Ratio Perm			0.00			0.11			0.03			0.12
v/c Ratio	0.23	0.47	0.02	0.91	0.94	0.34		0.86	0.23	0.72	0.79	0.28
Uniform Delay, d1	51.2	52.3	50.2	39.6	40.1	15.6		50.2	19.8	42.9	29.8	22.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.1	0.0	19.4	15.5	0.3		11.7	0.2	5.3	2.9	1.0
Delay (s)	51.9	53.4	50.3	59.0	55.6	15.9		61.9	19.9	48.2	32.7	23.4
Level of Service	D	D	D	E	E	B		E	B	D	C	C
Approach Delay (s)		52.7			47.4			51.1			34.7	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.8
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

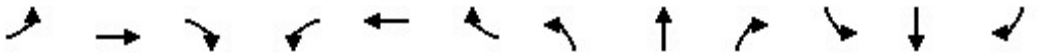
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	123	40	663	543	571	0	648	216	569	1751	407
Future Volume (vph)	79	123	40	663	543	571	0	648	216	569	1751	407
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.1	7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	0.91	0.86	0.91		0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3725	1667	1695	3244	1517		5353	1667	3614	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	3725	1667	1695	3244	1517		5353	1667	3614	5353	1667
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	104	162	53	721	590	621	0	682	227	599	1843	428
RTOR Reduction (vph)	0	0	48	0	14	72	0	0	54	0	0	203
Lane Group Flow (vph)	104	162	5	497	980	369	0	682	173	599	1843	225
Turn Type	Split	NA	Perm	Split	NA	pm+ov		NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		8	8	1		2	8	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	11.6	11.6	11.6	37.9	37.9	63.4		17.2	55.1	25.5	49.5	49.5
Effective Green, g (s)	11.6	11.6	11.6	37.9	37.9	63.4		17.2	55.1	25.5	49.5	49.5
Actuated g/C Ratio	0.10	0.10	0.10	0.32	0.32	0.53		0.14	0.46	0.21	0.41	0.41
Clearance Time (s)	7.1	7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	4.0	4.0
Lane Grp Cap (vph)	180	360	161	535	1024	801		767	765	767	2208	687
v/s Ratio Prot	c0.06	0.04		0.29	c0.30	0.10		0.13	0.07	0.17	c0.34	
v/s Ratio Perm			0.00			0.15			0.03			0.14
v/c Ratio	0.58	0.45	0.03	0.93	0.96	0.46		0.89	0.23	0.78	0.83	0.33
Uniform Delay, d1	51.9	51.2	49.1	39.7	40.3	17.6		50.5	19.6	44.6	31.6	23.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	0.9	0.1	22.5	18.5	0.4		14.6	0.2	7.8	3.9	1.3
Delay (s)	56.3	52.1	49.2	62.3	58.7	18.1		65.0	19.7	52.4	35.5	25.2
Level of Service	E	D	D	E	E	B		E	B	D	D	C
Approach Delay (s)		53.0			50.4			53.7			37.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.8
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		

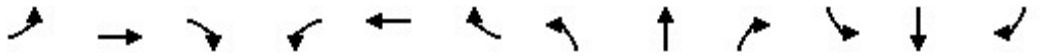
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	496	73	410	119	568	0	1482	499	255	716	74
Future Volume (vph)	171	496	73	410	119	568	0	1482	499	255	716	74
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Lane Util. Factor		0.95	1.00	0.91	0.86	0.91		0.91	1.00	0.97	0.91	1.00
Frt		1.00	0.85	1.00	0.92	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3678	1667	1695	3066	1517		5353	1667	3614	5353	1667
Flt Permitted		0.99	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3678	1667	1695	3066	1517		5353	1667	3614	5353	1667
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	533	78	432	125	598	0	1560	525	268	754	78
RTOR Reduction (vph)	0	0	66	0	161	59	0	0	47	0	0	40
Lane Group Flow (vph)	0	717	12	294	401	240	0	1560	478	268	754	38
Turn Type	Split	NA	Perm	Split	NA	pm+ov		NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		8	8	1		2	8	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		19.9	19.9	25.9	25.9	45.1		37.2	63.1	19.2	63.2	63.2
Effective Green, g (s)		19.9	19.9	25.9	25.9	45.1		37.2	63.1	19.2	63.2	63.2
Actuated g/C Ratio		0.15	0.15	0.20	0.20	0.35		0.29	0.49	0.15	0.49	0.49
Clearance Time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	4.0	4.0
Lane Grp Cap (vph)		563	255	337	610	526		1531	809	533	2602	810
v/s Ratio Prot		c0.19		c0.17	0.13	0.07		c0.29	0.12	c0.07	0.14	
v/s Ratio Perm			0.01			0.09			0.17			0.02
v/c Ratio		1.27	0.05	0.87	0.66	0.46		1.02	0.59	0.50	0.29	0.05
Uniform Delay, d1		55.1	47.0	50.4	48.0	32.9		46.4	24.1	51.0	20.0	17.6
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		136.5	0.1	21.1	2.6	0.6		27.9	1.2	3.4	0.3	0.1
Delay (s)		191.6	47.0	71.6	50.5	33.6		74.3	25.3	54.4	20.3	17.7
Level of Service		F	D	E	D	C		E	C	D	C	B
Approach Delay (s)		177.4			51.5			61.9			28.4	
Approach LOS		F			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	70.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.8
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		

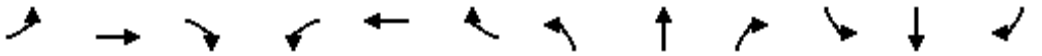
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	511	75	422	123	585	0	1527	514	263	738	76
Future Volume (vph)	176	511	75	422	123	585	0	1527	514	263	738	76
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Lane Util. Factor		0.95	1.00	0.91	0.86	0.91		0.91	1.00	0.97	0.91	1.00
Frt		1.00	0.85	1.00	0.92	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3678	1667	1695	3066	1517		5353	1667	3614	5353	1667
Flt Permitted		0.99	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3678	1667	1695	3066	1517		5353	1667	3614	5353	1667
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	189	549	81	444	129	616	0	1607	541	277	777	80
RTOR Reduction (vph)	0	0	65	0	160	90	0	0	44	0	0	45
Lane Group Flow (vph)	0	738	16	302	419	218	0	1607	497	277	777	35
Turn Type	Split	NA	Perm	Split	NA	pm+ov		NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		8	8	1		2	8	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		25.9	25.9	26.8	26.8	36.1		40.2	67.0	9.3	56.3	56.3
Effective Green, g (s)		25.9	25.9	26.8	26.8	36.1		40.2	67.0	9.3	56.3	56.3
Actuated g/C Ratio		0.20	0.20	0.21	0.21	0.28		0.31	0.52	0.07	0.43	0.43
Clearance Time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	4.0	4.0
Lane Grp Cap (vph)		732	332	349	632	421		1655	859	258	2318	721
v/s Ratio Prot		c0.20		c0.18	0.14	0.04		c0.30	0.12	c0.08	0.15	
v/s Ratio Perm			0.01			0.11			0.18			0.02
v/c Ratio		1.01	0.05	0.87	0.66	0.52		0.97	0.58	1.07	0.34	0.05
Uniform Delay, d1		52.0	42.1	49.9	47.5	39.6		44.3	21.7	60.4	24.4	21.3
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		35.3	0.1	19.5	2.6	1.1		16.2	0.9	76.9	0.4	0.1
Delay (s)		87.3	42.1	69.3	50.1	40.7		60.6	22.7	137.3	24.8	21.5
Level of Service		F	D	E	D	D		E	C	F	C	C
Approach Delay (s)		82.9			52.5			51.0			52.1	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	56.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.8
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

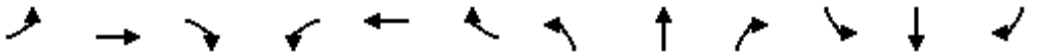
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	511	75	422	123	585	0	1527	514	263	738	76
Future Volume (vph)	176	511	75	422	123	585	0	1527	514	263	738	76
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.1	7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	0.91	0.86	0.91		0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.92	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3725	1667	1695	3066	1517		5353	1667	3614	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	3725	1667	1695	3066	1517		5353	1667	3614	5353	1667
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	189	549	81	444	129	616	0	1607	541	277	777	80
RTOR Reduction (vph)	0	0	66	0	160	108	0	0	44	0	0	45
Lane Group Flow (vph)	189	549	15	302	419	200	0	1607	497	277	777	35
Turn Type	Split	NA	Perm	Split	NA	pm+ov		NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		8	8	1		2	8	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	24.6	24.6	24.6	26.8	26.8	37.4		40.2	67.0	10.6	57.6	57.6
Effective Green, g (s)	24.6	24.6	24.6	26.8	26.8	37.4		40.2	67.0	10.6	57.6	57.6
Actuated g/C Ratio	0.19	0.19	0.19	0.21	0.21	0.29		0.31	0.52	0.08	0.44	0.44
Clearance Time (s)	7.1	7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	4.0	4.0
Lane Grp Cap (vph)	352	704	315	349	632	436		1655	859	294	2371	738
v/s Ratio Prot	0.10	c0.15		c0.18	0.14	0.04		c0.30	0.12	c0.08	0.15	
v/s Ratio Perm			0.01			0.09			0.18			0.02
v/c Ratio	0.54	0.78	0.05	0.87	0.66	0.46		0.97	0.58	0.94	0.33	0.05
Uniform Delay, d1	47.6	50.1	43.1	49.9	47.5	38.0		44.3	21.7	59.4	23.6	20.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	5.5	0.1	19.5	2.6	0.8		16.2	0.9	39.6	0.4	0.1
Delay (s)	49.1	55.6	43.2	69.3	50.1	38.8		60.6	22.7	99.0	24.0	20.7
Level of Service	D	E	D	E	D	D		E	C	F	C	C
Approach Delay (s)		52.9			52.0			51.0			42.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.8
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	243	518	82	422	141	585	0	1559	514	276	751	109
Future Volume (vph)	243	518	82	422	141	585	0	1559	514	276	751	109
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.1	7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Lane Util. Factor	1.00	0.95	1.00	0.91	0.86	0.91		0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.92	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3725	1667	1695	3073	1517		5353	1667	3614	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	3725	1667	1695	3073	1517		5353	1667	3614	5353	1667
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	261	557	88	444	148	616	0	1641	541	291	791	115
RTOR Reduction (vph)	0	0	71	0	133	71	0	0	44	0	0	65
Lane Group Flow (vph)	261	557	17	311	456	237	0	1641	497	291	791	50
Turn Type	Split	NA	Perm	Split	NA	pm+ov		NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		8	8	1		2	8	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	25.0	25.0	25.0	27.0	27.0	37.0		40.2	67.2	10.0	57.0	57.0
Effective Green, g (s)	25.0	25.0	25.0	27.0	27.0	37.0		40.2	67.2	10.0	57.0	57.0
Actuated g/C Ratio	0.19	0.19	0.19	0.21	0.21	0.28		0.31	0.52	0.08	0.44	0.44
Clearance Time (s)	7.1	7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	4.0	4.0
Lane Grp Cap (vph)	358	716	320	352	638	431		1655	861	278	2347	730
v/s Ratio Prot	0.14	c0.15		c0.18	0.15	0.04		c0.31	0.12	c0.08	0.15	
v/s Ratio Perm			0.01			0.11			0.18			0.03
v/c Ratio	0.73	0.78	0.05	0.88	0.71	0.55		0.99	0.58	1.05	0.34	0.07
Uniform Delay, d1	49.3	49.9	42.8	50.0	47.9	39.4		44.7	21.6	60.0	24.1	21.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.3	5.3	0.1	22.1	3.8	1.5		20.2	0.9	66.7	0.4	0.2
Delay (s)	56.6	55.2	42.9	72.0	51.7	41.0		64.9	22.6	126.7	24.4	21.3
Level of Service	E	E	D	E	D	D		E	C	F	C	C
Approach Delay (s)		54.4			54.2			54.4			49.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	53.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.8
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	140	138	0	0	647	173	0	0	0	20	0	28
Future Vol, veh/h	140	138	0	0	647	173	0	0	0	20	0	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	5	-	-	0	-	-	-	135	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	16965	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	92	92	92	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	159	157	0	0	681	182	0	0	0	27	0	37

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	863	0	-	-	-	0			1062	-	341
Stage 1	-	-	-	-	-	-			681	-	-
Stage 2	-	-	-	-	-	-			381	-	-
Critical Hdwy	4.14	-	-	-	-	-			6.29	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-			5.84	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-			6.04	-	-
Follow-up Hdwy	2.22	-	-	-	-	-			3.67	-	3.32
Pot Cap-1 Maneuver	775	-	0	0	-	-			251	0	655
Stage 1	-	-	0	0	-	-			451	0	-
Stage 2	-	-	0	0	-	-			625	0	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	775	-	-	-	-	-			195	0	655
Mov Cap-2 Maneuver	-	-	-	-	-	-			195	0	-
Stage 1	-	-	-	-	-	-			350	0	-
Stage 2	-	-	-	-	-	-			625	0	-

Approach	EB	WB	SB
HCM Control Delay, s	5.6	0	17.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	775	-	-	-	195	655
HCM Lane V/C Ratio	0.205	-	-	-	0.137	0.057
HCM Control Delay (s)	10.8	0.2	-	-	26.4	10.8
HCM Lane LOS	B	A	-	-	D	B
HCM 95th %tile Q(veh)	0.8	-	-	-	0.5	0.2

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	144	142	0	0	666	178	0	0	0	21	0	29
Future Vol, veh/h	144	142	0	0	666	178	0	0	0	21	0	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	5	-	-	0	-	-	-	135	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	16965	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	92	92	92	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	164	161	0	0	701	187	0	0	0	28	0	39

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	888	0	-	-	-	0			1093	-	351
Stage 1	-	-	-	-	-	-			701	-	-
Stage 2	-	-	-	-	-	-			392	-	-
Critical Hdwy	4.14	-	-	-	-	-			6.29	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-			5.84	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-			6.04	-	-
Follow-up Hdwy	2.22	-	-	-	-	-			3.67	-	3.32
Pot Cap-1 Maneuver	758	-	0	0	-	-			241	0	645
Stage 1	-	-	0	0	-	-			440	0	-
Stage 2	-	-	0	0	-	-			616	0	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	758	-	-	-	-	-			184	0	645
Mov Cap-2 Maneuver	-	-	-	-	-	-			184	0	-
Stage 1	-	-	-	-	-	-			335	0	-
Stage 2	-	-	-	-	-	-			616	0	-

Approach	EB	WB	SB
HCM Control Delay, s	5.7	0	18.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	758	-	-	-	184	645
HCM Lane V/C Ratio	0.216	-	-	-	0.152	0.06
HCM Control Delay (s)	11.1	0.2	-	-	28	10.9
HCM Lane LOS	B	A	-	-	D	B
HCM 95th %tile Q(veh)	0.8	-	-	-	0.5	0.2

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	152	142	0	0	672	206	0	0	0	100	0	40
Future Vol, veh/h	152	142	0	0	672	206	0	0	0	100	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	5	-	-	0	-	-	-	135	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	16965	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	92	92	92	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	173	161	0	0	707	217	0	0	0	133	0	53

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	924	0	-	-	-	0			1117	-	354
Stage 1	-	-	-	-	-	-			707	-	-
Stage 2	-	-	-	-	-	-			410	-	-
Critical Hdwy	4.14	-	-	-	-	-			6.29	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-			5.84	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-			6.04	-	-
Follow-up Hdwy	2.22	-	-	-	-	-			3.67	-	3.32
Pot Cap-1 Maneuver	735	-	0	0	-	-			233	0	642
Stage 1	-	-	0	0	-	-			437	0	-
Stage 2	-	-	0	0	-	-			603	0	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	735	-	-	-	-	-			173	0	642
Mov Cap-2 Maneuver	-	-	-	-	-	-			173	0	-
Stage 1	-	-	-	-	-	-			324	0	-
Stage 2	-	-	-	-	-	-			603	0	-

Approach	EB	WB	SB
HCM Control Delay, s	6	0	55.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	735	-	-	-	173	642
HCM Lane V/C Ratio	0.235	-	-	-	0.771	0.083
HCM Control Delay (s)	11.4	0.2	-	-	73.6	11.1
HCM Lane LOS	B	A	-	-	F	B
HCM 95th %tile Q(veh)	0.9	-	-	-	5	0.3

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	152	142	0	0	672	206	0	0	0	100	0	40
Future Vol, veh/h	152	142	0	0	672	206	0	0	0	100	0	40
Peak Hour Factor	0.88	0.88	0.88	0.95	0.95	0.95	0.92	0.92	0.92	0.75	0.75	0.75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	173	161	0	0	707	217	0	0	0	133	0	53
Number of Lanes	0	3	0	0	2	1	0	0	0	1	0	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	3	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	3
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	13.5	15.8	13.2
HCM LOS	B	C	B

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	84%	0%	0%	0%	0%	0%	100%	0%
Vol Thru, %	16%	100%	100%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	180	57	57	336	336	206	100	40
LT Vol	152	0	0	0	0	0	100	0
Through Vol	28	57	57	336	336	0	0	0
RT Vol	0	0	0	0	0	206	0	40
Lane Flow Rate	205	65	65	354	354	217	133	53
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.426	0.126	0.095	0.611	0.611	0.226	0.299	0.102
Departure Headway (Hd)	7.482	7.054	5.295	6.216	6.216	3.752	8.081	6.875
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	480	505	671	580	580	948	443	518
Service Time	5.262	4.834	3.073	3.979	3.979	1.513	5.866	4.66
HCM Lane V/C Ratio	0.427	0.129	0.097	0.61	0.61	0.229	0.3	0.102
HCM Control Delay	15.8	10.9	8.6	18.3	18.3	7.6	14.3	10.4
HCM Lane LOS	C	B	A	C	C	A	B	B
HCM 95th-tile Q	2.1	0.4	0.3	4.1	4.1	0.9	1.2	0.3

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	667	0	0	176	17	0	0	0	73	0	61
Future Vol, veh/h	38	667	0	0	176	17	0	0	0	73	0	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	5	-	-	0	-	-	-	135	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	16965	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	80	80	80	92	92	92	68	68	68
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	749	0	0	220	21	0	0	0	107	0	90

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	241	0	-	-	-	0			606	-	110
Stage 1	-	-	-	-	-	-			220	-	-
Stage 2	-	-	-	-	-	-			386	-	-
Critical Hdwy	4.14	-	-	-	-	-			6.29	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-			5.84	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-			6.04	-	-
Follow-up Hdwy	2.22	-	-	-	-	-			3.67	-	3.32
Pot Cap-1 Maneuver	1323	-	0	0	-	-			456	0	922
Stage 1	-	-	0	0	-	-			766	0	-
Stage 2	-	-	0	0	-	-			621	0	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	1323	-	-	-	-	-			430	0	922
Mov Cap-2 Maneuver	-	-	-	-	-	-			430	0	-
Stage 1	-	-	-	-	-	-			723	0	-
Stage 2	-	-	-	-	-	-			621	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1323	-	-	-	430	922
HCM Lane V/C Ratio	0.032	-	-	-	0.25	0.097
HCM Control Delay (s)	7.8	0.1	-	-	16.1	9.3
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.1	-	-	-	1	0.3

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	687	0	0	181	18	0	0	0	75	0	63
Future Vol, veh/h	39	687	0	0	181	18	0	0	0	75	0	63
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	5	-	-	0	-	-	-	135	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	16965	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	80	80	80	92	92	92	68	68	68
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	44	772	0	0	226	23	0	0	0	110	0	93

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	249	0	-	-	-	0			623	-	113
Stage 1	-	-	-	-	-	-			226	-	-
Stage 2	-	-	-	-	-	-			397	-	-
Critical Hdwy	4.14	-	-	-	-	-			6.29	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-			5.84	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-			6.04	-	-
Follow-up Hdwy	2.22	-	-	-	-	-			3.67	-	3.32
Pot Cap-1 Maneuver	1314	-	0	0	-	-			446	0	918
Stage 1	-	-	0	0	-	-			761	0	-
Stage 2	-	-	0	0	-	-			613	0	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	1314	-	-	-	-	-			420	0	918
Mov Cap-2 Maneuver	-	-	-	-	-	-			420	0	-
Stage 1	-	-	-	-	-	-			716	0	-
Stage 2	-	-	-	-	-	-			613	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1314	-	-	-	420	918
HCM Lane V/C Ratio	0.033	-	-	-	0.263	0.101
HCM Control Delay (s)	7.8	0.1	-	-	16.6	9.4
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.1	-	-	-	1	0.3

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	51	687	0	0	182	29	0	0	0	156	0	65
Future Vol, veh/h	51	687	0	0	182	29	0	0	0	156	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	5	-	-	0	-	-	-	135	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	16965	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	80	80	80	92	92	92	68	68	68
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	57	772	0	0	228	36	0	0	0	229	0	96

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	264	0	-	-	-	0			651	-	114
Stage 1	-	-	-	-	-	-			228	-	-
Stage 2	-	-	-	-	-	-			423	-	-
Critical Hdwy	4.14	-	-	-	-	-			6.29	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-			5.84	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-			6.04	-	-
Follow-up Hdwy	2.22	-	-	-	-	-			3.67	-	3.32
Pot Cap-1 Maneuver	1297	-	0	0	-	-			430	0	917
Stage 1	-	-	0	0	-	-			759	0	-
Stage 2	-	-	0	0	-	-			594	0	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	1297	-	-	-	-	-			397	0	917
Mov Cap-2 Maneuver	-	-	-	-	-	-			397	0	-
Stage 1	-	-	-	-	-	-			701	0	-
Stage 2	-	-	-	-	-	-			594	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	21
HCM LOS			C

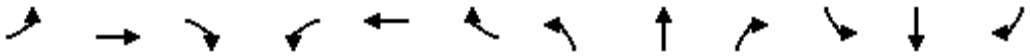
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1297	-	-	-	397	917
HCM Lane V/C Ratio	0.044	-	-	-	0.578	0.104
HCM Control Delay (s)	7.9	0.2	-	-	25.8	9.4
HCM Lane LOS	A	A	-	-	D	A
HCM 95th %tile Q(veh)	0.1	-	-	-	3.5	0.3

Intersection	
Intersection Delay, s/veh	14.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	51	687	0	0	182	29	0	0	0	156	0	65
Future Vol, veh/h	51	687	0	0	182	29	0	0	0	156	0	65
Peak Hour Factor	0.89	0.89	0.89	0.80	0.80	0.80	0.92	0.92	0.92	0.68	0.68	0.68
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	57	772	0	0	228	36	0	0	0	229	0	96
Number of Lanes	0	3	0	0	2	1	0	0	0	1	0	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	3	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	3
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	14.1	12.1	16.1
HCM LOS	B	B	C

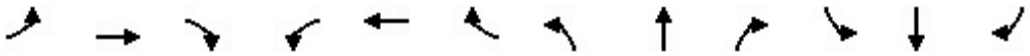
Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	27%	0%	0%	0%	0%	0%	100%	0%
Vol Thru, %	73%	100%	100%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	188	275	275	91	91	29	156	65
LT Vol	51	0	0	0	0	0	156	0
Through Vol	137	275	275	91	91	0	0	0
RT Vol	0	0	0	0	0	29	0	65
Lane Flow Rate	212	309	309	114	114	36	229	96
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.393	0.561	0.41	0.239	0.239	0.051	0.502	0.177
Departure Headway (Hd)	6.789	6.651	4.883	7.573	7.573	5.081	7.881	6.678
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	533	547	741	477	477	707	461	540
Service Time	4.489	4.351	2.583	5.288	5.288	2.796	5.581	4.378
HCM Lane V/C Ratio	0.398	0.565	0.417	0.239	0.239	0.051	0.497	0.178
HCM Control Delay	13.8	17.5	10.9	12.7	12.7	8.1	18.3	10.8
HCM Lane LOS	B	C	B	B	B	A	C	B
HCM 95th-tile Q	1.9	3.4	2	0.9	0.9	0.2	2.8	0.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	65	0	0	0	0	0	0	2478	0
Future Volume (Veh/h)	0	0	0	65	0	0	0	0	0	0	2478	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	84	0	0	0	0	0	0	2608	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								746				
pX, platoon unblocked												
vC, conflicting volume	2608	2608	652	652	2608	0	2608			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2608	2608	652	652	2608	0	2608			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	76	100	100	100			100		
cM capacity (veh/h)	12	24	411	353	24	1084	162			1622		

Direction, Lane #	WB 1	WB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	42	42	652	652	652	652
Volume Left	42	42	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	353	353	1700	1700	1700	1700
Volume to Capacity	0.12	0.12	0.38	0.38	0.38	0.38
Queue Length 95th (ft)	10	10	0	0	0	0
Control Delay (s)	16.6	16.6	0.0	0.0	0.0	0.0
Lane LOS	C	C				
Approach Delay (s)	16.6		0.0			
Approach LOS	C					

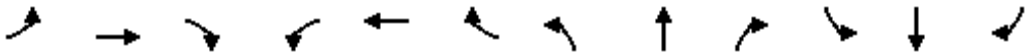
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	61.4%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	67	0	0	0	0	0	0	2552	0
Future Volume (Veh/h)	0	0	0	67	0	0	0	0	0	0	2552	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	87	0	0	0	0	0	0	2686	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								746				
pX, platoon unblocked												
vC, conflicting volume	2686	2686	672	672	2686	0	2686			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2686	2686	672	672	2686	0	2686			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	75	100	100	100			100		
cM capacity (veh/h)	10	21	399	342	21	1084	151			1622		

Direction, Lane #	WB 1	WB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	44	44	672	672	672	672
Volume Left	44	44	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	342	342	1700	1700	1700	1700
Volume to Capacity	0.13	0.13	0.40	0.40	0.40	0.40
Queue Length 95th (ft)	11	11	0	0	0	0
Control Delay (s)	17.1	17.1	0.0	0.0	0.0	0.0
Lane LOS	C	C				
Approach Delay (s)	17.1		0.0			
Approach LOS	C					

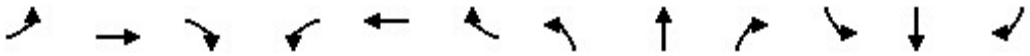
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	112	0	0	0	0	0	0	2627	0
Future Volume (Veh/h)	0	0	0	112	0	0	0	0	0	0	2627	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	145	0	0	0	0	0	0	2765	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								746				
pX, platoon unblocked												
vC, conflicting volume	2765	2765	691	691	2765	0	2765			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2765	2765	691	691	2765	0	2765			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	56	100	100	100			100		
cM capacity (veh/h)	9	19	387	331	19	1084	141			1622		

Direction, Lane #	WB 1	WB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	72	72	691	691	691	691
Volume Left	72	72	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	331	331	1700	1700	1700	1700
Volume to Capacity	0.22	0.22	0.41	0.41	0.41	0.41
Queue Length 95th (ft)	21	21	0	0	0	0
Control Delay (s)	18.9	18.9	0.0	0.0	0.0	0.0
Lane LOS	C	C				
Approach Delay (s)	18.9		0.0			
Approach LOS	C					

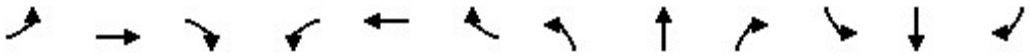
Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	64.6%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	38	0	0	0	0	0	0	1007	0
Future Volume (Veh/h)	0	0	0	38	0	0	0	0	0	0	1007	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	48	0	0	0	0	0	0	1060	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								746				
pX, platoon unblocked												
vC, conflicting volume	1060	1060	265	265	1060	0	1060			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1060	1060	265	265	1060	0	1060			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	93	100	100	100			100		
cM capacity (veh/h)	178	223	733	666	223	1084	653			1622		

Direction, Lane #	WB 1	WB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	24	24	265	265	265	265
Volume Left	24	24	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	666	666	1700	1700	1700	1700
Volume to Capacity	0.04	0.04	0.16	0.16	0.16	0.16
Queue Length 95th (ft)	3	3	0	0	0	0
Control Delay (s)	10.6	10.6	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	10.6		0.0			
Approach LOS	B					

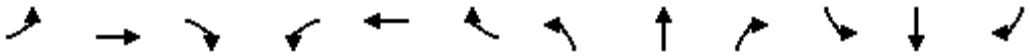
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	60.6%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	39	0	0	0	0	0	0	1038	0
Future Volume (Veh/h)	0	0	0	39	0	0	0	0	0	0	1038	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	49	0	0	0	0	0	0	1093	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								746				
pX, platoon unblocked												
vC, conflicting volume	1093	1093	273	273	1093	0	1093			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1093	1093	273	273	1093	0	1093			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	93	100	100	100			100		
cM capacity (veh/h)	169	213	724	658	213	1084	634			1622		

Direction, Lane #	WB 1	WB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	24	24	273	273	273	273
Volume Left	24	24	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	658	658	1700	1700	1700	1700
Volume to Capacity	0.04	0.04	0.16	0.16	0.16	0.16
Queue Length 95th (ft)	3	3	0	0	0	0
Control Delay (s)	10.7	10.7	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	10.7		0.0			
Approach LOS	B					

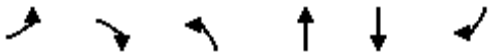
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	62.2%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	103	0	0	0	0	0	0	1055	0
Future Volume (Veh/h)	0	0	0	103	0	0	0	0	0	0	1055	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	130	0	0	0	0	0	0	1111	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								746				
pX, platoon unblocked												
vC, conflicting volume	1111	1111	278	278	1111	0	1111			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1111	1111	278	278	1111	0	1111			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	80	100	100	100			100		
cM capacity (veh/h)	164	208	720	653	208	1084	624			1622		

Direction, Lane #	WB 1	WB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	65	65	278	278	278	278
Volume Left	65	65	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	653	653	1700	1700	1700	1700
Volume to Capacity	0.10	0.10	0.16	0.16	0.16	0.16
Queue Length 95th (ft)	8	8	0	0	0	0
Control Delay (s)	11.1	11.1	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	11.1		0.0			
Approach LOS	B					

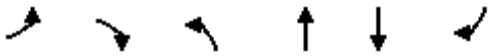
Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	113	0	0	2614	125
Future Volume (Veh/h)	0	113	0	0	2614	125
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.95	0.95
Hourly flow rate (vph)	0	123	0	0	2752	132
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				526		
pX, platoon unblocked						
vC, conflicting volume	2818	754	2884			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2818	754	2884			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	65	100			
cM capacity (veh/h)	14	352	126			

Direction, Lane #	EB 1	SB 1	SB 2	SB 3	SB 4
Volume Total	123	786	786	786	525
Volume Left	0	0	0	0	0
Volume Right	123	0	0	0	132
cSH	352	1700	1700	1700	1700
Volume to Capacity	0.35	0.46	0.46	0.46	0.31
Queue Length 95th (ft)	38	0	0	0	0
Control Delay (s)	20.6	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	20.6	0.0			
Approach LOS	C				

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	42	0	0	1094	64
Future Volume (Veh/h)	0	42	0	0	1094	64
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.95	0.95
Hourly flow rate (vph)	0	46	0	0	1152	67
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				526		
pX, platoon unblocked						
vC, conflicting volume	1186	322	1219			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1186	322	1219			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	100			
cM capacity (veh/h)	182	674	568			

Direction, Lane #	EB 1	SB 1	SB 2	SB 3	SB 4
Volume Total	46	329	329	329	232
Volume Left	0	0	0	0	0
Volume Right	46	0	0	0	67
cSH	674	1700	1700	1700	1700
Volume to Capacity	0.07	0.19	0.19	0.19	0.14
Queue Length 95th (ft)	5	0	0	0	0
Control Delay (s)	10.7	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.7	0.0			
Approach LOS	B				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	26.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	242	872	78	0	6
Future Vol, veh/h	0	242	872	78	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	95	95	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	318	918	82	0	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	500
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	-	-	-	0	442
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	442
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	442
HCM Lane V/C Ratio	-	-	-	0.015
HCM Control Delay (s)	-	-	-	13.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	843	210	40	0	1
Future Vol, veh/h	0	843	210	40	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	80	80	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	906	263	50	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	157
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	-	-	-	0	732
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	732
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	732
HCM Lane V/C Ratio	-	-	-	0.001
HCM Control Delay (s)	-	-	-	9.9
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	90	0	322	36	0	50
Future Vol, veh/h	90	0	322	36	0	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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	0	350	39	0	67

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	437	370	0	0	389	0
Stage 1	370	-	-	-	-	-
Stage 2	67	-	-	-	-	-
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	577	676	-	-	1170	-
Stage 1	699	-	-	-	-	-
Stage 2	956	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	577	676	-	-	1170	-
Mov Cap-2 Maneuver	611	-	-	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	956	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	611	1170	-
HCM Lane V/C Ratio	-	-	0.16	-	-
HCM Control Delay (s)	-	-	12	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	83	0	57	23	0	138
Future Vol, veh/h	83	0	57	23	0	138
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	86	86	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	90	0	66	27	0	203

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	283	80	0	0	93	0
Stage 1	80	-	-	-	-	-
Stage 2	203	-	-	-	-	-
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	707	980	-	-	1501	-
Stage 1	943	-	-	-	-	-
Stage 2	831	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	707	980	-	-	1501	-
Mov Cap-2 Maneuver	720	-	-	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	831	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	720	1501	-
HCM Lane V/C Ratio	-	-	0.125	-	-
HCM Control Delay (s)	-	-	10.7	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

INTERNAL CAPTURE

WORKSHEETS

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Troy Plaza Mixed-Use Development	**Organization:**	ROWE Professional Services Company
Project Location:	City of Troy, Oakland County, MI	**Performed By:**	J. Bauer
Scenario Description:	Site Build Out	**Date:**	7/13/2019
Analysis Year:	2020	**Checked By:**	M. Labadie
Analysis Period:	**AM Street Peak Hour**	**Date:**	7/15/2019

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	710, 720	10,692	sq. ft.	41	34	7
Retail	820	3,232	sq. ft.	3	2	1
Restaurant	932,937,940	10,986	sq. ft.	382	196	186
Cinema/Entertainment				0		
Residential				0		
Hotel	312	133	rooms	52	22	30
All Other Land Uses[2]				0		
				478	254	224

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	4	0	0	0
Retail	0		0	0	0	0
Restaurant	5	0		0	0	1
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	1	0	3	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	478	254	224
Internal Capture Percentage	6%	6%	7%
External Vehicle-Trips[5]	448	239	209
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	18%	71%
Retail	50%	0%
Restaurant	4%	3%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	5%	13%

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Troy Plaza Mixed-Use Development	**Organization:**	ROWE Professional Services Company
Project Location:	City of Troy, Oakland County, MI	**Performed By:**	J. Bauer
Scenario Description:	Site Build Out	**Date:**	7/13/2019
Analysis Year:	2020	**Checked By:**	M. Labadie
Analysis Period:	**PM Street Peak Hour**	**Date:**	7/15/2019

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	710, 720	10,692	sq. ft.	19	4	15
Retail	820	3,232	sq. ft.	43	21	22
Restaurant	932,937,940	10,986	sq. ft.	218	113	105
Cinema/Entertainment				0		
Residential				0		
Hotel	312	133	rooms	43	24	19
All Other Land Uses[2]				0		
				323	162	161

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	1	0	0	0
Retail	0		6	0	0	1
Restaurant	1	11		0	0	7
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	6	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	323	162	161
Internal Capture Percentage	22%	22%	22%
External Vehicle-Trips[5]	253	127	126
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	25%	20%
Retail	62%	32%
Restaurant	12%	18%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	33%	32%

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

ROAD COMMISSION FOR

OAKLAND COUNTY

RIGHT-TURN TREATMENT

WARRANT ANALYSIS

ROAD COMMISSION FOR OAKLAND COUNTY

PERMIT RULES, SPECIFICATIONS AND GUIDELINES

ROAD COMMISSION FOR OAKLAND COUNTY

DEPARTMENT OF CUSTOMER SERVICES

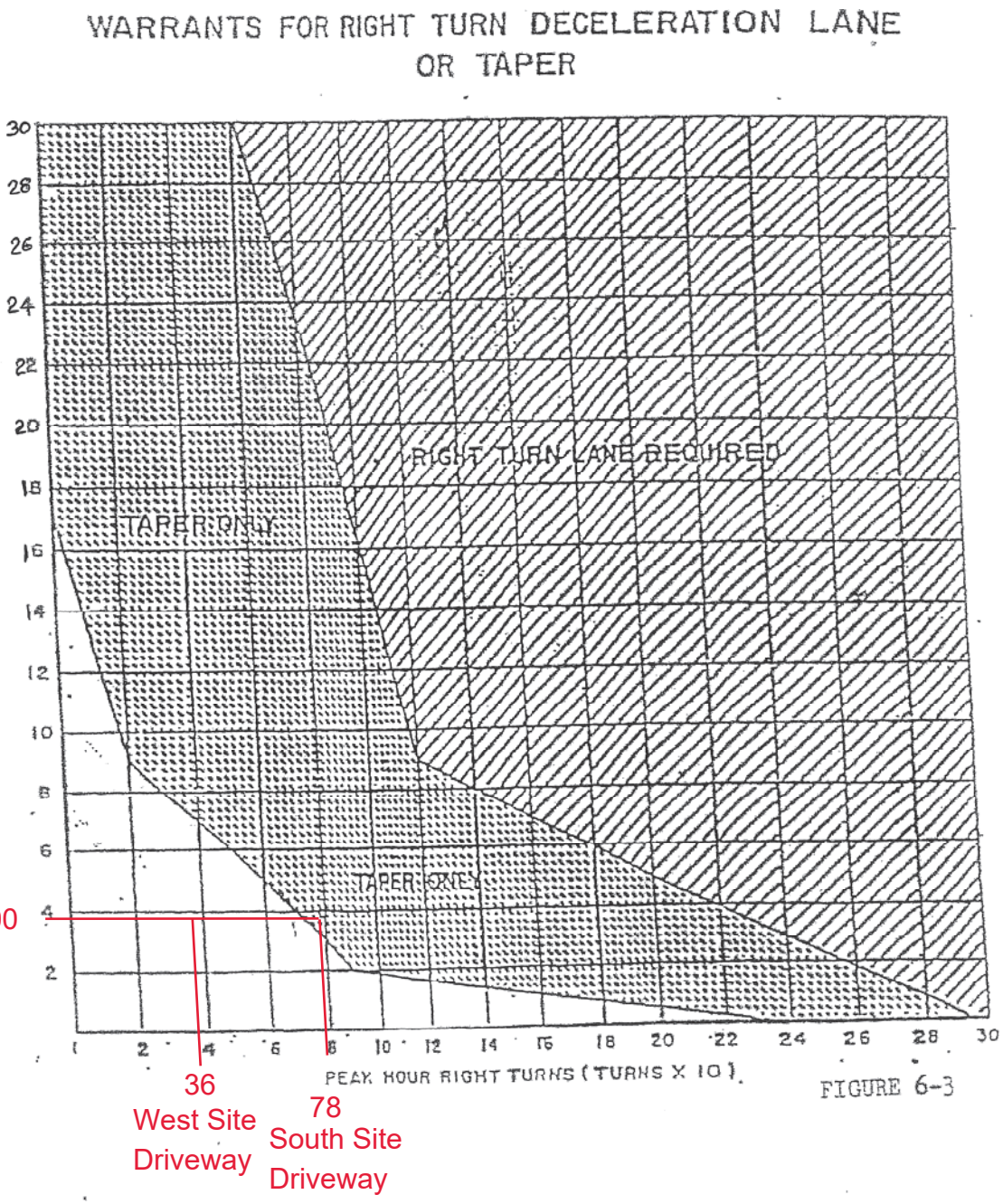
PERMITS DIVISION

2420 PONTIAC LAKE ROAD

WATERFORD, MI 48328

MARCH 14, 2013

FIGURE 6-3



Estimated ADT for both Corporate Drive and New King Drive

3,900

36 West Site Driveway

78 South Site Driveway

SHARED PARKING

WORKSHEETS

ULI Land Use	Size				City Parking Requirement								Required Parking		ULI Rate			
Hotel - Business	133	rooms	5	employ.	1 per	room	&	1 per	employ.				138		1.04			1.0400
Office < 25ksf	6813	sq. ft.			1 per	300	sq. ft.	&	per				23		3.33			80%
Medical/Dental Office	1850	sq. ft.			1 per	200	sq. ft.	&	per				9		5.00			85%
Community Shopping Center	3232	sq. ft.			1 per	250	sq. ft.	&	per				13		4.00			
Family Restaurant	**110**	seats		sq. ft.	1 per	2	seats	&	per				55		0.50			
	2072	sq. ft.			1 per	70	sq. ft.	&	per				30		14.29	1	=	14.29
Fast Food Restaurant	4414	sq. ft.			1 per	70	sq. ft.	&	per				63	93	14.29	70	=	1000
	0	sq. ft.			1 per	70	sq. ft.	&	per				0		14.29			
	21514				Parking provided on site plan: 266								331					

ULI Table 2-2 Ratios						
Weekday			Weekend			
Visitor	/	Employee	Visitor	/	Employee	
n/a	/	n/a	n/a	/	n/a	
8%	/	92%	8%	/	92%	
67%	/	33%	67%	/	33%	
81%	/	19%	80%	/	20%	
86%	/	14%	85%	/	15%	
85%	/	15%	86%	/	14%	
85%	/	15%	86%	/	14%	
85%	/	15%	86%	/	14%	

Adj. Parking Rates based on ULI Table 2-2						
Weekday			Weekend			
Visitor	/	Employee	Visitor	/	Employee	
1.00	/	0.04	1.00	/	0.04	
0.27	/	3.06	0.27	/	3.06	
3.35	/	1.65	3.35	/	1.65	
3.24	/	0.76	3.20	/	0.80	
0.43	/	0.07	0.42	/	0.08	
12.15	/	2.14	12.29	/	2.00	
12.15	/	2.14	12.29	/	2.00	
12.15	/	2.14	12.29	/	2.00	

Description: Mixed-Use Development

ksf = thousand square feet

Projected Parking Supply: 252					Mode Adjustment				Noncaptive Ratio			
			Max Parking Spaces		Weekday		Weekend		Weekday		Weekend	
Land Use	**Quantity**		**Weekday**	**Weekend**	**Daytime**	**Evening**	**Daytime**	**Evening**	**Daytime**	**Evening**	**Daytime**	**Evening**
Community Shopping Center (<400 ksf)	3,232	sf GLA	10	10	100%	100%	100%	100%	100%	100%	100%	100%
Employee			2	3	100%	100%	100%	100%	100%	100%	100%	100%
Regional Shopping Center (400 to 600 ksf)		sf GLA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Super Regional Shopping Center (>600 ksf)		sf GLA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Fine/Casual Dining Restaurant		sf GFA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Family Restaurant	106	Seats	46	45	100%	100%	100%	100%	100%	100%	100%	100%
Employee			7	8	100%	100%	100%	100%	100%	100%	100%	100%
Fast Food Restaurant	6,486	sf GFA	79	80	100%	100%	100%	100%	100%	100%	100%	100%
Employee			14	13	100%	100%	100%	100%	100%	100%	100%	100%
Nightclub		sf GFA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Cineplex		seats	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Performing Arts Theater		seats	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Arena		seats	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Pro Football Stadium		seats	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Pro Baseball Stadium		seats	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Health Club		sf GFA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Convention Center		sf GLA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Hotel-Business	133	rooms	133	133	100%	100%	100%	100%	100%	100%	100%	100%
Hotel-Leisure		rooms	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Restaurant/Lounge		sf GFA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Conference Ctr/Banquet (20 to 50 sq ft/guest room)		sf GFA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Convention Space (>50 sq ft/guest room)		sf GLA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			5	5	100%	100%	100%	100%	100%	100%	100%	100%
Residential, Rental, Shared Spaces		units	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Reserved	1	sp/unit	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Guest		units	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Residential, Owned, Shared Spaces		units	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Reserved	1	sp/unit	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Guest		units	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Office <25 ksf	6,813	sf GFA	2	2	100%	100%	100%	100%	100%	100%	100%	100%
Employee			21	21	100%	100%	100%	100%	100%	100%	100%	100%
Office 25 to 100 ksf		sf GFA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Office 100 to 500 ksf		sf GFA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Office >500 ksf		sf GFA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Data Processing Office		sf GFA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Medical/Dental Office	1,850	sf GFA	6	6	100%	100%	100%	100%	100%	100%	100%	100%
Employee			3	3	100%	100%	100%	100%	100%	100%	100%	100%
Bank (Branch) with Drive-In		sf GFA	0	0	100%	100%	100%	100%	100%	100%	100%	100%
Employee			0	0	100%	100%	100%	100%	100%	100%	100%	100%
Subtotal Customer/Guest Spaces			276	276								
Subtotal Employee/Resident Spaces			52	53								
Subtotal Reserved Spaces			0	0								
Total Parking Spaces			328	329								

