



# PLANNING COMMISSION MEETING AGENDA REGULAR MEETING

500 W. Big Beaver  
Troy, MI 48084  
(248) 524-3364  
[www.troymi.gov](http://www.troymi.gov)  
[planning@troymi.gov](mailto:planning@troymi.gov)

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

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**February 10, 2015**

**7:00 P.M.**

**Council Chambers**

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1. ROLL CALL
2. APPROVAL OF AGENDA
3. MINUTES – January 27, 2015
4. PUBLIC COMMENT – For Items Not on the Agenda

### **PRELIMINARY SITE PLAN REVIEW**

5. PRELIMINARY SITE PLAN REVIEW (File Number SP 1002) – Proposed The Mark of Troy, Southeast corner of Maple and Axtell (2785 W Maple), Section 32, Currently Zoned IB (Integrated Industrial and Business) District

### **OTHER BUSINESS**

6. PUBLIC COMMENT – Items on Current Agenda
7. 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](mailto: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 Edmunds called the Regular meeting of the Troy City Planning Commission to order at 7:00 p.m. on January 27, 2015 in the Council Board Room of the Troy City Hall.

1. ROLL CALL

Present:

- Karen Crusse
- Donald Edmunds
- Michael W. Hutson
- Tom Krent
- Philip Sanzica
- Thomas Strat
- John J. Tagle

Also Present:

- R. Brent Savidant, Planning Director
- Ben Carlisle, Carlisle/Wortman Associates, Inc.
- Allan Motzny, Assistant City Attorney
- Kathy L. Czarnecki, Recording Secretary

2. APPROVAL OF AGENDA

**Resolution # PC-2015-01-004**

- Moved by: Hutson
- Seconded by: Krent

**RESOLVED**, To approve the Agenda as prepared.

Yes: All present (7)

**MOTION CARRIED**

3. APPROVAL OF MINUTES

**Resolution # PC-2015-01-005**

- Moved by: Strat
- Seconded by: Tagle

**RESOLVED**, To approve the minutes of the January 13, 2015 Regular meeting as published.

Yes: All present (7)

**MOTION CARRIED**

4. PUBLIC COMMENT – Items not on the Agenda

There was no one present who wished to speak.

5. ZONING BOARD OF APPEALS (ZBA) REPORT

There was no Zoning Board of Appeals meeting in January.

6. DOWNTOWN DEVELOPMENT AUTHORITY (DDA) REPORT

There was no Downtown Development Authority meeting in January.

7. PLANNING AND ZONING REPORT

Mr. Savidant addressed the following items:

- Planning Commission 2014 Annual Report.
- Economic Development Activity Update.
- Planning Commission Board appointments.
- 5-Year Parks and Recreation Plan.

### PRELIMINARY SITE PLAN REVIEW

8. PRELIMINARY SITE PLAN REVIEW (File Number SP 1002) – Proposed The Mark of Troy, Southeast corner of Maple and Axtell (2785 W Maple), Section 32, Currently Zoned IB (Integrated Industrial and Business) District

Mr. Carlisle reported on the Preliminary Site Plan application. He addressed minor revisions to the plan since last reviewed by the Board. Mr. Carlisle specifically addressed major changes as a result of the Traffic Study and requirements of the Road Commission of Oakland County (RCOC), as follows:

- Eliminating access off Maple.
- Shifting and aligning Axtell across Maple.
- Shifting two buildings that front on Maple to comply with setback requirements.
- RCOC to evaluate need of traffic signal at Maple and Axtell after completion of road improvements at Maple and Coolidge; applicant to escrow money.

Mr. Carlisle stated support for the Preliminary Site Plan application as well as support for the recent revisions to the plan. He recommended to table the item so the applicant can submit revised plans.

The applicant, Steve Schafer, was present. Mr. Schafer addressed:

- Alignment of Axtell; truck turning radius; decel/right turn lane.
- Elevations, contrasting colors; bike storage.
- Neighboring restaurant to west as relates to Axtell access.
- Landscaping along Axtell.
- Timeline of RCOC road improvements at Maple and Coolidge.

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

**OTHER BUSINESS**

9. **PUBLIC COMMENT** – Items on Current Agenda

There was no one present who wished to speak.

10. **PLANNING COMMISSION COMMENT**

There were general Planning Commission comments.

The Regular meeting of the Planning Commission adjourned at 8:00 p.m.

Respectfully submitted,

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Donald Edmunds, Chair

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Kathy L. Czarnecki, Recording Secretary

G:\Planning Commission Minutes\2015 PC Minutes\Draft\2015 01 27 Regular Meeting\_Draft.doc

DATE: February 4, 2015

TO: Planning Commission

FROM: R. Brent Savidant, Planning Director

SUBJECT: PRELIMINARY SITE PLAN REVIEW (File Number SP 1002) – Proposed The Mark of Troy, Southeast corner of Maple and Axtell (2785 W Maple), Section 32, Currently Zoned IB (Integrated Industrial and Business) District

The petitioner Schafer Development submitted the above referenced Preliminary Site Plan application for a proposed apartment complex at the southeast corner of Maple and Axtell.

The property is currently zoned IB (Integrated Industrial and Business) District. The Planning Commission is responsible for granting Preliminary Site Plan approval for this item.

The proposed development has been discussed conceptually by the Planning Commission on two occasions and the site plan was discussed at the January 27, 2015 meeting.

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. Minutes from January 27, 2015 Planning Commission meeting (draft)
3. Report prepared by Carlisle/Wortman Associates, Inc.

G:\SITE PLANS\SP 1002 The Mark of Troy Sec 32\SP-1002 PC Memo 02 10 2015.docx

**PROPOSED RESOLUTION**

PRELIMINARY SITE PLAN REVIEW (File Number SP 1002) – Proposed The Mark of Troy, Southeast corner of Maple and Axtell (2785 W Maple), Section 32, Currently Zoned IB (Integrated Industrial and Business) District

**Resolution # PC-2015-02-**

Moved by:

Seconded by:

**RESOLVED**, The Planning Commission hereby approves a reduction in the total number of required parking spaces for the proposed The Mark of Troy apartment complex to 494 when a total of 496 spaces are required on the site based on the off-street parking space requirements for multiple-family developments. This 2-space reduction is minimal and will still allow the development to meet parking demands, as per similar projects developed by the applicant. This reduction meets the standards of Section 13.06; and,

**BE IT FINALLY RESOLVED**, That Preliminary Site Plan Approval, pursuant to Article 8 of the Zoning Ordinance, as requested for the proposed The Mark of Troy, located on the southeast corner of Maple and Axtell (2785 W. Maple), Section 32, within the IB (Integrated Industrial and Business) District, be granted, subject to the following:

1. Provide planting details for the Landscape Plan, including bioswales, prior to Final Site Plan Approval.
2. Design of internal traffic circle to be approved by Engineering prior to Final Site Plan Approval.

\_\_\_\_\_ ) or

(denied, for the following reasons: \_\_\_\_\_) or

(postponed, for the following reasons: \_\_\_\_\_)

Yes:

No:

**MOTION CARRIED/FAILED**



Legend:

Aerial

- Red: Band\_1
- Green: Band\_2
- Blue: Band\_3

417 0 208 417 Feet

Scale 1: 2,500



## **PRELIMINARY SITE PLAN REVIEW**

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- Shifting two buildings that front on Maple to comply with setback requirements.
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Mr. Carlisle stated support for the Preliminary Site Plan application as well as support for the recent revisions to the plan. He recommended to table the item so the applicant can submit revised plans.

The applicant, Steve Schafer, was present. Mr. Schafer addressed:

- Alignment of Axtell; truck turning radius; decel/right turn lane.
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- Neighboring restaurant to west as relates to Axtell access.
- Landscaping along Axtell.
- Timeline of RCOC road improvements at Maple and Coolidge.