Recommended Parking Ratios					
Spaces required per unit land use					
Land Use	Weekday		Weekend		Unit
	Visitor	Employee	Visitor	Employee	
Community Shopping Center (<400 ksf)	2.90	0.70	3.20	0.80	/ksf GLA
Regional Shopping Center (400 to 600 ksf)	Linear 2.9<x<3.2				/ksf GLA
Super Regional Shopping Center (>600 ksf)	3.20	0.80	3.60	0.90	/ksf GLA
Fine/Casual Dining Restaurant	15.25	2.75	17.00	3.00	/ksf GLA
Family Restaurant	9.00	1.50	12.75	2.25	/ksf GLA
Fast Food Restaurant	12.75	2.25	12.00	2.00	/ksf GLA
Nightclub	15.25	1.25	17.50	1.50	/ksf GLA
Cineplex	0.19	0.01	0.26	0.01	/seat
Performing Arts Theater	0.30	0.07	0.33	0.07	/seat
Arena	0.27	0.03	0.30	0.03	/seat
Pro Football Stadium	0.30	0.01	0.30	0.01	/seat
Pro Baseball Stadium	0.31	0.01	0.34	0.01	/seat
Health Club	6.60	0.40	5.50	0.25	/ksf GLA
Convention Center	5.50	0.50	5.50	0.50	/ksf GLA
Hotel-Business	1.00	0.25	0.90	0.18	/room
Hotel-Leisure	0.90	0.25	1.00	0.18	/room
Restaurant/Lounge	10.00		10.00		/ksf GLA
Conference Ctr/Banquet (20 to 50 sq ft/guest room)	30.00		30.00		/ksf GLA
Convention Space (>50 sq ft/guest room)	20.00		10.00		/ksf GLA
Residential, Rental, Shared Spaces *	0.15	1.50	0.15	1.50	/unit
Residential, Owned, Shared Spaces *	0.15	1.7	0.15	1.7	/unit
Office <25 ksf	0.30	3.5	0.03	0.35	/unit
Office 25 to 100 ksf	Linear 0.3<x<0.25				/ksf GLA
Office 100 to 500 ksf	Linear 0.25<x<0.2				/ksf GLA
Office >500 ksf	0.20	2.60	0.02	0.26	/ksf GLA
Data Processing Office	0.25	5.75	0.03	0.58	/ksf GLA
Medical/Dental Office	3.00	1.50	3.00	1.50	/ksf GLA
Bank (Branch) with Drive-In	3.00	1.60	3.00	1.60	/ksf GLA

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Maximum Parking

		Weekdays			Weekend		
	Quantity	Base Ratio	Unit	Max Spaces	Base Ratio	Unit	Max Spaces
Community Shopping Center (<400 ksf)	3,232	3.24	/ksf GLA	10	3.20	/ksf GLA	10
Employee		0.76	/ksf GLA	2	0.80	/ksf GLA	3
Regional Shopping Center (400 to 600 ksf)	0	0.00	/ksf GLA	0	0.00	/ksf GLA	0
Employee		0.00	/ksf GLA	0	0.00	/ksf GLA	0
Super Regional Shopping Center (>600 ksf)	0	3.20	/ksf GLA	0	3.60	/ksf GLA	0
Employee		0.80	/ksf GLA	0	0.90	/ksf GLA	0
Fine/Casual Dining Restaurant	0	15.25	/ksf GLA	0	17.00	/ksf GLA	0
Employee		2.75	/ksf GLA	0	3.00	/ksf GLA	0
Family Restaurant	106	0.43	Seats	46	0.42	Seats	45
Employee		0.07	Seats	7	0.08	Seats	8
Fast Food Restaurant	6,486	12.15	/ksf GLA	79	12.29	/ksf GLA	80
Employee		2.14	/ksf GLA	14	2.00	/ksf GLA	13
Nightclub	0	15.25	/ksf GLA	0	17.50	/ksf GLA	0
Employee		1.25	/ksf GLA	0	1.50	/ksf GLA	0
Cineplex	0	0.19	/seat	0	0.26	/seat	0
Employee		0.01	/seat	0	0.01	/seat	0
Performing Arts Theater	0	0.30	/seat	0	0.33	/seat	0
Employee		0.07	/seat	0	0.07	/seat	0
Arena	0	0.27	/seat	0	0.30	/seat	0
Employee		0.03	/seat	0	0.03	/seat	0
Pro Football Stadium	0	0.30	/seat	0	0.30	/seat	0
Employee		0.01	/seat	0	0.01	/seat	0
Pro Baseball Stadium	0	0.31	/seat	0	0.34	/seat	0
Employee		0.01	/seat	0	0.01	/seat	0
Health Club	0	6.60	/ksf GLA	0	5.50	/ksf GLA	0
Employee		0.40	/ksf GLA	0	0.25	/ksf GLA	0
Convention Center	0	5.50	/ksf GLA	0	5.50	/ksf GLA	0
Employee		0.50	/ksf GLA	0	0.50	/ksf GLA	0
Hotel-Business	133	1.00	/rooms	133	1.00	/rooms	133
Hotel-Leisure	0	0.90	/rooms	0	1.00	/rooms	0
Restaurant/Lounge	0	10.00	/ksf GLA	0	10.00	/ksf GLA	0
Conference Ctr/Banquet (20 to 50 sq ft/guest ro	0	30.00	/ksf GLA	0	30.00	/ksf GLA	0
Convention Space (>50 sq ft/guest room)	0	20.00	/ksf GLA	0	10.00	/ksf GLA	0
Employee	133	0.04	/rooms	5	0.04	/rooms	5
Residential, Rental, Shared Spaces	0	0.50	/unit	0	0.50	/unit	0
Reserved	0	1.0	/unit	0	1.0	/unit	0
Guest	0	0.15	/unit	0	0.15	/unit	0
Residential, Owned, Shared Spaces	0	0.70	/unit	0	0.70	/unit	0
Reserved	0	1.0	/unit	0	1.0	/unit	0
Guest	0	0.15	/unit	0	0.15	/unit	0
Office <25 ksf	6,813	0.27	/ksf GLA	2	0.27	/ksf GLA	2
Employee		3.06	/ksf GLA	21	3.06	/ksf GLA	21
Office 25 to 100 ksf	0	3.33	/ksf GLA	0	3.33	/ksf GLA	0
Employee		0.00	/ksf GLA	0	0.00	/ksf GLA	0
Office 100 to 500 ksf	0	0.00	/ksf GLA	0	0.00	/ksf GLA	0
Employee		0.00	/ksf GLA	0	0.00	/ksf GLA	0
Office >500 ksf	0	0.20	/ksf GLA	0	0.02	/ksf GLA	0
Employee		2.60	/ksf GLA	0	0.26	/ksf GLA	0
Data Processing Office	0	0.25	/ksf GLA	0	0.03	/ksf GLA	0
Employee		5.75	/ksf GLA	0	0.58	/ksf GLA	0
Medical/Dental Office	1,850	3.35	/ksf GLA	6	3.35	/ksf GLA	6
Employee		1.65	/ksf GLA	3	1.65	/ksf GLA	3
Bank (Branch) with Drive-In	0	3.00	/ksf GLA	0	3.00	/ksf GLA	0
Employee		1.60	/ksf GLA	0	1.60	/ksf GLA	0
Subtotal Customer/Guest Spaces				274			274
Subtotal Employee/Resident Spaces				54			55
Subtotal Reserved Spaces				0			0
Total Parking Spaces				328			329

Combined Monthly Adjustments

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Late Dec
Community Shopping Center (<400 ksf)	56%	57%	64%	63%	66%	67%	64%	69%	64%	66%	72%	100%	80%
Employee	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	90%	100%	90%
Regional Shopping Center (400 to 600 ksf)	56%	57%	64%	63%	66%	67%	64%	69%	64%	66%	72%	100%	80%
Employee	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	90%	100%	90%
Super Regional Shopping Center (>600 ksf)	56%	57%	64%	63%	66%	67%	64%	69%	64%	66%	72%	100%	80%
Employee	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	90%	100%	90%
Fine/Casual Dining Restaurant	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Employee	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Family Restaurant	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Employee	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Fast Food Restaurant	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Employee	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Nightclub	84%	86%	98%	90%	90%	91%	94%	96%	92%	98%	96%	100%	95%
Employee	90%	90%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Cineplex Weekday	27%	21%	20%	19%	27%	41%	55%	40%	15%	15%	25%	23%	100%
Employee	50%	50%	50%	50%	50%	75%	75%	75%	50%	50%	50%	50%	100%
Cineplex Weekend	71%	59%	67%	58%	71%	82%	92%	75%	51%	62%	78%	67%	100%
Employee	80%	80%	80%	80%	80%	100%	100%	90%	80%	80%	80%	80%	100%
Performing Arts Theater	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	100%	100%
Employee	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Arena	90%	100%	100%	100%	100%	75%	0%	0%	60%	65%	90%	95%	95%
Employee	100%	100%	100%	100%	100%	75%	10%	10%	75%	75%	100%	100%	100%
Pro Football Stadium	0%	0%	0%	0%	0%	0%	0%	67%	0%	0%	0%	100%	100%
Employee	10%	10%	10%	10%	10%	10%	10%	100%	10%	10%	10%	100%	100%
Pro Baseball Stadium	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%
Employee	10%	10%	10%	10%	100%	100%	100%	100%	100%	100%	10%	10%	10%
Health Club	100%	95%	85%	70%	65%	65%	65%	70%	80%	85%	85%	90%	95%
Employee	100%	100%	95%	80%	75%	75%	75%	80%	90%	95%	95%	100%	100%
Convention Center	75%	100%	90%	55%	60%	50%	45%	75%	80%	85%	100%	60%	0%
Employee	85%	100%	100%	65%	70%	60%	55%	85%	90%	95%	100%	70%	10%
Hotel-Business	71%	85%	91%	90%	92%	100%	98%	92%	93%	93%	81%	67%	50%
Hotel-Leisure	90%	100%	100%	100%	90%	90%	100%	100%	75%	75%	75%	50%	100%
Restaurant/Lounge	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Conference Ctr/Banquet (20 to 50 sq ft/guest ro	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Convention Space (>50 sq ft/guest room)	75%	100%	90%	55%	60%	50%	45%	75%	80%	85%	100%	60%	0%
Employee	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Residential, Rental, Shared Spaces	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Reserved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Guest	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Residential, Owned, Shared Spaces	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Reserved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Guest	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Office <25 ksf	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Employee	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Office 25 to 100 ksf	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Employee	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Office 100 to 500 ksf	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Employee	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Office >500 ksf	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Employee	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Data Processing Office	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Employee	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Medical/Dental Office	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Employee	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Bank (Branch) with Drive-In	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Employee	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%

FINAL CALCULATIONS

Peak Mo:	July												
Parking Demand - Weekday	216	227	244	239	246	250	251	249	240	247	234	235	209
Parking Demand - Weekend	215	228	245	241	246	251	252	250	241	247	236	238	210
Month Index	January	February	March	April	May	June	July	August	September	October	November	December	Late December

Weekday Peak	251	July
Weekend Peak	252	July

Table
Project: Stellar Plaza Courtyard
Description: Mixed-Use Development

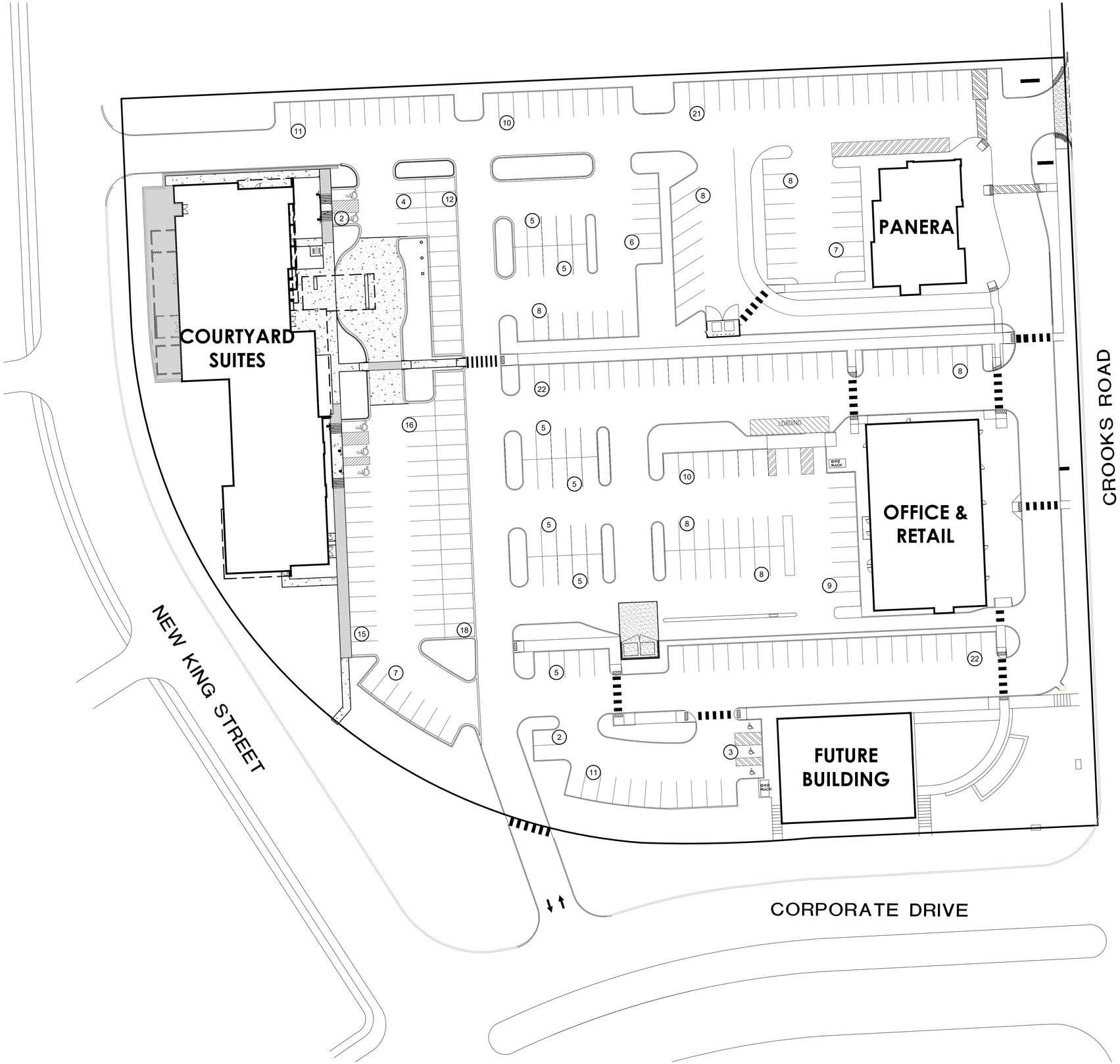
7/17/2019

SHARED PARKING DEMAND SUMMARY

PEAK MONTH: JULY -- PEAK PERIOD: 12 PM, WEEKEND

			Weekday					Weekend					Weekday			Weekend		
	Project Data		Base	Mode	Non-Captive	Project		Base	Mode	Non-Captive	Project		Peak Hr Adj	Peak Mo Adj	Estimated Parking	Peak Hr Adj	Peak Mo Adj	Estimated Parking
Land Use	Quantity	Unit	Rate	Adj	Ratio	Rate	Unit	Rate	Adj	Ratio	Rate	Unit	12 PM	July	Demand	12 PM	July	Demand
Community Shopping Center (<400 ksf)	3,232	sf GLA	3.24	1.00	1.00	3.24	/ksf GLA	3.20	1.00	1.00	3.20	/ksf GLA	0.95	0.64	6	0.80	0.64	5
Employee			0.76	1.00	1.00	0.76	/ksf GLA	0.80	1.00	1.00	0.80	/ksf GLA	1.00	0.80	2	1.00	0.80	2
Family Restaurant	106	Seats	0.43	1.00	1.00	0.43	Seats	0.42	1.00	1.00	0.42	Seats	1.00	0.98	45	1.00	0.98	44
Employee			0.07	1.00	1.00	0.07	Seats	0.08	1.00	1.00	0.08	Seats	1.00	1.00	7	1.00	1.00	8
Fast Food Restaurant	6,486	sf GFA	12.15	1.00	1.00	12.15	/ksf GLA	12.29	1.00	1.00	12.29	/ksf GLA	1.00	0.98	77	1.00	0.98	78
Employee			2.14	1.00	1.00	2.14	/ksf GLA	2.00	1.00	1.00	2.00	/ksf GLA	1.00	1.00	14	1.00	1.00	13
Hotel-Business	133	rooms	1.00	1.00	1.00	1.00	/rooms	1.00	1.00	1.00	1.00	/rooms	0.55	0.98	72	0.55	0.98	72
Employee			0.04	1.00	1.00	0.04	/rooms	0.04	1.00	1.00	0.04	/rooms	1.00	1.00	5	1.00	1.00	5
Office <25 ksf	6,813	sf GFA	0.27	1.00	1.00	0.27	/unit	0.27	1.00	1.00	0.27	/unit	0.15	0.95	0	0.90	0.95	2
Medical/Dental Office	1,850	sf GFA	3.35	1.00	1.00	3.35	/ksf GLA	3.35	1.00	1.00	3.35	/ksf GLA	0.30	0.95	2	0.30	0.95	2
Employee			1.65	1.00	1.00	1.65	/ksf GLA	1.65	1.00	1.00	1.65	/ksf GLA	1.00	0.95	3	1.00	0.95	3
													Customer		202	Customer		203
													Employee		49	Employee		49
													Reserved		0	Reserved		0
													Total		251	Total		252

SITE PLAN



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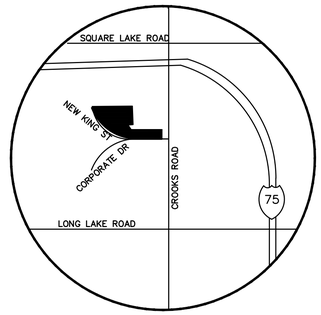

LOCATION MAP
NOT TO SCALE

STELLAR DEVELOPMENT, LLC
2600 AUBURN ROAD, SUITE 160
AUBURN HILLS, MI 48326
PH: 810-444-7815

PREPARED UNDER DIRECTION:
ANDREW ANDRE, P.E.
MI PE# 47380
STELLAR DEVELOPMENT, LLC

TROY PLAZA

CITY OF TROY, OAKLAND COUNTY, MICHIGAN

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ISSUED FOR	DATE
TRAFFIC STUDY	07/10/19

DATE :
DRAWN : ACA
CHECKED : ACA
SCALE : 1"=30'
JOB NO :

SHEET TITLE :
OVERALL SITE PLAN

SHEET
SP-1

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

0' 30' 60' 90'
SCALE: 1" = 30'

ROWE PROFESSIONAL SERVICES COMPANY

Large Firm Resources. Personal Attention.℠

Memorandum

To: Jimmy Asmar, Elite Hospitality, LLC

From: Michael J. Labadie, PE and Jill Bauer, PE, PTOE

Date: August 14, 2019

RE: Courtyard Troy, Traffic Impact Assessment – Amendment

ROWE Professional Services Company has completed our traffic impact assessment amendment related to the proposed Courtyard Troy development to be located on the west side of Crooks Road, north of Corporate Drive/I-75 Ramps, in the City of Troy, Oakland County. The current site plan (included in the materials attached to this report) indicates a hotel with 133 rooms, 8,516 square feet of general office space, 2,176 square feet of medical office space, a 2,072-square-foot coffee shop with drive-through window, a 4,414-square-foot Panera bread shop with drive-through window, and a 4,500 square-foot sit-down restaurant with up to 106 seats. This traffic impact assessment amendment has been completed in response to comments received from the City of Troy engineering consultant OHM, in a memorandum dated August 1, 2019.

Level of Service Analysis

An additional Level of service (LOS) analysis for the AM and PM peak hours were performed for the intersection of Crooks Road and Corporate Drive/I-75 ramps under future (Build) conditions, without the recommended No Build improvement of providing an eastbound left-turn only lane to address the current and forecasted poor operation at the intersection.

According to the most recent edition (6th Edition) of the Highway Capacity Manual, level of service is a qualitative measure describing operational conditions of a traffic stream or intersection. Level of service ranges from A to F, with LOS A being the best. LOS D is generally considered to be acceptable. Table 1 presents the criteria for defining the various levels of service for signalized intersections.

The operational analysis of the Crooks Road and Corporate Drive/I-75 ramps intersection was performed utilizing 2000 HCM intersection methodology, since the HCM 6th Edition methodology does not support analysis of shared lanes at signalized intersections, or more than three through lanes on an approach to an unsignalized intersection.

Although Crooks Road and Corporate Drive are both boulevards, direct left-turns are allowed at their intersection and there is only a single set of signal heads for each approach. (Typically at boulevard intersections, there are "near" and "far" heads with different clearance intervals to ensure vehicles do not become "trapped" in the middle of the intersection.) Due to this, the intersection of Crooks Road and Corporate Drive/I-75 ramps was modeled as a single intersection rather than the typical dual-intersection boulevard configuration specified in Michigan Department of Transportation standards.

Table 1
Level of Service Criteria (Signalized Intersection)

Level of Service	Average Stopped Delay/Vehicle (seconds)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Note: LOS D is considered acceptable in urban/suburban areas.

The results of the level of service analyses for the intersection of Crooks Road and Corporate Drive/I-75 ramps are summarized in Tables 2 and 3.

Signalized Intersection of Crooks Road and Corporate Drive/I-75 Ramps

The City of Troy's engineering consultant, OHM, has asked that the operational analysis of this intersection not be completed via accepted practice with the timing permit provided by the Road Commission for Oakland County, but rather perform field observations of timings during the peak periods and "average" the observed timings. However, the ongoing construction on I-75 in the vicinity of the project and the disruption to normal traffic patterns precluded this from being performed, and the timing permit information was utilized in the operational analysis.

The results of the existing level of service analysis for the signalized intersection of Crooks Road and Corporate Drive/I-75 ramps indicate that, under existing conditions, all approaches to the intersection operate at an LOS D or better during the AM peak hour, except for the westbound approach which operates at an LOS E. During the PM peak hour, all approaches to the intersection operate at an LOS D or better, except for the northbound and eastbound approaches which operate at an LOS E and LOS F, respectively. The overall intersection operates at an LOS D during the AM peak hour and at an LOS E during the PM peak hour.

With the addition of background traffic and accounting for possible SCATS optimization of the intersection signal timing, all approaches to the intersection would operate at an LOS D or better during both peak periods, except for the eastbound approach during the PM peak hour, which would continue to operate at an LOS F. The overall intersection would continue operate at an LOS D during the AM peak hour and at an LOS E during the PM peak hour.

With inclusion of the recommended background improvement of providing a dedicated eastbound left-turn lane with 200 feet of storage and accounting for possible SCATS optimization of the intersection signal timing, all approaches to the intersection would operate at an LOS D or better during both the AM and PM peak hours. The overall intersection would operate at an LOS D during both peak periods.

Including site generated traffic and accounting for possible SCATS optimization of the intersection timing, but not including the recommended background improvement of providing a dedicated eastbound left-turn lane with 200 feet of storage, all approaches to the intersection would operate at an LOS D during the AM peak hour. During the PM peak hour, the westbound approach would operate at an LOS D, and the northbound, southbound, and eastbound approaches would operate at an LOS E. The overall intersection would operate at an LOS D during the AM peak hour and at an LOS E during the PM peak hour.

The intersection would continue to operate in a manner like the background with improvements scenario with the addition of site generated traffic.

The operational results for the intersection of Crooks Road and Corporate Drive/I-75 ramps are presented in Tables 2 and 3.

Table 2
AM Peak Hour
Level of Service Analysis for Crooks Road and Corporate Drive/I-75 Ramps

Approach	2018 Existing[1]	2020 Background[2]	2020 Background Improved[3]	2020 Total Future w/o Imp.	2020 Total Future[5]
Northbound Crooks Road	D (39.9)	D (51.1)	D (51.1)	D (53.7)	D (53.7)
Southbound Crooks Road	C (31.8)	D (36.0)	C (34.7)	D (39.6)	D (37.5)
Eastbound Corporate Drive	D (53.3)	D (53.1)	D (52.7)	D (54.8)	D (53.0)
Westbound I-75 Off-Ramp	*E (70.9)*	D (47.5)	D (47.4)	D (50.5)	D (50.4)
Overall Intersection	**D (46.7)**	**D (42.8)**	**D (42.1)**	**D (46.1)**	**D (44.9)**

(XX.X) Average seconds of delay per vehicle.
1. Operational results represent existing splits provided in timing permit.
2. Operational results represent SCATS optimization.
3. Includes background (No Build) construction of an eastbound left-turn lane with 200 feet of storage.
4. Does not include recommended background (no Build) improvements to address existing and background poor operation of intersection during PM peak hour.
5. Total future condition assumes background improvements.

Table 3
PM Peak Hour
Level of Service Analysis for Crooks Road and Corporate Drive/I-75 Ramps

Approach	2018 Existing[1]	2020 Background[2]	2020 Background Improved[3]	2020 Total Future w/o Imp.	2020 Total Future[4]
Northbound Crooks Road	*E (61.9)*	D (51.0)	D (51.0)	*E (74.9)*	D (54.4)
Southbound Crooks Road	C (28.4)	D (52.1)	D (42.1)	*E (74.7)*	D (49.0)
Eastbound Corporate Drive	*F (177.4)*	*F (82.9)*	D (52.9)	*E (70.1)*	D (54.4)
Westbound I-75 Off-Ramp	D (51.5)	D (52.5)	D (52.0)	D (54.0)	D (54.2)
Overall Intersection	***E (70.3)***	***E (56.5)***	**D (49.6)**	***E (69.5)***	**D (53.2)**

(XX.X) Average seconds of delay per vehicle.
1. Operational results represent existing splits provided in timing permit.
2. Operational results represent SCATS optimization.
3. Includes background (No Build) construction of an eastbound left-turn lane with 200 feet of storage.
4. Does not include recommended background (no Build) improvements to address existing and background poor operation of intersection during PM peak hour.
5. Total future condition assumes background improvements.

Conclusions and Recommendations

The proposed Courtyard Troy consists of a hotel with 133 rooms, 8,516 square feet of general office space, 2,176 square feet of medical office space, a 2,072 square-foot coffee shop with drive-through window, a 4,414-square-foot Panera bread shop with drive-through window, and a 4,500-square-foot sit-down

restaurant with up to 106 seats. The proposed development will have access to southbound Crooks Road, westbound Corporate Drive, and New King Drive via a single driveway on each roadway.

The proposed mixed-use development is forecast to generate 289 new trips during the AM peak hour (159 inbound and 130 outbound from the site) and 158 new trips during the PM peak hour (79 inbound and 79 outbound from the site).

A revised operational analysis was performed for the total future conditions for the intersection of Crooks Road and Corporate Drive/I-75 ramps.

To address impacts from existing and background traffic volumes, it is recommended that an eastbound left-turn lane with 200 feet of storage be provided at the intersection of Corporate Drive with Crooks Road.

Attachments

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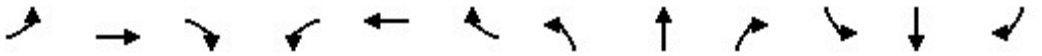
LEVEL OF SERVICE

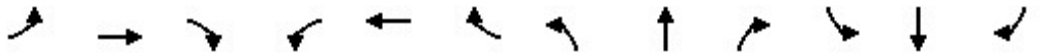
OUTPUT REPORTS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	123	40	663	543	571	0	648	216	569	1751	407
Future Volume (vph)	79	123	40	663	543	571	0	648	216	569	1751	407
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Lane Util. Factor		0.95	1.00	0.91	0.86	0.91		0.91	1.00	0.97	0.91	1.00
Frt		1.00	0.85	1.00	0.97	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3654	1667	1695	3244	1517		5353	1667	3614	5353	1667
Flt Permitted		0.98	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3654	1667	1695	3244	1517		5353	1667	3614	5353	1667
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	104	162	53	721	590	621	0	682	227	599	1843	428
RTOR Reduction (vph)	0	0	47	0	14	74	0	0	54	0	0	206
Lane Group Flow (vph)	0	266	6	497	980	367	0	682	173	599	1843	222
Turn Type	Split	NA	Perm	Split	NA	pm+ov		NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		8	8	1		2	8	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		12.9	12.9	37.9	37.9	62.1		17.2	55.1	24.2	48.2	48.2
Effective Green, g (s)		12.9	12.9	37.9	37.9	62.1		17.2	55.1	24.2	48.2	48.2
Actuated g/C Ratio		0.11	0.11	0.32	0.32	0.52		0.14	0.46	0.20	0.40	0.40
Clearance Time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	4.0	4.0
Lane Grp Cap (vph)		392	179	535	1024	785		767	765	728	2150	669
v/s Ratio Prot		c0.07		0.29	c0.30	0.09		0.13	0.07	0.17	c0.34	
v/s Ratio Perm			0.00			0.15			0.03			0.13
v/c Ratio		0.68	0.03	0.93	0.96	0.47		0.89	0.23	0.82	0.86	0.33
Uniform Delay, d1		51.6	48.0	39.7	40.3	18.4		50.5	19.6	45.8	32.8	24.8
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.6	0.1	22.5	18.5	0.4		14.6	0.2	10.2	4.7	1.3
Delay (s)		56.2	48.0	62.3	58.7	18.9		65.0	19.7	56.0	37.4	26.1
Level of Service		E	D	E	E	B		E	B	E	D	C
Approach Delay (s)		54.8			50.5			53.7			39.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.8
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	243	518	82	422	141	585	0	1559	514	276	751	109
Future Volume (vph)	243	518	82	422	141	585	0	1559	514	276	751	109
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Lane Util. Factor		0.95	1.00	0.91	0.86	0.91		0.91	1.00	0.97	0.91	1.00
Frt		1.00	0.85	1.00	0.92	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3667	1667	1695	3073	1517		5353	1667	3614	5353	1667
Flt Permitted		0.98	1.00	0.95	0.99	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3667	1667	1695	3073	1517		5353	1667	3614	5353	1667
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	261	557	88	444	148	616	0	1641	541	291	791	115
RTOR Reduction (vph)	0	0	68	0	154	81	0	0	46	0	0	69
Lane Group Flow (vph)	0	818	20	311	435	227	0	1641	495	291	791	46
Turn Type	Split	NA	Perm	Split	NA	pm+ov		NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		8	8	1		2	8	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		29.9	29.9	27.0	27.0	35.1		37.2	64.2	8.1	52.1	52.1
Effective Green, g (s)		29.9	29.9	27.0	27.0	35.1		37.2	64.2	8.1	52.1	52.1
Actuated g/C Ratio		0.23	0.23	0.21	0.21	0.27		0.29	0.49	0.06	0.40	0.40
Clearance Time (s)		7.1	7.1	7.1	7.1	6.8		6.8	7.1	6.8	6.8	6.8
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	4.0	4.0
Lane Grp Cap (vph)		843	383	352	638	409		1531	823	225	2145	668
v/s Ratio Prot		c0.22		c0.18	0.14	0.03		c0.31	0.12	c0.08	0.15	
v/s Ratio Perm			0.01			0.12			0.17			0.03
v/c Ratio		0.97	0.05	0.88	0.68	0.55		1.07	0.60	1.29	0.37	0.07
Uniform Delay, d1		49.6	39.0	50.0	47.5	40.7		46.4	23.7	61.0	27.4	24.0
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		23.9	0.1	22.1	3.0	1.6		44.9	1.2	160.9	0.5	0.2
Delay (s)		73.5	39.1	72.0	50.6	42.4		91.3	24.9	221.9	27.9	24.2
Level of Service		E	D	E	D	D		F	C	F	C	C
Approach Delay (s)		70.1			54.0			74.9			74.7	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	69.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.8
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

memorandum

Date: August 28, 2019

To: Bill Huotari, PE
cc: Sara Merrill, PE, PTOE, Stephen Dearing, PE, PTOE
From: Stephan Maxe, PE

Re: Troy Plaza Courtyard
Traffic Impact Study Review

I have reviewed the traffic impact study amendment for the proposed Courtyard hotel and various other developments, located in the Troy Plaza site in the northwest quadrant of the Crooks Road and Corporate Drive intersection. The proposed development includes a Courtyard Hotel, Retail, Office Building, Fast-Food Restaurant and High Turnover Restaurant. The study was prepared by Rowe Professional Services and is dated August 14th, 2019.

OHM accepts the findings of the traffic impact study. The study shows that there are lengthy delays at the Crooks Road/I-75 off-ramp/Corporate Drive intersection and the development will significantly add to the delays at this intersection. The suggested eastbound left turn lane with 200' of storage on Corporate Drive will improve intersection operations to an acceptable level of service.

OHM has no additional comments.

OHM Advisors
34000 PLYMOUTH ROAD
LIVONIA, MICHIGAN 48150
T 734.522.6711
F 734.522.6427
OHM-Advisors.com

memorandum

Date: October 1, 2019

To: Bill Huotari, PE
CC: Sara Merrill, PE, PTOE
From: Stephan Maxe, PE

Re: Plaza Courtyard
Preliminary Site Plan – 3rd Review

I have reviewed the revised preliminary site plan for the proposed Courtyard hotel, located in the Troy Plaza site in the northwest quadrant of the Crooks Road and Corporate Drive intersection. The proposed development includes a 5-story, 133 room hotel, with parking on site. The plans were prepared by Stellar Development, LLC., and dated September 24th, 2019.

At this time, OHM recommends approval of the preliminary site plan.

OHM offers the following comments:

1. The preliminary site plan comments previously noted have been adequately addressed.

2. The shared parking study and updated traffic impact study have been reviewed and accepted.

OHM Advisors
34000 PLYMOUTH ROAD
LIVONIA, MICHIGAN 48150
T 734.522.6711
F 734.522.6427
OHM-Advisors.com

STATE OF MICHIGAN
COUNTY OF OAKLAND
CITY OF TROY

CONDITIONAL REZONING AGREEMENT

This Development Agreement ("Agreement"), dated _____, 2012 is entered into by and between Tinelle Properties, LLC, a Michigan Limited Liability Company, whose address is 29850 Northwestern Hwy., Suite 200, Southfield, MI 48034 ("Developer"), and the City of Troy, a Michigan municipal corporation, having its principal offices at 500 W. Big Beaver Road, Troy, Michigan 48084 ("City").

R E C I T A L S:

A. Developer is the owner of certain real property located in the City of Troy, Oakland County, Michigan, containing approximately 6.157 acres, as more particularly described on Exhibit A attached hereto (the "Property").

B. Developer has applied for Conditional Rezoning pursuant to Troy's Zoning Ordinance, Chapter 39, Section 16.04 from Planned Unit Development ("PUD") district to one section, designated as Phase I in the attached Exhibit B, as a Community Business ("CB") district and one section, designated Phase II in the attached Exhibit B, as a Office Mixed Use ("OM"),. (See attached Exhibit B for details of split.) That Ordinance requires that an applicant for conditional rezoning prepare a Conditional Rezoning Agreement ("Agreement") which requires that specific provisions be included in the Agreement.

C. As part of approval of this Agreement, which will result in a rezoning of the Property from PUD district to an CB and a OM district, Developer has offered and agrees to make the improvements, proceed with the project and comply with any document submission dates and/or project completion dates, as described in this Agreement and any incorporated documents. Any conditions, representations or promises included in the Agreement have been voluntarily offered by the Developer to induce the City to rezone the land to the proposed classifications. The Developer and the City agree that the rezoning and the terms of this Agreement provides for: (i) the promotion of the public health, safety and welfare; (ii) compatibility with the Master Plan; (iii) compliance with all terms and conditions of the zoning district to which the land is to

be rezoned, except as otherwise allowed in the Agreement; (iv) the accommodation of service and facility loads for public services and facilities affected by the proposed development; (v) compatibility with adjacent uses of land; and (vi) other legitimate objectives authorized under the Michigan Municipal Planning Act, MCL 125.3101, et. seq. and Chapter 39, Section 16.04 of the City of Troy Zoning Ordinance. The burden of the conditions on the Developer is roughly proportionate to the burdens being created by the development, and to the benefit which will accrue to Property as a result of the requirements represented in the project and/or development.

D. For the purpose of confirming the rights, obligations and restrictions in connection with the improvements and development to be undertaken on the Property, the parties have entered into this Agreement. The rezoning of the Property to CB and OM district shall become effective as set out in Section 3.1 of this Agreement. Once this Agreement is approved by the Troy City Council, it shall be binding upon the City, the Developer, the owner, the owner of units within the Development, any owners associations, and their agents, successors and assigns. The City's Zoning District Map shall be updated to reflect the amendment to the Zoning Ordinance and the District Map within a reasonable period of time after the effective date of the rezoning.

NOW, THEREFORE, the Developer and the City, for the good and valuable consideration outlined in this Agreement, the receipt and sufficiency of which are hereby acknowledged, agree as follows:

ARTICLE I

GENERAL TERMS

1.1 This Agreement, including all incorporated documents, shall run with the land. The land is the Property described in the attached Exhibit A. Reference to "Developer" in this Agreement, and/or any incorporated documents, shall include the owner of the Property, Developer's agents, successors and assigns. It is the intent of Developer and the City to put all future owners of the Property, all future leaseholders and/or all parties in interest on notice of the rights, obligations and restrictions contained herein by recording this Agreement, including the site plan(s), if any, and any incorporated documents with the Oakland County Register of Deeds. If the project or development plan includes any type of condominium element, any termination of any condominium community or association shall not nullify or void this Agreement. As part of this Agreement and pursuant to State statute, if a Master Deed is not controlling for all or any portion of a condominium project, the terms and conditions of this Agreement shall be considered "Deed Restrictions" for any successors or assigns of the Property.

1.2 The Property shall be developed and improved in accordance with the following which shall be referred to herein as the "Conditional Rezoning Agreement Documents":

A. Chapter 39, Section 16.04 of the City's Zoning Ordinance, and amendments, if any.

B. This Conditional Rezoning Agreement.

C. Chapter 39, Section 4.13, which set out the requirements for development in a CB district classification, and Chapter 39, Section 4.17 which sets out the requirements for development in a OM district classification, unless those requirements are amended by the Conditional Rezoning Agreement.

D. Any other documents that are incorporated into this Agreement as Exhibit C.

E. The site plan, as approved by the Planning Commission, attached as Exhibit D, is incorporated herein by reference.

1.3 The Ordinance amendment granting the conditional rezoning reclassifies the zoning of the Property to CB and OM districts and constitutes the land use authorization for the Property, and all use improvement of the Property shall be in substantial conformity with the provisions of the Zoning Ordinance applicable to the zoning district and this Agreement.

ARTICLE II

CONDITIONS FOR REZONING

2.1 In consideration for the City's rezoning of the Property from its current classification of PUD district to a future classifications of CB and OM districts, the Developer agrees to be bound by the following conditions:

A. The development of the first two buildings of Phase I, (CB district), within six (6) months of obtaining building permits; including the parking, drive-aisles and building pad for corner building.

B. The Future Restaurant Building Pad of Phase I will not be marketed to a bank, a chain drug store or any other vehicular intensive use; but will be considered for all uses permitted in a CB district.

C. The details of the Future Restaurant Building Pad of Phase I shall be subject to planning approval and be modified by administrative approval with-in their jurisdiction;

D. The OM parcel (designated as Phase II) will be limited to and developed as either an office building or a hotel as presented in the approval package;

E. Prior to the development of Phase II, Developer shall provide the City with a traffic and parking study analysis.

F. The 25'0" high standard light poles will be turned off and/or reduced after 11:00 p.m. until sunrise. As to Phase I, no additional lighting is proposed to be building mounted to illuminate the site.

2.2 Developer represents and confirms that the Property shall not be used or developed in a manner that is inconsistent with conditions placed on rezoning as set out in this Agreement.

2.3 Developer shall be subject to the expiration provisions of Section16.04. E.of the Zoning Ordinance and Section 5.2 of this Agreement.

ARTICLE III

REZONING

3.1 Directly after approval of this Agreement, City Council shall pass a Resolution rezoning the Property from PUD district zoning classification to an CB and a OM district classifications. That Resolution shall also state that the Zoning Map shall be amended to reflect a new zoning classification. The Planning Director shall take necessary action to amend the Zoning Map to the new classification along with a relevant designation that will provide reasonable notice of the Conditional Rezoning Agreement. The Conditional Rezoning Approval and the amendment to Zoning Map shall not become effective until the Conditional Rezoning Agreement is recorded with the Oakland County Register of Deeds and a certified copy of the Agreement is filed with the City Clerk.

ARTICLE IV

DEVELOPER'S RIGHTS, OBLIGATIONS AND PROPERTY RESTRICTIONS

4.1 Developer shall have the right to develop the Property in accordance with the Conditional Rezoning Agreement Documents and shall receive Preliminary and Final approval in accordance with the City's Zoning Ordinance and this Agreement. If development and/or actions are undertaken on or with respect to the Property in violation of the Conditional Rezoning Agreement, such development and/or actions shall constitute a violation of the City of Troy Code of Ordinances and deemed a nuisance per se. In such cases the City may issue a stop work order relative to the property and seek any other lawful remedies. Until curative action is taken to bring the Property into compliance with the Conditional Rezoning Agreement, the City may withhold, or, following notice and an opportunity to be heard revoke permits and certificates, in addition to or in lieu of such other lawful action to achieve compliance.

4.2 All development, use, and improvement of the Property shall be subject to and in accordance with this Agreement, the Conditional Rezoning Agreement Documents, all applicable City Ordinances, and shall also be subject to and in accordance with all other approvals and permits required under applicable City Ordinances and State law.

4.3 Developer shall comply with the City Code of Ordinances, make any necessary application for permits and obtain any necessary permits for the development of the property including signage.

ARTICLE V

THE CITY'S RIGHTS AND OBLIGATIONS

5.1 The action of the City in entering into this Conditional Rezoning Agreement is based upon the understanding that the intent and spirit of the police power objectives of the City relative to the Property are embodied in the Conditional Rezoning Agreement Documents and those powers are assured based upon the development and/or undertakings on the Property. The City is thus achieving its police power objective and has not, by this Agreement, bargained away or otherwise compromised any of its police power objectives.

5.2 Conditional Rezoning Approval shall expire following a period of two (2) years from the effective date of the rezoning as set out above unless progress has been diligently pursued and substantial completion has occurred in accordance with permits issued by the City. The City shall have the sole discretion to determine if progress has been diligently pursued by the Developer of the Property. The City, through its employees and agents, shall at all times be allowed to enter onto the Property to determine if the progress of the development.

5.3 The City may initiate legal action for the enforcement of any of the provisions, requirements, and obligations set forth in the Conditional Rezoning Agreement. In the event the City obtains any relief as a result of such litigation, Developer shall pay all court costs and attorney fees incurred by the City in connection with such suit;

5.4 If the Developer is developing the Property in non-compliance with the Conditional Rezoning Agreement, the City may issue a stop work order as to any or all aspects of the Development, may deny the issuance of any requested building permit or certificate of occupancy within any part or all of the Development regardless of whether the Developer is the named applicant for such permit or certificate of occupancy, and may suspend further inspections of any or all aspects of the Development.

5.5 To the extent the Conditional Rezoning Agreement Documents deviate from the City of Troy Development Standards, Zoning Ordinance or other City ordinances, or any amendments thereto, the Conditional Rezoning Agreement Documents shall control. All improvements constructed in accordance with the Conditional Rezoning Agreement Documents shall be deemed to be conforming under the Zoning Ordinance and in compliance with all ordinances of the City.

ARTICLE VI

MISCELLANEOUS PROVISIONS

6.1 This Agreement may not be modified, replaced, amended or terminated except as provided for in this Agreement.

6.2 This Agreement shall be governed by and construed in accordance with the laws of the State of Michigan.

6.3 If there is a conflict between the terms of any of the Conditional Rezoning Agreement Documents, such documents shall control in the following order: (a) Chapter 39, Section 16.04 of the City's Zoning Ordinance, and amendments, if any (b) this Agreement and any Conditional Rezoning Agreement Documents. Where there is a question with regard to applicable regulations for a particular aspect of the Development, or with regard to clarification, interpretation, or definition of terms or regulations, and there are no apparent express provisions of the Conditional Rezoning Agreement Documents which apply, the City in the reasonable exercise of its discretion, shall determine the regulations of the City's Zoning Ordinance, as that Ordinance may have been amended, or other Ordinances which shall be applicable provided such

determination is not inconsistent with the nature and intent of the Conditional Rezoning Agreement Documents.

6.4 After consulting with their respective attorneys, Developer and City confirm that this Agreement is authorized by and consistent will all applicable state and federal law and the United States and Michigan Constitutions, that the terms of this Agreement are reasonable, that they shall be estopped from taking a contrary position in the future, and that each shall be entitled to injunctive relief to prohibit any actions by the other inconsistent with the terms of this Agreement. Developer and the City fully accept and agree to the final terms, conditions, requirements and obligations of the Agreement and all Conditional Rezoning Agreement Documents, and shall not be permitted in the future to claim that the effect of the Agreement and the Conditional Rezoning Agreement Documents result in an unreasonable limitation upon uses of all or a portion of the Property, or claim that enforcement of any of the Agreement and the Conditional Rezoning Agreement Documents causes an inverse condemnation or taking of all or a portion of the Property. Furthermore, it is agreed that the improvements and undertakings set forth in the Agreement and the Conditional Rezoning Agreement Documents are roughly proportional to the burden being created by the development, and to the benefit which will accrue to the Property as a result of the requirements represented by the development.

6.5 This Agreement may be executed in multiple counterparts, each of which shall be deemed an original and all of which shall constitute one agreement. The signature of any party to any counterpart shall be deemed to be a signature to, and may be appended to, any other counterpart.

6.6 This Agreement shall be binding on, and shall inure to the benefit of the parties and their respective successors and assigns.

6.7 Developer acknowledges that if Troy City Council does not pass a resolution authorizing the rezoning of the property and/or approving the Conditional Rezoning Agreement, then the Troy Planning Commission's approval of the site plan and/or special use or conditional rezoning becomes null and void.

THIS AGREEMENT was executed by the respective parties on the date specified with the notarization of their name.

"Developer"
Tinelle Properties, LLC

By: _____
Amer Asmar

Its: Managing Member

STATE OF MICHIGAN)
) ss.
COUNTY OF OAKLAND)

The foregoing instrument was acknowledged before by Amer Asmar this day of September, 2012

Patrick J. Fisher
Notary Public, State of Michigan
County of Oakland
My Commission Exp. April 21, 2018
Acting in the County of _____

_____
_____, Notary Public
Oakland County, Michigan
My Commission Expires: April 21 2018

CITY OF TROY, a Michigan municipal corporation

_____
By: Janice Daniels
Its: Mayor

By: Aileen Bittner
Its: City Clerk

STATE OF MICHIGAN)
) ss.
COUNTY OF OAKLAND)

The foregoing instrument was acknowledged before me this _____ day of 20___

_____
, Notary Public
Oakland County, Michigan
My Commission Expires: _____

PREPARED BY:
Ira S. Auslander
26261 Evergreen
Suite 130
Southfield, Michigan, 48076

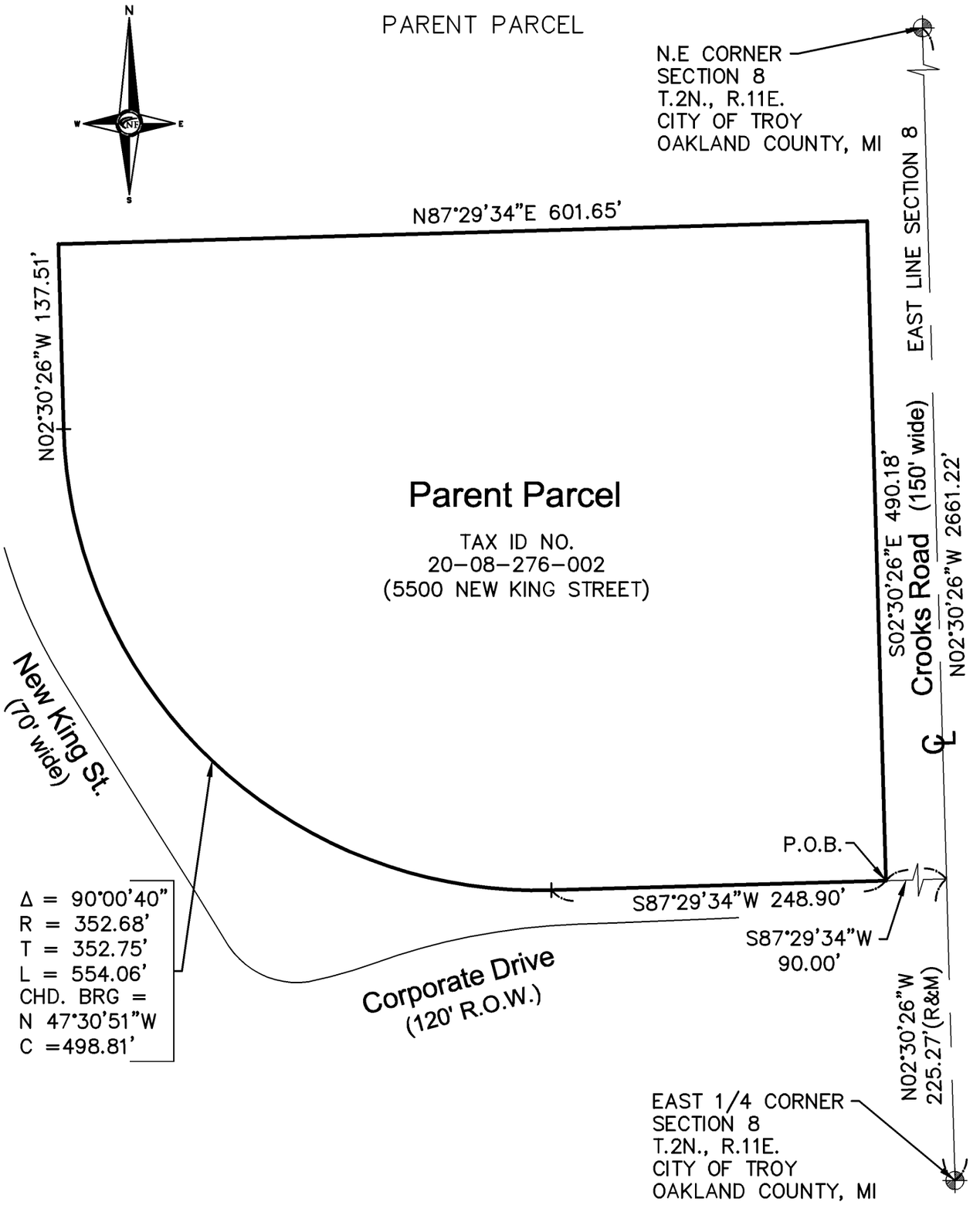
WHEN RECORDED RETURN TO:
City Clerk
City of Troy
500 W. Big Beaver Road
Troy, Michigan 48084

EXHIBIT A

LEGAL DESCRIPTION OF THE PROPERTY

Exhibit A

PARENT PARCEL



LEGAL DESCRIPTION - PARENT PARCEL

A PARCEL OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 8, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: BEGINNING AT A POINT DISTANT N.02°30'26"W., 225.27' FEET ALONG THE EAST LINE OF SECTION 8 AND S.87°29'34"W., 90.00 FEET TO A POINT ON THE WEST RIGHT-OF-WAY LINE OF CROOKS ROAD (150' WIDE) FROM THE EAST 1/4 CORNER OF SAID SECTION 8; THENCE S.87°29'34"W., 248.90 FEET; THENCE 554.06 FEET ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 352.68 FEET, CHORD BEARING N.47°30'51"W., 498.81 FEET; THENCE N.02°30'26"W., 137.51 FEET; THENCE N.87°29'34"E., 601.65 FEET; THENCE S.02°30'26"E., 490.18 FEET ALONG THE WEST RIGHT-OF-WAY LINE OF SAID CROOKS ROAD TO THE POINT OF BEGINNING.
CONTAINING 268,226.44 SQUARE FEET OR 6.157 ACRES.
TAX ID NO. 20-08-276-002 (5500 NEW KING STREET)

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

NF ENGINEERS

PREPARED FOR:	SCALE	REVISED	DRAWN	JOB NO.	SHEET
TINELLE PROPERTIES, LLC	1" = 100'	10-01-12	MRC	C380-02	1 of 3

Exhibit A

LEGAL DESCRIPTION – PARCELS 1 AND 2

LEGAL DESCRIPTION - PARCEL 1

A PARCEL OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 8, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: BEGINNING AT A POINT DISTANT N.02°30'26"W., 225.27' FEET ALONG THE EAST LINE OF SECTION 8 AND S.87°29'34"W., 90.00 FEET TO A POINT ON THE WEST RIGHT–OF–WAY LINE OF CROOKS ROAD (150' WIDE) FROM THE EAST 1/4 CORNER OF SAID SECTION 8; THENCE S.87°29'34"W., 248.90 FEET; THENCE 1.10 FEET ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A RADIUS OF 352.68 FEET, CHORD BEARING S.87°34'11"W., 1.10 FEET; THENCE N.02°30'26"W., 490.18 FEET; THENCE N.87°29'34"E., 250.00 FEET; THENCE S.02°30'26"E., 490.18 FEET ALONG THE WEST RIGHT–OF–WAY LINE OF SAID CROOKS ROAD TO THE POINT OF BEGINNING.

CONTAINING 122,545.00 SQUARE FEET OR 2.813 ACRES.

LEGAL DESCRIPTION - PARCEL 2

A PARCEL OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 8, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE EAST 1/4 CORNER OF SAID SECTION 8; THENCE N.02°30'26"W., 225.27' FEET ALONG THE EAST LINE OF SECTION 8; THENCE S.87°29'34"W., 338.90 FEET; THENCE 1.10 FEET ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A RADIUS OF 352.68 FEET, CHORD BEARING S.87°34'11"W., 1.10 FEET TO THE POINT OF BEGINNING; THENCE 552.95 FEET ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A RADIUS OF 352.68 FEET, CHORD BEARING N.47°25'29"W., 498.03 FEET; THENCE N.02°30'26"W., 137.51 FEET; THENCE N.87°29'34"E., 351.65 FEET; THENCE S.02°30'26"E., 490.18 FEET TO THE POINT OF BEGINNING.

CONTAINING 145,681.45 SQUARE FEET OR 3.344 ACRES.

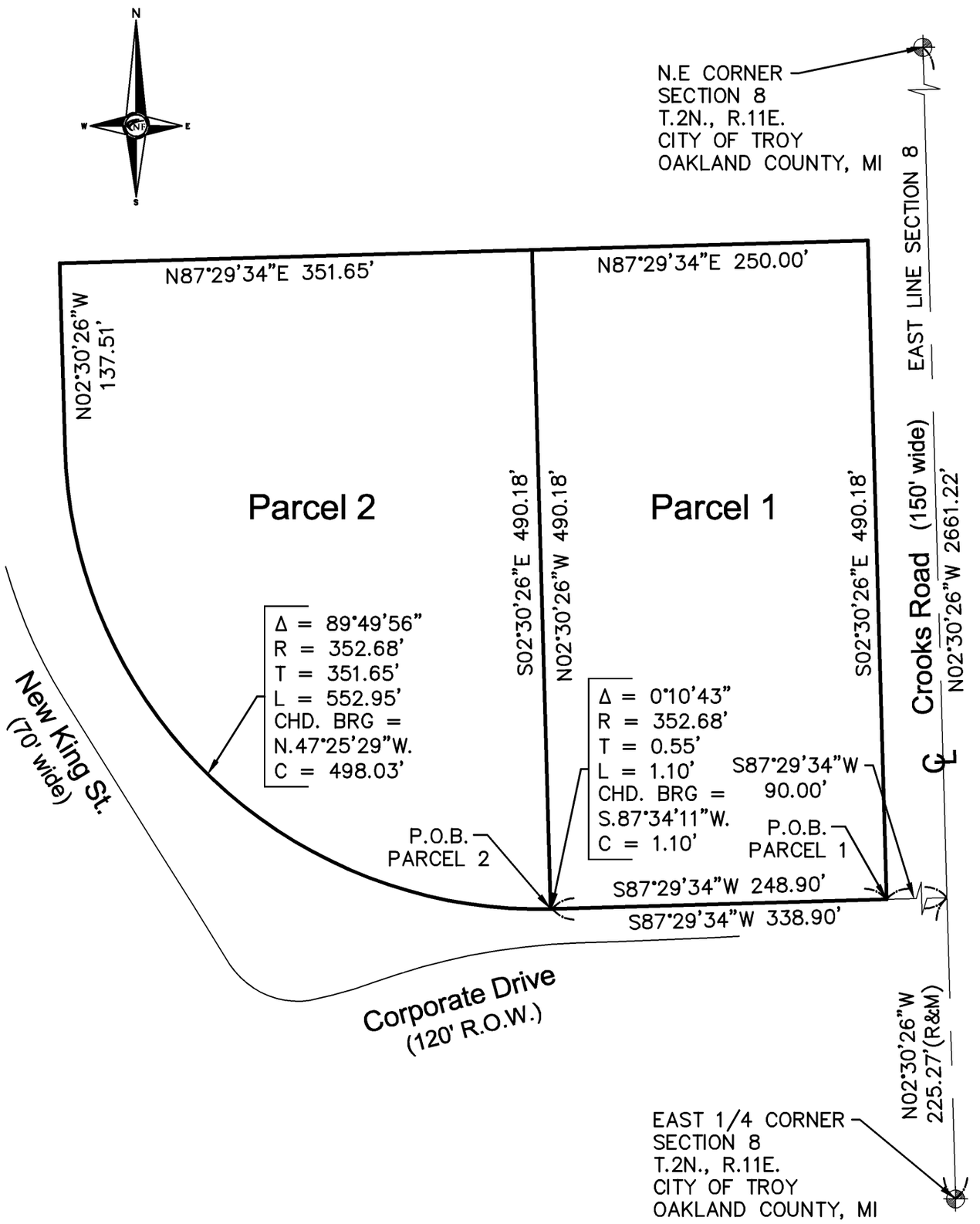
NF ENGINEERS
NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

PREPARED FOR:
TINELLE
PROPERTIES, LLC

REVISED	DRAWN	JOB NO.	SHEET
10-01-12	MRC	C380-02	2 of 3

Exhibit A

PROPERTY SKETCH – PARCELS 1 AND 2



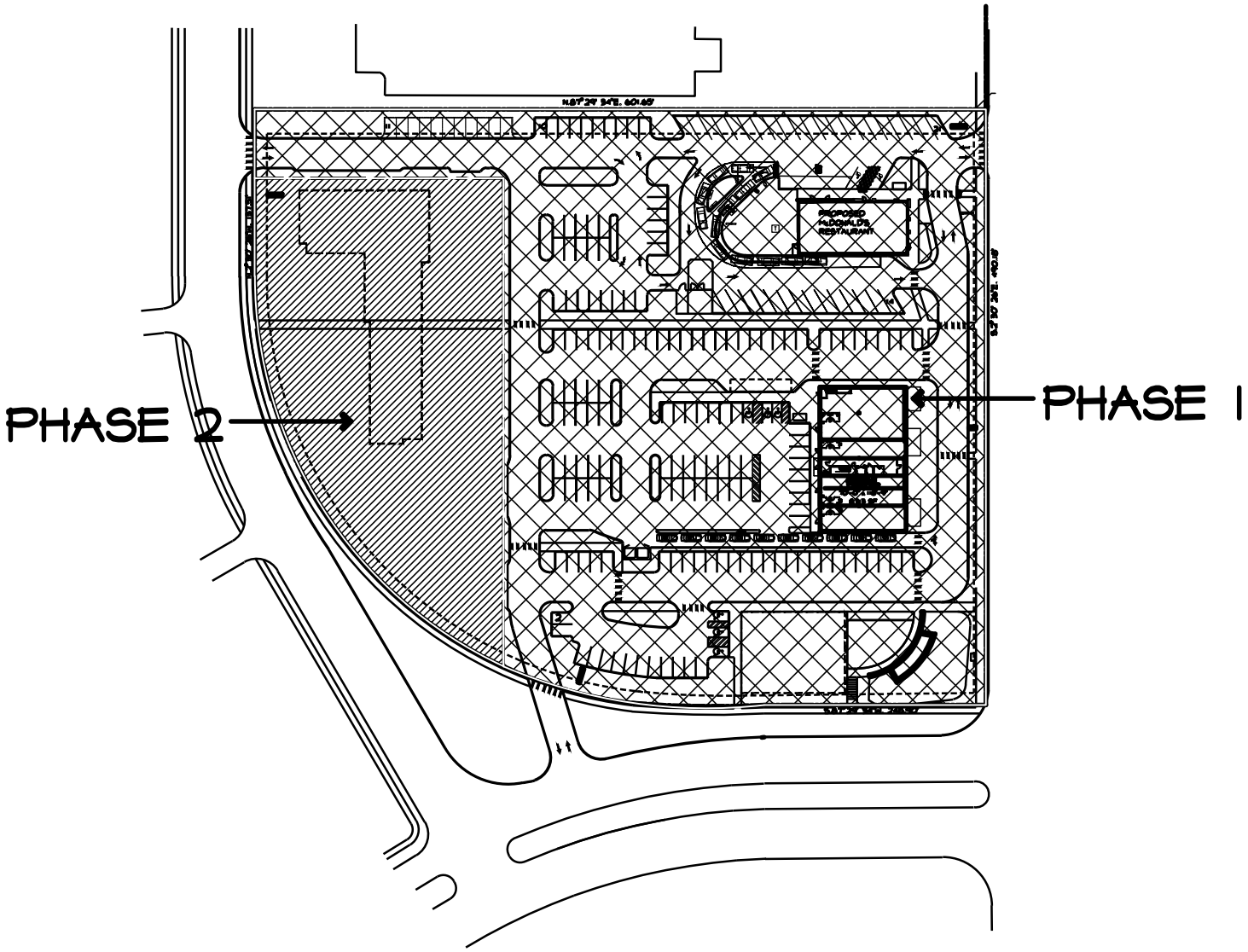
NF ENGINEERS

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

PREPARED FOR:	SCALE	REVISED	DRAWN	JOB NO.	SHEET
TINELLE PROPERTIES, LLC	1" = 100'	10-01-12	MRC	C380-02	3 of 3

EXHIBIT B

DESIGNATIONS OF PHASE I and PHASE II



TROY PLAZA PHASING PLAN

NO SCALE

EXHIBIT C

ALL CONDITIONS AS REQUIRED BY CHAPTER 39, SECTION 16.04 OF THE ZONING ORDINANCE AND THE CITY OF TROY

A. The development of the first two buildings of Phase I, (CB district), within six (6) months of obtaining building permits; including the parking, drive-aisles and building pad for corner building.

B. The Future Restaurant Building Pad of Phase I will not be marketed to a bank, a chain drug store or any other vehicular intensive use; but will be considered for all uses permitted in a CB district.

C. The details of the Future Restaurant Building Pad of Phase I shall be subject to Planning Department approval and be modified by administrative approval with-in their jurisdiction;

D. The OM parcel (designated as Phase II) will be limited to and developed as either an office building or a hotel as presented in the approval package;

E. Prior to the development of Phase II, Developer shall provide the City with a traffic and parking study analysis.

F. The 25'0" high standard light poles will be turned off and/or reduced after 11:00 p.m. until sunrise. As to phase I, no additional lighting is proposed to be building mounted to illuminate the site.

EXHIBIT D

SITE PLAN APPROVED BY CITY OF TROY PLANNING COMMISSION

Troy Plaza

Troy, Michigan

Drawing Schedule		Issued	Issued	Issued	Issued	Issued	Issued	Issued
		Conditional Rezoning	Conditional Rezoning	Pln'g Comm Submittal	Pln'g Comm Resubmittal			
SP-1	Cover Sheet	06-04-12	07-09-12	07-16-12	08-28-12			
SP-2	Site Plan	06-04-12	07-09-12	07-16-12	08-28-12			
SP-3	Site Lighting Photometric Plan		07-09-12	07-16-12	08-28-12			
C-1	Demolition Plan	06-04-12		07-16-12	08-24-12			
C-2	Grading Plan	06-04-12		07-16-12	08-24-12			
C-3	Utility Plan	06-04-12		07-16-12	08-24-12			
C-4	Soil Erosion & Sediment Control	06-04-12		07-16-12	08-24-12			
1	Boundary/Topographic/Tree Survey			07-16-12	07-16-12			
LS-1	Landscape Plan			07-16-12	08-27-12			
LS-2	Plant Material List & Details			07-16-12	08-27-12			
A-1	Retail Building Floor Plans	06-04-12		07-16-12	07-16-12			
A-2	Retail Building Elevations	06-04-12		07-16-12	07-16-12			
A1-O	McDonalds Floor Plan	06-04-12		07-16-12	07-16-12			
A2-O	McDonalds Elevations	06-04-12		07-16-12	07-16-12			
A2-1	McDonalds Elevations	06-04-12		07-16-12	07-16-12			

DEVELOPER:

tinelle PROPERTIES LLC

a Commercial Management and Development Co.

Tinelle Properties LLC
29850 Northwestern Hwy
Southfield MI 48034
248.557.5454

ARCHITECT:

MGA Architects/Designers

Moiseev/Gordon Associates, Inc.
4351 Delemere Court
Royal Oak, MI 48073
248.549.4500 voice 248.549.7300 facs.
www.mga-architects.net

CIVIL ENGINEER:

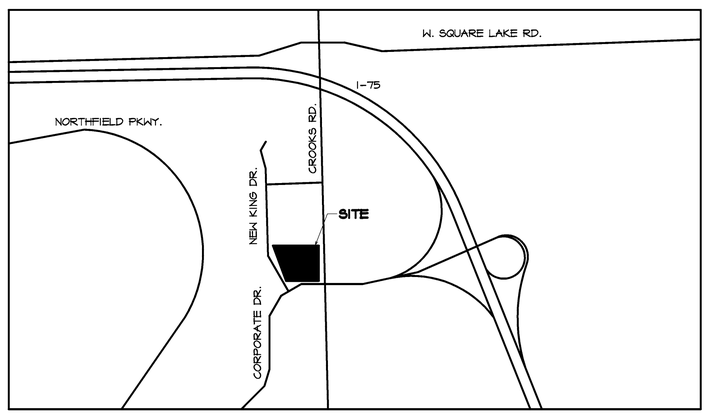
Sitto Building & Engineering

29850 Northwestern Highway
Suite 200
Southfield, MI 4807374
tel: 248.709.0044 facs: 248.246.6800
imad@sittoengineers.com

LANDSCAPE ARCHITECT:

FPA
Community Land Planner and registered Landscape Architect
16000 W. 9-Mile Road, Suite 520
Southfield, Michigan 48075
ph. (248) 557-5588
fax. (248) 557-5416

CALVIN HALL & ASSOCIATES
Professional Landscape Architects



North
Location Map
Scale: N.T.S.

MGA Architects/Designers

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

248.549.4500 voice
248.549.7300 facs.

www.mga-architects.net

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Use figured dimensions only. Do not scale the drawings.

Client:
Tinelle Properties LLC
29850 NORTHWESTERN HIGHWAY
SOUTHFIELD, MI 48034

Project Title:
Troy Plaza
TROY, MI 48230

Sheet Title:
Title Sheet

Project Number: 06418.02
Drawn By: AJM
Checked By:
Approved By:
Date: 08-09-06

Issued:

Owner Review	Owner Review
02-07-12	04-30-12
Owner Review	Conditional
02-14-12	Rezoning
Owner Review	06-04-12
02-27-12	Revised
Owner Review	07-09-12
02-29-12	Planning Comm Submittal
Owner Review	07-16-12
03-13-12	Pln'g Comm Resubmittal
Owner Review	07-30-12
03-20-12	Revised
Owner Review	08-15-12
03-22-12	Revised
Owner Review	08-28-12
04-11-12	

Sheet Number:
SP-1

File: #01.10000,20000

LAND/BUILDING/PARKING DATA AND NOTES

LAND AREA:
GROSS OVERALL PARCEL AREA: **268,226 S.F. OR 6.157 ACRES**

ZONING CLASSIFICATION: **CURRENTLY SUBJECT TO PUD #13**

PROPOSED ZONING: **OM OFFICE MIXED USE WESTERN PORTION**
CB COMMUNITY BUSINESS EASTERN PORTION

ADJACENT ZONING: **RC TO NORTH & WEST**
OM TO EAST & SOUTH

BUILDING AREA: McDONALD'S **4,200 S.F.**
RETAIL BUILDING 16,626 S.F.

BUILDING SETBACKS REQUIRED:
FRONT YARD SETBACK: **10 FEET**
SIDE YARD SETBACK: **20 FEET**
SIDE YARD SETBACK: **20 FEET**
REAR YARD SETBACK: **30 FEET**

BUILDING SETBACKS PROVIDED:
FRONT YARD SETBACK (CROOKS RD.) **65 FEET**
FRONT YARD SETBACK (CORPORATE DRIVE) **10 FEET**
SIDE YARD SETBACK (NORTH) **75 FEET**

PARKING REQUIRED:
REQUIRED PARKING WITH RESTAURANT AT CORNER PAD SITE
A RANGE BETWEEN 171 AND 220
REQUIRED PARKING WITH PAD SITE VACANT
A RANGE BETWEEN 131 AND 163
SEE ATTACHED PARKING CALCULATIONS FOR DETAIL

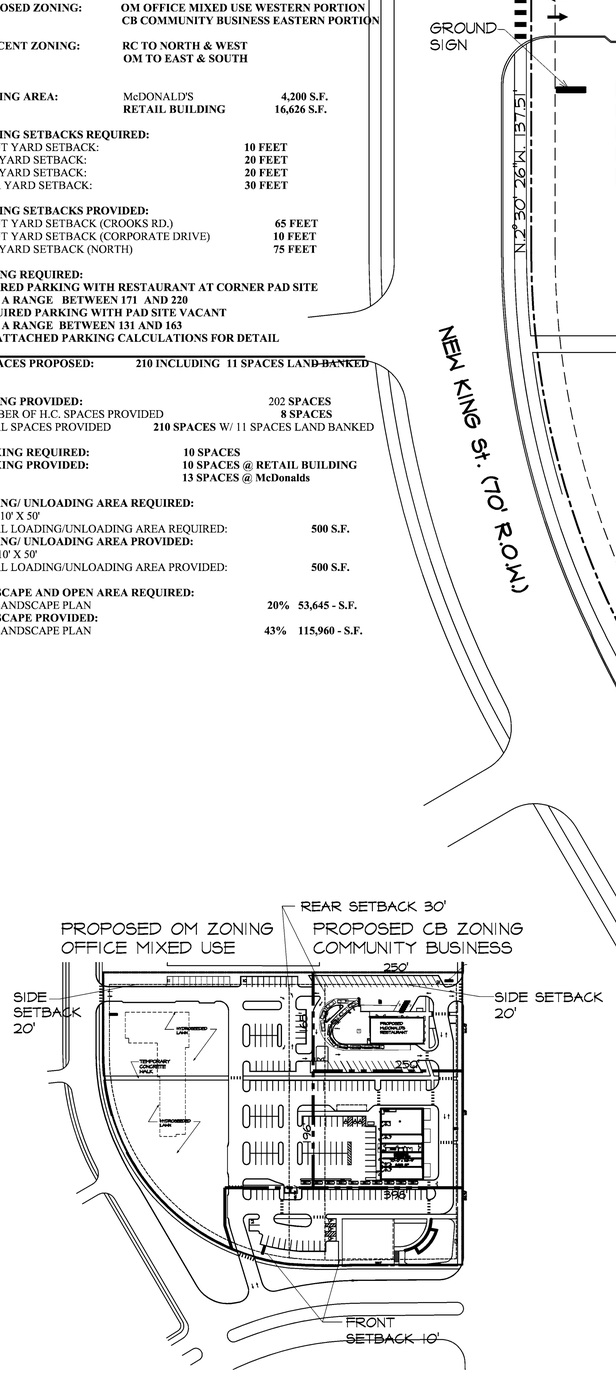
TOTAL SPACES PROPOSED: **210 INCLUDING 11 SPACES LAND ~~BANKED~~**

PARKING PROVIDED: 202 **SPACES**
NUMBER OF H.C. SPACES PROVIDED **8 SPACES**
TOTAL SPACES PROVIDED **210 SPACES** W/ 11 SPACES LAND BANKED

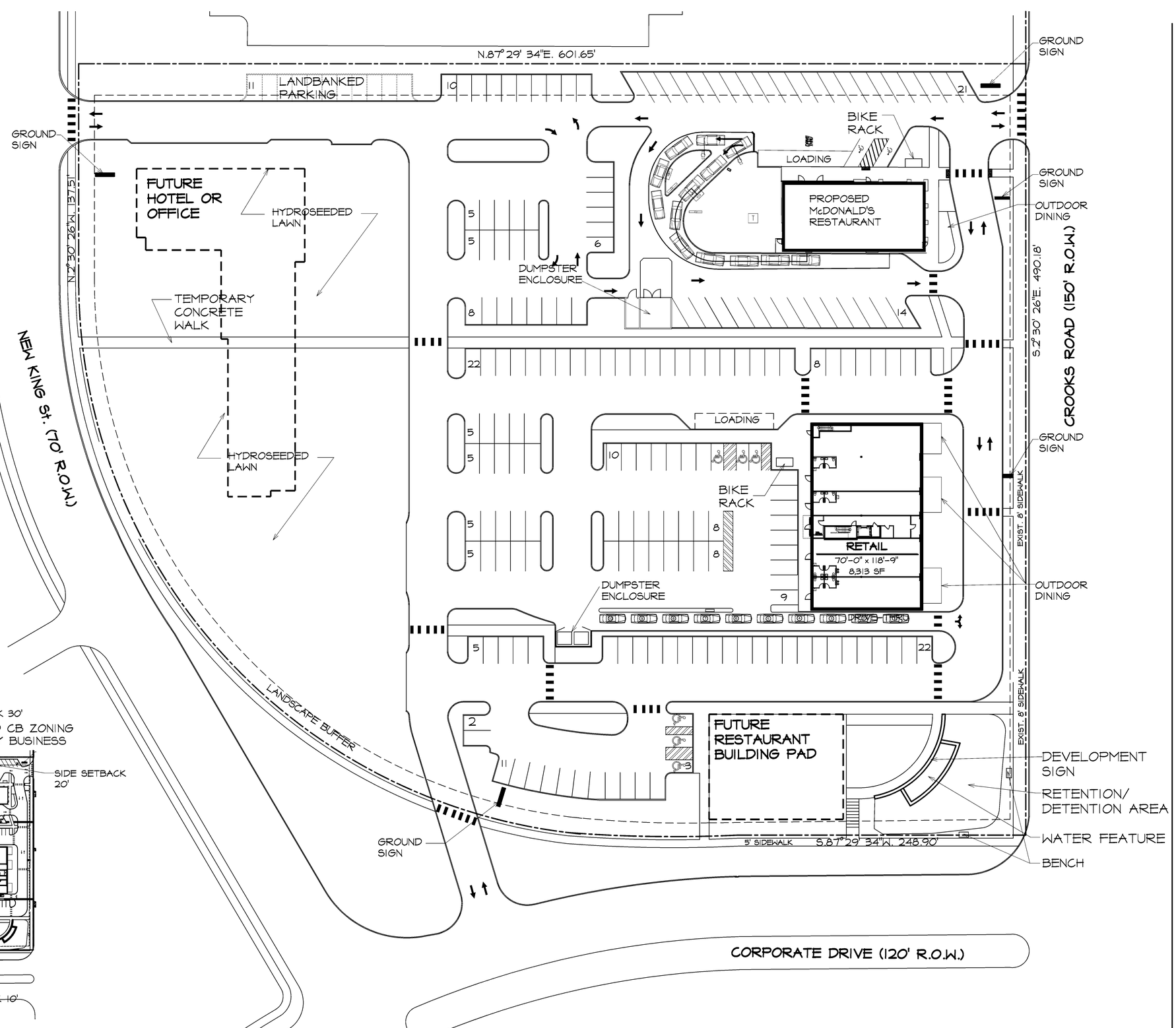
STACKING REQUIRED: **10 SPACES**
STACKING PROVIDED: **10 SPACES @ RETAIL BUILDING**
13 SPACES @ McDonalds

LOADING/ UNLOADING AREA REQUIRED:
(2) @ 10' X 50'
TOTAL LOADING/UNLOADING AREA REQUIRED: **500 S.F.**
LOADING/ UNLOADING AREA PROVIDED:
(2) @10' X 50'
TOTAL LOADING/UNLOADING AREA PROVIDED: **500 S.F.**

LANDSCAPE AND OPEN AREA REQUIRED:
SEE LANDSCAPE PLAN **20% 53,645 - S.F.**
LANDSCAPE PROVIDED:
SEE LANDSCAPE PLAN **43% 115,960 - S.F.**



NORTH
PROPOSED ZONING
NO SCALE:



NORTH
SITE PLAN
SCALE: 1" = 30'-0"

MGA Architects/Designers

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

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Client:
Tinelle Properties LLC
29850 NORTHWESTERN HIGHWAY
SOUTHFIELD, MI 48034

Project Title:
Troy Plaza
TROY, MI 48230

Sheet Title:
SITE PLAN

Project Number: 06418.02
Drawn By: AJM
Checked By:
Approved By:
Date: 08-09-06

Issued:

Owner Review	02-07-12
Owner Review	02-14-12
Owner Review	02-27-12
Owner Review	02-29-12
Owner Review	03-13-12
Owner Review	03-20-12
Owner Review	03-22-12
Owner Review	04-11-12
Owner Review	04-30-12
Conditional Rezoning	06-04-12
Revised	07-09-12
Planning Comm Submittal	07-16-12
Plng Comm Resubmittal	07-30-12
Revised	08-15-12
Revised	08-28-12

Sheet Number:
SP-2

File: #01.10000,20000

LUMINAIRE SCHEDULE

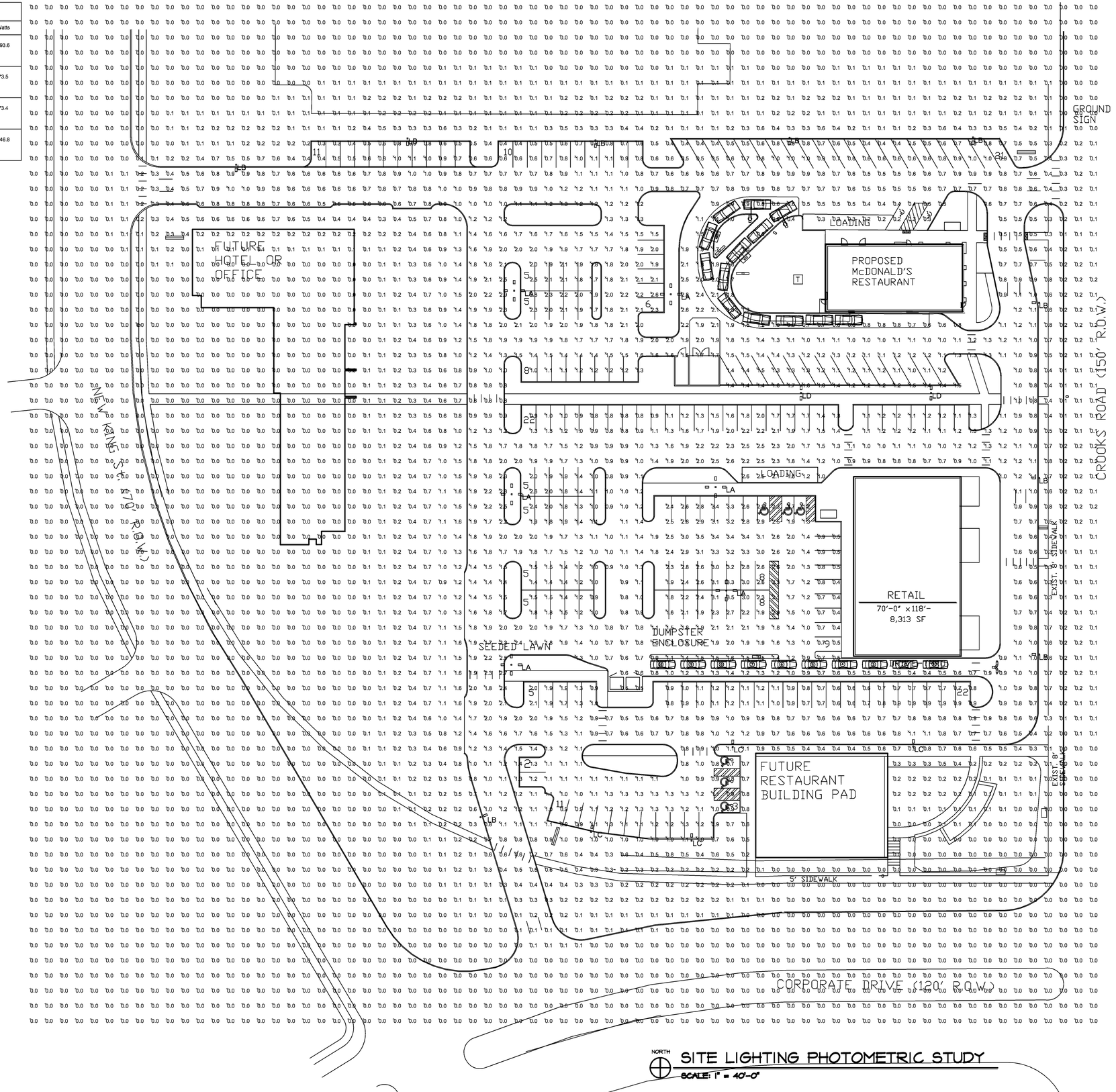
Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	LA	7	LITHONIA #DSX1 LED 1 30B700/50K SR4 MVOLT	DSX1 LED WITH 1 LIGHT ENGINE, 700mA DRIVER, 5000K LEDS, TYPE 4 OPTICS	ONE 73.4-WATT LED, AIMED DOWN POS.	DSX1_LED_1_30B700_50K_SR4_MVOLT.ies	Absolute	0.90	293.6
	LB	9	LITHONIA #DSX1 LED 1 30B700/40K SR3 MVOLT	DSX1 LED WITH 1 LIGHT ENGINE, 700mA DRIVER, 4000K LEDS, TYPE 3 OPTICS	ONE 73.5-WATT LED, AIMED DOWN POS.	DSX1_LED_1_30B700_40K_SR3_MVOLT.ies	Absolute	0.90	73.5
	LC	6	LITHONIA #DSX1 LED 1 30B700/50K SR4 MVOLT	DSX1 LED WITH 1 LIGHT ENGINE, 700mA DRIVER, 5000K LEDS, TYPE 4 OPTICS	ONE 73.4-WATT LED, AIMED DOWN POS.	DSX1_LED_1_30B700_50K_SR4_MVOLT.ies	Absolute	0.90	73.4
	LD	2	LITHONIA #DSX1 LED 1 30B700/50K SR4 MVOLT	DSX1 LED WITH 1 LIGHT ENGINE, 700mA DRIVER, 5000K LEDS, TYPE 4 OPTICS	ONE 73.4-WATT LED, AIMED DOWN POS.	DSX1_LED_1_30B700_50K_SR4_MVOLT.ies	Absolute	0.90	146.8

STATISTICS

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
OVERALL LTG VALUES AT GRADE	+	0.4 fc	3.5 fc	0.0 fc	N / A	N / A
PARKING AREA	*	1.2 fc	3.5 fc	0.2 fc	17.5:1	6.0:1

LUMINAIRE LOCATIONS

No.	Label	Location X	Location Y	MH	Orientation	Tilt
1	LB	3958.9	310.4	25.0	180.0	0.0
2	LB	4072.2	327.8	25.0	180.0	0.0
3	LB	4196.3	326.5	25.0	180.0	0.0
4	LB	4324.5	328.2	25.0	180.0	0.0
5	LB	4445.6	328.4	25.0	180.0	0.0
6	LA	4142.6	227.2	25.0	180.0	0.0
7	LA	4141.0	92.6	25.0	180.0	0.0
8	LA	4275.6	97.4	25.0	180.0	0.0
9	LA	4246.0	224.8	25.0	180.0	0.0
10	LB	4489.3	-13.2	25.0	270.0	0.0
11	LB	4489.3	103.4	25.0	270.0	0.0
12	LB	4489.3	219.2	25.0	270.0	0.0
13	LC	4952.9	128.4	25.0	52.5	0.0
14	LC	5016.1	68.3	25.0	38.3	0.0
15	LB	4120.4	-120.8	25.0	68.6	0.0
16	LC	4193.4	-130.5	25.0	10.3	0.0
17	LC	4259.7	-136.3	25.0	1.0	0.0
18	LA	4140.7	-20.0	25.0	180.0	0.0
19	LA	4981.1	-61.3	25.0	180.0	0.0
20	LA	4282.7	29.0	25.0	180.0	0.0
21	LC	4286.9	-74.4	25.0	1.0	0.0
22	LC	4406.2	-74.1	25.0	1.0	0.0
23	LD	4332.1	159.5	25.0	1.0	0.0
24	LD	4417.9	159.5	25.0	1.0	0.0



SITE LIGHTING PHOTOMETRIC STUDY

SCALE: 1" = 40'-0"

MGA Architects/Designers

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

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Client:

Tinelle Properties LLC

29850 NORTHWESTERN HIGHWAY
SOUTHFIELD, MI 48034

Project Title:

Troy Plaza

TROY, MI 48230

Sheet Title:

SITE LIGHTING PHOTOMETRIC PLAN

Project Number: 06418.02
Drawn By: AJM
Checked By:
Approved By:
Date: 08-09-06

Issued:

Owner Review 02-07-12
Owner Review 02-14-12
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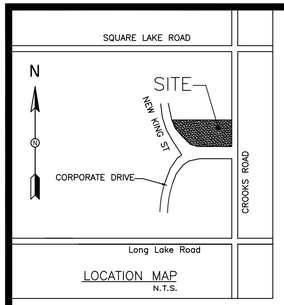
Revised 08-15-12
Revised 08-28-12

Sheet Number:

SP-3

File: #01.10000,20000

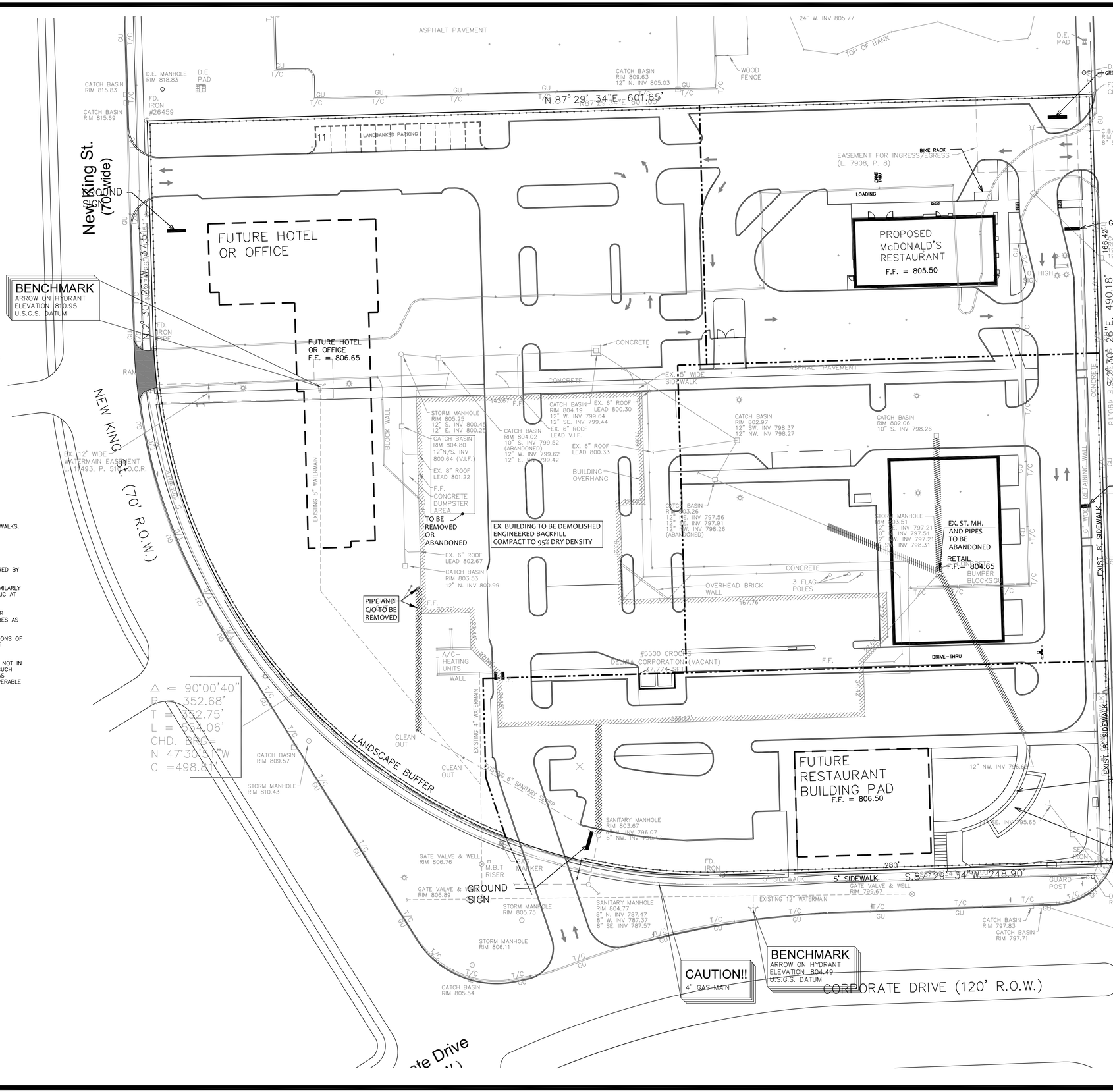


STANDARD NOTES:

1. NOTIFY THE CITY OF TROY ENGINEERING DEPARTMENT A MINIMUM OF 72 HOURS PRIOR TO THE START OF OF CONSTRUCTION.
2. ALL CONSTRUCTION MUST BE CONFORMING TO CURRENT STANDARDS AND SPECIFICATIONS ADOPTED BY THE CITY OF TROY.
3. UTILITIES TO BE UNDERGROUND.
4. CALL MISS DIG (800-482-7171) A MINIMUM OF 72 HOURS PRIOR TO START OF DEMOLITION AND/OR CONSTRUCTION ACTIVITIES.
5. ALL SOIL EROSION AND SILT FENCE MUST BE CONTROLLED AND CONTAINED ON-SITE.
6. ALL EXCAVATION UNDER OR WITHIN 3 FEET OF PUBLIC PAVEMENT, EXISTING ORPROPOSED, SHALL BE BACKFILLED AND COMPACTED WITH SAND (CLASS II MDOT).
7. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE TO EXISTING UTILITIES.
8. PRIOR TO ISSUANCE OF AN OCCUPANCY PERMIT AN ENGINEERING SITE INSPECTION IS REQUIRED.