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



605 S. Main Street, Ste. 1  
Ann Arbor, MI 48104  
(734) 662-2200  
(734) 662-1935 Fax

Date: February 5, 2015

## Preliminary Site Plan Review For City of Troy, Michigan

<b>Applicant:</b>	Schafer Development
<b>Project Name:</b>	The Mark of Troy
<b>Location:</b>	2785 W. Maple Road
<b>Current Zoning:</b>	IB, Integrated Industrial and Business District
<b>Action Requested:</b>	Site Plan Review

### BACKGROUND

The Maple Road Apartments is a redevelopment of the 9-acre McGregor site at the southeast corner of Maple Road and Axtell Drive. The applicant is requesting approval to demolish the existing building and construct seven (7) apartment buildings, varying from thirty-two (32) to forty (40) apartment units each. The total number of proposed apartments is 248 dwelling units. The proposed buildings are five (5) stories. The site is zoned IB, Integrated Industrial and Business District. Multiple family dwelling is a permitted use in this district.

### PREVIOUS PLANNING COMMISSION REVIEW

The applicant has revised their plans to incorporate recommendations from the Traffic Study and Planning Commission. The applicant has submitted a complete plan set showing the shift in Axtell Drive that was recommended by the Traffic Study. The significant changes to the plans since the last Planning Commission review:

- 1. The applicant has shifted the two (2) buildings that front on Maple Road to comply with the 30-foot setback.**

All buildings comply with setback requirements.

- 2. Due to the shift in Axtell Drive, the applicant has shifted the Maple Road buildings south to comply with the 30-foot setback.**

All buildings comply with setback requirements.

- 3. The applicant has added an internal traffic circle / roundabout at the primary entrance off Axtell Drive.**

This is the first plan that has shown this traffic circle. The traffic circle has not been reviewed by the Engineering Department. If the preliminary site plan is approved by the Planning Commission, the traffic circle will be reviewed as part of final site plan. Overall, the inclusion or the removal of the traffic circle will not significantly affect site layout.

- 4. The applicant has increased the sidewalk width on Maple Road to 8-feet.**

The 8-foot sidewalk on Maple Road complies with City standard.

- 5. The applicant has eliminated the entrance gates.**

The applicant has eliminated the entrance gates along Axtell Drive. If the gates are proposed in the future, they will be reviewed by the Engineering Department, the Police Department, and Fire Department.

- 6. Provide planting details including bioswales, and a detail of the landscape bed along Maple Road**

The applicant has provided a conceptual landscape plan for the site, which include planting along Maple Road, Axtell Drive, and the bioswales along the southern and western property line. However, the applicant has not provided any landscaping details. These will be required as part of the final site plan review. The final landscape plan shall confirm site landscaping of 20%.

- 7. The site plan is deficient overall by two (2) parking spaces.**

As required by ordinance, the applicant is required to provide two (2) spaces for each dwelling unit. Based on 248 units, the applicant is required to provide 496 spaces. In previous plans, the applicant exceeded the parking requirement. However, with the shift in Axtell Drive, the applicant has had to rearrange their site layout and has removed some site parking. In the revised plans, the applicant is providing 494 spaces.

The Planning Commission may grant a parking deviation. We find that based on the use of the property as an apartment which will likely not be 100% occupied at all times and the mix of units, 494 spaces should be sufficient. If the applicant finds in the future that additional parking is necessary, there are some limited opportunities to convert landscape area to parking. Any change to the future site plan would require a City approval.

**RECOMMENDATIONS**

We recommend the Planning Commission grant the preliminary site plan approval with the parking deviation.