DEMOLITION AND SAFETY NOTES:

1. INSTALL SOIL EROSION MEASURES AS REQUIREED.
2. REMOVE ALL EXISTING ON-SITE PAVEMENT, CURB AND CUTTER, AND SIDEWALKS.
3. REMOVE EXISTING BUILDING AND ABANDONE FOUNDATION, REFILL WITH ENIGNEERED BACKFILL UP TO REQUIRED GRADES, SEE GRADING PLAN.
4. CLOSE EXISTING APPROACHES AND LANDSCAPE AS PER CITY STANDARDS.
5. REMOVE OR ABANDONE EXISTING CIVIL AND GENERAL UTILITIES AS REQUIRED BY DESIGN PLANS, SEE GARDING AND UTILITY PLANS.
6. INSTALL NECCESSARY SHORING, BARRICADES, SIGNS, COVERS AND ALL SIMILARLY REQUIRED MEASURE BY OSHA TO PROTECT THE WORKERS AND THE PUBLIC AT ALL TIMES.
7. IT SHALL BE THE RESPONSIBILITY OF THE PROPOERTY OWNER, DEVELOPER AND/OR CONTRACTOR TO INITIATE AND MAINTAIN OSHA REQUIRED MEASURES AS MAY BE NECESSARY.
8. SUCH PROGRAMS SHALL PROVIDE FOR FREQUENT AND REGULAR INSPECTIONS OF THE JOB SITES, MATERIALS, AND EQUIPMENT TO BE MADE BY COMPETENT PERSONS.
9. THE USE OF ANY MACHINERY, TOOL, MATERIAL, OR EQUIPMENT WHICH IS NOT IN COMPLIANCE WITH ANY APPLICABLE OSHA REQUIREMENT IS PROHIBITED, SUCH MACHINE, TOOL, MATERIAL, OR EQUIPMENT SHALL EITHER BE IDENTIFIED AS UNSAFE BY TAGGING OR LOCKING THE CONTROLS TO RENDER THEM INOPERABLE OR SHALL BE PHYSICALLY REMOVED FROM ITS PLACE OF OPERATION.



SITTO BUILDING & ENGINEERING

29850 NORTHWESTERN HWY. SUITE 200
SOUTHFIELD, MI 48034
TEL: (248) 709-0044
FAX: (248) 246-6800
EMAIL: IMAD@SITTOENGINEERS.COM

PROJECT

TROY PLAZA
5500 NEW KING ST.
TROY, MI

CLIENT

TINELLE PROPERTIES
29850 NORTHWESTERN HWY. SUITE 200
SOUTHFIELD, MI 48034

REVISIONS

1- 08/24/12 PER NEW SITE PLAN

NOTES

PLEASE DO NOT SCALE DRAWING

PROFESSIONAL SEAL

SCALE

1" = 30'

DATE

05/19/2012

JOB NO.

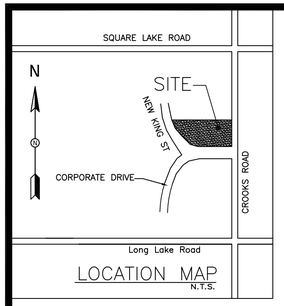
2012-32

SHEET TITLE

DEMOLITION PLAN

SHEET NO.

C-1



LOCATION MAP
N.T.S.

DETENTION CALCULATIONS

REQUIRED DETENTION VOLUME
AREA = 6.16 ACRES
C = 0.81
Qa = (A) (0.2 CFS/ACRE) = 1.23 CFS
Qo = Qa/AC = 0.25 CFS/ACRE

STORAGE TIME FOR 25-YEAR STORM
T = -25 + (8062.5/Qo)1/2
T = 155.70 MINUTES

Vs = 12,900 (T)/(T+25) - 40(Qo)(T)
Vs = 9,577.50 CUBIC FEET/ACRE-IMPERVIOUS

VT = VsxAxC = 47,787.87 CF.
0.22 ACRE-FEET

DETENTION SIZING (UNDERGROUND PIPE STORAGE)
** 14 - 5' DIA. HDPE PIPES @ 174 L.F. = 47,818.68 CF.

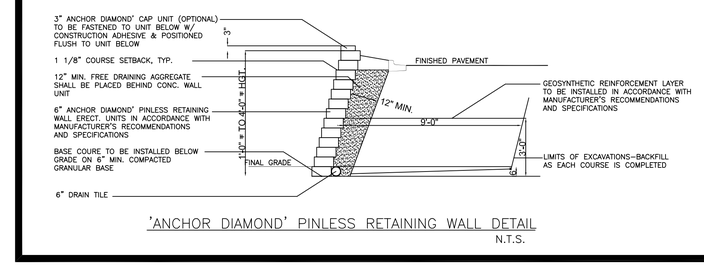
** PARKING LOT STORAGE MIGHT BE UTILIZED TO MINIMIZE THE SIZE THE UNDERGROUND STORAGE SYSTEM. A MORE DETAILED CALCULATIONS WILL BE PROVIDED FOR REVIEW AT THE FINAL CIVIL ENGINEERING DESIGN STAGE.

ORIFICE CONTROL CALCULATIONS
ALLOWABLE DISCHARGE (Qa) = 1.23 CFS
FLOW (Q) = CA(2gH)^0.5
C = 0.62
ORIFICE CROSS SECTION AREA (A)
GRAVITY (G) = 32.2 FEET/SEC^2
H = DISTANCE FROM HIGHWATER TO CENTER OF PIPE
D = DEPTH OF PONDING = 5 FEET
A = Qa / (0.62 x (2x32.2xh)^0.5) = 0.38 FT. = 4.5 INCH.
USE 4 IN. PIPE RESTRICTOR

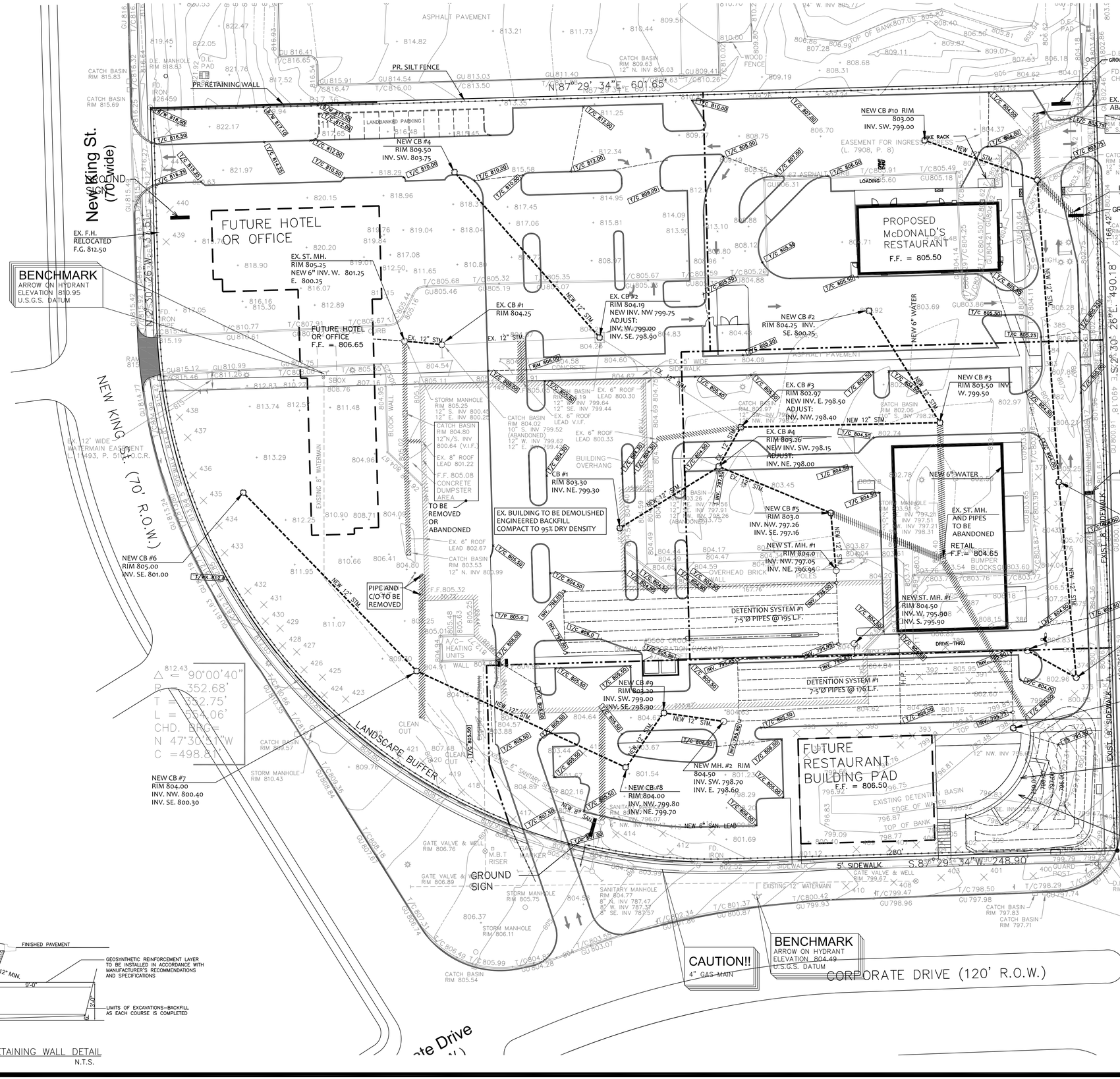
WATER TREATMENT NOTE:
PRE-MANUFACTURED WATER TREATMENT MANHOLES WILL BE UTILIZED TO PROVIDE THE STORM WATER TREATMENT AS REQUIRED BY THE CITY OF TROY.

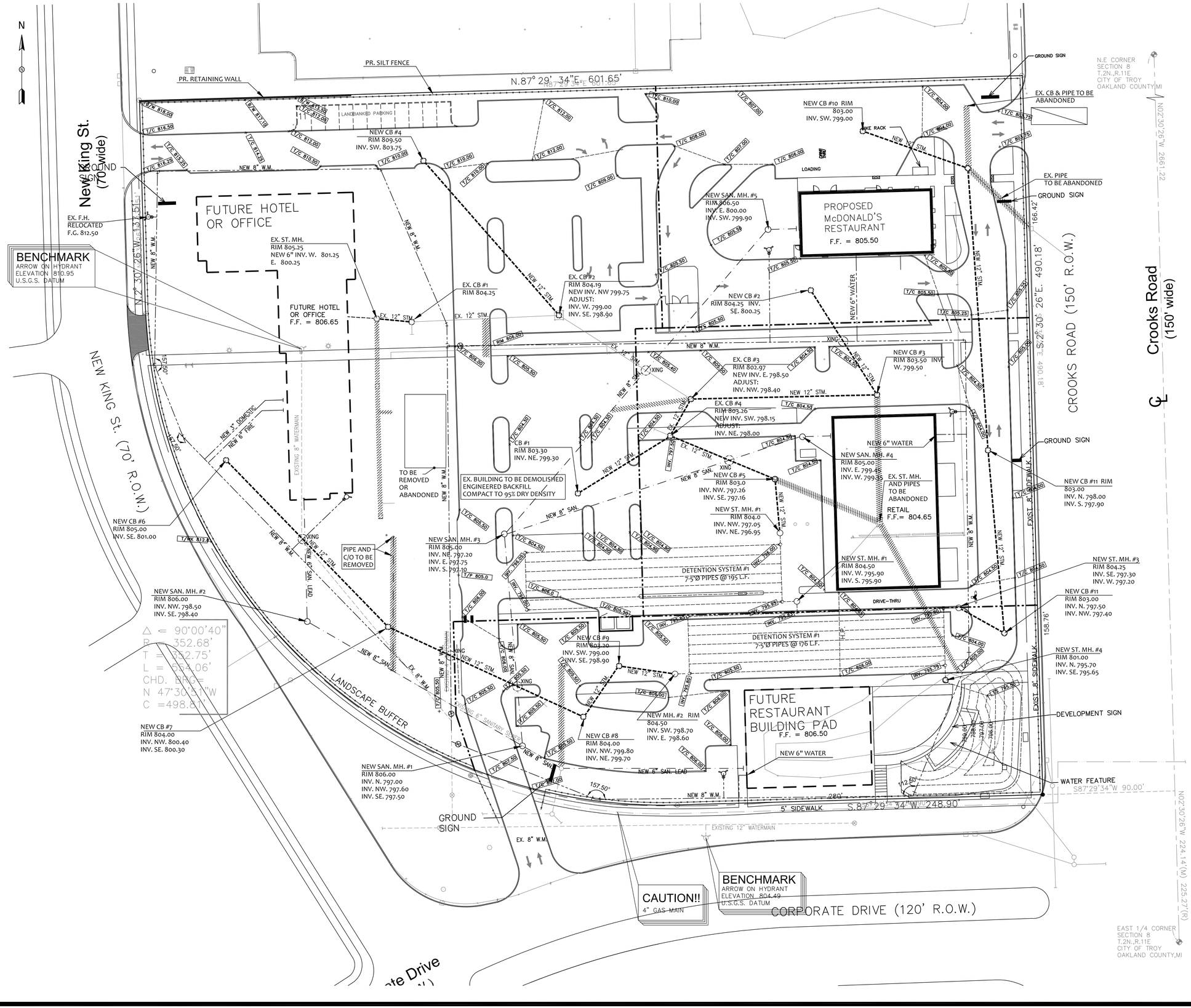
GRADING NOTES:

1. SLOPE ALL PAVED SURFACES TO DRAIN TO STORM STRUCTURES. MINIMUM SLOPE ON NEW PAVED AREAS SHALL BE 0.6%, MAXIMUM SHALL BE 6%.
2. CHECK LOCATION OF ALL UTILITY LINES PRIOR TO DIGGING. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO UTILITIES AND/OR THE OWNER'S PROPERTY AND SHALL REPAIR, REPLACE, OR RESTORE SAME AT THE CONTRACTOR'S EXPENSE. CALL MISS DIG (3) WORKING DAYS BEFORE DIGGING AT 1-800-482-7171.
3. SLOPE ALL SITE WORK UNIFORMLY BETWEEN NEW GRADES OR BETWEEN NEW GRADES AND EXISTING GRADES. THIS INCLUDES SLOPING ALL SITE WORK BETWEEN NEW GRADES AND RIM ELEVATION GRADES AT CATCH BASINS. TRANSITIONS BETWEEN CHANGE IN GRADES SHALL BE CONSTRUCTED WITH A MINIMUM 25 FOOT VERTICAL CURVE. PLAN GRADES INDICATE POINT OF INTERSECTION ELEVATIONS. ABRUPT GRADE CHANGES AT CATCH BASINS AND HIGH POINTS ARE NOT ALLOWED
4. AREA OF BUILDINGS, WALKS, AND PAVING SHALL BE STRIPPED OF TOPSOIL. TOPSOIL SHALL BE STORED ON THIS CONSTRUCTION SITE FOR RE-USE. EXCESS EXCAVATED MATERIAL SHALL BE REMOVED FROM THIS CONSTRUCTION SITE.
5. ALL FILL NECESSARY TO PROVIDE SUBGRADES FOR INTERIOR CONCRETE FLOOR SLABS, WALKS, DRIVEWAYS AND PARKING SPACES SHALL BE MICHIGAN DEPARTMENT OF TRANSPORTATION, CLASS II.
6. OBTAIN PERMIT AND PROVIDE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES IN ACCORD WITH COUNTY AND TOWNSHIP REQUIREMENTS. SEE EROSION CONTROL NOTES AND LEGEND.
7. ALL STORM SEWER STRUCTURES AND COVERS SHALL BE IN ACCORD. WITH MDOT STANDARD SPECS. USE COVER "D" IN PAVED AREAS, COVER "E" IN LAWN AREAS, COVER "K" AT CURB LOCATIONS AND COVER "A" FOR MANHOLES.
8. CONNECT ALL ROOF DOWNSPOUTS AND FOOTING DRAINS TO STORM STRUCTURES AND PROVIDE POSITIVE FLOW AWAY FROM BUILDING.
9. DRAIN TILE FOR EDGE DRAINS AND SUB-PAVEMENT DRAINS WHERE INDICATED SHALL BE 6" POLYETHYLENE, CORRUGATED PERFORATED DRAINAGE PIPE WITH NYLON SOCK. PROVIDE FITTINGS FOR TURNS AND CONNECTIONS AS REQUIRED. CONNECT TO STORM STRUCTURE.
10. FOR THE PURPOSE OF THESE BIDDING DOCUMENTS THE TERM "DEVELOPER" SHALL BE CONTRACTOR.
11. DEVELOPER SHALL OBTAIN APPROVAL FROM THE MACOMB COUNTY DRAIN COMMISSIONER AND THE MI DEQ PRIOR TO CONSTRUCTING THE STORM SYSTEM AND DISCHARGE INTO THE COUNTY STORM DRAIN.
12. STORM SEWER CATCH BASINS SHALL BE 4' DIA. TYPICAL.
13. REFER TO CITY OF TROY DESIGN STANDARDS & DETAILS.



'ANCHOR DIAMOND' PINLESS RETAINING WALL DETAIL
N.T.S.


N87° 29' 34"E 601.65
N02°30'26"W 2661.22
S02°30'26"E 490.18'
N02°30'26"W 224.14'(M) 225.2'(R)
S87°29'34"W 90.00'
S.87°29'34"W 248.90
Crooks Road (150' R.O.W.)
New King St. (70' wide)
NEW KING (70' R.O.W.)
CORPORATE DRIVE (120' R.O.W.)
LANDSCAPE BUFFER
BENCHMARK
ARROW ON HYDRANT
ELEVATION 810.95
U.S.G.S. DATUM
BENCHMARK
ARROW ON HYDRANT
ELEVATION 804.49
U.S.G.S. DATUM
CAUTION!!
4" GAS MAIN
FUTURE HOTEL OR OFFICE
F.F. = 806.65
FUTURE HOTEL OR OFFICE
PROPOSED McDONALD'S RESTAURANT
F.F. = 805.50
FUTURE RESTAURANT BUILDING PAD
F.F. = 806.50
EX. BUILDING TO BE DEMOLISHED ENGINEERED BACKFILL COMPACT TO 95% DRY DENSITY
EX. F.H. RELOCATED F.G. 812.50
EX. ST. MH. RIM 805.25 NEW 6" INV. W. 801.25 E. 800.25
EX. CB #1 RIM 804.25
EX. CB #2 RIM 804.19 NEW INV. NW 799.75 ADJUST: INV. W. 799.00 INV. SE. 798.90
NEW CB #2 RIM 804.25 INV. SE. 800.25
NEW CB #3 RIM 803.50 INV. W. 799.50
EX. CB #3 RIM 802.97 NEW INV. E. 798.50 ADJUST: INV. NW. 798.40
EX. CB #4 RIM 803.26 NEW INV. SW. 798.15 ADJUST: INV. NE. 798.00
NEW CB #4 RIM 809.50 INV. SW. 803.75
NEW CB #5 RIM 803.0 INV. NW. 797.26 INV. SE. 797.16
NEW CB #6 RIM 805.00 INV. SE. 801.00
NEW CB #7 RIM 804.00 INV. NW. 800.40 INV. SE. 800.30
NEW CB #8 RIM 804.00 INV. NW. 799.80 INV. NE. 799.70
NEW CB #9 RIM 803.30 INV. SW. 799.00 INV. SE. 798.90
NEW CB #10 RIM 803.00 INV. SW. 799.00
NEW CB #11 RIM 803.00 INV. N. 798.00 INV. S. 797.90
NEW CB #11 RIM 803.00 INV. N. 797.50 INV. NW. 797.40
CB #1 RIM 803.30 INV. NE. 799.30
EX. CB & PIPE TO BE ABANDONED
EX. PIPE TO BE ABANDONED
NEW ST. MH. #1 RIM 804.50 INV. W. 795.90 INV. S. 795.90
NEW ST. MH. #1 RIM 804.0 INV. NW. 797.05 INV. NE. 796.95
NEW ST. MH. #3 RIM 804.25 INV. SE. 797.30 INV. W. 797.20
NEW ST. MH. #4 RIM 801.00 INV. N. 795.70 INV. SE. 795.65
EX. ST. MH. AND PIPES TO BE ABANDONED RETAIL F.F. = 804.65
DETENTION SYSTEM #1 7.5'Ø PIPES @ 195 L.F.
DETENTION SYSTEM #1 7.5'Ø PIPES @ 176 L.F.
PR. SILT FENCE
PR. RETAINING WALL
PIPE AND C/O TO BE REMOVED
TO BE REMOVED OR ABANDONED
NEW 6" WATER
NEW 12" STM.
NEW 8" SAN. LEAD
EX. 12' WIDE WATERMAIN EASEMENT L. 11493, P. 514, O.C.R.
EX. 8" WATERMAIN
EX. 5' WIDE SIDEWALK
EX. 6' WIDE CONCRETE SIDEWALK
EXIST. 8' SIDEWALK
5' SIDEWALK
ASPHALT PAVEMENT
LANDBANKED PARKING
EASEMENT FOR INGRESS & EGRESS (L. 7908, P. 8)
10' WIDE EASEMENT FOR PUBLIC UTILITIES L. 10107, P. 225, O.C.R.
BIKE RACK
LOADING
DRIVE-THRU
GROUND SIGN
GROUND SIGN UNDERGROUND AMERITECH
DEVELOPMENT SIGN
TRAFFIC
WATER FEATURE
N.E CORNER SECTION 8 T.2N.,R.11E CITY OF TROY OAKLAND COUNTY,MI
EAST 1/4 CORNER SECTION 8 T.2N.,R.11E CITY OF TROY OAKLAND COUNTY,MI
CATCH BASIN RIM 815.83
CATCH BASIN RIM 815.69
CATCH BASIN RIM 809.63 12" N. INV 805.03
CATCH BASIN RIM 802.99 12" N. INV 798.89 8" N. INV 798.99
CATCH BASIN RIM 801.70 12" NW. INV 797.90 12" SE. INV 797.80
CATCH BASIN RIM 804.02 10" S. INV 799.52 (ABANDONED) 12" W. INV 799.62 12" E. INV 799.44
CATCH BASIN RIM 804.80 12"N/S. INV 800.64 (V.I.F.)
CATCH BASIN RIM 803.53 12" N. INV 800.99
CATCH BASIN RIM 805.57
CATCH BASIN RIM 802.06 12" NW. INV 798.76
CATCH BASIN RIM 797.83
CATCH BASIN RIM 797.71
STORM MANHOLE RIM 805.25 12" S. INV 800.45 12" E. INV 800.25
STORM MANHOLE RIM 810.43
STORM MANHOLE RIM 805.75
STORM MANHOLE RIM 806.11
STORM MANHOLE RIM 798.70 12" NW. INV 790.50 36" N/S. INV 790.10
STORM MANHOLE RIM 798.30 12" NW. INV 794.50 12" S. INV 794.50
STORM MANHOLE RIM 798.25 12" NW. INV 794.15 12" N. INV 798.05 15" E. INV 793.85
SANITARY MANHOLE RIM 804.77 8" N. INV 787.47 8" W. INV 787.37 8" SE. INV 787.57
D.E. MANHOLE RIM 818.83
D.E. MANHOLE RIM 799.26
D.E. MANHOLE GROUND SIGN
FD. IRON #26459
FD. CHISELED"X"
FD. IRON
EX. 6" ROOF LEAD 802.67
EX. 6" ROOF LEAD 800.33
EX. 6" ROOF LEAD V.I.F.
F.F. 805.08 CONCRETE DUMPSTER AREA
F.F.805.32
F.F. 805.0
A/C-HEATING UNITS
BUILDING OVERHANG
BLOCK WALL
WOOD FENCE
CHAIN LINK FENCE
TOP OF BANK
EDGE OF WATER
EXISTING DETENTION BASIN
EXISTING 12" WATERMAIN
GATE VALVE & WELL RIM 806.76
GATE VALVE & WELL RIM 806.89
GATE VALVE & WELL RIM 799.67
M.B.T RISER
CLEAN OUT
GUARD POST
CURB
SBOX
HYD.
RAMP
CONCRETE
ASPHALT
GRAVEL
GRASS
BUMPER BLOCKS
OVERHEAD BRICK WALL
OVERFLOW STRUCTURE RIM 799.11 12" NW. INV 794.71 12" SE. INV 794.71
CATCH BASIN RIM 798.66 12" SE. INV 795.66
CATCH BASIN RIM 797.90 12" NW. INV 794.80
CATCH BASIN RIM 798.83
CATCH BASIN RIM 805.54
CATCH BASIN RIM 805.99
CATCH BASIN RIM 804.28
CATCH BASIN RIM 803.57
CATCH BASIN RIM 803.39
CATCH BASIN RIM 802.52
CATCH BASIN RIM 801.12
CATCH BASIN RIM 799.79
CATCH BASIN RIM 798.50
CATCH BASIN RIM 798.29
CATCH BASIN RIM 797.74
SANITARY MANHOLE RIM 804.77 8" N. INV 787.47 8" W. INV 787.37 8" SE. INV 787.57
SANITARY MANHOLE RIM 796.07 6" NW. INV 788.57
SANITARY MANHOLE RIM 801.54
SANITARY MANHOLE RIM 801.23
SANITARY MANHOLE RIM 799.64
SANITARY MANHOLE RIM 799.47
SANITARY MANHOLE RIM 797.91
SANITARY MANHOLE RIM 797.76
SANITARY MANHOLE RIM 797.51 W. INV 797.51 E. INV 798.31
SANITARY MANHOLE RIM 796.83
SANITARY MANHOLE RIM 796.81
SANITARY MANHOLE RIM 796.75
SANITARY MANHOLE RIM 796.92
SANITARY MANHOLE RIM 796.83
SANITARY MANHOLE RIM 796.87
SANITARY MANHOLE RIM 799.09
SANITARY MANHOLE RIM 798.77
SANITARY MANHOLE RIM 798.98
SANITARY MANHOLE RIM 798.98
SANITARY MANHOLE RIM 798.98


N
New King St.
(70' wide)
PR. RETAINING WALL
PR. SILT FENCE
N.87° 29' 34"E. 601.65'
LANDBANKED PARKING
NEW 8" W.M.
EX. F.H.
RELOCATED
F.G. 812.50
BENCHMARK
ARROW ON HYDRANT
ELEVATION 810.95
U.S.G.S. DATUM
N.2° 30' 26"W. 613.51'
FUTURE HOTEL
OR OFFICE
EX. ST. MH.
RIM 805.25
NEW 6" INV. W. 801.25
E. 800.25
FUTURE HOTEL
OR OFFICE
F.F. = 806.65
NEW CB #4
RIM 809.50
INV. SW. 803.75
EX. CB #1
RIM 804.25
EX. 12" STM.
EX. CB #2
RIM 804.19
NEW INV. NW 799.75
ADJUST:
INV. W. 799.00
INV. SE. 798.90
NEW 12" STM.
NEW 8" W.M.
NEW CB #10 RIM
803.00
INV. SW. 799.00
BIKE RACK
NEW 12" STM.
LOADING
NEW SAN. MH. #5
RIM 806.50
INV. E. 800.00
INV. SW. 799.90
PROPOSED
McDONALD'S
RESTAURANT
F.F. = 805.50
NEW CB #2
RIM 804.25 INV.
SE. 800.25
NEW 6" WATER
EX. CB & PIPE TO BE
ABANDONED
GROUND SIGN
EX. PIPE
TO BE ABANDONED
GROUND SIGN
166.42'
N.E CORNER
SECTION 8
T.2N.,R.11E
CITY OF TROY
OAKLAND COUNTY,MI
N02°30'26"W 266.22
CROOKS ROAD (150' R.O.W.)
℄ Crooks Road
(150' wide)
S02°30'26"E. 490.18'
490.18'
NEW 12" STM.
NEW 6" WATER
NEW CB #3
RIM 803.50 INV.
W. 799.50
EX. CB #3
RIM 802.97
NEW INV. E. 798.50
ADJUST:
INV. NW. 798.40
NEW 12" STM.
NEW 8" SAN.
XING
EX. CB #4
RIM 803.26
NEW INV. SW. 798.15
ADJUST:
INV. NE. 798.00
NEW 6" WATER
NEW SAN. MH. #4
RIM 805.00
INV. E. 799.15
INV. W. 799.35
EX. ST. MH.
AND PIPES
TO BE
ABANDONED
RETAIL
F.F.= 804.65
GROUND SIGN
NEW CB #11 RIM
803.00
INV. N. 798.00
INV. S. 797.90
EXIST. 8' SIDEWALK
NEW 8" W.M.
NEW ST. MH. #1
RIM 804.50
INV. W. 795.90
INV. S. 795.90
NEW ST. MH. #3
RIM 804.25
INV. SE. 797.30
INV. W. 797.20
NEW CB #11
RIM 803.00
INV. N. 797.50
INV. NW. 797.40
158.76'
NEW ST. MH. #4
RIM 801.00
INV. N. 795.70
INV. SE. 795.65
DEVELOPMENT SIGN
FUTURE
RESTAURANT
BUILDING PAD
F.F. = 806.50
NEW 6" WATER
WATER FEATURE
S87°29'34"W 90.00'
S.87° 29' 34" W. 248.90'
NO2°30'26"W 224.14'(M) 225.27'(R)
EAST 1/4 CORNER
SECTION 8
T.2N.,R.11E
CITY OF TROY
OAKLAND COUNTY,MI
NEW 6" SAN. LEAD
NEW 8" W.M.
NEW 3" DOMESTIC
NEW 6" FIRE
EXISTING 8" WATERMAIN
TO BE
REMOVED
OR
ABANDONED
EX. BUILDING TO BE DEMOLISHED
ENGINEERED BACKFILL
COMPACT TO 95% DRY DENSITY
CB #1
RIM 803.30
INV. NE. 799.30
NEW 12" STM.
NEW 8" SAN.
NEW SAN. MH. #3
RIM 805.00
INV. NE. 797.20
INV. E. 797.75
INV. S. 797.10
PIPE AND
C/O TO BE
REMOVED
DETENTION SYSTEM #1
7.5'Ø PIPES @ 195 L.F.
NEW ST. MH. #1
RIM 804.0
INV. NW. 797.05
INV. NE. 796.95
NEW CB #5
RIM 803.0
INV. NW. 797.26
INV. SE. 797.16
NEW CB #6
RIM 805.00
INV. SE. 801.00
NEW SAN. MH. #2
RIM 806.00
INV. NW. 798.50
INV. SE. 798.40
△ = 90°00'40"
R = 352.68'
T = 352.75'
L = 554.06'
CHD. BRG=
N 47°30'51"W
C =498.81'
NEW CB #7
RIM 804.00
INV. NW. 800.40
INV. SE. 800.30
LANDSCAPE BUFFER
NEW 6" SAN.
EX. 6" W.M.
EXISTING 6" SANITARY SEWER
NEW SAN. MH. #1
RIM 806.00
INV. N. 797.00
INV. NW. 797.60
INV. SE. 797.50
NEW CB #8
RIM 804.00
INV. NW. 799.80
INV. NE. 799.70
NEW MH. #2 RIM
804.50
INV. SW. 798.70
INV. E. 798.60
NEW CB #9
RIM 803.30
INV. SW. 799.00
INV. SE. 798.90
DETENTION SYSTEM #1
7.5'Ø PIPES @ 176 L.F.
DRIVE-THRU
NEW 6" SAN. LEAD
157.50°
280'
12.60'
5' SIDEWALK
EXISTING 12" WATERMAIN
EX. 8" W.M.
GROUND
SIGN
CAUTION!!
4" GAS MAIN
BENCHMARK
ARROW ON HYDRANT
ELEVATION 804.49
U.S.G.S. DATUM
CORPORATE DRIVE (120' R.O.W.)
NEW 3" DOMESTIC
NEW 6" FIRE
NEW 8" W.M.
NEW 12" STM.
NEW 8" SAN.
NEW 6" SAN. LEAD
EX. 12" STM.
EX. 8" W.M.
NEW 8" SAN.
NEW 12" STM.
NEW 8" W.M.
NEW 6" SAN.
NEW 12" STM.
NEW 8" W.M.
NEW 8

SOIL EROSION AND SEDIMENT CONTROL NOTES:

1. DEVELOPER/PROPERTY OWNER SHALL SUBMIT A DETAILED EROSION CONTROL PLAN AND OBTAIN A SOIL EROSION & SEDIMENTATION CONTROL PERMIT PRIOR TO ANY EARTH CHANGES.

2. CONSTRUCTION OPERATIONS SHALL BE SCHEDULED AND PERFORMED SO THAT PREVENTATIVE EROSION CONTROL MEASURES ARE IN PLACE PRIOR TO EXCAVATION AND TEMPORARY STABILIZATION MEASURES ARE IN PLACE IMMEDIATELY FOLLOWING BACKFILLING AND/OR GRADING OPERATIONS.

3. BORROW AND FILL DISPOSAL AREAS WILL BE SELECTED AND APPROVED AT TIME OF PLAN REVIEW.

4. SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.

5. CLEANUP WILL BE DONE IN A MANNER TO INSURE THAT EROSION CONTROL MEASURES ARE NOT DISTURBED.

6. THE PROJECT WILL CONTINUALLY BE INSPECTED FOR SOIL EROSION AND SEDIMENT CONTROL COMPLIANCE. DEFICIENCIES WILL BE CORRECTED BY THE DEVELOPER WITHIN 24 HOURS.

7. TEMPORARY EROSION CONTROL MEASURES SHALL BE COMPLETELY REMOVED BY THE DEVELOPER UPON ESTABLISHMENT OF PERMANENT CONTROL MEASURES.

8. PERMANENT STABILIZATION SHALL BE COMPLETED WITHIN 5 DAYS OF FINAL GRADE. IF THIS CANNOT BE ACHIEVED, THAN ALL TEMPORARY PERMANENT SOIL EROSION AND SEDIMENT CONTROL MEASURES MUST STAY IN PLACE AND MUST BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED.

9. THIS PROJECT SHALL BE CONSTRUCTED IN COMPLIANCE WITH PART 91 OF ACT 451 OF 1994 AS AMENDED. AN MDEQ PERMIT IS REQUIRED FOR WORK IN THE WATERCOURSE.

10. GROSS ACREAGE DISTURBED BY THIS CONSTRUCTION ACTIVITY = 6.16 Ac.

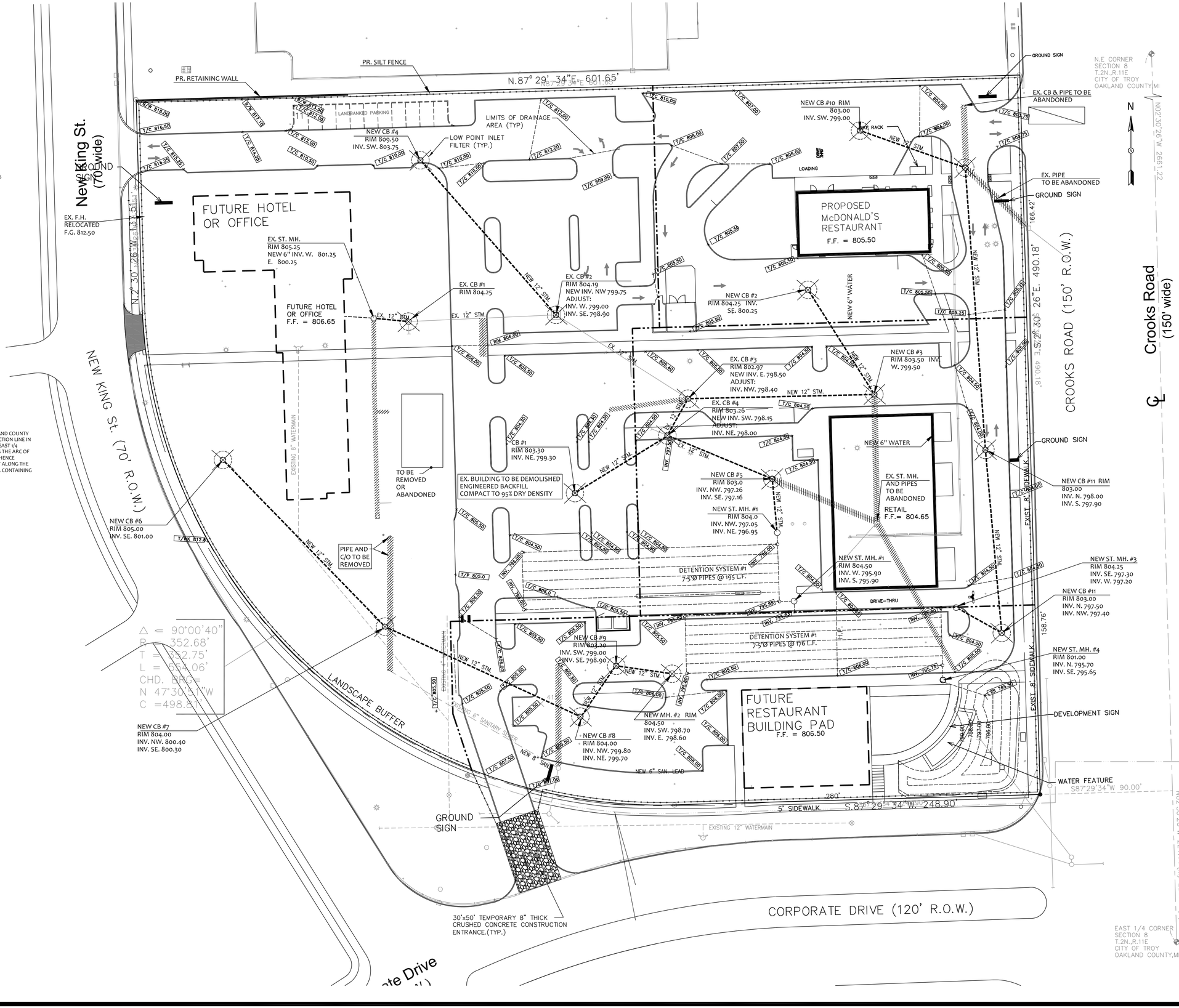
CONSTRUCTION SEQUENCE

1. DEMOLITION, EXCAVATION AND STOCKPILING OF SOIL.
2. IMPLEMENTATION OF TEMPORARY EROSION CONTROL MEASURES; SELECTIVE GRADING, DIVERSIONS AS REQUIRED IN FIELD, PROTECTION OF EXISTING UTILITIES AND FAVILITIES.
3. PERIODIC MAINTENANCE OF AFFECTED EROSION CONTROL MEASURES.
4. PERMANENT MEASURES; FINAL GRADING, SEEDING AND MULCHING.

THIS PROJECT SHALL BE CONSTRUCTED IN COMPLIANCE WITH PART 91 OF ACT 451 OF 1994, AS AMENDED. THE SOIL EROSION AND SEDIMENT CONTROL ACT.

LEGAL DESCRIPTION (FURNISHED BY CLIENT)

A PARCEL OF LAND LOCATED IN THE N.E. 1/4 OF SECTION 8, T2N., R11E, CITY OF TROY, OAKLAND COUNTY MICHIGAN, DESCRIBED AS: BEGINNING AT A POINT N02°30'26"W 224.14 FEET ALONG THE SECTION LINE IN CROOKS ROAD AND S87°29'34"W 90.00 FEET TO THE WEST RIGHT OF WAY LINE, FROM THE EAST 1/4 CORNER OF SAID SECTION 8; THENCE S87°29'34"W 248.90 FEET; THENCE 554.06 FEET ALONG THE ARC OF A CURVE TO THE RIGHT (CHORD BEARING N47°30'51"W 498.81 FEET, RADIUS 352.68 FEET,) THENCE N02°30'26"W 137.51 FEET; THENCE N87°29'34"E 601.65 FEET; THENCE S02°30'26"E 490.18 FEET ALONG THE WEST RIGHT OF WAY LINE OF SAID CROOKS ROAD(150' WIDE) TO THE POINT OF BEGINNING. CONTAINING 268,226 SQUARE FEET OR 6.16 ACRES. SIDWELL #20-8-276-002



SITTO BUILDING & ENGINEERING
29850 NORTHWESTERN HWY. SUITE 200
SOUTHFIELD, MI 48034
TEL: (248) 709-0044
FAX: (248) 246-6800
EMAIL: IMAD@SITTOENGINEERS.COM

PROJECT

TROY PLAZA
5500 NEW KING ST.
TROY, MI

CLIENT

TINELLE PROPERTIES
29850 NORTHWESTERN HWY. SUITE 200
SOUTHFIELD, MI 48034

REVISIONS

1- 08/24/12 PER NEW SITE PLAN

NOTES

PLEASE DO NOT SCALE DRAWING

PROFESSIONAL SEAL

SCALE

1" = 30'

DATE

05/19/2012

JOB NO.

2012-32

SHEET TITLE

SOIL EROSION AND SEDIMENT CONTROL

SHEET NO.

C-4

Master Tree List

Client Name: Neumann Smith & Associates
Job Number: 3-C380
Job Location: Delmia Parking Addition
Date Completed: 04/03/2002

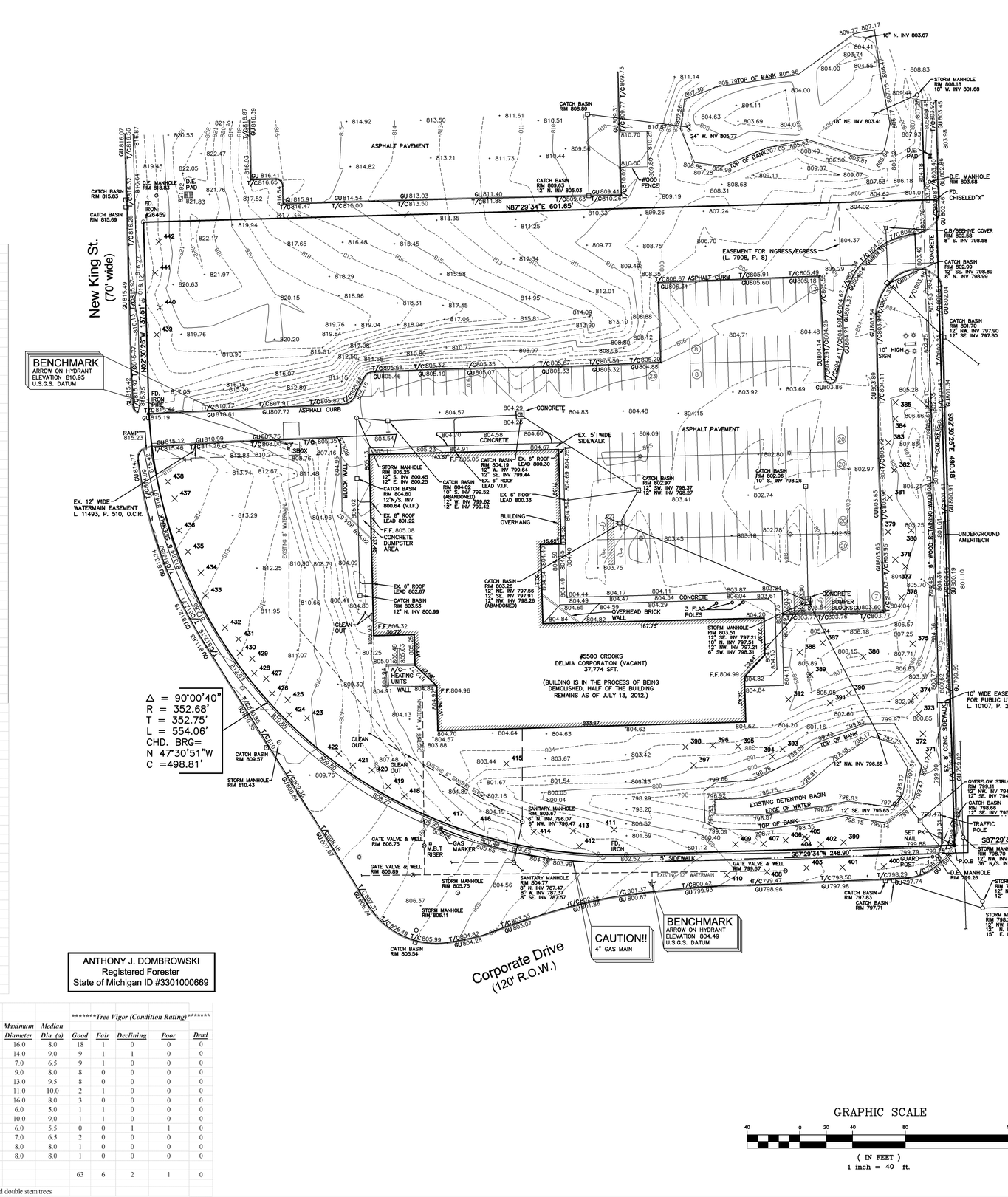
Tree #	*Botanical Name*	*Commom Name*	*Dia.*	*Condition*
371	Acer platanoides	Norway Maple	7	good
372	Acer platanoides	Norway Maple	5	fair
373	Acer platanoides	Norway Maple	6	good
374	Acer platanoides	Norway Maple	6	good
375	Acer platanoides	Norway Maple	7	good
376	Fraxinus americana	White Ash	8	good
377	Fraxinus americana	White Ash	6	good
378	Acer ginnala	Amur Maple	6	good
379	Acer ginnala	Amur Maple	4	fair
380	Fraxinus americana	White Ash	8	good
381	Pinus nigra	Austrian Pine	11	good
382	Fraxinus americana	White Ash	6	good
383	Juglans nigra	Black Walnut	8	fair
384	Pinus nigra	Austrian Pine	9	fair
385	Juglans nigra	Black Walnut	10	good
386	Fraxinus americana	White Ash	5	good
387	Quercus rubra	Red Oak	9	good
388	Quercus rubra	Red Oak	10	good
389	Quercus rubra	Red Oak	9	good
390	Quercus rubra	Red Oak	13	good
391	Quercus rubra	Red Oak	10	good
392	Quercus rubra	Red Oak	13	good
393	Prunus spp.	Flowering Cherry	6	declining
394	Prunus spp.	Flowering Cherry	5	poor
395	Quercus rubra	Red Oak	9	good
396	Quercus rubra	Red Oak	9	good
397	Malus spp.	Flowering Crab Apple	9	good
398	Malus spp.	Flowering Crab Apple	9	good
399	Acer saccharum	Sugar Maple	10	good
400	Acer platanoides	Norway Maple	7	good
401	Acer platanoides	Norway Maple	6	good
402	Acer saccharum	Sugar Maple	9	good
403	Acer platanoides	Norway Maple	7	good
404	Acer saccharum	Sugar Maple	9	good
405	Acer saccharum	Sugar Maple	6	good
406	Acer saccharum	Sugar Maple	11	good
407	Acer saccharum	Sugar Maple	9	good
408	Acer platanoides	Norway Maple	6	good
409	Acer saccharum	Sugar Maple	14	fair
410	Acer platanoides	Norway Maple	7	good
411	Fraxinus americana	White Ash	9	good
412	Pseudotsuga menziesii	Douglas-Fir	8	good
413	Picea abies	Norway Spruce	8	good
414	Picea abies	Norway Spruce	16	good
415	Acer saccharum	Sugar Maple	5	good
416	Fraxinus americana	White Ash	14	good
417	Fraxinus americana	White Ash	16	good
418	Malus spp.	Flowering Crab Apple	4	good
419	Malus spp.	Flowering Crab Apple	8	good
420	Gleditisia triacanthos	Honeylocust	7	good
421	Gleditisia triacanthos	Honeylocust	6	good
422	Malus spp.	Flowering Crab Apple	8	good
423	Fraxinus americana	White Ash	8	good
424	Fraxinus americana	White Ash	8	good
425	Fraxinus americana	White Ash	7	fair
426	Malus spp.	Flowering Crab Apple	8	good
427	Malus spp.	Flowering Crab Apple	5	good
428	Malus spp.	Flowering Crab Apple	5	good
429	Fraxinus americana	White Ash	8	good
430	Ulmus americana	American Elm	8	good
431	Acer saccharum	Sugar Maple	5	good
432	Acer saccharum	Sugar Maple	5	good
433	Fraxinus americana	White Ash	11	good
434	Fraxinus americana	White Ash	10	good
435	Fraxinus americana	White Ash	9	good
436	Fraxinus americana	White Ash	10	good
437	Fraxinus americana	White Ash	9	good
438	Fraxinus americana	White Ash	8	good
439	Fraxinus americana	White Ash	7	good
440	Picea abies	Norway Spruce	7	good
441	Acer saccharum	Sugar Maple	7	declining
442	Pinus nigra	Austrian Pine	10	good

ANTHONY J. DOMBROWSKI
Registered Forester
State of Michigan ID #3301000669

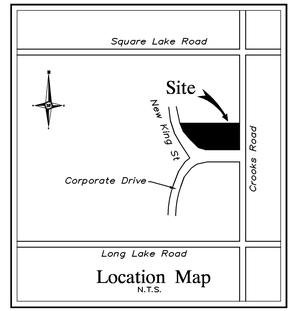
Tree Survey Summary

Common Name	*Botanical Name*	*Total # trees*	*Percentage of Total*	*Average Dia. (a)*	*Minimum Diameter*	*Maximum Diameter*	*Median Dia. (a)*	*Good*	*Fair*	*Declining*	*Poor*	*Dead*
								*******Tree Vigor (Condition Rating)*******				
White Ash	Fraxinus americana	19	26.39%	8.8	5.0	16.0	8.0	18	1	0	0	0
Sugar Maple	Acer saccharum	11	15.28%	8.2	5.0	14.0	9.0	9	1	1	0	0
Norway Maple	Acer platanoides	10	13.89%	6.4	5.0	7.0	6.5	9	1	0	0	0
Flowering Crab Apple	Malus spp.	8	11.11%	7.0	4.0	9.0	8.0	8	0	0	0	0
Red Oak	Quercus rubra	8	11.11%	10.3	9.0	13.0	9.5	8	0	0	0	0
Austrian Pine	Pinus nigra	3	4.17%	10.0	9.0	11.0	10.0	2	1	0	0	0
Norway Spruce	Picea abies	3	4.17%	10.3	7.0	16.0	8.0	3	0	0	0	0
Amur Maple	Acer ginnala	2	2.78%	5.0	4.0	6.0	5.0	1	1	0	0	0
Black Walnut	Juglans nigra	2	2.78%	9.0	8.0	10.0	9.0	1	1	0	0	0
Flowering Cherry	Prunus spp.	2	2.78%	5.5	5.0	6.0	5.5	0	0	1	1	0
Honeylocust	Gleditisia triacanthos	2	2.78%	6.5	6.0	7.0	6.5	2	0	0	0	0
American Elm	Ulmus americana	1	1.39%	8.0	8.0	8.0	8.0	1	0	0	0	0
Douglas-fir	Pseudotsuga menziesii	1	1.39%	8.0	8.0	8.0	8.0	1	0	0	0	0
		72	100.00%					63	6	2	1	0

(a) Average and median diameter calculations include only the largest stem diameter for multiple and double stem trees



GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.



SURVEY NOTE - 7/13/2012

THE BUILDING SHOWN ON THIS SURVEY IS IN THE PROCESS OF BEING DEMOLISHED. NO NEW FIELD WORK HAS BEEN PERFORMED SINCE THE ORIGINAL SURVEY AND NO NEW TITLE WORK PROVIDED BY THE CLIENT FOR THE REISSUE OF THIS SURVEY.

CERTIFICATE OF SURVEY

WE HEREBY CERTIFY THAT WE HAVE SURVEYED THE PROPERTY HEREIN DESCRIBED AND THAT WE HAVE PLACED MARKER IRONS AT THE CORNERS OF THE PARCEL OR AS INDICATED IN THE ABOVE SKETCH.

KEVIN NAVAROLI, PLS NO.: 53503 DATE: 7-13-2012

LEGAL DESCRIPTION

A PARCEL OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 8, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: BEGINNING AT A POINT DISTANT N.02°30'26"W., 225.27' FEET ALONG THE EAST LINE OF SECTION 8 AND S.87°29'34"W., 90.00 FEET TO A POINT ON THE WEST RIGHT-OF-WAY LINE OF CROOKS ROAD (150' WIDE) FROM THE EAST 1/4 CORNER OF SAID SECTION 8; THENCE S.87°29'34"W., 248.90 FEET; THENCE 554.06 FEET ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 352.68 FEET, CHORD BEARING N.47°30'51"W., 498.81 FEET; THENCE N.02°30'26"W., 137.51 FEET; THENCE N.87°29'34"E., 601.65 FEET; THENCE S.02°30'26"E., 490.18 FEET ALONG THE WEST RIGHT-OF-WAY LINE OF SAID CROOKS ROAD TO THE POINT OF BEGINNING.

CONTAINING 268,226.44 SQUARE FEET OR 6.157 ACRES.

TAX ID NO. 20-08-276-002 (5500 NEW KING STREET)

TREE PRESERVATION PLAN NOTES

TREE #'S: 371,372,373,393,394,395,396,397,398,411,413 & 415 ARE LOCATED IN THE AREA OF THE EXISTING DETENTION BASIN. THESE TREES SHALL BE PROTECTED DURING CONSTRUCTION. THE EXISTING DETENTION BASIN IS PLANNED TO BE ENLARGED PER THE ATTACHED ENGINEERING SITE PLAN SHEET SP1.

EXTREME CARE SHALL BE TAKEN BY THE CONTRACTOR DURING THE GRADING OPERATION TO MAKE SURE THAT THESE TREES ARE NOT DAMAGED AS THEY ARE EXPECTED TO REMAIN. PROPOSED GRADING AT THE TREE LOCATIONS WILL NOT BE SIGNIFICANTLY CHANGED

FLOOD HAZARD NOTE

THIS PROPERTY IS NOT LOCATED WITHIN THE FLOOD HAZARD AREA INDICATED BY FLOOD INSURANCE RATE MAP (FIRM) NO. 26125C0531F DATED: SEPTEMBER 29, 2006

TOPOGRAPHIC SURVEY NOTES

ALL ELEVATIONS ARE EXISTING ELEVATIONS.

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

THIS SURVEY MAY NOT SHOW ALL EASEMENTS OF RECORD UNLESS AN UPDATED TITLE POLICY IS FURNISHED TO THE SURVEYOR BY THE OWNER.

LEGEND

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

NOWAK & FRAUS

Consulting Engineers
Land Surveyors
Land Planners

46777 Woodward Avenue
Pontiac, MI 48342-5032
Tel. (248) 332-7931
Fax. (248) 332-8257

SEAL

STATE OF MICHIGAN — KEVIN NAVAROLI — PROFESSIONAL SURVEYOR NO. 53503 — LICENSED PROFESSIONAL SURVEYOR

PROJECT
5500 New King Street
Troy, MI

CLIENT
Tinelle Properties, LLC
c/o Sitto Building
& Engineering
29850 Northwestern Hwy.
Suite 200
Farmington Hills, MI 48034
Contact: Imad Sitto
(248) 709-0044 - Tel.
(248) 246-6800 - Fax

PROJECT LOCATION
Part of the NE. 1/4
of Section 8
T. 2 North, R. 11 East
City of Troy,
Oakland County, Michigan

SHEET
Boundary / Topographic / Tree Survey

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE)

DATE/ REVISION
12-19-03 ISSUED FOR ENGINEERING REVIEW
12-19-03 REISSUED FOR NEW CLIENT

DRAWN BY:
M. CARNAGHI

DESIGNED BY:

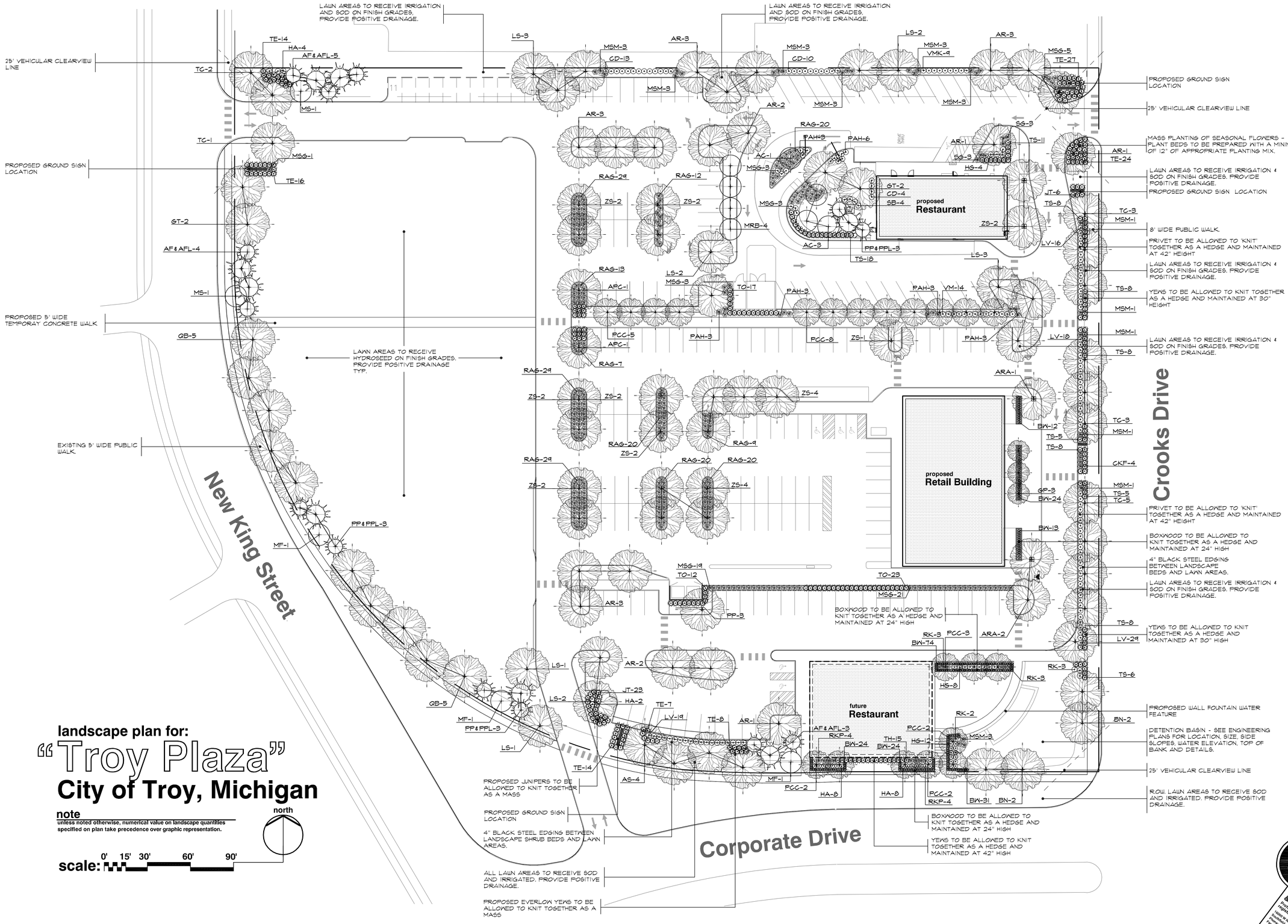
APPROVED BY:
K. NAVAROLI

DATE:
July 13, 2012

SCALE:
1"=40'

N/F JOB NO.
C380-02

SHEET NO.
1 of 1



landscape plan for:

"Troy Plaza"

City of Troy, Michigan

note
unless noted otherwise, numerical value on landscape quantities specified on plan take precedence over graphic representation.

north

scale: 0' 15' 30' 60' 90'

FPA

FELINO A. PASCUAL and ASSOCIATES

Community Land Planner and registered Landscape Architect

16000 W. 9-Mile Road, Suite 520
Southfield, Michigan 48075
ph. (248) 557-5588
fax. (248) 557-5416

seal:

STATE OF MICHIGAN
FELINO A. PASCUAL
LANDSCAPE ARCHITECT
No. 1433
REGISTERED LANDSCAPE

client:

TINELLE PROPERTIES
29850 Northwestern Hwy,
Suite 200
Southfield, Michigan 48034

project:

Troy Plaza

project location:

City of Troy, Michigan

Crooks Road, Corporate Drive, and New King Street

sheet title:

Landscape Plan (Hotel Option)

issue/revision date:

site plan update	7-12-2012
plan submittal	7-16-2012
plan submittal	8-27-2012

drawn by: **JP**

checked by: **FP**

date: **7-5-2012**

notice:

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Do Not scale drawings. Use figured dimensions only

project no: **LS12.051.08**

sheet no: **LS-1** of 2

CALVIN HALL & ASSOCIATES
Professional Land Development Engineering
Surveying
Grand Rapids, Michigan 49525
Phone: (616) 447-0900
Fax: (616) 447-0915

plant material list

key	SHT.L-1	botanical name	common name	size
		LARGE AND SMALL DECIDUOUS TREES		
GP	3	GINGKO BILOBA 'PRINCETON SENTRY'	PRINCETON SENTRY GINKGO	3" BB
AS	4	ACER SACCHARUM	SUGAR MAPLE	3" BB
AR	18	ACER R. 'FRANKSRED'	RED SUNSET RED MAPLE	3" BB
ARA	3	ACER R. 'ARMSTRONG'	ARMSTRONG RED MAPLE	3" BB
BN	4	BETULUS NIGRA	RIVER BIRCH (MULTI-STEM MIN. 4-CANES)	12' BB
TC	14	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LINDEN	3" BB
LS	13	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	3" BB
ZS	23	ZELKOVA SERRATA 'GREEN VASE'	GREEN VASE ZELKOVA	3" BB
QB	10	QUERCUS 'BICOLOR'	SWAMP WHITE OAK	3" BB
GT	4	GLEDITSIA TRI. INERMIS 'SKYCOLE'	SKYLINE LOCUST	3" BB
APC	2	ACER P. 'CRIMSON KING'	CRIMSON KING NORWAY MAPLE	3" BB
PCC	22	PYRUS CALLERYANA 'CHANTICLEAR'	CLEVELAND SELECT PEAR	2" BB
MS	2	MALUS FLORIBUNDA	JAPANESE FLOWERING CRABAPPLE	2" BB
MF	3	MALUS 'SNOWDRIFT'	SNOWDRIFT CRABAPPLE	2" BB
MRB	4	MALUS 'RED BARON'	RED BARON CRABAPPLE	2" BB
AC	4	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY (MULTI-STEM)	8' BB

key	SHT.L-1	botanical name	common name	size
		SHRUBS		
HA	22	HYDRANGEA A. 'ANNABELLE'	ANNABELLE HYDRANGEA	#5 CONT.
HG	24	HYDRANGEA M. 'GLOWING EMBERS'	'GLOWING EMBERS' HYDRANGEA	#5 CONT.
CD	27	COTONOEASTER A. DIVARICATUS	SPREADING COTONEASTER	3' BB
RAG	208	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC	#3 CONT.
VMK	9	VIBURNUM X.B. 'MOHAWK'	MOHAWK VIBURNUM	3' BB
VM	14	VIBURNUM P.T. 'MARIESII'	MARIESII DOUBLEFILE VIBRUNUM	3' BB
RK	11	ROSA 'KNOCKOUT'	KNOCKOUT ROSE	#5 CONT.
RKP	8	ROSA 'PINK DOUBLE KNOCKOUT'	PINK DOUBLE KNOCKOUT ROSE	#5 CONT.
SG	6	SPIRAEA JAPONICA 'GOLDFLAME'	GOLDFLAME SPIRAEA	#3 CONT.
SB	4	SPIRAEA X.B. 'ANTHONY WATERER'	ANTHONY WATERER SPIRAEA	#3 CONT.
LV	82	LIGUSTRUM X. 'VACARY1'	GOLDEN VICARY PRIVET	3' BB

key	SHT.L-1	botanical name	common name	size
		LARGE AND SMALL EVERGREENS		
JT	29	JUNIPERUS S. TAMARISCIFOLIA	TAM JUNIPER	24" BB
TH	15	TAXUS X.M. 'HICKSII'	HICKS YEW	36" BB
TS	85	TAXUS X.M. 'SEBIAN'	SEBIAN YEW	24" BB
TE	110	TAXUS X.M. 'EVERLOW'	EVERLOW YEW	24" BB
PP	7	PICEA PUNGEN	COLORADO GREEN SPRUCE	8' BB
PPL	3	PICEA PUNGEN	COLORADO GREEN SPRUCE	10' BB ●
AF	7	ABIES CONCOLOR	CONCOLOR WHITE FIR	8' BB
AFL	5	ABIES CONCOLOR	CONCOLOR WHITE FIR	10' BB ●
TO	52	THUJA OCCIDENTALIS 'SMARAGD'	EMERALD GREEN ARBORVITAE	6' BB
BW	192	BUXUS M. 'WINTER GEM'	WINTER GEM BOXWOOD	18" BB

plant material list

key	quant.	botanical name	common name	size
		PERENNIALS AND GRASSES		
CKF	4	CALAMAGROSTIS X.A. 'KARL FOERSTER'	KARL FOERSTER'S FEATHER REED GRASS	#3 CONT.
PAH	21	PENNISETUM ALOPECUROIDES 'HAMELN'	HAMELN DWARF FOUNTAIN GRASS	#3 CONT.
MSM	26	MISCANTHUS SINENSIS 'MORNING LIGHT'	'MORNING LIGHT' JAPANESE SILVER GRASS	#3 CONT.
MSG	53	MISCANTHUS SINENSIS 'GRACILLIMUS'	NARROW LEAVED JAPANESE SILVER GRASS	#3 CONT.

general landscape notes:

1. LANDSCAPE CONTRACTOR SHALL VISIT THE SITE, INSPECT EXISITNG CONDITIONS, REVIEW PROPOSED PLANTINGS AND RELATED WORK, CONTACT THE OWNER AND/OR LANDSCAPE ARCHITECT WITH ANY CONCERNS OR DISCREPANCY BETWEEN THE PLAN, PLANT MATERIAL LIST, AND/OR SITE CONDITIONS.
2. PRIOR TO BEGINING OF CONSTRUCTION ON ANY WORK, CONTRACTORS SHALL VERIFY LOCATIONS OF ALL ON SITE UTILITIES, GAS, ELECTRIC, TELEPHONE, CABLE TO BE LOCATED BY CONTACTING MISS DIG 1-800-482-7171. ANY DAMAGE OR INTERRUPTION OF SERVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COORDINATE ALL RELATED WORK ACTIVITIES WITH OTHER TRADES AND REPORT ANY UNACCEPTABLE JOB CONDITIONS TO OWNER PRIOR TO COMMENCING
3. NUMERICAL VALUE ON THE LANDSCAPE QUANTITIES SPECIFIED ON THE PLAN TAKE PRECEEDENCE OVER GRAPHIC REPRESENTATION. VERIFY ANY CONCERN-DISCREPANCY WITH LANDSCAPE ARCHITECT.
4. ALL CONSTRUCTION AND PLANT MATERIAL LOCATION TO BE ADJUSTED ON SITE IF NECESSARY.
5. ALL SUBSTITUTIONS OR DEVIATIONS FROM THE LANDSCAPE PLAN MUST BE APPROVED BY CITY OF TROY AND LANDSCAPE ARCHITECT
6. ALL LARGE TREES AND EVERGREENS TO BE STAKED, GUYED AND WRAPPED AS DETAIL SHOWN ON PLAN.
7. PLANT BEDS TO BE DRESSED WITH MIN. 3" OF FINELY DOUBLE SHREDDED HARDBARK MULCH.
8. DIG SHRUB PITS 1' LARGER THAN SHRUB ROOT BALLS AND TREE PITS 2' LARGER THAN ROOT BALL. BACK FILL WITH ONE PART TOP SOIL AND ONE PART SOIL FROM EXCAVATED PLANTING HOLE.
9. REMOVE ALL TWINE, WIRE AND BURLAP FROM TREE AND SHRUB EARTH BALLS, AND FROM TREE TRUNKS.
10. NATURAL COLOR, FINELY SHREDDED HARDWOOD BARK MULCH REQUIRED FOR ALL PLANTINGS. 4" THICK BARK MULCH FOR TREES IN 4' DIA CIRCLE WITH 3" PULLED AWAY FROM TRUNK. 3" THICK BARK MULCH FOR SHRUBS AND 2" THICK BARK MULCH FOR PERENNIALS.
11. PLANT MATERIAL QUALITY & INSTALLATION SHALL BE IN ACCORDANCE WITH THE CURRENT AMERICAN ASSOCIATION OF NURSERYTHEN LANDSCAPE STANDARDS.
12. PROVIDE PEAT SOD FOR ALL NEW AND DISTURBED LAUN AREAS UNLESS NOTED OTHERWISE.
13. ALL PLANTING AREAS TO BE PREPARED WITH APPROPRIATE SOIL MIXTURES AND FERTILIZER BEFORE PLANT INSTALLATION.
14. PLANT TREES AND SHRUBS GENERALLY NO CLOSER THEN THE FOLLOWING DISTANCES FROM SIDEWALKS, CURBS AND PARKING STALLS:
    a.). SHADE TREES ____ 5 FT.
    b.). ORNAMENTAL AND EVERGREEN TREES (CRABS, PINE SPRUCE, ETC.) ____ 10 FT.
    c.). SHRUBS THAT ARE LESS THAN 1 FOOT TALL AND WIDE AT MATURITY. ____ 2 FT.
15. NO TREES OR EVERGREENS TO BE INSTALLED OVER ANY PROPOSED OR EXISTING UTILITY LINES AS SHOWN ON THE OVERALL LANDSCAPE PLAN. SEE ENGINEERING PLANS FOR EXACT LOCATION AND DETAILS.
16. ALL LAWN AREAS AND LANDSCAPE BEDS TO BE FULLY IRRIGATED WITH A AUTOMATIC UNDERGROUND SYSTEMS. IRRIGATION SYSTEM TO HAVE SEPARTE ZONES FOR LAWN AREAS, PARKING ISLANDS, AND SHRUB BEDS WITH DIFFERENT CONTROL MOISTURE LEVEL ADJUSTMENT PER ZONE AS REQUIRED
17. UNLESS NOTED OTHERWISE, LANDSCAPE BEDS ADJACENT TO LAWN TO RECIEVE EDGING. EDGING SHALL BE 4" X 1/8" METAL (FINISH BLACK OR GREEN) OR APPROVED EQUAL AND TO BE INSTALLED WITH HORIZONTAL METAL STAKES AT 32" O.C. OR PER MANUFACTERER'S SPECIFICATION.
18. ALL NEW PARKING ISLANDS AND LANDSCAPE BEDS ADJACENT AND NEXT TO BUILDING SHALL BE EXCAVATED OF ALL BUILDING MATERIALS AND POOR SOILS & MIN. OF 16"-18" DEPTH. BACK FILL WITH GOOD, MEDIUM TEXTURED PLANTING SOILS, ADD A MIN. 4" OF TOPSOIL OVERFILL TO FINISH GRADE. PROVIDE POSITIVE DRAINAGE.
19. WATERING OF ALL PLANTS AND TREES TO BE PROVIDED IMMEDIATELY AND MULCHING WITHIN 24 HOURS AFTER INSTALLATION.
20. ALL TREE PITS TO BE TESTED FOR PROPER DRAINAGE PRIOR TO TREE PLANTING. PROVIDE APPROPERATES DRAINAGE SYSTEM AS REQUIRED IF THE TREE PIT DOES NOT DRAIN SUFFICIENTLY.
21. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPE PLANT MATERIALS AND IRRIGATION INSTALLATION FOR A PERIOD OF ONE YEAR BEGINNING AFTER THE COMPLETION OF LANDSCAPE INSTALLTION DATE APPROVED BY THE CITY OR LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL REPLACE DURING AND AT THE END OF THE GUARANTEE PERIOD, ANY DEAD OR UNACCEPTABLE PLANTS, AS DETERMINED BY THE CITY OR LANDSCAPE ARCHITECT, WITHOUT COST TO THE OWNER.
22. ALL DEAD OR DISEASED PLANT MATERIALS SHALL BE REMOVED AND REPLACED WITHIN SIX (6) MONTHS AFTER IT DIES OR IN THE NEXT PLANTING SEASON, WHICHEVER OCCURS FIRST. THE PLANTING SEASON FOR DECIDUOUS SHALL BE BETWEEN MARCH 1, JUNE 1, AND OCTOBER 1 UNTIL THE PREPARED SOIL BECOMES FROZEN. THE PLANTING SEASON FOR EVERGREEN PLANTS SHALL BE BETWEEN MARCH 1 AND JUNE 1. PLANT MATERIAL INSTALLED TO REPLACE DEAD OR DISEASED MATERIAL SHALL BE AS CLOSE AS FRATICAL TO THE SIZE OF MATERIAL IT IS INTENDED TO REPLACE
22. ALL PROPOSED EVERGREEN SHRUB PLANTINGS ADJACENT TO WALKS AND ROAD R.O.W. TO BE PROTECTED WITH DARK GREEN COLOR BURLAP SCREEN AND SPRAYED WITH WILT PRUF PLANT PROTECTOR PRODUCT DURING WINTER SEASON.

STAKING/GUYING LOCATION

NOTE:
Orient staking/guying to prevailing winds, except on slopes greater than 3:1 orient to slope.

Use same staking/guying orientation for all plants within each grouping or area.

landscape requirements:

parking lot landscape

TOTAL NO. OF PARKING SPACES PROVIDE ____ 210 SPACES

	REQUIRED	PROVIDED
NO. OF PARKING LOT TREES (1-TREE PER 8-SPACES (210-SPACES/8-SPACES PER TREE = 26.25 TREES))	27 TREES	65 + TREES
MIN. PARKING LOT ISLAND AREA	200 SQFT.	200 SQFT. +

greenbelt requirements

TOTAL LIN. FEET OF ROAD FRONTAGE ____ 1430' ±

TOTAL NO OF GREENBELT TREES REQUIRED ____ 47.6 TREES

MINIMUM GREENBELT WIDTH ____ 10'

	REQUIRED	PROVIDED
NO. OF GREENBELT TREES (CROOKS ROAD) (490' CROOKS ROAD R.O.W. FRONTAGE / 1-TREE PER 30' = 16.4-TREES)	16.4	14
NO. OF GREENBELT TREES (NEW KING STREET) (540' NEW KING STREET R.O.W. FRONTAGE / 1-TREE PER 30' = 19.6-TREES)	19.6	27
NO. OF GREENBELT TREES (CORPORATE DRIVE) (350' CORPORATE DRIVE R.O.W. FRONTAGE / 1-TREE PER 30' = 11.6-TREES)	11.6	14

site landscape area

TOTAL AREAS OF RETAIL SITE (NET) ____ 268,226 SQ.FT. (6.16 ACRES ±)

AREAS OF SITE LANDSCAPE AREAS REQUIRED (20% OF SITE= 268,226 SQ.FT. X 20 = 53645 SQ.FT.) ____ 53,645 SQ.FT.

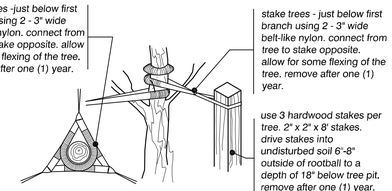
AREAS OF SITE LANDSCAPE AREAS PROVIDED ____ 115,960 SQ.FT. (43%)

SOFTSCAPE (GREENBELT, ISLANDS, FOUNDATION, PLANTERS, AND OPEN SPACE) ____ 113,311 SQ.FT.

HARDSCAPE (PLAZA AREA AND OUTDOOR DINING AREAS) ____ 2649 SQ.FT.

tree staking detail

no scale



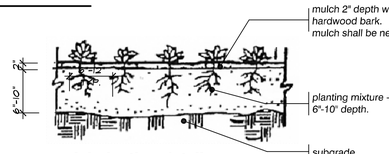
stake trees -just below first branch using 2 - 3" wide belt-like nylon. connect from tree to stake opposite. allow for some flexing of the tree. remove after one (1) year.

stake trees - just below first branch using 2 - 3" wide belt-like nylon. connect from tree to stake opposite. allow for some flexing of the tree. remove after one (1) year.

use 3 hardwood stakes per tree. 2" x 2" x 8' stakes. drive stakes into undisturbed soil 6'-8" outside of rootball to a depth of 18" below tree pit. remove after one (1) year. do not use wire or rope thru a hose.

perennial planting detail

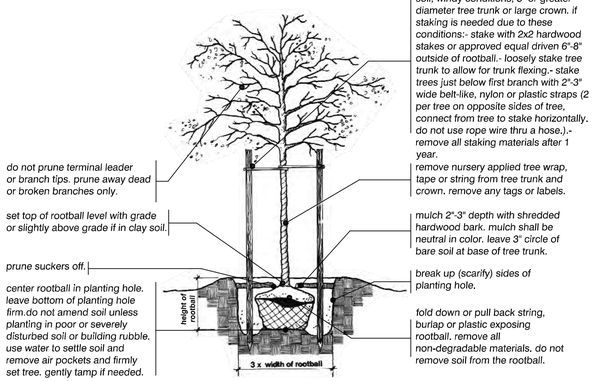
no scale



mulch 2" depth with shredded hardwood bark. mulch shall be neutral in color.

planting mixture - 6"-10" depth.

subgrade.



do not stake trees unless in heavy clay soil, windy conditions, 3" or greater diameter tree trunk or large crown. if staking is needed due to these conditions:- stake with 2x2 hardwood stakes or approved equal driven 6"-8" outside of rootball.- loosely stake tree trunk to allow for trunk flexing.- stake trees just below first branch with 2"-3" wide belt-like, nylon or plastic straps (2 per tree on opposite sides of tree, connect from tree to stake horizontally. do not use rope wire thru a hose.).- remove all staking materials after 1 year.

do not prune terminal leader or branch tips. prune away dead or broken branches only.

remove nursery applied tree wrap, tape or string from tree trunk and crown. remove any tags or labels.

set top of rootball level with grade or slightly above grade if in clay soil.

mulch 2"-3" depth with shredded hardwood bark. mulch shall be neutral in color. leave 3" circle of bare soil at base of tree trunk.

prune suckers off.

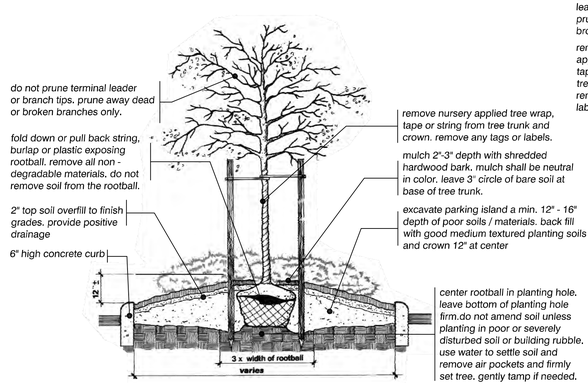
break up (scarify) sides of planting hole.

center rootball in planting hole. leave bottom of planting hole firm.do not amend soil unless planting in poor or severely disturbed soil or building rubble. use water to settle soil and remove air pockets and firmly set tree. gently tamp if needed.

fold down or pull back string, burlap or plastic exposing rootball. remove all non-degradable materials. do not remove soil from the rootball.

tree planting detail

no scale



do not prune terminal leader or branch tips. prune away dead or broken branches only.

remove nursery applied tree wrap, tape or string from tree trunk and crown. remove any tags or labels.

fold down or pull back string, burlap or plastic exposing rootball. remove all non - degradable materials. do not remove soil from the rootball.

mulch 2"-3" depth with shredded hardwood bark. mulch shall be neutral in color. leave 3" circle of bare soil at base of tree trunk.

2" top soil overfill to finish grades. provide positive drainage

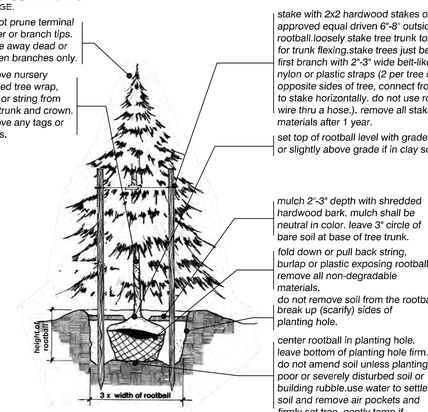
excavate parking island a min. 12" - 16" depth of poor soils / materials. back fill with good medium textured planting soils and crown 12" at center

6" high concrete curb

center rootball in planting hole. leave bottom of planting hole firm.do not amend soil unless planting in poor or severely disturbed soil or building rubble. use water to settle soil and remove air pockets and firmly set tree. gently tamp if needed.

parking island planting detail

no scale



do not prune terminal leader or branch tips. prune away dead or broken branches only.

remove nursery applied tree wrap, tape or string from tree trunk and crown. remove any tags or labels.

stake with 2x2 hardwood stakes or approved equal driven 6"-8" outside of rootball.loosely stake tree trunk to allow for trunk flexing.stake trees just below first branch with 2"-3" wide belt-like, nylon or plastic straps (2 per tree on opposite sides of tree, connect from tree to stake horizontally. do not use rope wire thru a hose.). remove all staking materials after 1 year.

set top of rootball level with grade or slightly above grade if in clay soil.

mulch 2"-3" depth with shredded hardwood bark. mulch shall be neutral in color. leave 3" circle of bare soil at base of tree trunk.

fold down or pull back string, burlap or plastic exposing rootball. remove all non-degradable materials.

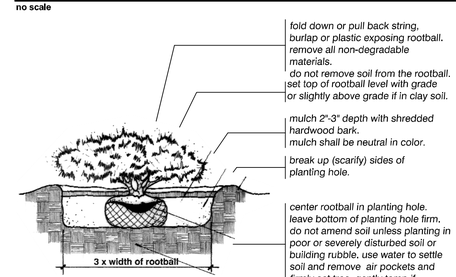
do not remove soil from the rootball.

break up (scarify) sides of planting hole.

center rootball in planting hole. leave bottom of planting hole firm. do not amend soil unless planting in poor or severely disturbed soil or building rubble.use water to settle soil and remove air pockets and firmly set tree. gently tamp if needed.

evergreen planting detail

no scale



fold down or pull back string, burlap or plastic exposing rootball. remove all non-degradable materials.

do not remove soil from the rootball.

set top of rootball level with grade or slightly above grade if in clay soil.

mulch 2"-3" depth with shredded hardwood bark. mulch shall be neutral in color.

break up (scarify) sides of planting hole.

center rootball in planting hole. leave bottom of planting hole firm. do not amend soil unless planting in poor or severely disturbed soil or building rubble. use water to settle soil and remove air pockets and firmly set tree. gently tamp if needed.

shrub planting detail

no scale

Plant Material List, Planting Details and Notes

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (It's the law in all but Michigan)

CAUTION!!! THE LOCATION AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE AND NOT WARRANTEE TO BE EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OF ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION PRIOR TO THE START OF CONSTRUCTION.

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ph. (248) 557-5588
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seal:

STATE OF MICHIGAN FELINO A. PASCUAL LANDSCAPE ARCHITECT No. 1433 REGISTERED LANDSCAPE ARCHITECT

client:

TINELLE PROPERTIES
29850 Northwestern Hwy, Suite 200
Southfield, Michigan 48034

project:

Troy Plaza (Office Option)

project location:

City of Troy, Michigan

Crooks Road, Corporate Drive, and New King Street

sheet title:

plant material list and details

issue/revision date:

site plan update	7-12-2012
plan submittal	7-16-2012
plan submittal	8-27-2012

drawn by: **JP**

checked by: **FP**

date: **7-9-2012**

notice:

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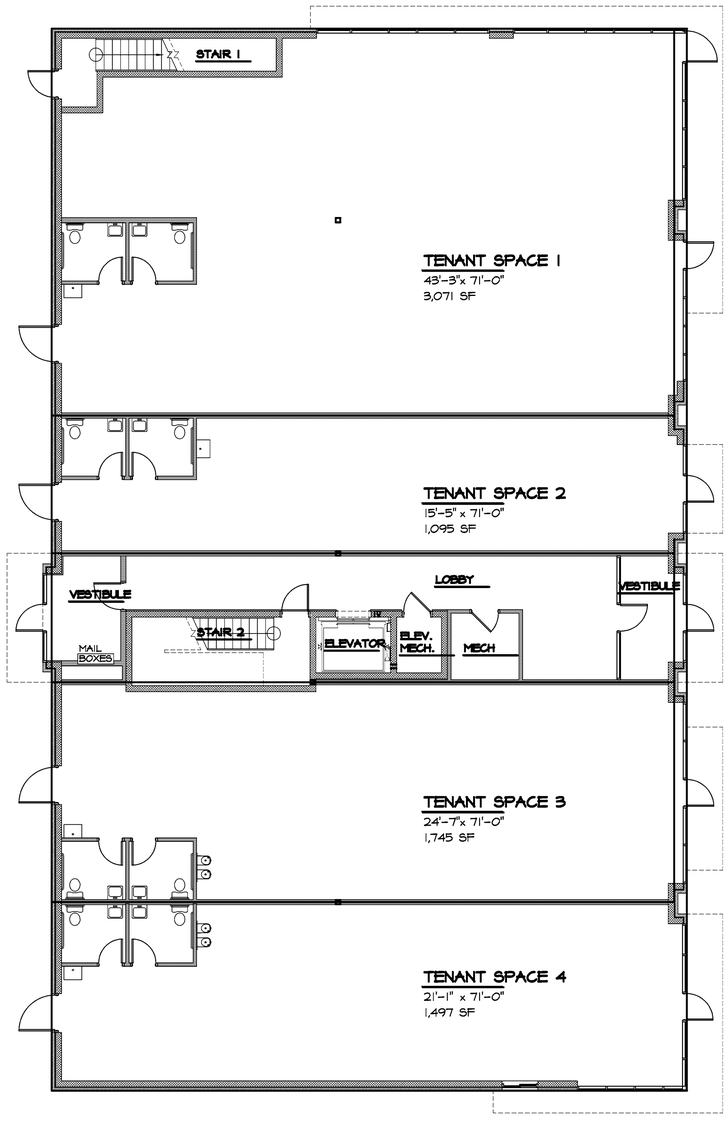
project no: **LS12.051.08**

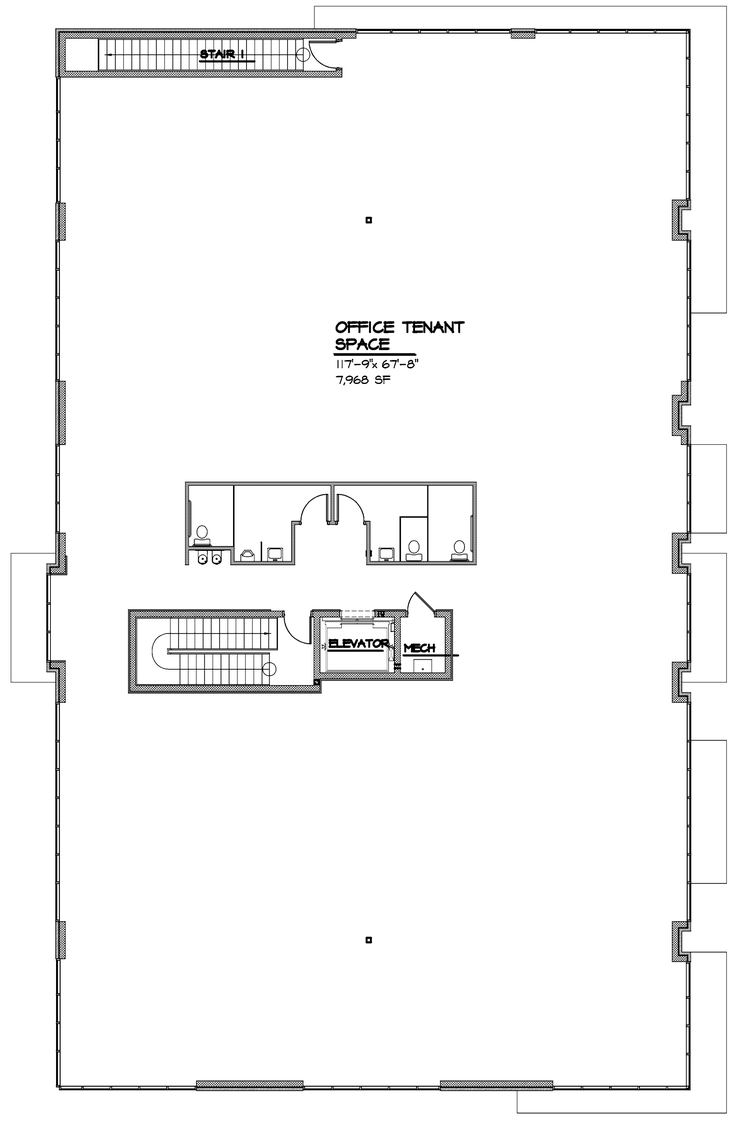
sheet no: **LS-2 of 2**



NORTH

FIRST FLOOR PLAN

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



NORTH

SECOND FLOOR PLAN

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

MGA Architects/Designers

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

248.549.4500 voice
248.549.7300 facs.

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Client:
Tinelle Properties LLC
29850 NORTHWESTERN HIGHWAY
SOUTHFIELD, MI 48034

Project Title:
Troy Plaza
TROY, MI 48230

Sheet Title:
RETAIL BUILDING FIRST FLOOR PLAN

Project Number: 06418.02
Drawn By: AJM
Checked By:
Approved By:
Date: 08-09-06

Issued:

Owner Review 02-07-12	Owner Review 04-30-12
Owner Review 02-14-12	Conditional Rezoning 06-04-12
Owner Review 02-27-12	Revised 07-09-12
Owner Review 02-29-12	Planning Comm Submittal 07-16-12
Owner Review 03-13-12	
Owner Review 03-20-12	
Owner Review 03-22-12	
Owner Review 04-11-12	

Sheet Number:
A-1

File: #01.10000,20000

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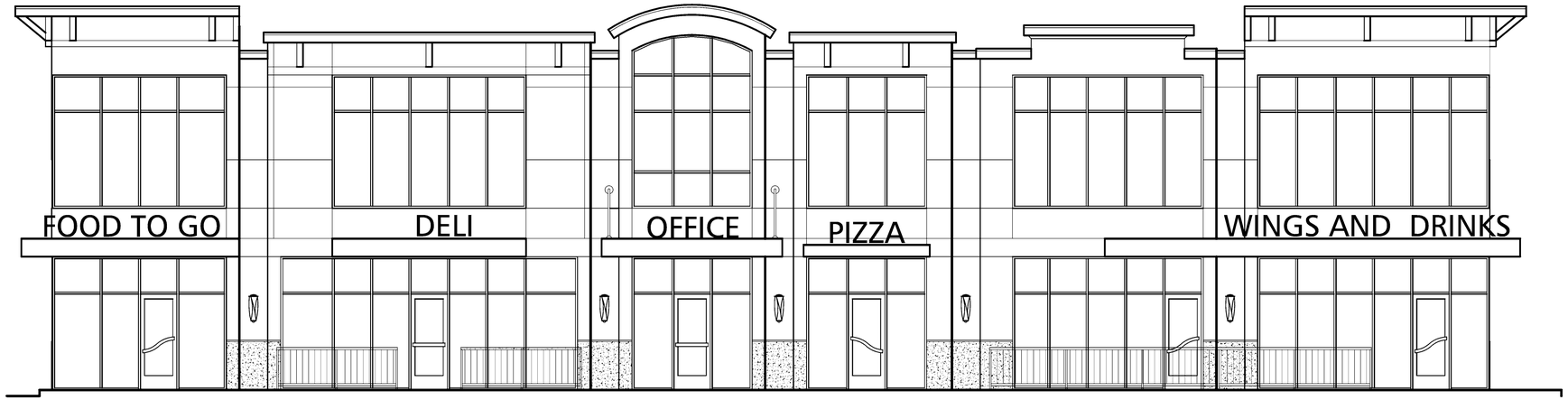
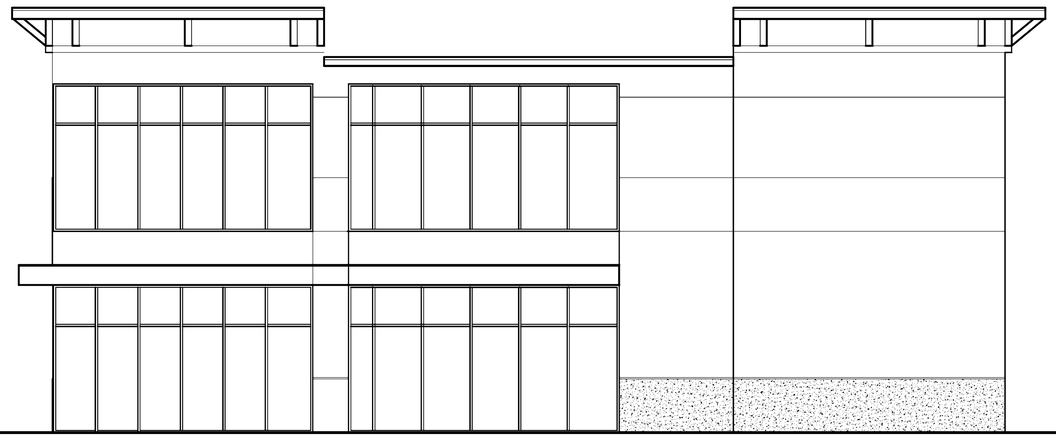


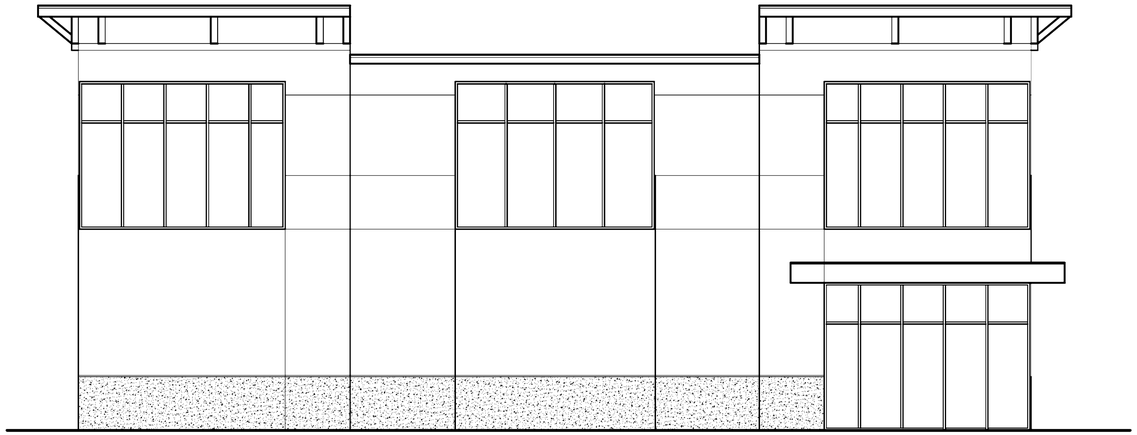
EAST ELEVATION

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



SOUTH ELEVATION

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



SOUTH ELEVATION

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

WEST ELEVATION

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

MGA Architects/Designers

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

248.549.4500 voice
248.549.7300 facs.

www.mga-architects.net

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Do not scale the drawings.

Client:
Tinelle Properties LLC
29850 NORTHWESTERN HIGHWAY
SOUTHFIELD, MI 48034

Project Title:
Troy Plaza
TROY, MI 48230

Sheet Title:
RETAIL BUILDING ELEVATIONS

Project Number: 06418.02
Drawn By: AJM
Checked By:
Approved By:
Date: 08-09-06

Issued:
Owner Review 02-07-12
Owner Review 02-14-12
Owner Review 02-27-12
Owner Review 02-29-12
Owner Review 03-13-12
Owner Review 03-20-12
Owner Review 03-22-12
Owner Review 04-11-12
Owner Review 04-30-12
Conditional Rezoning 06-04-12
Revised 07-09-12
Planning Comm Submittal 07-16-12

Sheet Number:
A-2

File: #01.10000,20000

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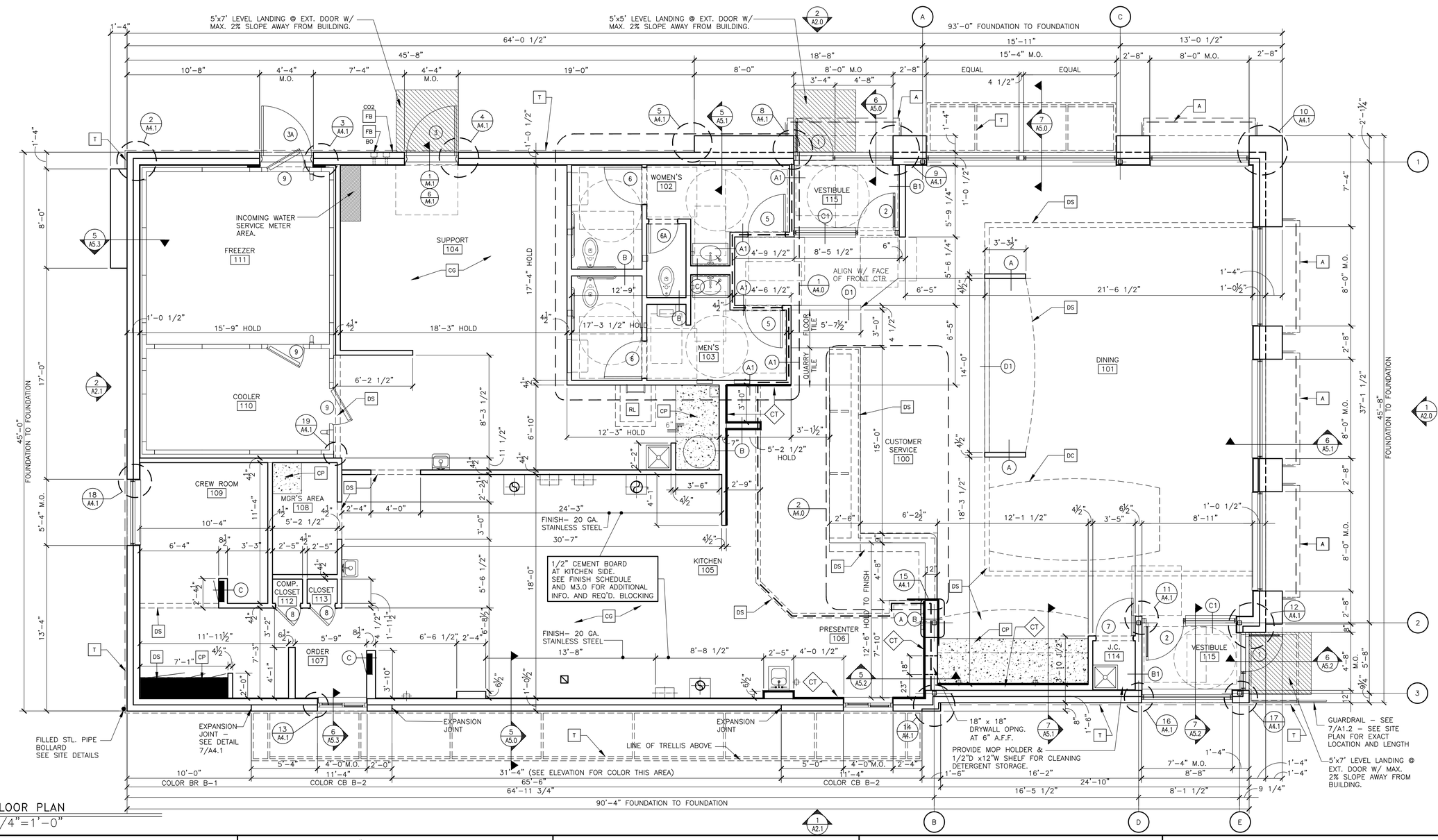
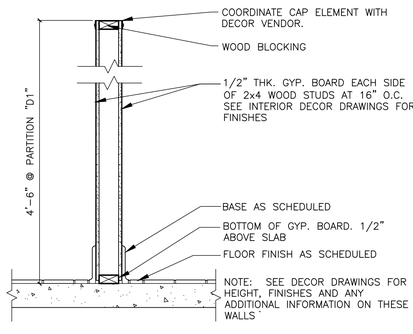


1 A1.0 **FLOOR PLAN**
1/4"=1'–0"



3 A1.0 **PARTIAL HT. PARTITION DETAIL**
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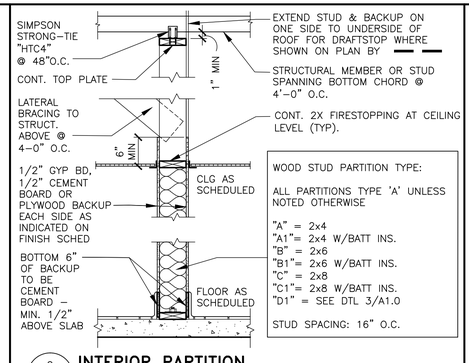

2 A1.0 **INTERIOR PARTITION**
3/4"=1'–0"

KEY NOTES

- A AWNING ABOVE – BY OTHERS
- CG G.C. TO PROVIDE 4"x4"x5'–0" HIGH STAINLESS STEEL CORNER GUARDS AT ALL EXPOSED LOCATIONS IN KITCHEN/SUPPORT AREA. CORNER GUARDS TO START AT FINISH FLOOR. ATTACH WITH WOOD SCREWS INTO WOOD BLOCKING BULLNOSE COVE BASE WHERE TILE MEETS STAINLESS STEEL CORNER
- CP CONCRETE EQMT PAD – SEE STRUCTURAL
- DC SUSPENDED DECORATIVE CEILING TREATMENT – SEE DECOR DRAWINGS FOR ADDITIONAL INFORMATION.
- DS DROPPED SOFFIT ABOVE – SEE REFLECTED CEILING PLAN
- FB CO2 FILL BOX (EQUIPMENT SCHEDULE ITEM 49.00)
  CO2
- FB OPTIONAL BULK OIL FILL BOX (EQPM SCHEDULE ITEM 700.18)
  BO CONFIRM USE WITH MCDONALD'S PROJECT MANAGER

SYMBOL LEGEND

- (A) PARTITION TYPE TAG SEE 2/A1.0
- DRAFT STOPPING – SEE 2/A1.0
- (7) DOOR TAG – SEE DOOR SCHEDULE ON A6.0
- (CT) CERAMIC WALL TILE @ CUSTOMER SERVICE AND KITCHEN SERVING AREAS – TO BE COORDINATED W/FINAL DINING DECOR SCHEME & McDONALD'S AREA CONSTRUCTION MANAGER
- X KEY NOTE

- RL ROOF ACCESS LADDER W/HATCH ABOVE SEE STRUCTURAL FRAMING PLAN FOR LOCATING DIMENSIONS
- T TRELLIS SYSTEM ABOVE SEE 4/A5.0 FOR NOTES SEE ROOF PLAN FOR DIMENSIONS

GENERAL NOTES

1. EXTERIOR DIMENSIONS ARE TO COLUMN REFERENCE LINES AND EXTERIOR FACE OF FINISH UNLESS OTHERWISE NOTED. INTERIOR DIMENSIONS ARE TO FACE OF FINISH.
2. SEE 4/A5.0 FOR EXTERIOR WALL ASSEMBLY TYPES. SEE 2/A1.0 FOR INTERIOR PARTITION TYPES. INTERIOR PARTITIONS ARE TYPE 'A' UNLESS NOTED OTHERWISE.
3. SEE EXTERIOR ELEVATIONS FOR WINDOW TYPES
4. SEE SHEET A6.0 FOR DOOR AND ROOM FINISH SCHEDULES
5. SEE SITE PLAN FOR SIDEWALKS, RAMPS, ETC.
6. GC TO PROVIDE ADA SIGNAGE PACKAGE AND INSTALL SIGNS AT LOCATIONS AND POSITIONS INDICATED IN PACKAGE OR AS REQUIRED BY LOCAL CODES. SIGNAGE PACKAGE SUPPLIED BY: FORREST PERMA–SIGN 1–800–214–8765 9292 1ST ST., BOX 588 www.forrestpermasigns.com NEW ROCHELLE, NY 10802
7. MAXIMUM OCCUPANCY SIGN TO BE POSTED PER LOCAL CODE. SIGN FURNISHED AND INSTALLED BY GENERAL CONTRACTOR.
8. ALL HANDSINK LOCATIONS SHALL HAVE CEMENT BOARD BACKING 48" IN HEIGHT A.F.F.
9. COORDINATE ALL REQUIRED BLOCKING FOR WALL HUNG EQUIPMENT, SHELVINGS, ETC. FOR PROPER INSTALLATION HEIGHTS.

BY	DESCRIPTION	DATE	REV

PREPARED BY:
Michael J. Ceferin
Licensed Architect
2111 McDonald's Drive, Oak Brook IL 60523
Phone: (630) 623-6204

License Expires: 10/31/2011

PREPARED FOR:
McDonald's USA, LLC

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DRAWN BY	STD ISSUE DATE	REVIEWED BY	DATE ISSUED
VVS	MARCH 2009	MR	5/18/2011

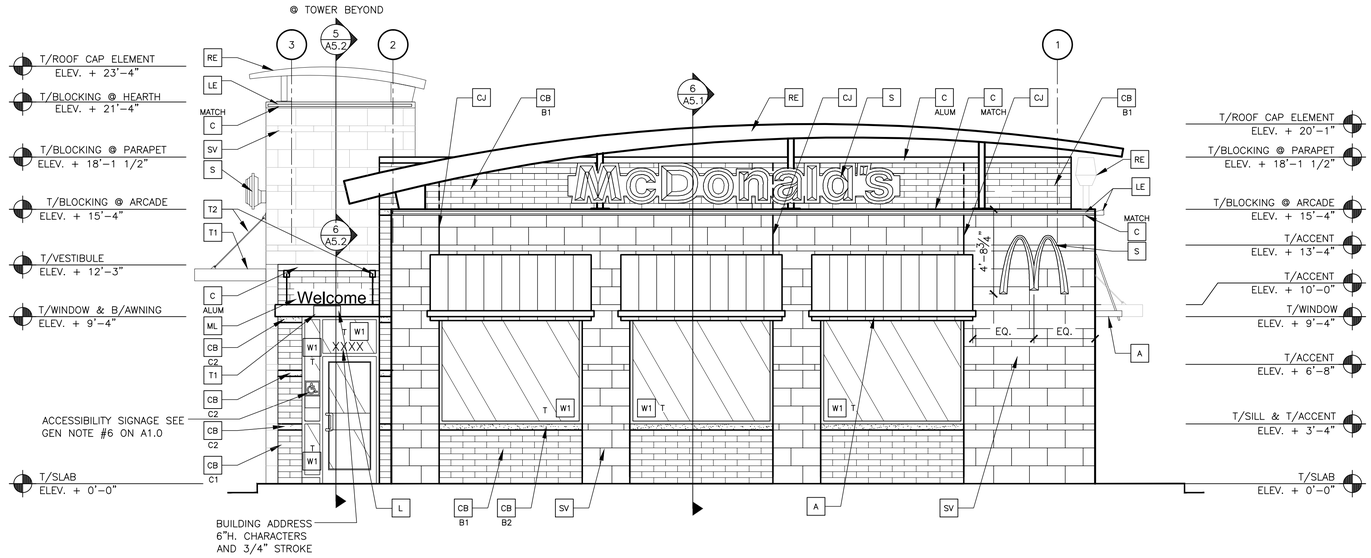
TROY, MICHIGAN

TITLE
2009 STANDARD BUILDING
4587+5' REAR – WOOD/WOOD

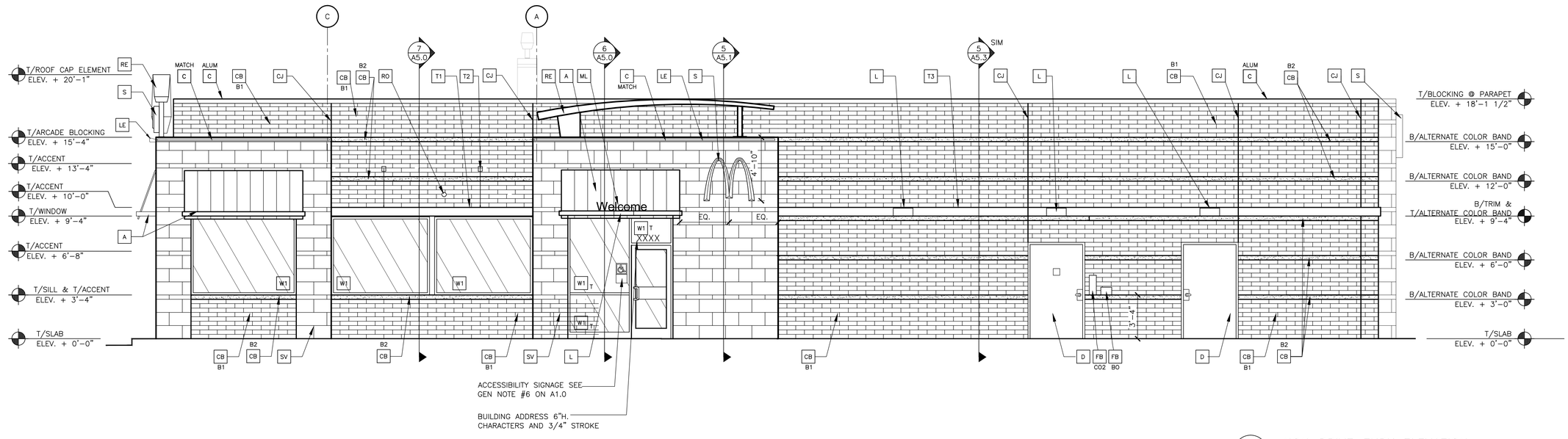
DESCRIPTION	SITE ADDRESS
WOOD BEARING WALLS W/4" BRICK EXTERIOR FINISH	
WOOD ROOF TRUSS FRAMING	
STONE VENEER ARCADE FINISH	
SITE ID	72 W. MAPLE RD
021–1893	

SHEET NO.
021–1893.00.0
A1.0
FLOOR PLAN

K:\DIV\CENTRAL_ MICH\021–1893–00–0 TROY,MI\A–PLAN.DWG 05–26–2011 14:02



1 A2.0 **FRONT ELEVATION**
1/4" = 1'-0"



2 A2.0 **NON-DRIVE-THRU ELEVATION**
1/4" = 1'-0"

KEY NOTES:

- A — METAL AWNING – UNDER SEPARATE PERMIT, COLOR TO BE ALTERNATING STRIPES TO MATCH PANTONE 123C AND 109C
- CB B1 — UTILITY SIZE CONCRETE BRICK, TYPE– BELLA BRICK CONTACT: CONSUMERS CONCRETE PRODUCTS (616-243-3651) COLOR: B1 = OLYMPIA BLEND TEXTURE, SMOOTH FACE; B2 = MIDLAND, SMOOTH FACE
- C ALUM — METAL COPING – COLOR = ALUMINUM
- C MATCH — METAL COPING – COLOR TO MATCH SURROUNDNG MATERIAL
- D — HOLLOW METAL DOOR – PAINT TO MATCH COLOR OF SURROUNDING MATERIAL
- CJ — CONTROL JOINT, SEE DETAIL 7/A4.1
- FB CO2 — CO2 FILL BOX (EQPM SCHEDULE ITEM 49.00)
- FB BO — OPTIONAL BULK OIL FILL BOX (EQPM SCHEDULE ITEM 700.18) – CONFIRM USE WITH MCD PROJECT MANAGER
- L — LIGHT FIXTURE (WALL SCONCE) – SEE ELECTRICAL
- LE — UP & DOWN LED LIGHTING – SEE ELECTRICAL
- ML — METAL LETTERING – BY OTHERS
- PB — PIPE BOLLARD – PAINTED YELLOW
- PT — RMHC COIN COLLECTOR
- RE — ROOF CAP ELEMENT BY OTHERS
- RO — ROOF DRAIN OVERFLOW PIPE PAINT TO MATCH SURROUNDING MATERIAL
- S — McDONALD'S SIGNAGE BY OTHERS – UNDER SEPARATE PERMIT. SEE SIGNAGE SUPPORT NOTE ON THIS SHEET.
- SV — STONE VENEER– TYPE: ROCKCAST ST003, COLOR: BUFFSTONE, TEXTURE: SMOOTH, SIZE: 4"x12"x24" NOM. ACCENT STRIPE– TYPE: ROCKCAST ST204, COLOR: BUFFSTONE, TEXTURE: CHISELED, SIZE: 4"x4"x24" NOM.
- T1 — ALUMINUM TRELLIS
- T2 — TRELLIS TIE–BACK
- T3 — 2X8 WALL FASCIA – REFER TO SIM. DETAIL 3 ON SHEET A5.1
- W1 T — EXTERIOR WINDOW ASSEMBLY – SEE A5.0 T = TEMPERED GLASS
- W2 XX — DRIVE–THRU WINDOW BY READY ACCESS CONFIRM MODEL, OPTIONS, AND SIZE WITH MCD PROJECT MANAGER OPTIONS INCLUDE: TRANSOM (SHOWN); AIR CURTAIN; FLYFAN/TRANSOM & 432 SQ IN MAX SERVICE OPENING (WHERE REQD BY CODE) — SLIDE DIRECTION: RL = RIGHT TO LEFT LR = LEFT TO RIGHT

SIGNAGE SUPPORT NOTE:
UNIBODY FASCIA SIGN WALL SUPPORTS TO BE VERIFIED WITH McDONALD'S AREA CONSTRUCTION MANAGER AND COORDINATED WITH SIGN MANUFACTURER.

GLAZING REQUIREMENTS:
U VALUE = 0.45
SHGC = 0.40

REV	DATE	DESCRIPTION	BY

PREPARED BY:

PREPARED FOR: McDonald's USA, LLC

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DRAWN BY: VVS
STD ISSUE DATE: MARCH 2009
REVIEWED BY: MR
DATE ISSUED: 5/16/2011

TITLE: 2009 STANDARD BUILDING 4587+5' REAR – WOOD/WOOD
DESCRIPTION: WOOD BEARING WALLS W/4" BRICK EXTERIOR FINISH; WOOD ROOF TRUSS FRAMING; STONE VENEER ARCADE FINISH
SITE ID: 021-1893
SITE ADDRESS: 72 W. MAPLE RD
TROY, MICHIGAN

SHEET NO. 021-1893.00.0 **A2.0** ELEVATIONS

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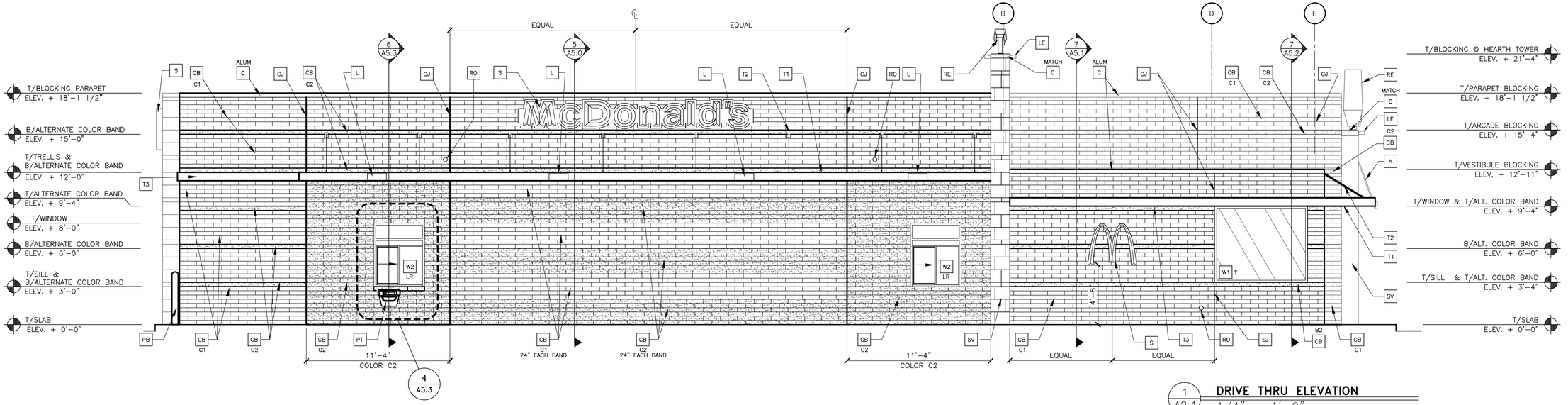
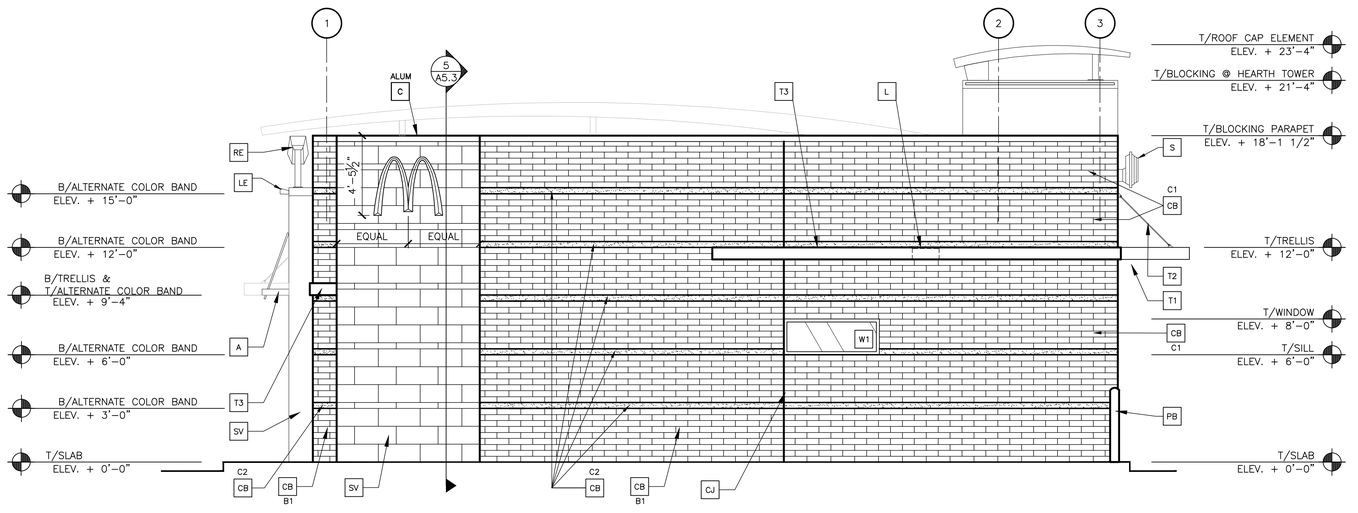


1 A2.1 **DRIVE THRU ELEVATION**
1/4" = 1'-0"



2 A2.1 **REAR ELEVATION**
1/4" = 1'-0"

KEY NOTES:

- A — METAL AWNING – UNDER SEPARATE PERMIT, COLOR TO BE ALTERNATING STRIPES TO MATCH PANTONE 123C AND 109C
- CB B1 — UTILITY SIZE CONCRETE BRICK, TYPE– BELLA BRICK CONTACT: CONSUMERS CONCRETE PRODUCTS (616–243–3651) COLOR: B1 = OLYMPIA BLEND TEXTURE, SMOOTH FACE; B2 = MIDLAND, SMOOTH FACE
- C ALUM — METAL COPING – COLOR = ALUMINUM
- C MATCH — METAL COPING – COLOR TO MATCH SURROUNDNG MATERIAL
- D — HOLLOW METAL DOOR – PAINT TO MATCH COLOR OF SURROUNDING MATERIAL
- CJ — CONTROL JOINT, SEE DETAIL 7/A4.1
- FB C02 — CO2 FILL BOX (EQPM SCHEDULE ITEM 49.00)
- FB B0 — OPTIONAL BULK OIL FILL BOX (EQPM SCHEDULE ITEM 700.18) – CONFIRM USE WITH MCD PROJECT MANAGER
- L — LIGHT FIXTURE (WALL SCONCE) – SEE ELECTRICAL
- LE — UP & DOWN LED LIGHTING – SEE ELECTRICAL
- ML — METAL LETTERING – BY OTHERS
- PB — PIPE BOLLARD – PAINTED YELLOW
- PT — RMHC COIN COLLECTOR
- RE — ROOF CAP ELEMENT BY OTHERS
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- SV — STONE VENEER– TYPE: ROCKCAST ST003, COLOR: BUFFSTONE, TEXTURE: SMOOTH, SIZE: 4"x12"x24" NOM. ACCENT STRIPE– TYPE: ROCKCAST ST204, COLOR: BUFFSTONE, TEXTURE: CHISELED, SIZE: 4"x4"x24" NOM.
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- W1 T — EXTERIOR WINDOW ASSEMBLY – SEE A5.0 T = TEMPERED GLASS
- W2 XX — DRIVE–THRU WINDOW BY READY ACCESS CONFIRM MODEL, OPTIONS, AND SIZE WITH MCD PROJECT MANAGER OPTIONS INCLUDE: TRANSOM (SHOWN); AIR CURTAIN; FLYFAN/TRANSOM & 432 SQ IN MAX SERVICE OPENING (WHERE REQD BY CODE). SLIDE DIRECTION: RL = RIGHT TO LEFT LR = LEFT TO RIGHT

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UNIBODY FASCIA SIGN WALL SUPPORTS TO BE VERIFIED WITH McDONALD'S AREA CONSTRUCTION MANAGER AND COORDINATED WITH SIGN MANUFACTURER.

GLAZING REQUIREMNTS:
U VALUE = 0.45
SHGC = 0.40

REV	DATE	DESCRIPTION	BY

PREPARED BY:

PREPARED FOR: McDonald's USA, LLC

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DRAWN BY	STD ISSUE DATE
VVS	MARCH 2009
REVIEWED BY	DATE ISSUED
MR	5/16/2011

TITLE: 2009 STANDARD BUILDING 4587+5' REAR – WOOD/WOOD

DESCRIPTION: WOOD BEARING WALLS W/4" BRICK EXTERIOR FINISH; WOOD ROOF TRUSS FRAMING; STONE VENEER ARCADE FINISH

SITE ID: 021–1893

SITE ADDRESS: 72 W. MAPLE RD

TROY, MICHIGAN

SHEET NO. 021–1893.00.0
A2.1
ELEVATIONS

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DATE: September 19, 2019

TO: Planning Commission

FROM: R. Brent Savidant, Planning Director

SUBJECT: PRELIMINARY SITE PLAN REVIEW (SP JPLN2019-0032) - Proposed GFA Long Lake Multifamily Development, West side of Dequindre, north of Long Lake (PIN 88-20-12-476-070), Section 12, Currently Zoned NN (Neighborhood Node "J") and EP (Environmental Protection) Districts

The petitioner GFA Long Lake submitted the above referenced Preliminary Site Plan application for a 25-unit residential project on the 2.389 acre parcel. The units are proposed to be 3 stories in height.

The property is currently zoned NN (Neighborhood Node "J") 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 JPLN2019-0032 GFA LONG LAKE\PC Memo 2019 11 12.docx

PROPOSED RESOLUTION

PRELIMINARY SITE PLAN REVIEW (SP JPLN2019-0032) - Proposed GFA Long Lake Multifamily Development, West side of Dequindre, north of Long Lake (PIN 88-20-12-476-070), Section 12, Currently Zoned NN (Neighborhood Node "J") and EP (Environmental Protection) Districts

Resolution # PC-2019-11-
Moved by:
Seconded by:

RESOLVED, That Preliminary Site Plan Approval, pursuant to Article 8 of the Zoning Ordinance, as requested for the proposed GFA Long Lake Multifamily Development, located on the West side of Dequindre, north of Long Lake (PIN 88-20-12-476-070), Section 12, Zoned NN (Neighborhood Node "J") and EP (Environmental Protection) Districts, be granted, subject to applicant the following:

1. Shift development to provide 40-foot setback along the rear (west) property line.
2. Submit photometric plans and fixture details prior to Final Site Plan Approval.
3. Provide at least one guest space as ADA compatible.

_____) or

(denied, for the following reasons: _____) or

(postponed, for the following reasons: _____)

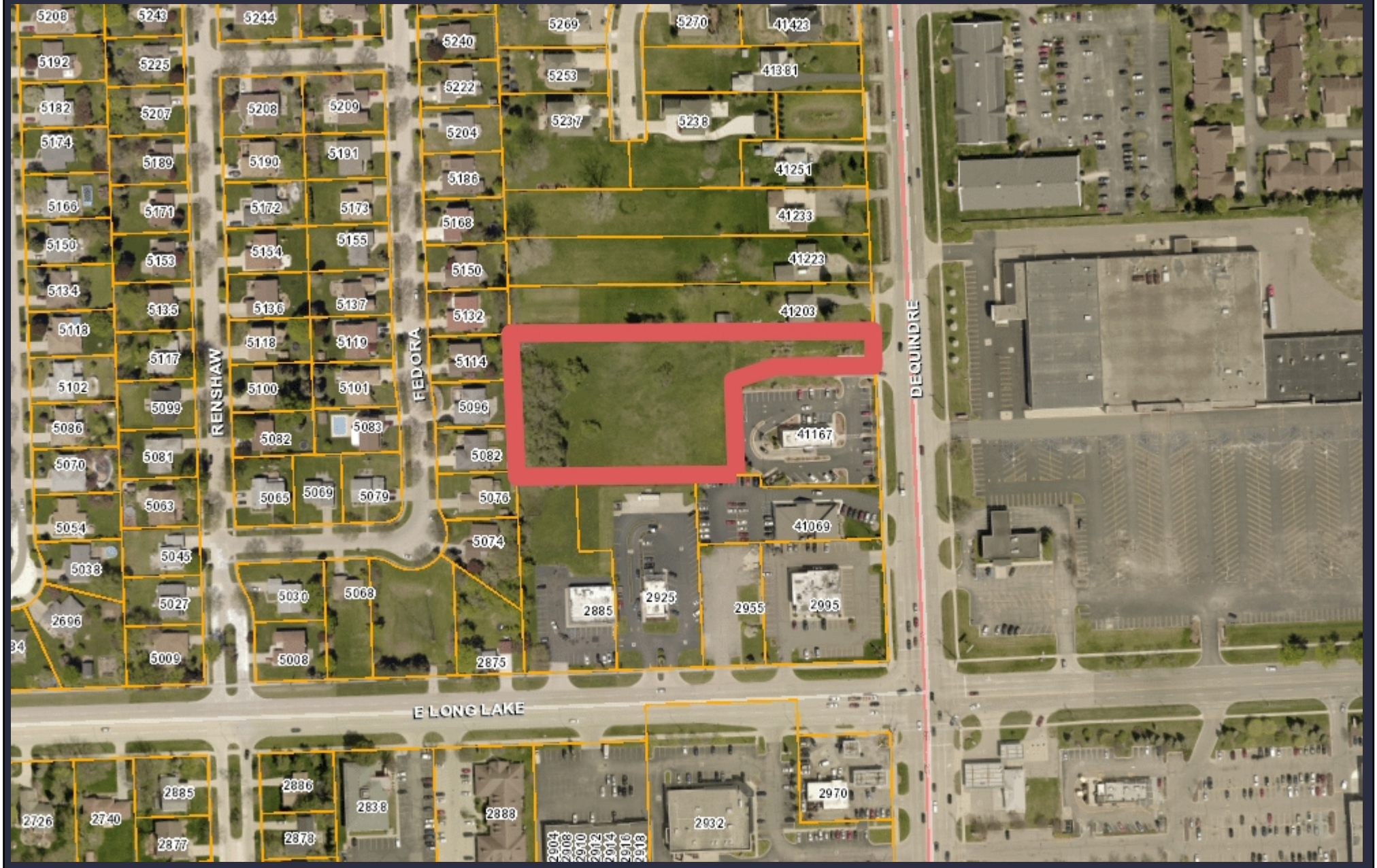
Yes:
No:

MOTION CARRIED/FAILED

Yes:
No:

MOTION CARRIED/FAILED

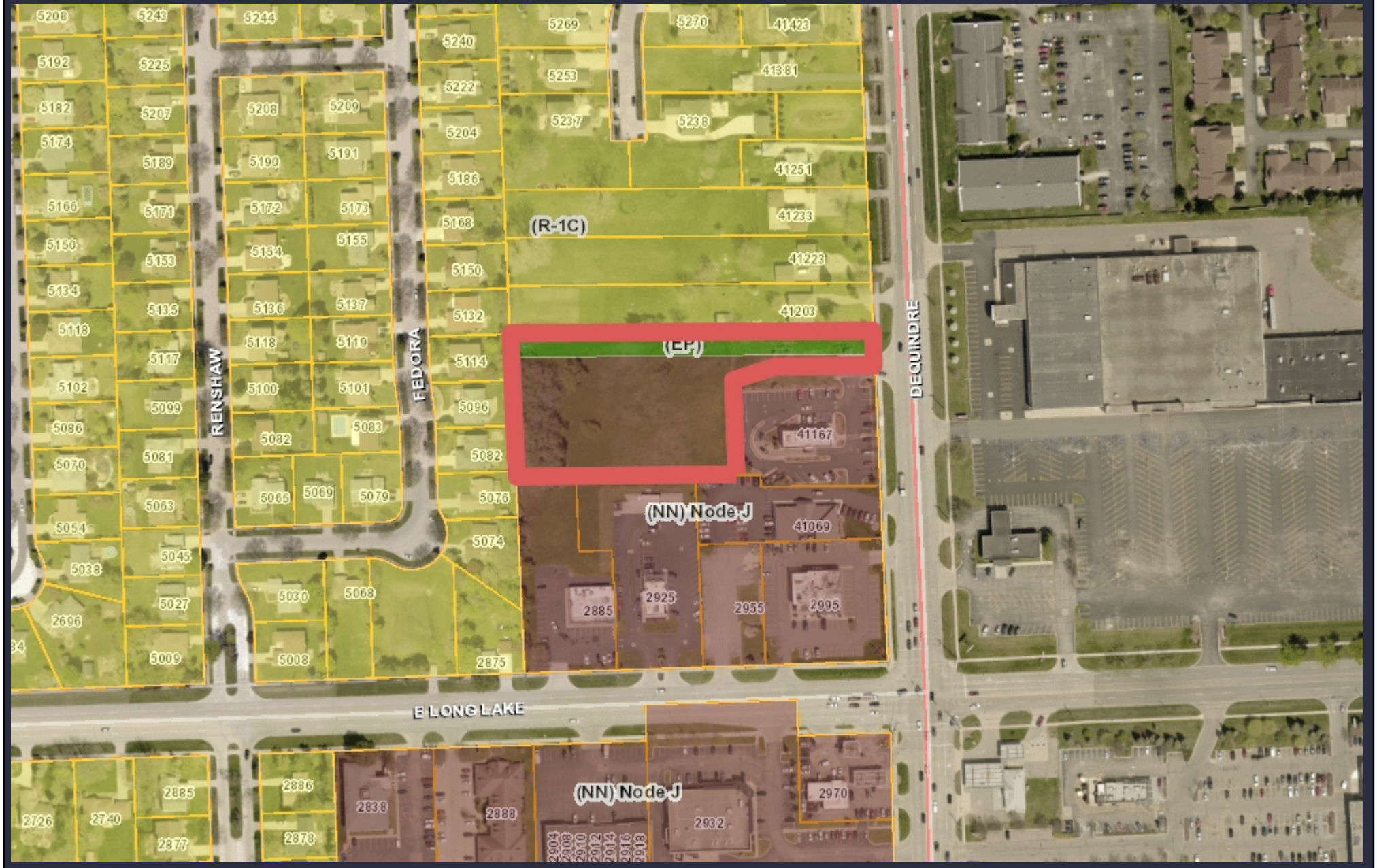
GIS Online



595 0 297 595 Feet

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

GIS Online



595 0 297 595 Feet

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

Carlisle | Wortman
ASSOCIATES, INC.

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

Date: November 5, 2019

Preliminary Site Plan Review
For
City of Troy, Michigan

Applicant:	GFA Development 3301 Mirage Drive Troy, MI 48083
Project Name:	GFA Townhomes
Plan Date:	September 18, 2019
Location:	West side of Dequindre Road between 18 Mile Road and English Drive
Zoning:	EP, Environmental Protection Neighborhood Node (NN) – J
Action Requested:	Preliminary Site Plan Approval

SITE DESCRIPTION

The subject site is located on the west side of Dequindre Road between 18 Mile Road and English Drive. The site is 2.39 acres and is vacant, undeveloped property. There is a 40-foot wide strip of EP, Environmental Protection zoned property. The applicant proposes to landscape, install underground detention, and put a sidewalk within the EP portion of the site. There is already a 60' storm drain and a concrete screenwall within the area zoned EP. These items will remain. The remaining (all of the building area) area of the property is zoned Neighborhood Node (NN).

The applicant proposes two different building types. The buildings in the interior are narrower and provide for a front porch and entrance. The exterior buildings have a front entrance on the garage elevation and an elevated deck on the rear elevation.

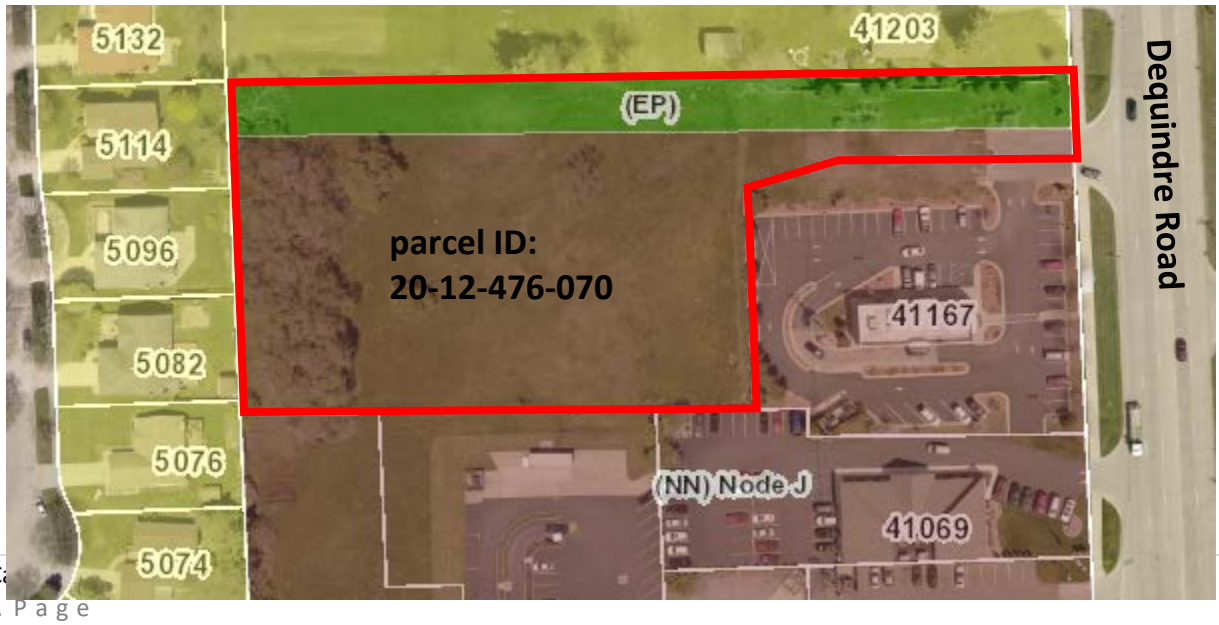
Richard K. Carlisle, *President* Douglas J. Lewan, *Executive Vice President* John L. Enos, *Principal*
David Scurto, *Principal* Benjamin R. Carlisle, *Principal* Sally M. Elmiger, *Principal* Craig Strong, *Principal* R. Donald Wortman, *Principal*
Laura K. Kreps, *Associate* Paul Montagno, *Associate*

Figure 1: *60-inch drain and concrete wall*

The applicant proposes to develop the site as twenty-five (25) attached townhomes, accessed by an existing shared access drive with Taco Bell off of Dequindre road. The buildings are proposed to have individual, direct unit access from the proposed interior drive. At the center of the development, twelve (12) of the units will have pedestrian access to a pedestrian circulation area and courtyard. All proposed townhomes are two (2) stories, accompanied by a 2-car garage.

Multiple family residential is a permitted use in the NN. An aerial image of the subject site, with a zoning districts overlay, is provided in ***Figure 1***.

Figure 1. *Subject Site*



Size of Subject Property:
The parcel is 2.389 net acres

Proposed Uses of Subject Parcel:
Twenty-five (25) attached townhomes

Current Use of Subject Property:
The subject property is currently unimproved and vacant.

Current Zoning:
The property is currently zoned NN, Neighborhood Node District

Surrounding Property Details:

Direction	Zoning	Use
North	R1-C, Single Family	Single Family Residential
South	NN, Neighborhood Node	Neighborhood Commercial
East	NN, Neighborhood Node	Neighborhood Commercial
West	R1-C, Single Family	Single Family Residential

NATURAL FEATURES

Topography: A topographic survey has been provided on sheet C-1.0 and shows that the site has a generally flat landscape.

Wetlands: There are no wetlands on site.

Floodplain: There are no floodplains onsite.

Woodlands: The applicant has identified a total of 23 regulated trees on the site. Of the trees surveyed, 1 is a landmark tree and 22 are woodland trees. The applicant is preserving 21 of the 22 woodland trees.

Replacement Details		
Protected Tree	**Inches Removed**	**Replacement Required**
Landmark	22 inches	22 inches
Woodland	6 inches	3 inches
Preservation/Mitigation	**Inches Preserved**	**Credit**
Landmark	0 inches	0 inches
Woodland	197 inches	394 inches
Protected Replacement Required	25 Inches	
Preservation Credit	394 Inches	
Total	**+ 369-inch credit**	

Total Tree Mitigation	Zero. The number of inches preserved and credited exceed the mitigation required.

Items to be addressed: *None.*

BUILDING ARRANGEMENT

The site configuration consists of twenty-five (25) townhomes in five clusters of three homes, one cluster of four homes, and a row of six homes. The clusters are configured around a central courtyard with pedestrian sidewalks connecting to a "meandering" sidewalk, through the EP zoned portion of the site, that provides access to the east and Dequindre Road. We find the proposed configuration suitable for the type and size of the development proposed.

Items to be addressed: *None.*

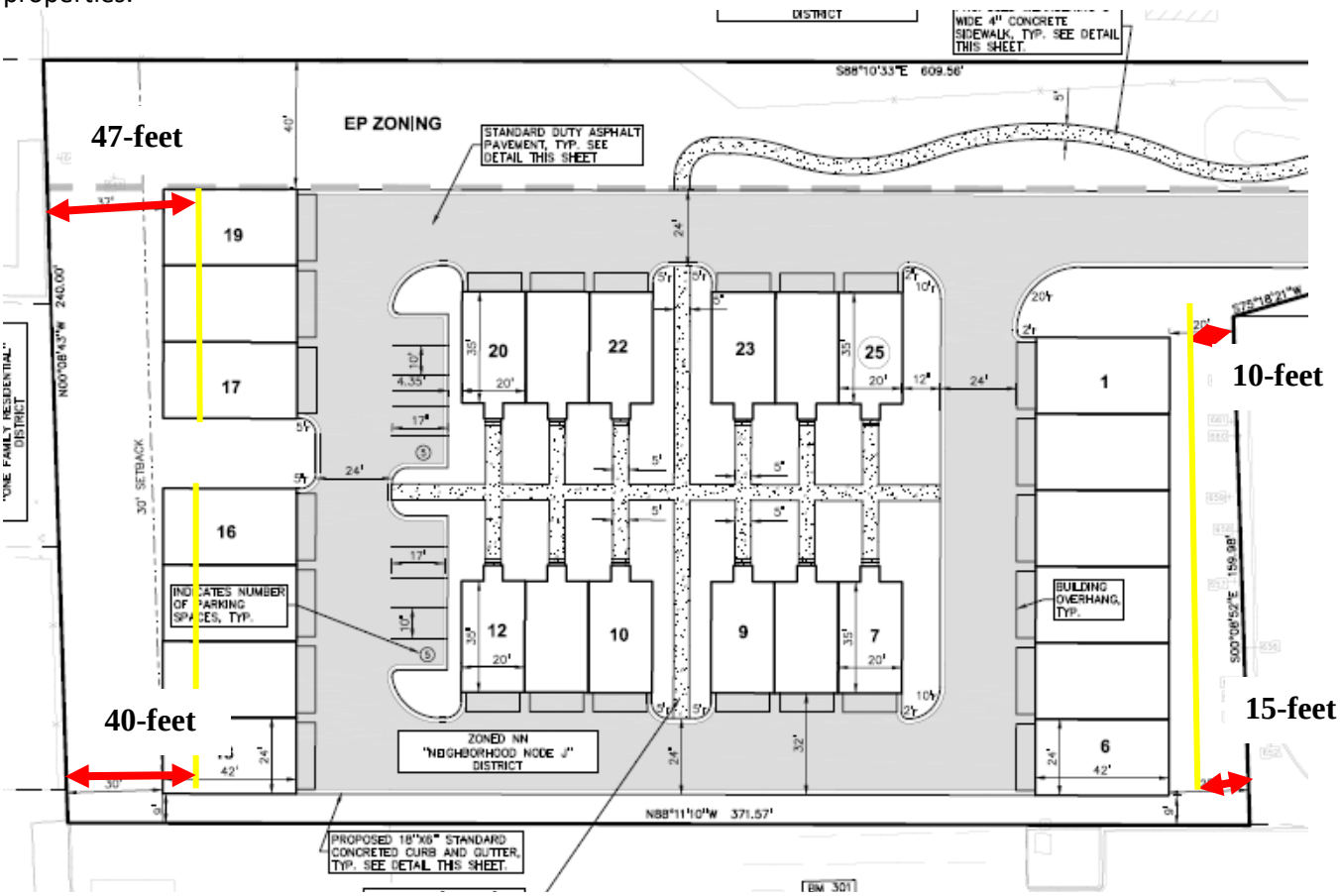
AREA, WIDTH, HEIGHT, SETBACKS

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

	Required	Provided	Compliance
Front (east property line)	10-foot build-to-line	25 feet (this property is a flag lot, however, and this requirement is not applicable)	Complies
Side (north)	N/A, building may be placed up to property line	Buildings are 24' from EP easement.	Complies
Side (south)	N/A, building may be placed up to property line	9 feet	Complies
Rear (west)	30-foot minimum setback	30 feet	Complies. See discussion below
Building Height	Maximum 4 stories, 55 feet, Minimum 2 stories	3 stories, 33'-4"	Complies
Lot Coverage (Building)	30%	21%	Complies
Minimum Open Space	20%	45%	Complies
Parking Location	Cannot be located in front yard	Within garages	Complies

Though the applicant has met the 30-foot rear (west) yard setback, we find that there is an opportunity to provide a greater buffer along the rear (west) property line. The applicant could shift the entire

development 10-feet to the east to provide a 40-foot setback along the rear (west) property line. The 40-foot setback along the rear property line matches the rear yard setback of the adjacent residential properties.



Items to be addressed: *Shift development to provide 40-foot setback along the rear (west) property line.*

PARKING

Section 13.06.G of the Zoning Ordinance requires:

	Required	Provided
Residential: 2 spaces per unit	25 Units = 50 spaces	50 garage spaces + 10 guest spaces = 60 spaces
Barrier Free	0	0
Bicycle Parking	0	0
Loading	0	0
Total	**50 spaces**	**50 spaces within garages and 10 guest spaces**

The applicant is providing 2-car garages and 10 surface guest spaces. One of the guest spaces must be ADA compatible.

Items to be Addressed: *Provide at least one guest space as ADA compatible.*

SITE ACCESS AND CIRCULATION

Vehicular access to the site is via Dequindre Road. The site plan does not include a truck turn-around or other alternative option besides the looping interior drive. A concrete, internal pedestrian sidewalk network is also proposed. The fire department has reviewed the applicant and finds access sufficient.

Items to be addressed: *None*

LANDSCAPING

A landscaping plan has been provided on sheet L-1.0 and are supplemented by tree protection and planting details on sheet L-1.1. The applicant should verify that the plant list provided on sheet L-1.0 corresponds to drawings provided. The following table discusses the development's compliance with the landscape requirements set forth in Section 13.02.

	Required:	**Provided:**	**Compliance:**
North Property Line:			
Landscape buffering: Required buffering between two differentiating land uses. Alternative 1 or 2.	1 large evergreen every 10 feet or 1 narrow evergreen every 3 feet. Approx. 370'/10=37 trees	37 evergreen screening trees	Complies
East Property Line:			
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.	Environmental Protection easement area along access drive.	Existing trees to remain with added greenbelt trees proposed in median.	Complies
West Property Line:			
Landscape buffering:	1 large evergreen every 10 feet or 1 narrow evergreen every 3 feet. 240' / 10= 24 trees	26 evergreen screening trees	Complies
South Property Line:			
Landscape buffering:	1 large evergreen every 10 feet or 1 narrow evergreen every 3 feet. Alternative screening method may be considered by the Planning Commission.	Six (6) foot fence along property boundary.	Planning Commission shall consider alternative screening proposed.
Overall:			
Site landscaping:	15%	Over 20%	Complies

A minimum of twenty percent (20%) of the site area shall be comprised of landscape material. Up to twenty-five percent (25%) of the required landscape area may be brink, stone, pavers, or other public plaza elements, but shall not include any parking area or required sidewalks.			
Mitigation:	The tree inventory and calculations are in compliance with the requirements of the ordinance. The replacement calculations show more than 300 inches in DBH credit because of the 21 woodland trees preserved, minus the removal of 1 woodland tree and 1 landmark tree.		

Transformer / Trash Enclosure:
The applicant has not indicated a central trash enclosure. It is assumed that each unit will have trash bins in the garage to be rolled out for trash pickup.

***Items to be Addressed**: Planning Commission to consider the use of a fence in place of required screening at the south edge of the property*

PHOTOMETRICS

A photometric plan has not been provided. For final site plan a photometric plan and fixture details are required to be submitted.

***Items to be Addressed:** Submit photometric plans and fixture details.*

FLOOR PLAN AND ELEVATIONS

Two types of elevations and floor plans have been provided. Floor plans and elevations have been provided. The primary front elevation is brick and stone. The rear and side elevations are brick on the first floor and siding on the second floor. The applicant should indicate what the second-floor siding material. Elevations show architectural details, variations in material and pattern as well as general color scheme.

The applicant should bring a material samples to the meeting.

***Items to be Addressed:** Bring material samples to the meeting.*

DESIGN STANDARDS and SITE PLAN REVIEW STANDARDS

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

Section 5.06.E. outlines Design Standards:

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

Please see Section 5.06.E for standard details.

We find that the design standards have been met.

Section 8.06 outlines Site Plan Review Design Standards.

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

Please see Section 8.06 for standard details

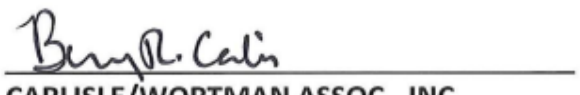
The applicant is providing a medium density multiple family residential project. If the additional setback is provided, the project transitions from a number of commercial uses and the rear yards of single family residential to the north and east. The applicant has provided the required evergreen screen between those yards and the multiple family development. We find that the site plan standards have been met.

RECOMMENDATION

We recommend preliminary site plan with the following conditions:

1. *Shift development to provide 40-foot setback along the rear (west) property line.*
2. *Submit photometric plans and fixture details*
3. *Provide at least one guest space as ADA compatible.*

Sincerely,



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

PRELIMINARY SITE PLANS FOR

GFA 18 MILE & DEQUINDRE

PART OF THE SOUTHEAST 1/4 OF SECTION 12, T. 02N., R. 11E.,

TROY, OAKLAND COUNTY, MICHIGAN

OWNER/APPLICANT/DEVELOPER:

GFA DEVELOPMENT, INC.
3301 MIRAGE DRIVE
TROY, MI 48083
CONTACT: GARY ABITHEIRA
PHONE: (248) 840-2828
EMAIL: GFAHOMES@GMAIL.COM

CIVIL ENGINEER:

PEA, INC.
2430 ROCHESTER CT, SUITE 100
TROY, MI 48083
CONTACT: JOHN B. THOMPSON
PHONE: (248) 689-9090 EXT. 1109
FAX: (248) 689-1044
EMAIL: JTHOMPSON@PEAINC.COM

LANDSCAPE ARCHITECT:

PEA, INC.
7927 NEMCO WAY, SUITE 115
BRIGHTON, MI 48116
CONTACT: JANET EVANS, P.L.A.
PHONE: (517) 546-8583
FAX: (517) 546-8973
EMAIL: JEVANS@PEAINC.COM

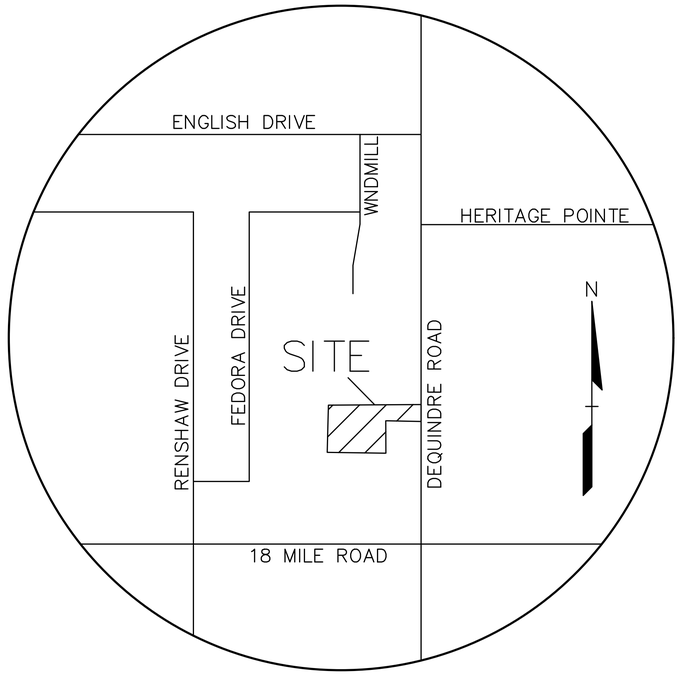
ARCHITECT:

MGA ARCHITECTS/DESIGNERS
MOISEEV/GORDON ASSOCIATES, INC.
4351 DELEMERE COURT
ROYAL OAK, MI 48073
CONTACT: ANDREW J. MOISEEV, RA
PHONE: (248) 549-4500 EXT. 221
FAX: (248) 549-7300
PHONE: ANDREWM@MGA-ARCHITECTS.NET

LEGAL DESCRIPTION
(Per City of Troy Assessor)

PARCEL ID 20-12-476-070
Land in the City of Troy, Oakland County, Michigan, described as follows:

Part of Lots 10, 11 and 12 of JENNINGS SUBDIVISION, as recorded in Liber 59, Page 8, Oakland County Records, beginning at point distant North 00 degrees 08 minutes 52 West 60 feet and North 89 degrees 32 minutes 26 seconds West 60 feet and North 00 degrees 08 minutes 52 West 493.11 feet from the Southeast section corner; thence North 88 degrees 10 minutes 33 seconds West 170 feet; thence South 75 degrees 18 minutes 21 seconds West 70.21 feet; thence South 00 degrees 08 minutes 52 seconds East 159.98 feet; thence North 88 degrees 11 minutes 10 seconds West 371.57 feet; thence North 00 degrees 08 minutes 43 seconds West 240 feet; thence South 88 degrees 10 minutes 33 seconds East 609.56 feet; thence South 00 degrees 08 minutes 52 seconds East 59.99 feet to beginning.



LOCATION MAP
NO SCALE

Sheet List Table

C-0.0 COVER SHEET
C-1.0 TOPOGRAPHIC SURVEY
C-2.0 PRELIMINARY SITE PLAN
C-3.0 PRELIMINARY GRADING PLAN
C-4.0 PRELIMINARY UTILITY PLAN
L-1.0 PRELIMINARY LANDSCAPE PLAN
L-1.1 LANDSCAPE DETAILS
T-1.0 PRELIMINARY PRESERVATION PLAN

NOT FOR CONSTRUCTION

XREF: S:\PROJECTS\2016\2016-368\DWG\TOPOBASE-16368.DWG
XREF: S:\PROJECTS\2016\2016-368\DWG\XBASE-16368.DWG
XREF: S:\PROJECTS\2016\2016-368\DWG\XTBLK-16368.DWG

No.	BY	CHK	DESCRIPTION	DATE

REVISIONS

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t: 248.689.9090
f: 248.689.1044
www.peainc.com

GARY ABITHEIRA
986 EMLSFORD DR.
TROY, MI 48083

COVER SHEET
GFA 18 MILE & DEQUINDRE
PART OF THE SOUTHEAST 1/4 OF SECTION 12, T. 02N., R. 11E.,
TROY, OAKLAND COUNTY, MI

DES.	TK	DN.	MM	SUR.	RQ	P.M.	JBT

S:\PROJECTS\2016\2016-368 GFA 18 MILE & DEQUINDRE-JPB\Dwg\Site Plans\(C-1.0) COVER-16368.dwg

ORIGINAL ISSUE DATE:
SEPTEMBER 18, 2019

PEA JOB NO. 2016-368

SCALE: N.T.S.

DRAWING NUMBER:
C-0.0

LEGAL DESCRIPTION
(Per City of Troy Assessor)

PARCEL ID 20-12-476-070
Land in the City of Troy, Oakland County, Michigan, described as follows:

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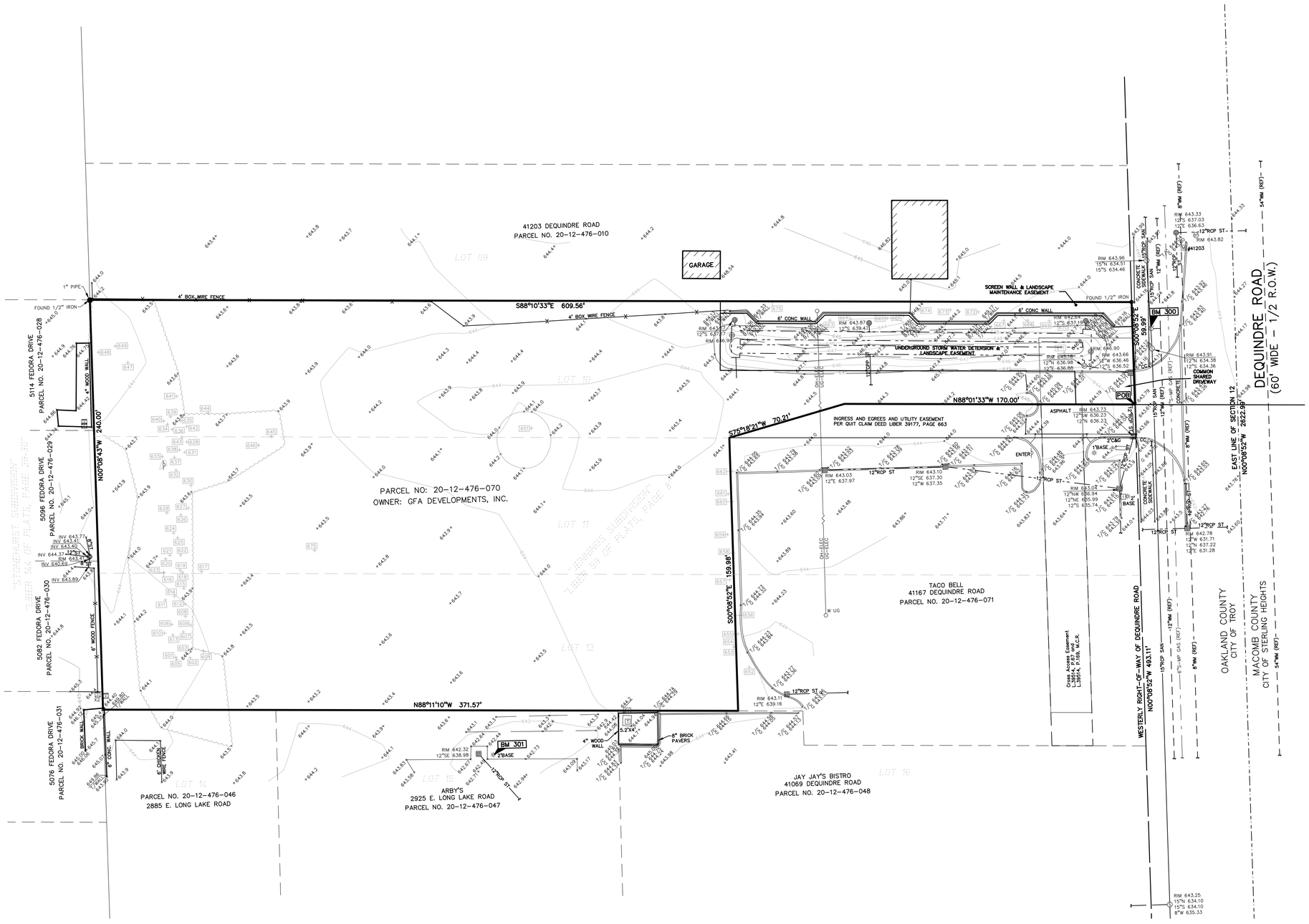
FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0552F, DATED SEPTEMBER 29, 2006.

BENCHMARKS
(GPS DERIVED – NAVD88)

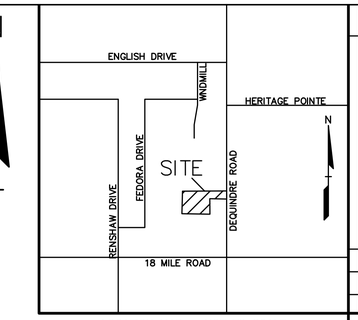
BM #300
PUNCH MARK ON ARROW OF A HYDRANT LOCATED ON THE WEST SIDE OF DEQUINDRE ROAD, APPROX. 45'± NORTHEAST OF THE NORTHEAST PROPERTY CORNER.
ELEV. = 645.78

BM #301
PUNCH MARK ON THE NORTHWEST BOLT OF A LIGHT POLE LOCATED AT THE NORTH SIDE OF THE ARBY'S PARKING LOT, APPROX. 26'± SOUTH OF THE SOUTH PROPERTY LINE.
ELEV. = 645.29

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, YARD DRAIN
- 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

GAS CONSUMERS ENERGY QUARTER SECTION MAP 02-61-12-4, DATED 10-21-05

CITY OF TROY UTILITY GIS MAP

TACO BELL GRADING AND UTILITY PLAN, DESIGN, INC. PROJECT NO. 61055, DWG. NAME 055UT, DATED 11-07-07

TACO BELL SITE PLAN, DESIGN, INC. PROJECT NO. 61055, DWG. NAME 055SP, DATED 6-27-07

No.	BY	CHK	DESCRIPTION	DATE
			REVISIONS	

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TROY, MI 48083

TOPOGRAPHIC SURVEY
GFA 18 MILE & DEQUINDRE
PART OF THE SOUTHEAST 1/4 OF SECTION 12, T. 02N., R. 11E., TROY, OAKLAND COUNTY, MI

DES.	DN.	SUR.	P.M.
TK	MM	RQ	JBT

S:\PROJECTS\2016\2016-368 GFA 18 MILE & DEQUINDRE-JP8\Dwg\Site Plans\[C-1.0] TOPO-16368.dwg

ORIGINAL ISSUE DATE:
SEPTEMBER 18, 2019

PEA JOB NO. 2016-368

SCALE: 1" = 30'

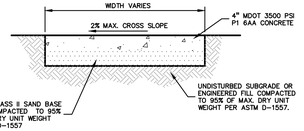
DRAWING NUMBER:
C-1.0

NOT FOR CONSTRUCTION

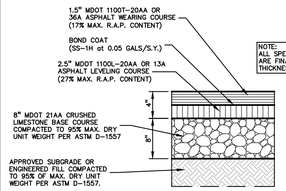
XREF: S:\PROJECTS\2016\2016-368\DWG\TOPOBASE-16368.DWG
XREF: S:\PROJECTS\2016\2016-368\DWG\XBASE-16368.DWG
XREF: S:\PROJECTS\2016\2016-368\DWG\XTBLK-16368.DWG

NOTE:
CROSS-SLOPE OF SIDEWALK MUST NOT EXCEED 2.0%, EXCEPT IN TRANSITION AREA MATCHING INTO EXISTING SIDEWALK

PROVIDE 1" DEPTH SAWCUT CONTROL JOINTS AT INTERVALS EQUAL TO THE WIDTH OF THE SIDEWALK (NOT TO EXCEED 8' INTERVAL).

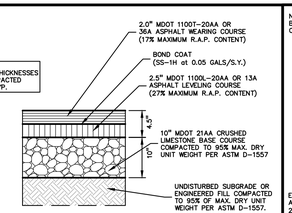


CONCRETE SIDEWALK
NOT TO SCALE



STANDARD DUTY ASPHALT DETAIL
(NOT FOR USE IN THE RIGHT-OF-WAY)
NOT TO SCALE

NOTE:
ALL SPECIFIED THICKNESSES ARE FINAL COMPACTED THICKNESSES, TYP.

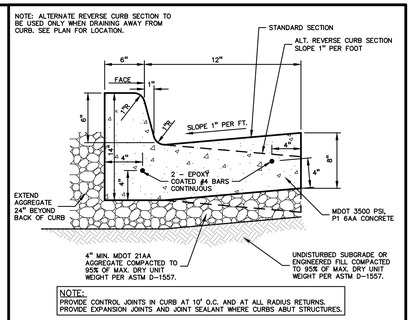


HEAVY DUTY ASPHALT DETAIL
(NOT FOR USE IN THE RIGHT-OF-WAY)
NOT TO SCALE

AGGREGATE BASE NOTE:
THIS PAVEMENT SECTION DESIGN ASSUMES THE USE OF MDOT 21AA CRUSHED LIMESTONE BASE MATERIAL THAT MEETS THE REQUIREMENTS OF MDOT STANDARD SPECIFICATION SECTION 902 FOR AGGREGATES. IF CRUSHED CONCRETE AGGREGATE BASE IS PROPOSED IN LIEU OF THE SPECIFIED CRUSHED LIMESTONE MATERIAL, PEA INC. WILL REQUIRE A MINIMUM 25% INCREASE IN BASE THICKNESS. HOWEVER, IF TESTING DOCUMENTATION IS PROVIDED TO PEA, INC. THAT SHOWS THAT THE CRUSHED CONCRETE MATERIAL MEETS ALL REQUIREMENTS OF MDOT SPECIFICATION SECTION 902, THEN THE 25% INCREASE IN THICKNESS MAY BE REEVALUATED.

ASPHALT MATERIAL NOTES:
HOT-MIX ASPHALT MIXTURES UTILIZING RECYCLED ASPHALT PAVEMENT (RAP) MUST MEET MDOT SPECIAL PROVISION 12SPS01(E). THE BINDER GRADE FOR THIS WORK IS PG58-22. IF ASPHALT MIXES CONTAINING RAP ARE TO BE SUPPLIED FOR THIS PROJECT, THE ASPHALT BINDER MUST BE REVISED PER MDOT TIER 1' OR TIER 2' REQUIREMENTS (RAP CONTENT UP TO 27% MAXIMUM). TIER 3 MIXES ARE NOT ACCEPTABLE ON THIS PROJECT. AN ASPHALT MIX DESIGN FOR ALL SPECIFIED MIXES SHOULD BE FORWARDED TO PEA INC. FOR REVIEW PRIOR TO CONSTRUCTION

NOTE: ALTERNATE REVERSE CURB SECTION TO BE USED ONLY WHEN DRAINING AWAY FROM CURB. SEE PLAN FOR LOCATION.

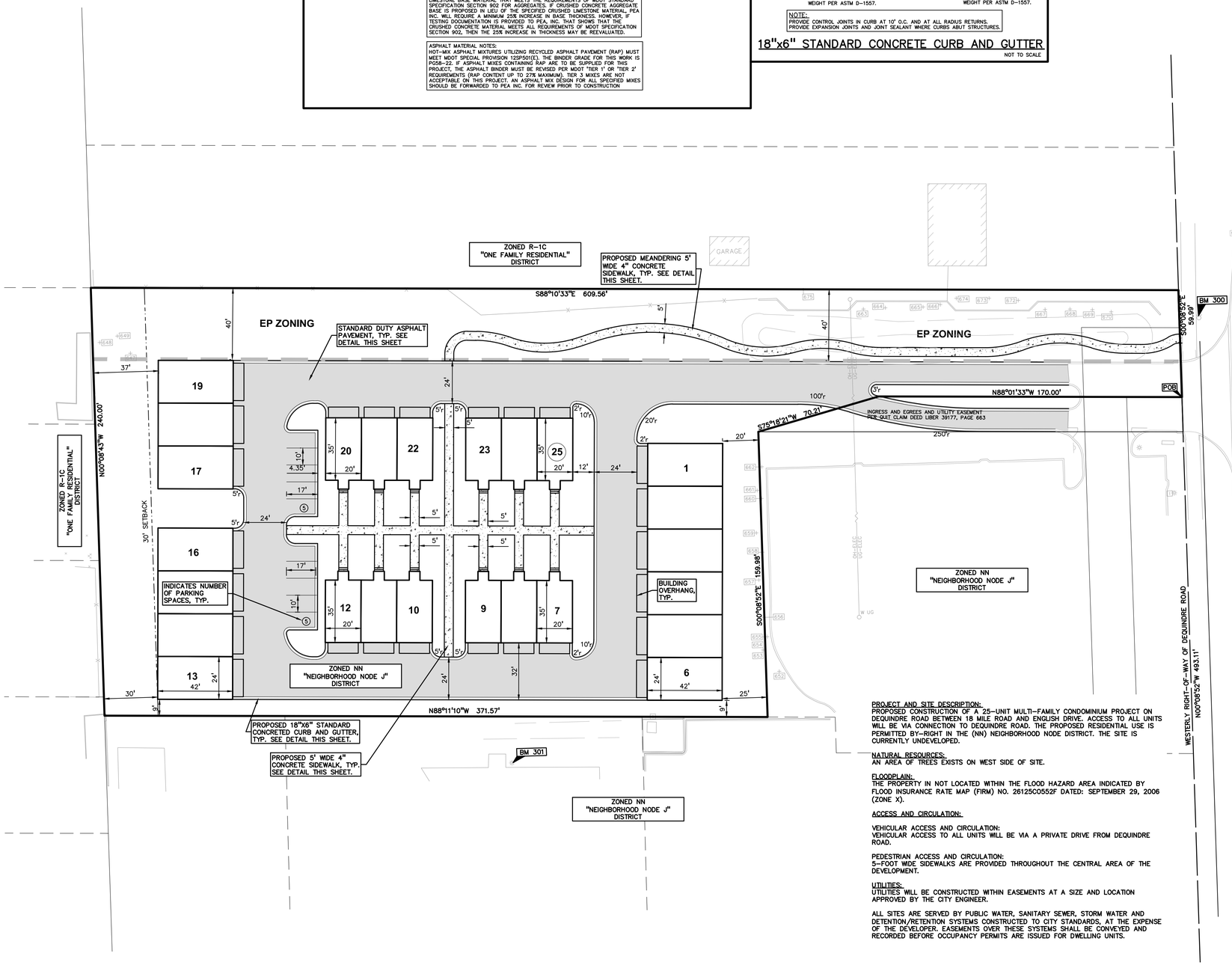


NOTE:
PROVIDE CONTROL JOINTS IN CURB AT 10' O.C. AND AT ALL RADIUS RETURNS. PROVIDE EXPANSION JOINTS AND JOINT SEALANT WHERE CURBS ABUT STRUCTURES.

18"x6" STANDARD CONCRETE CURB AND GUTTER
NOT TO SCALE

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

NOTE:
ALL WORK IN THE DEQUINDRE ROAD RIGHT-OF-WAY IS UNDER THE JURISDICTION OF THE ROAD COMMISSION FOR OAKLAND COUNTY AND REQUIRES A PERMIT.



PROJECT AND SITE DESCRIPTION:
PROPOSED CONSTRUCTION OF A 25-UNIT MULTI-FAMILY CONDOMINIUM PROJECT ON DEQUINDRE ROAD BETWEEN 18 MILE ROAD AND ENGLISH DRIVE. ACCESS TO ALL UNITS WILL BE VIA CONNECTION TO DEQUINDRE ROAD. THE PROPOSED RESIDENTIAL USE IS PERMITTED BY-RIGHT IN THE (NN) NEIGHBORHOOD NODE DISTRICT. THE SITE IS CURRENTLY UNDEVELOPED.

NATURAL RESOURCES:
AN AREA OF TREES EXISTS ON WEST SIDE OF SITE.

FLOODPLAIN:
THE PROPERTY IN NOT LOCATED WITHIN THE FLOOD HAZARD AREA INDICATED BY FLOOD INSURANCE RATE MAP (FIRM) NO. 26125C0552F DATED: SEPTEMBER 29, 2006 (ZONE X).

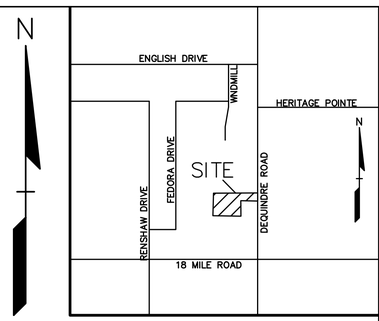
ACCESS AND CIRCULATION:

VEHICULAR ACCESS AND CIRCULATION:
VEHICULAR ACCESS TO ALL UNITS WILL BE VIA A PRIVATE DRIVE FROM DEQUINDRE ROAD.

PEDESTRIAN ACCESS AND CIRCULATION:
5-FOOT WIDE SIDEWALKS ARE PROVIDED THROUGHOUT THE CENTRAL AREA OF THE DEVELOPMENT.

UTILITIES:
UTILITIES WILL BE CONSTRUCTED WITHIN EASEMENTS AT A SIZE AND LOCATION APPROVED BY THE CITY ENGINEER.

ALL SITES ARE SERVED BY PUBLIC WATER, SANITARY SEWER, STORM WATER AND DETENTION/RETENTION SYSTEMS CONSTRUCTED TO CITY STANDARDS, AT THE EXPENSE OF THE DEVELOPER. EASEMENTS OVER THESE SYSTEMS SHALL BE CONVEYED AND RECORDED BEFORE OCCUPANCY PERMITS ARE ISSUED FOR DWELLING UNITS.



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	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
Y.D.	SQUARE, ROUND & BEEHIVE CATCH BASIN, YARD DRAIN
	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

671.21
671
STD DUTY | HEAVY DUTY | R.O.W. ONLY
STD DUTY | HEAVY DUTY | DEEP STRENGTH

REFERENCE DRAWINGS

GAS CONSUMERS ENERGY QUARTER SECTION MAP 02-61-12-4, DATED 10-21-05

CITY OF TROY UTILITY GIS MAP

TACO BELL GRADING AND UTILITY PLAN, DESIGN, INC. PROJECT NO. 61055, DWG. NAME 055UT, DATED 11-07-07

TACO BELL SITE PLAN, DESIGN, INC. PROJECT NO. 61055, DWG. NAME 055SP, DATED 6-27-07

SITE DATA TABLE:

SITE AREA: 2.389 ACRES (104,056.4021 SQ.FT.) NET AND GROSS

ZONING: NN, SITE TYPE NN:B AND EP

PROPOSED USE: TOWNHOMES

BUILDING INFORMATION:
MAXIMUM ALLOWABLE BUILDING HEIGHT = 55 FEET (4 STORIES)
PROPOSED BUILDING HEIGHT = 2 STORY

BUILDING FOOTPRINT AREA = 21,864 SQ.FT.

BUILDING LOT COVERAGE = 21%

SETBACK REQUIREMENTS:

NN:B ZONING DISTRICT:

FRONT SETBACK (EAST):	10 FEET REQUIRED	20' PROVIDED
SIDE SETBACK (NORTH):	0 FEET REQUIRED	40' PROVIDED
SIDE SETBACK (SOUTH):	0 FEET REQUIRED	9' PROVIDED
REAR SETBACK (WEST):	30 FEET REQUIRED	30' PROVIDED

PARKING CALCULATIONS:
MULTIFAMILY = 2 SPACES PER UNIT REQUIRED
TOTAL REQUIRED PARKING = 2 X 25 GARAGE = 50 SPACES
TOTAL GUEST PARKING = 10 SPACES

TOTAL PROVIDED PARKING = 60 SPACES (INCLUDES 2-CAR GARAGES)

OPEN SPACE:
MINIMUM OPEN SPACE REQUIRED = 20%
PROVIDED OPEN SPACE = 45%

SITE SOILS INFORMATION:
ACCORDING TO THE USDA NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY FOR OAKLAND COUNTY, THE SITE CONSISTS OF THE FOLLOWING SOIL TYPES:

52A - SELFRIDGE LOAMY SAND, 0 TO 3 PERCENT SLOPES

NOT FOR CONSTRUCTION

XREF: S:\PROJECTS\2016\2016-368\DWG\TOPOBASE-16368.DWG
XREF: S:\PROJECTS\2016\2016-368\DWG\XBASE-16368.DWG
XREF: S:\PROJECTS\2016\2016-368\DWG\XTBLK-16368.DWG

No.	BY	CHK	DESCRIPTION	DATE
			REVISIONS	

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GARY ABITHEIRA
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TROY, MI 48083

PRELIMINARY SITE PLAN
GFA 18 MILE & DEQUINDRE
PART OF THE SOUTHEAST 1/4 OF SECTION 12, T. 02N., R. 11E., TROY, OAKLAND COUNTY, MI

DES.	TK	DN.	MM	SUR.	RO	P.M.	JBT

S:\PROJECTS\2016\2016-368 GFA 18 MILE & DEQUINDRE - PRELIM\Dwg\SITE Plans\(C-2.0) DBA-16368.dwg

ORIGINAL ISSUE DATE:
SEPTEMBER 18, 2019

PEA JOB NO. 2016-368

SCALE: 1" = 30'

DRAWING NUMBER:
C-2.0

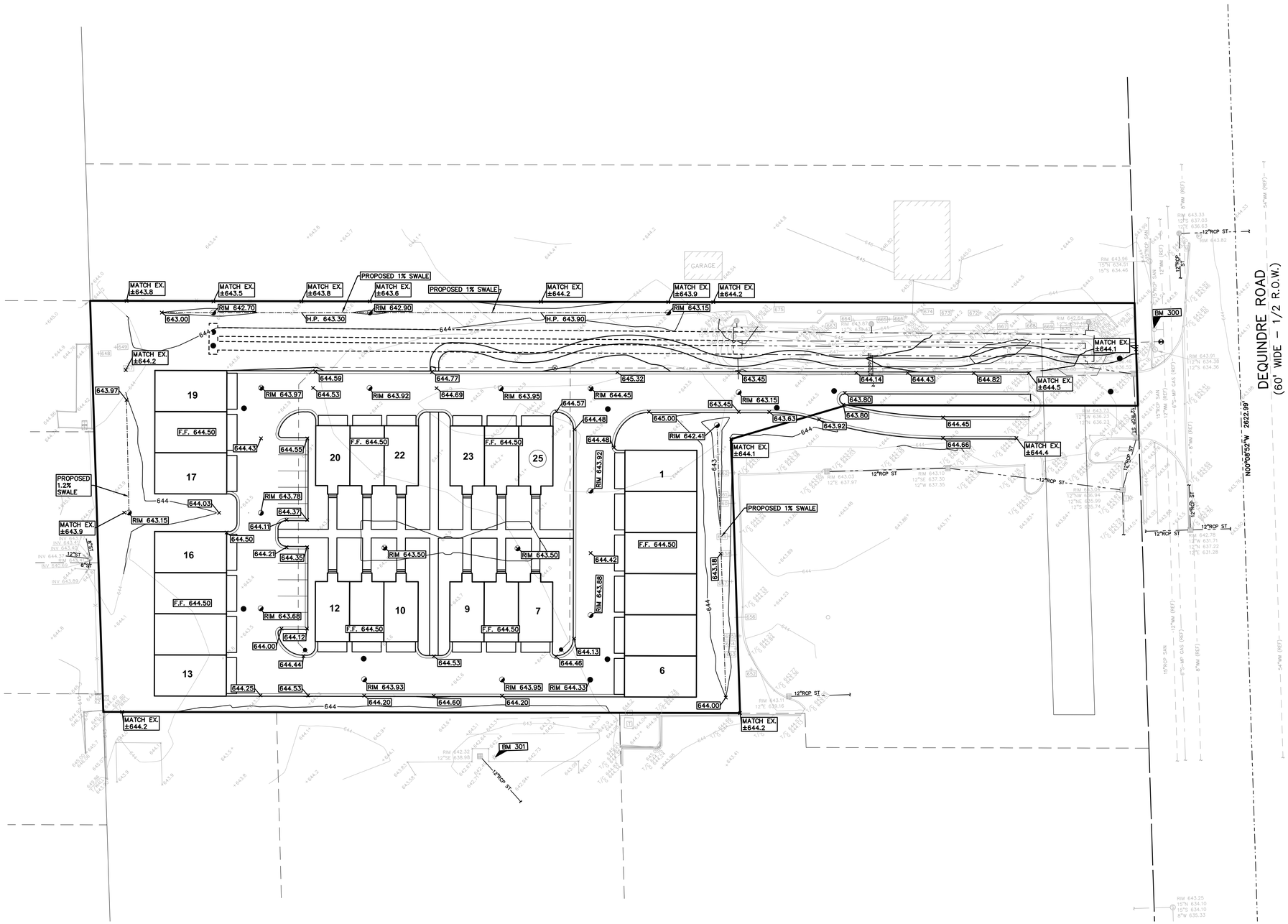
FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0552F, DATED SEPTEMBER 29, 2006.

BENCHMARKS
(GPS DERIVED – NAVD88)

BM #300
PUNCH MARK ON ARROW OF A HYDRANT LOCATED ON THE WEST SIDE OF DEQUINDRE ROAD, APPROX. 45'± NORTHEAST OF THE NORTHEAST PROPERTY CORNER.
ELEV. – 645.78

BM #301
PUNCH MARK ON THE NORTHWEST BOLT OF A LIGHT POLE LOCATED AT THE NORTH SIDE OF THE ARBY'S PARKING LOT, APPROX. 26'± SOUTH OF THE SOUTH PROPERTY LINE.
ELEV. – 645.29

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


DEQUINDRE ROAD
(60' WIDE – 1/2 R.O.W.)
N00°08'52"W 2622.99'
MATCH EX. ±643.8
MATCH EX. ±643.5
MATCH EX. ±643.8
MATCH EX. ±643.6
PROPOSED 1% SWALE
MATCH EX. ±644.2
MATCH EX. ±643.9
MATCH EX. ±644.2
RIM 642.70
643.00
H.P. 643.30
RIM 642.90
H.P. 643.90
RIM 643.15
644
GARAGE
MATCH EX. ±644.2
MATCH EX. ±644.1
BM 300
643.97
644.59
644.53
644.77
645.32
643.45
644.14
644.43
644.82
MATCH EX. ±644.5
19
RIM 643.97
RIM 643.92
644.69
RIM 643.95
644.57
RIM 644.45
RIM 643.15
643.80
643.63
643.80
644.45
F.F. 644.50
644.43
644.55
F.F. 644.50
F.F. 644.50
644.48
644.48
645.00
RIM 642.41
644.92
644.66
MATCH EX. ±644.1
MATCH EX. ±644.4
20
22
23
25
1
17
PROPOSED 1.2% SWALE
644.03
RIM 643.78
644.37
644.11
644.50
RIM 643.15
MATCH EX. ±643.9
12"ST
8"SS
644.21
644.35
RIM 643.50
RIM 643.50
644.42
F.F. 644.50
16
12
10
9
7
RIM 643.68
644.12
644.00
644.44
F.F. 644.50
F.F. 644.50
644.13
644.46
RIM 643.68
643.18
PROPOSED 1% SWALE
644
643
13
644.25
644.53
RIM 643.93
RIM 643.95
RIM 644.33
644.20
644.60
644.20
644.00
6
MATCH EX. ±644.2
MATCH EX. ±644.2
BM 301
12"RCP ST
12"RCP ST
12"RCP ST

Project: GFA 18 MILE & DEQUINDRE
Location: TROY, MI
Date: 9/16/2019
Project No: 2016-368

25 YEAR STORM DETENTION DESIGN (OAKLAND COUNTY DESIGN METHOD)

Contributing Area (A):	2.39	AC.
Allowable Discharge (Qa)	0.48	C.F.S. (=0.2 CFS/AC.)
Coefficient of Runoff (Cr):	0.56	

Calculation of Required Discharge/Acre

Qo = ((Qa)/(A)(Cr): 0.36

T = -25 + ((8062.5/Qo))0.5: 125.25

Storage Volume Required:

Vs = (12900(T)/(T+25)) - 40Qo(T): 8964.29

Vt = (Vs)(A)(Cr): **11997.8**

PIPE STORAGE:	
L=	612 ft.
SIZE=	60 in.
C.F./FT.=	19.625 c.f./ft.
VOLUME=	12,010.50 c.f.

CALCULATIONS OF EXISTING U.G. DETENTION:

PER TACO BALL AS-BUILT DRAWINGS DATED 11-09-07.

EXISTING UNDERGROUND 25 YEAR STORM DETENTION DESIGN

Contributing Area (A):	1.35	AC.
Allowable Discharge (Qa)	0.27	C.F.S. (=0.2 CFS/AC.)
Coefficient of Runoff (Cr):	0.59	

Calculation of Required Discharge/Acre

Qo = ((Qa)/(A)(Cr): 0.34

T = -25 + ((8062.5/Qo))0.5: 129

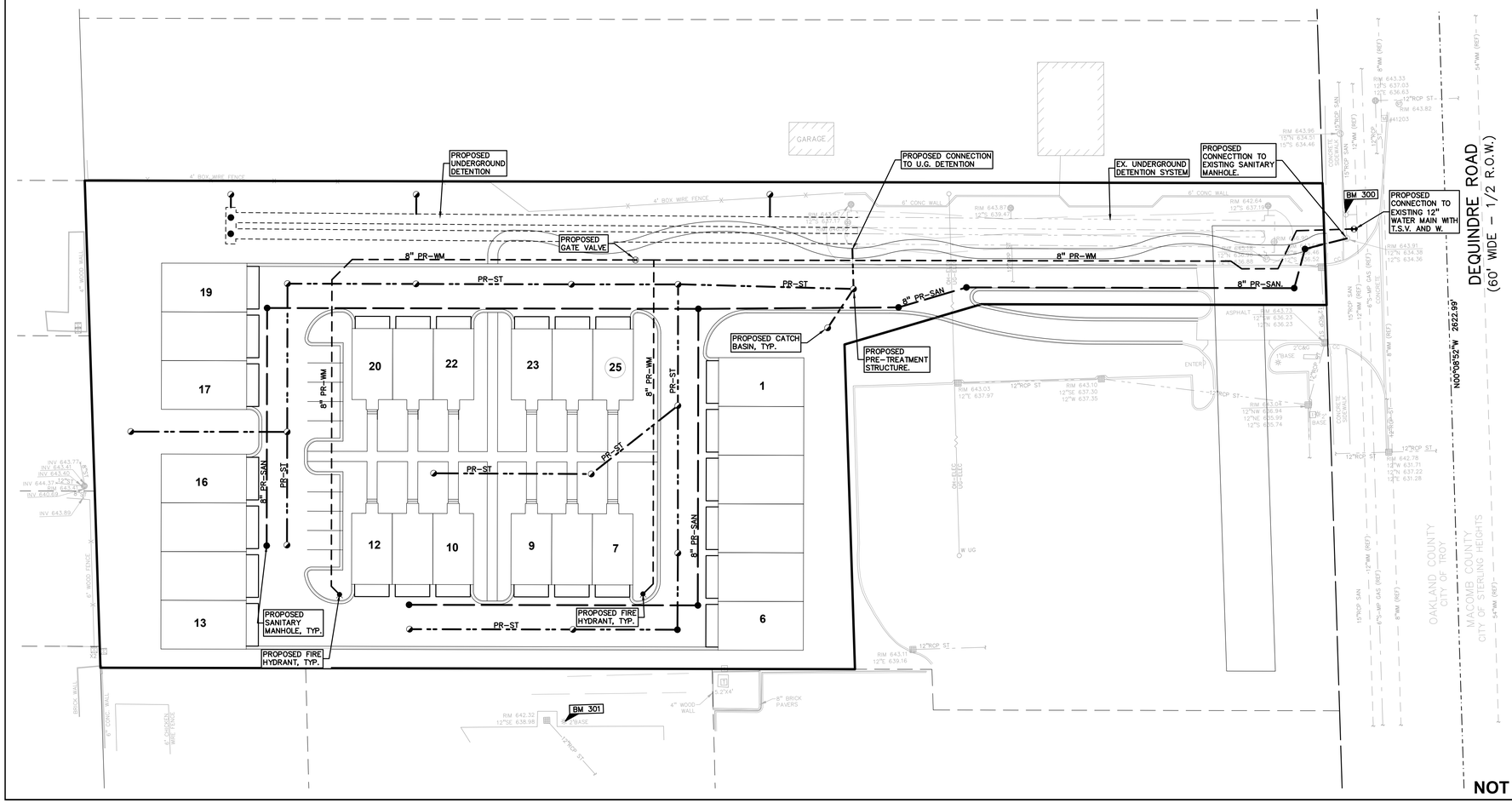
Storage Volume Required:

Vs = (12900(T)/(T+25)) - 40Qo(T): 9057

Vt = (Vs)(A)(Cr): 7214

PROVIDED STORAGE IN UNDERGROUND DETENTION

DETENTION SYSTEM PROVIDED: 60" SLCPP PIPE
STORAGE PER LINEAR FOOT OF PIPE: 19.63 C.F.
NUMBER OF ROWS PROVIDED: 2
LENGTH OF ROWS PROVIDED: 200 L.F.
TOTAL STORAGE VOLUME PROVIDED (2 X 200 X 19.63): 7852 C.F



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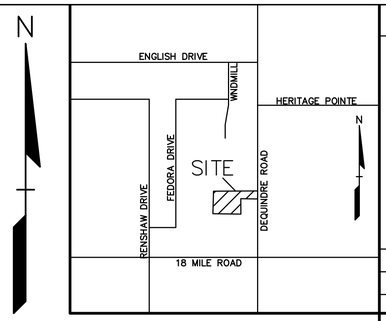
XREF: S:\PROJECTS\2016\2016-368\DWG\XTBLK-16368.DWG



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	PROPOSED	
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-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
Y.D.	Y.D.	SQUARE, ROUND & BEEHIVE CATCH BASIN, YARD DRAIN
		POST INDICATOR VALVE
		WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
M T T		MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
?		UNIDENTIFIED STRUCTURE
816.06	671.21	SPOT ELEVATION
670	671	CONTOUR LINE
		FENCE
		GUARD RAIL
		STREET LIGHT
		SIGN
CONC.	STD DUTY / HEAVY DUTY / R.O.W. ONLY	CONCRETE
ASPH.	STD DUTY / HEAVY DUTY / DEEP STRENGTH	ASPHALT
GRAVEL		GRAVEL SHOULDER
		WETLAND

REFERENCE DRAWINGS

GAS CONSUMERS ENERGY QUARTER SECTION MAP 02-61-12-4, DATED 10-21-05
CITY OF TROY UTILITY QS MAP
TACO BELL GRADING AND UTILITY PLAN, DESIGN, INC. PROJECT NO. 61055, DWG. NAME 055UT, DATED 11-07-07
TACO BELL SITE PLAN, DESIGN, INC. PROJECT NO. 61055, DWG. NAME 055SP, DATED 6-27-07

NOTE:

ALL WORK IN THE DEQUINDRE ROAD RIGHT-OF-WAY IS UNDER THE JURISDICTION OF THE ROAD COMMISSION FOR OAKLAND COUNTY AND REQUIRES A PERMIT.

GRAPHIC SCALE

-30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

No.	BY	CHK	DESCRIPTION	DATE
			REVISIONS	

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986 EMLSFORD DR.
TROY, MI 48083

PRELIMINARY UTILITY PLAN
GFA 18 MILE & DEQUINDRE
PART OF THE SOUTHEAST 1/4 OF SECTION 12, T. 02N., R. 11E., TROY, OAKLAND COUNTY, MI

DES.	TK	DN.	MM	SUR.	RQ	P.M.	JBT

\\peainc.local\pea\PROJECTS\2016\2016-368 GFA 18 MILE & DEQUINDRE--JPB\Dwg\Site Plans\(C-4.0) UTIL-16368.dwg

ORIGINAL ISSUE DATE:
SEPTEMBER 18, 2019

PEA JOB NO. 2016-368

SCALE: 1" = 30'

DRAWING NUMBER:
C-4.0

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

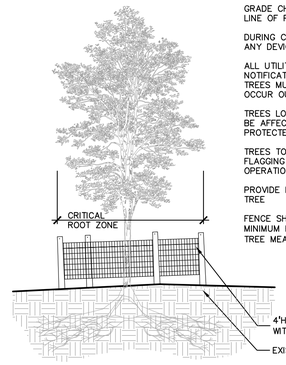
ALL UTILITY SERVICE REQUESTS MUST INCLUDE NOTIFICATION TO THE INSTALLER THAT PROTECTED TREES MUST BE AVOIDED. ALL TRENCHING SHALL OCCUR OUTSIDE OF THE PROTECTIVE FENCING

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

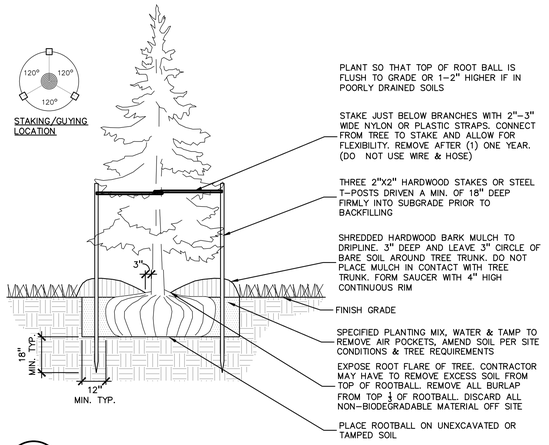
PROVIDE FENCE AROUND CRITICAL ROOT ZONE OF TREE

FENCE SHALL BE PLACED IN A CIRCLE WITH A MINIMUM RADIUS OF 1' PER 1" DIAMETER OF THE TREE MEASURED AT 4.5' ABOVE GROUND



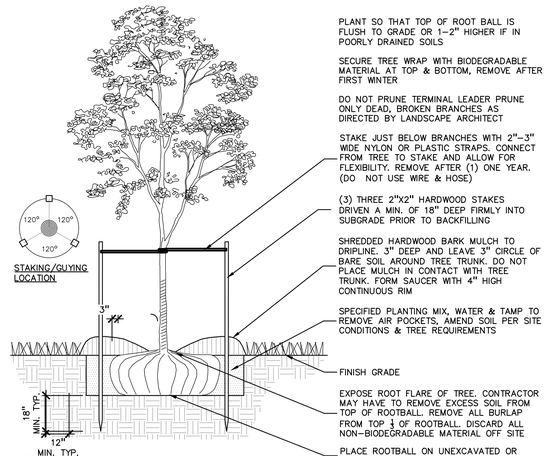
3 TREE PROTECTION DETAIL

SCALE: 1" = 3'-0"



2 EVERGREEN TREE PLANTING DETAIL

SCALE: 1" = 3'-0"



1 DECIDUOUS TREE PLANTING DETAIL

SCALE: 1" = 3'-0"

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XREF: S:\PROJECTS\2016\2016-368\DWG\CONSTRUCTION\368-BASE-15XXX.DWG
XREF: S:\PROJECTS\2016\2016-368\DWG\CONSTRUCTION\368-BLK-15XXX.DWG

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			REVISIONS	

STATE OF MICHIGAN
KIMBERLY DIETZEL
No. 1401
LANDSCAPE ARCHITECT

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GFA 18 MILE & DEQUINDRE
PART OF THE SOUTHEAST 1/4 OF SECTION 12, T. 02N., R.11E.,
TROY, OAKLAND COUNTY, MI

DES.	DN.	SUR.	P.M.
TK	MM	RQ	JBT

S:\PROJECTS\2016\2016-368 GFA 18 MILE & DEQUINDRE--JBT\Dwg\Landscape\(L-1.0) LANDSCAPE DETAILS-111808.dwg

ORIGINAL ISSUE DATE:
SEPTEMBER 18, 2019

PEA JOB NO. 2016-368

SCALE: SEE DWG

DRAWING NUMBER:
L-1.1

GRAPHIC SCALE

−30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

DECIDUOUS TREE PLANT LIST:					
QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC
2	AS2.5	Sugar Maple	*Acer saccharum 'Green Mountain'*	2.5" Cal.	B&B
2	QR2.5	Red Oak	*Quercus rubra*	2.5" Cal.	B&B
4	TOTAL DEC.				
EVERGREEN TREE PLANT LIST:					
QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC
7	AC8	Concolor Fir	*Abies concolor*	8' Ht.	B&B
7	PA8	Norway Spruce	*Picea abies*	8' Ht.	B&B
7	PC8	Columnar Norway Spruce	*Picea abies 'Cupressina'*	8' Ht.	B&B
7	PG8	Black Hills Spruce	*Picea glauca 'Densata'*	8' Ht.	B&B
5	PO8	Serbian Spruce	*Picea omorika*	8' Ht.	B&B
6	PB8	Lacebark Pine	*Pinus bungeana*	8' Ht.	B&B
10	PN8	Austrian Pine	*Pinus nigra*	8' Ht.	B&B
7	PS8	Eastern White pine	*Pinus strobus*	8' Ht.	B&B
56	TOTAL EVG.				

KEY

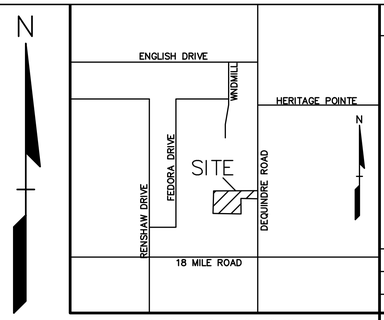
= EVERGREEN SCREENING TREES

= PARKING LOT TREES

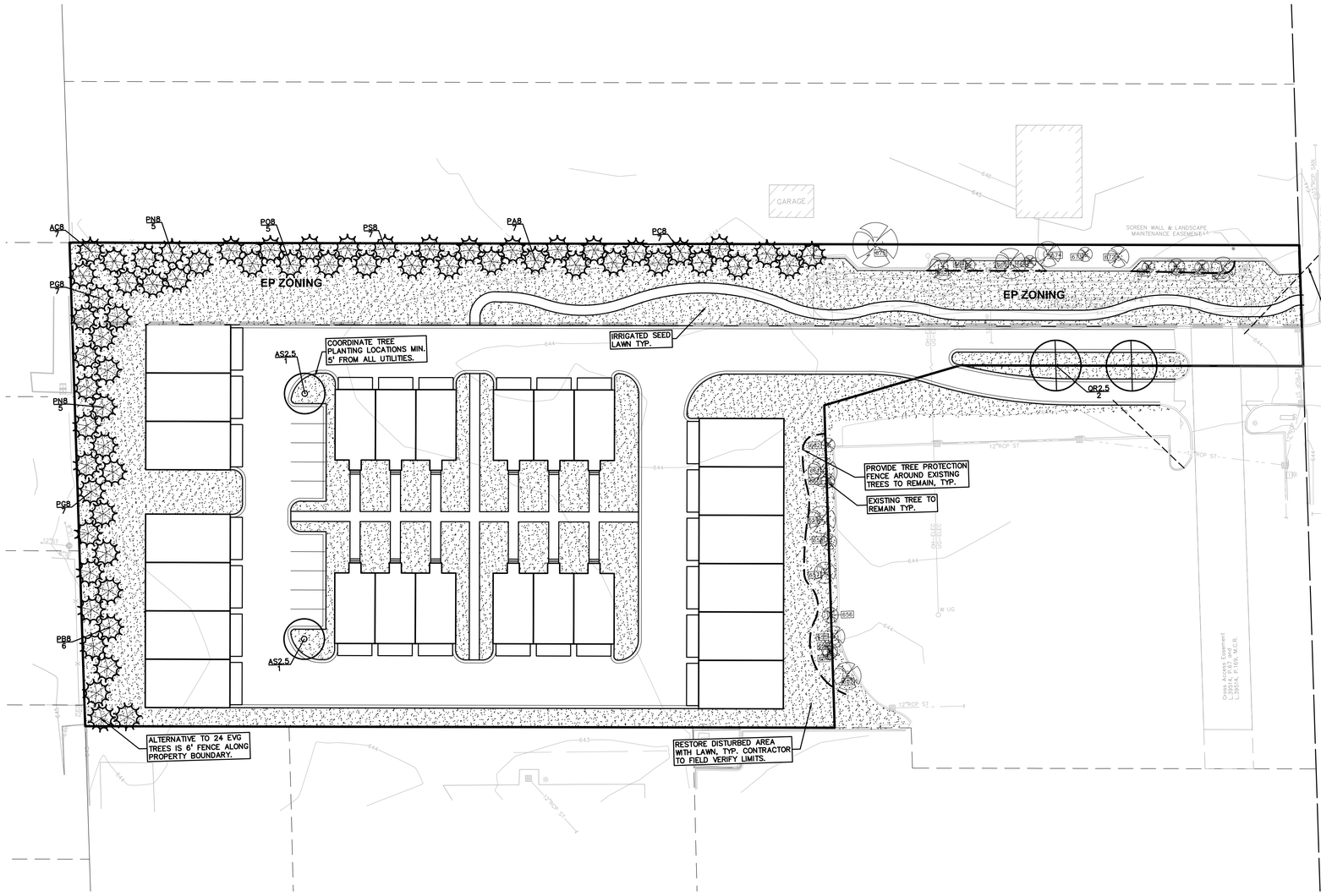
= GREENBELT TREES

= IRRIGATED SEED LAWN

= EXISTING TREES W/ TREE PROTECTION FENCING



LOCATION MAP – NOT TO SCALE



LANDSCAPE CALCULATIONS:

PER CITY OF TROY ZONING ORDINANCE; NN

GREENBELT TREES
REQUIRED: 1 DEC TREE / 30 LF OF STREET FRONTAGE. 60' OF RIGHT OF WAY/ 30 = 2 DEC TREES REQUIRED.

PROVIDED: 2 PROPOSED TREES

PARKING LOT TREES
REQUIRED: 1 TREE / 8 PARKING SPACES
10 SPACES / 8 = 2 TREES

PROVIDED: 2 TREES

REPLACEMENT TREES
REQUIRED: REPLACE 50% OF REMOVED DBH OF WOODLAND TREES, AND 100% OF REMOVED LANDMARK TREES DBH. 1 WOODLAND AND 1 LANDMARK TREES REMOVED, SEE CALCULATIONS THIS SHEET. 384" DBH CREDIT SAVED, 0 REPLACEMENT TREES REQUIRED.

PROVIDED: 27 EXISTING TREES SAVED, NO REPLACEMENT REQUIRED.

SCREENING TREES
REQUIRED: 1 LARGE EVG TREE / 10 LF (USE ALT 2: MULTIFAMILY ADJACENT TO SINGLE FAMILY RESIDENTIAL –NORTH & WEST).

NORTH–370 LF/10 = 37 LG EVG
(6' FENCE ALONG REMAINING PROPERTY BOUNDARY.)
WEST– 240 LF /10 = 24 LG EVG

PROVIDED: TREES
NORTH– 37 LG EVG
WEST– 24 LG EVG

GENERAL PLANTING NOTES:

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

NOT FOR CONSTRUCTION

XREF: S:\PROJECTS\2016\2016–368\DWG\TOPOBASE–16368.DWG
XREF: S:\PROJECTS\2016\2016–368\DWG\XBASE–16368.DWG
XREF: S:\PROJECTS\2016\2016–368\DWG\XTBLK–16368.DWG

No.	BY	CHK	DESCRIPTION	DATE
			REVISIONS	

STATE OF MICHIGAN
KIMBERLY A. DIETZEL
No. 1141
LANDSCAPE ARCHITECT

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t: 248.689.9090
f: 248.689.1044
www.peainc.com

GARY ABITHEIRA
986 EMLSFORD DR.
TROY, MI 48083

PRELIMINARY LANDSCAPE PLAN
GFA 18 MILE & DEQUINDRE
PART OF THE SOUTHEAST 1/4 OF SECTION 12, T. 02N., R. 11E., TROY, OAKLAND COUNTY, MI

DES.	DN.	SUR.	P.M.
TK	MM	RG	JBT

S:\PROJECTS\2016\2016–368 GFA 18 MILE & DEQUINDRE–JBT\Dwg\Landscape\XL–1.0 LANDSCAPE–16368.dwg

ORIGINAL ISSUE DATE:
SEPTEMBER 18, 2019

PEA JOB NO. 2016-368

SCALE: 1" = 30'

DRAWING NUMBER:
L-1.0

TAG	CODE	DBH	COMMON NAME	LATIN NAME	COND	NOTE	CLASS	SAVE / REMOVE	ON-SITE	REPLACE
601	EE	25	Siberian Elm	Ulmus pumila	Very-Poor		INVASIVE	R	Y	-
602	NS	6	Norway Spruce	Picea Abies	Very-Poor		WOODLAND	R	Y	-
603	EE	14	Siberian Elm	Ulmus pumila	Fair	1	INVASIVE	R	Y	-
604	CC	6	Choke Cherry	Prunus virginia	Poor		WOODLAND	R	Y	-
605	EE	6	Siberian Elm	Ulmus pumila	Good		INVASIVE	R	Y	-
606	EE	22	Siberian Elm	Ulmus pumila	Good		INVASIVE	R	Y	-
607	EE	7	Siberian Elm	Ulmus pumila	Very-Poor		INVASIVE	R	Y	-
608	EE	22	Siberian Elm	Ulmus pumila	Very-Poor		INVASIVE	R	Y	-
609	EE	25	Siberian Elm	Ulmus pumila	Good		INVASIVE	R	Y	-
610	EE	6	Siberian Elm	Ulmus pumila	Very-Poor		INVASIVE	R	Y	-
611	EE	13	Siberian Elm	Ulmus pumila	Poor		INVASIVE	R	Y	-
612	EE	14	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
613	EE	17	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
614	EE	13	Siberian Elm	Ulmus pumila	Poor		INVASIVE	R	Y	-
615	EE	19	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
616	EE	8	Siberian Elm	Ulmus pumila	Poor		INVASIVE	R	Y	-
617	EE	24	Siberian Elm	Ulmus pumila	Poor		INVASIVE	R	Y	-
618	EE	14	Siberian Elm	Ulmus pumila	Very-Poor		INVASIVE	R	Y	-
619	EE	12	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
620	EE	13	Siberian Elm	Ulmus pumila	Poor		INVASIVE	R	Y	-
621	EE	18	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
622	EE	8	Siberian Elm	Ulmus pumila	Poor		INVASIVE	R	Y	-
623	EE	8	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
624	EE	9	Siberian Elm	Ulmus pumila	Very-Poor		INVASIVE	R	Y	-
625	EE	20	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
626	EE	9	Siberian Elm	Ulmus pumila	Poor		INVASIVE	R	Y	-
627	EE	11	Siberian Elm	Ulmus pumila	Very-Poor		INVASIVE	R	Y	-
628	EE	8	Siberian Elm	Ulmus pumila	Very-Poor		INVASIVE	R	Y	-
629	EE	20	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
630	EE	13	Siberian Elm	Ulmus pumila	Very-Poor		INVASIVE	R	Y	-
631	EE	6	Siberian Elm	Ulmus pumila	Very-Poor		INVASIVE	R	Y	-
632	EE	19	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
633	MW	8	White Mulberry	Morus alba	Fair		INVASIVE	R	Y	-
634	EE	12	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
635	EE	14	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
636	EE	8	Siberian Elm	Ulmus pumila	Poor		INVASIVE	R	Y	-
637	EE	20	Siberian Elm	Ulmus pumila	Poor		INVASIVE	R	Y	-
638	EE	9	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
639	EE	22	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
640	MW	7	White Mulberry	Morus alba	Poor		INVASIVE	R	Y	-
641	E	12	American Elm	Ulmus americana	Fair		INVASIVE	R	Y	-
642	EE	8	Siberian Elm	Ulmus pumila	Very-Poor		INVASIVE	R	Y	-
643	EE	22	Siberian Elm	Ulmus pumila	Poor		INVASIVE	R	Y	-
644	BW	7	Black Walnut	Juglans nigra	Poor		WOODLAND	R	Y	-
645	CA	11	Crab Apple	Malus caronaria	Very-Poor		WOODLAND	R	Y	-
646	EE	20	Siberian Elm	Ulmus pumila	Poor		INVASIVE	R	Y	-
647	E	10	American Elm	Ulmus americana	Good		INVASIVE	R	Y	-
648	EE	16	Siberian Elm	Ulmus pumila	Good		INVASIVE	R	Y	-
649	EE	7	Siberian Elm	Ulmus pumila	Fair		INVASIVE	R	Y	-
650	BX	20	Box elder	Acer negundo	Very Poor		INVASIVE	S	Y	-
651	EE	13	Siberian Elm	Ulmus pumila	Fair	1	INVASIVE	R	Y	-
652	DF	13	Douglas Fir	Pseudotsuga menziesii	Good		WOODLAND	S	Y	-
653	BS	6	Blue Spruce	Picea pungens	Good		WOODLAND	S	Y	-
654	NS	8	Norway Spruce	Picea Abies	Good		WOODLAND	S	Y	-
655	NS	10	Norway Spruce	Picea Abies	Good		WOODLAND	S	Y	-
656	BS	7	Blue Spruce	Picea pungens	Poor		WOODLAND	S	Y	-
657	NS	10	Norway Spruce	Picea Abies	Good		WOODLAND	S	Y	-
658	BS	7	Blue Spruce	Picea pungens	Good		WOODLAND	S	Y	-
659	NS	13	Norway Spruce	Picea Abies	Fair		WOODLAND	S	Y	-
660	NS	6	Norway Spruce	Picea Abies	Good		WOODLAND	S	Y	-
661	NS	14	Norway Spruce	Picea Abies	Good		WOODLAND	S	Y	-
662	BS	6	Blue Spruce	Picea pungens	Good		WOODLAND	S	Y	-
663	DF	13	Douglas Fir	Pseudotsuga menziesii	Good		WOODLAND	S	Y	-
664	BS	7	Blue Spruce	Picea pungens	Good		WOODLAND	S	Y	-
665	DF	15	Douglas Fir	Pseudotsuga menziesii	Good		WOODLAND	S	Y	-
666	BS	6	Blue Spruce	Picea pungens	Good		WOODLAND	S	Y	-
667	BS	6	Blue Spruce	Picea pungens	Fair		WOODLAND	S	Y	-
668	DF	8	Douglas Fir	Pseudotsuga menziesii	Good		WOODLAND	S	Y	-
669	BS	7	Blue Spruce	Picea pungens	Good		WOODLAND	S	Y	-
670	NS	12	Norway Spruce	Picea Abies	Good		WOODLAND	S	Y	-
671	FC	6	Flowering Cherry	Prunus spp.	Good		WOODLAND	R	Y	REPLACE
672	DF	11	Douglas Fir	Pseudotsuga menziesii	Good		WOODLAND	S	Y	-
673	BS	7	Blue Spruce	Picea pungens	Good		WOODLAND	S	Y	-
674	NS	12	Norway Spruce	Picea Abies	Good		WOODLAND	S	Y	-
675	RB	22	River Birch	Betula nigra	Fair		LANDMARK	R	Y	REPLACE

GRAPHIC SCALE

−30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

KEY

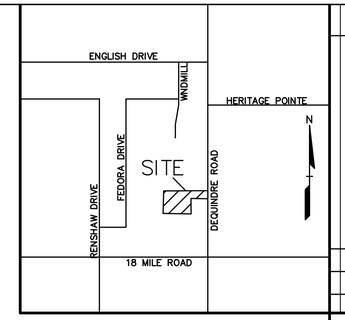
(2782) = EXISTING TREES TO REMAIN WITH TREE PROTECTION FENCING

(2782) = TREES TO BE REMOVED

WOODLAND TREES			
WOODLAND TREES REMOVED:	**1**		(REPLACE AT 50% OF REMOVED DBH)
6" DBH x 0.5 =		**3"**	REPLACEMENT
WOODLAND TREES SAVED:	21		(CREDIT OF 2X DBH)
197 DBH x 2 =		**394"**	CREDIT
3 -	394	=	-391
" " DBH REQUIRED FOR WOODLAND REPLACEMENT			

LANDMARK TREES			
LANDMARK TREES REMOVED:	1		(REPLACE AT 100% OF REMOVED DBH)
22" DBH x 1 =		**22"**	REPLACEMENT
LANDMARK TREES SAVED:	0		(CREDIT OF 2X DBH)
" DBH x 2 =		**"**	CREDIT
22 -	0	=	22

369 " TOTAL DBH CREDITED TOWARDS REPLACEMENT



LOCATION MAP – NOT TO SCALE

41203 DEQUINDRE ROAD
PARCEL NO. 20-12-476-010

EP ZONING

EP ZONING

EXISTING TREE TO BE REMOVED TYP.

PROVIDE TREE PROTECTION FENCE AROUND EXISTING TREES TO REMAIN, TYP.

EXISTING TREE TO REMAIN TYP.

INGRESS AND EGREES AND UTILITY EASEMENT
PER QUIT CLAIM DEED LIBER 39177, PAGE 663

PARCEL NO: 20-12-476-070
OWNER: GFA DEVELOPMENTS, INC.

5096 FEDORA DRIVE
PARCEL NO. 20-12-476-029

5082 FEDORA DRIVE
PARCEL NO. 20-12-476-030

5076 FEDORA DRIVE
PARCEL NO. 20-12-476-031

PARCEL NO. 20-12-476-046
2885 E. LONG LAKE ROAD

ARBY'S
2925 E. LONG LAKE ROAD
PARCEL NO. 20-12-476-047

TACO BELL
41167 DEQUINDRE ROAD
PARCEL NO. 20-12-476-071

JAY JAY'S BISTRO
41069 DEQUINDRE ROAD
PARCEL NO. 20-12-476-048

Cross Access Easement
L39514, P.67, and
L39514, P.169, M.C.R.

GARAGE

NOT FOR CONSTRUCTION

XREF: S:\PROJECTS\2016\2016-368\DWG\TOPOBASE-16368.DWG
XREF: S:\PROJECTS\2016\2016-368\DWG\XBASE-16368.DWG
XREF: S:\PROJECTS\2016\2016-368\DWG\XTBLK-16368.DWG

No.	BY	CHK	DESCRIPTION	DATE

REVISIONS

STATE OF MICHIGAN
KIMBERLY DIETZEL
No. 1741
LANDSCAPE ARCHITECT

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986 EMLSFORD DR.
TROY, MI 48083

PRELIMINARY PRESERVATION PLAN
GFA 18 MILE & DEQUINDRE
PART OF THE SOUTHEAST 1/4 OF SECTION 12, T. 02N., R. 11E.,
TROY, OAKLAND COUNTY, MI

DES.	DN.	SUR.	P.M.
TK	MM	RQ	JBT

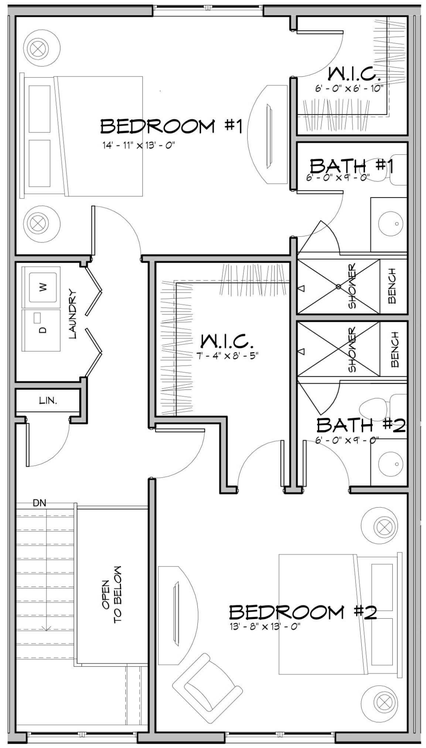
S:\PROJECTS\2016\2016-368 GFA 18 MILE & DEQUINDRE--PEA\Landscape\V(1-1-0) TREE PRESERVATION-16368.dwg

ORIGINAL ISSUE DATE:
SEPTEMBER 18, 2019

PEA JOB NO. 2016-368

SCALE: 1" = 30'

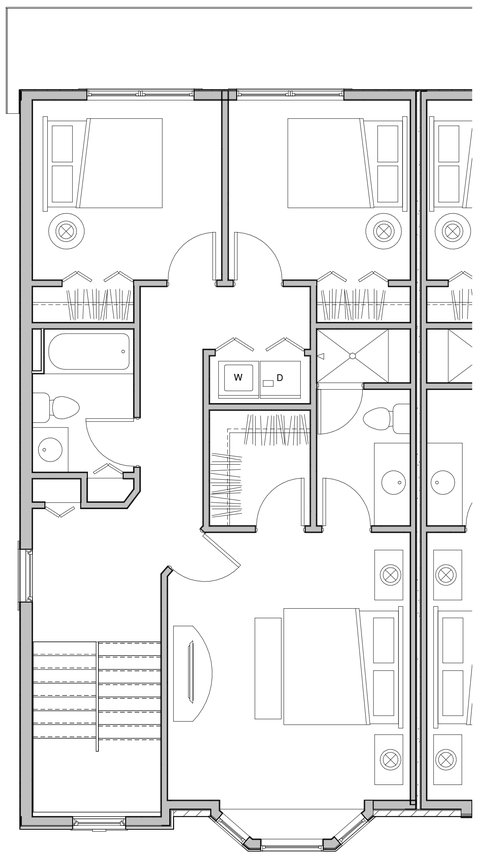
DRAWING NUMBER:
T-1.0



ALTERNATE #1

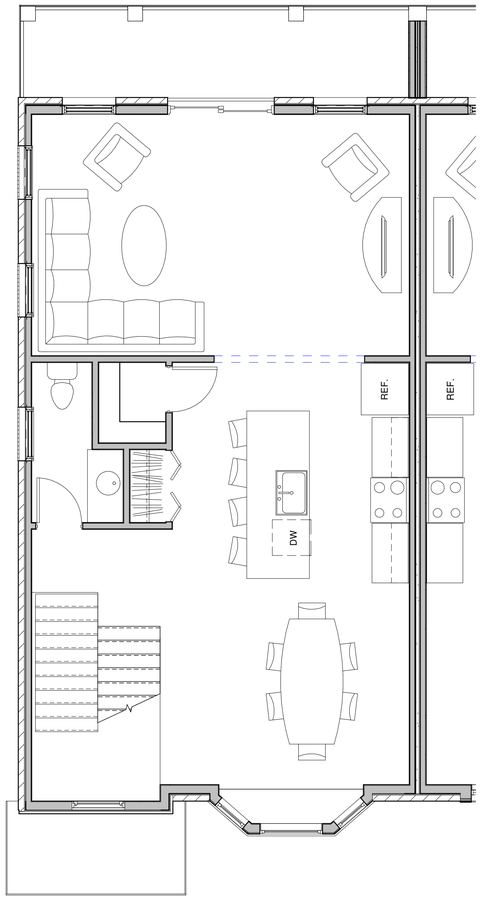
THIRD FLOOR ALTERNATE

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



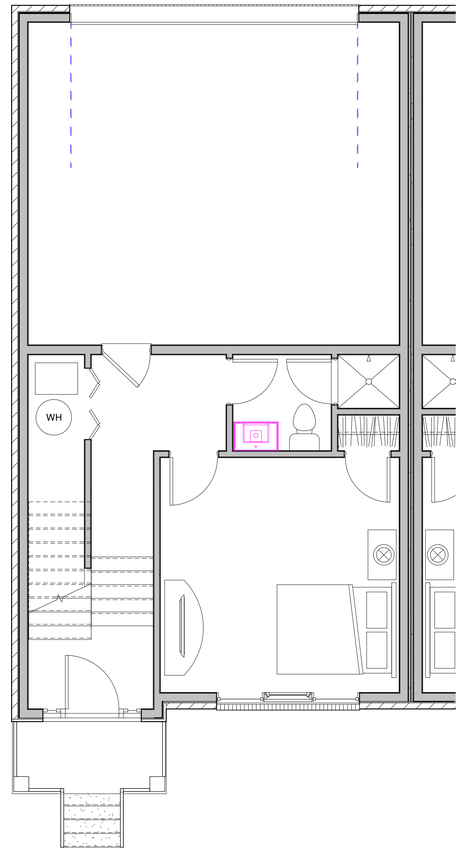
THIRD FLOOR PLAN

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



SECOND FLOOR

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



FIRST FLOOR

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

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

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248.549.7300 facs.

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Client:

GFA Development

Project Title:

Square Lake

Troy, MI

Sheet Title:

Unit Plans

Project Number: 16327
Drawn By: JB
Checked By: AJM
Approved By: AJM
Date: 1-13-17

Issued:

Owner Review	2017-01-13
Owner Review	2017-01-26
For Site Plan Approval	2018-03-27
For Site Plan Approval	2019-10-02

Sheet Number:

A1

10/2/2019 4:21:06 PM

FRONT

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

BACK

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

MGA
Architects/Designers

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

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Client:

GFA Development

Project Title:

Square Lake

Troy, MI

Sheet Title:

Proposed Elevation

Project Number: 16327
Drawn By: JB
Checked By: AJM
Approved By: AJM
Date: 1-13-17

Issued:

Owner Review	2017-01-13
Owner Review	2017-01-26
For Site Plan Approval	2018-03-27
For Site Plan Approval	2019-10-02

Sheet Number:

A2

10/2/2019 4:21:18 PM

SIDE

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

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Project Title:

Square Lake

Troy, MI

Sheet Title:

SIDE ELEVATION

Project Number: 16327
Drawn By: JB
Checked By: AJM
Approved By: AJM
Date: 1-13-17

Issued:

Owner Review	2017-01-13
Owner Review	2017-01-26
For Site Plan Approval	2018-03-27
For Site Plan Approval	2019-10-02

Sheet Number:

A3

10/2/2019 4:21:21 PM

FRONT

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

REAR

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

MGA
Architects/Designers

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

248.549.4500 voice
248.549.7300 facs.

www.mga-architects.net

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Client:

GFA Development

Project Title:

The Landings

Troy, MI

Sheet Title:

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For Site Plan Approval	2019-11-7

Sheet Number:

A2

11/7/2019 11:03:52 AM

SIDE

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

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11/7/2019 11:03:53 AM