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

Cc:

# PRELIMINARY SITE PLAN FOR THE MARK OF TROY CITY OF TROY, OAKLAND COUNTY, MICHIGAN



**NEDERVELD**  
www.nederveld.com  
800.222.1868  
**ANN ARBOR**  
3025 Miller Rd.  
Ann Arbor, MI 48103  
Phone: 734.929.6963  
**CHICAGO**  
**COLUMBUS**  
**HOLLAND**  
**INDIANAPOLIS**  
**ST. LOUIS**

**PREPARED FOR:**  
Schafer Development  
Steve Schafer  
  
29800 Middlebelt Rd, Suite 150  
Farmington Hills, MI 48334  
Phone: 248.932.7500

**REVISIONS:**  
Title: Submitted for City review V. Date: 12/29/14  
Drawn: GAN Checked: JVR S. Date: 12/29/14  
Title: Submitted for City review V. Date: 01/13/15  
Drawn: GAN Checked: JVR S. Date: 01/13/15  
Title: Submitted for City review Date: 01/30/15

**DESIGN TEAM CONTACTS**

**DEVELOPER/OWNER**  
Schafer Development  
Steve Schafer  
29800 Middlebelt Rd, Suite 150  
Farmington Hills, MI 48334  
Phone: 248.932.7500

**ARCHITECT**  
Hobbs + Black Architects  
100 N. State St.  
Ann Arbor, MI 48104  
Phone: 734.663.4189

**ENGINEER/SURVEYOR**  
Nederveld  
3025 Miller Rd.  
Ann Arbor, MI 48103  
Phone: 734.929.6963

**PROJECT SUMMARY**

**PROJECT DESCRIPTION**

- THE PROJECT SITE (48.23 ACRES, T1N 20-32-126-001) IS LOCATED AT THE CORNER OF WEST MAPLE AND AXTELL DRIVE, IN THE CITY OF TROY, MICHIGAN.
- THE EXISTING BUILDINGS AND SITE FEATURES WILL BE DEMOLISHED.
- THE PROPOSED PROJECT INCLUDES THE CONSTRUCTION OF SEVEN (7) MULTIFAMILY UNIT BUILDINGS CONSISTING OF 248 TOTAL UNITS ALONG WITH A CLUB HOUSE/POOL & COMMON AREA, SERVICED BY ASPHALT PARKING LOTS WITH ACCESS TO AXTELL DRIVE, UTILITY CONNECTIONS TO CITY OF TROY PUBLIC UTILITIES, LANDSCAPING, AND SITE LIGHTING.
- TWO (2) NEW CURB CUTS ARE PROPOSED ALONG AXTELL DRIVE.
- NO ACCESS IS PROPOSED TO WEST MAPLE ROAD.
- ALL IMPROVEMENTS ARE PROPOSED TO BE CONSTRUCTED IN ONE PHASE.

**COMMUNITY IMPACT**

- THE PROPOSED DEVELOPMENT WILL PROVIDE AN INCREASED TAX BASE WITH NO ANTICIPATED NEGATIVE IMPACTS TO THE SCHOOL DISTRICT.
- THE PROPOSED DEVELOPMENT WILL HAVE NO SIGNIFICANT IMPACT ON AIR OR WATER QUALITY.
- A TRAFFIC IMPACT STUDY IS CURRENTLY UNDERWAY AND WILL BE PROVIDED TO THE CITY FOR REVIEW AND APPROVAL ONCE COMPLETE.

**SITE ANALYSIS**

- THE USDA NATURAL RESOURCES CONSERVATION SERVICE INDICATES THAT THE PREDOMINANT SOIL TYPE ON-SITE IS UDIPSAMMENTS, UNDULATING. THIS SOIL TYPE IS RATED IN HYDROLOGIC SOIL GROUP A. THE PERMEABILITY OF THIS SOIL IS VERY GOOD.
- THE SITE IS LOCATED OUTSIDE THE 100-YEAR FLOODPLAIN.
- THERE ARE NO EXISTING WETLANDS LOCATED ON SITE.

**STORM WATER MANAGEMENT**

STORM WATER RUNOFF GENERATED BY SITE IMPROVEMENTS WILL BE TREATED ON-SITE, IN ACCORDANCE WITH THE OAKLAND COUNTY WATER RESOURCE COMMISSIONERS STANDARDS. THE PROPOSED STORM WATER MANAGEMENT FACILITIES WILL OUTLET TO THE EXISTING STORM SEWER LOCATED IN W MAPLE ROAD.

**SANITARY SEWER SERVICE**

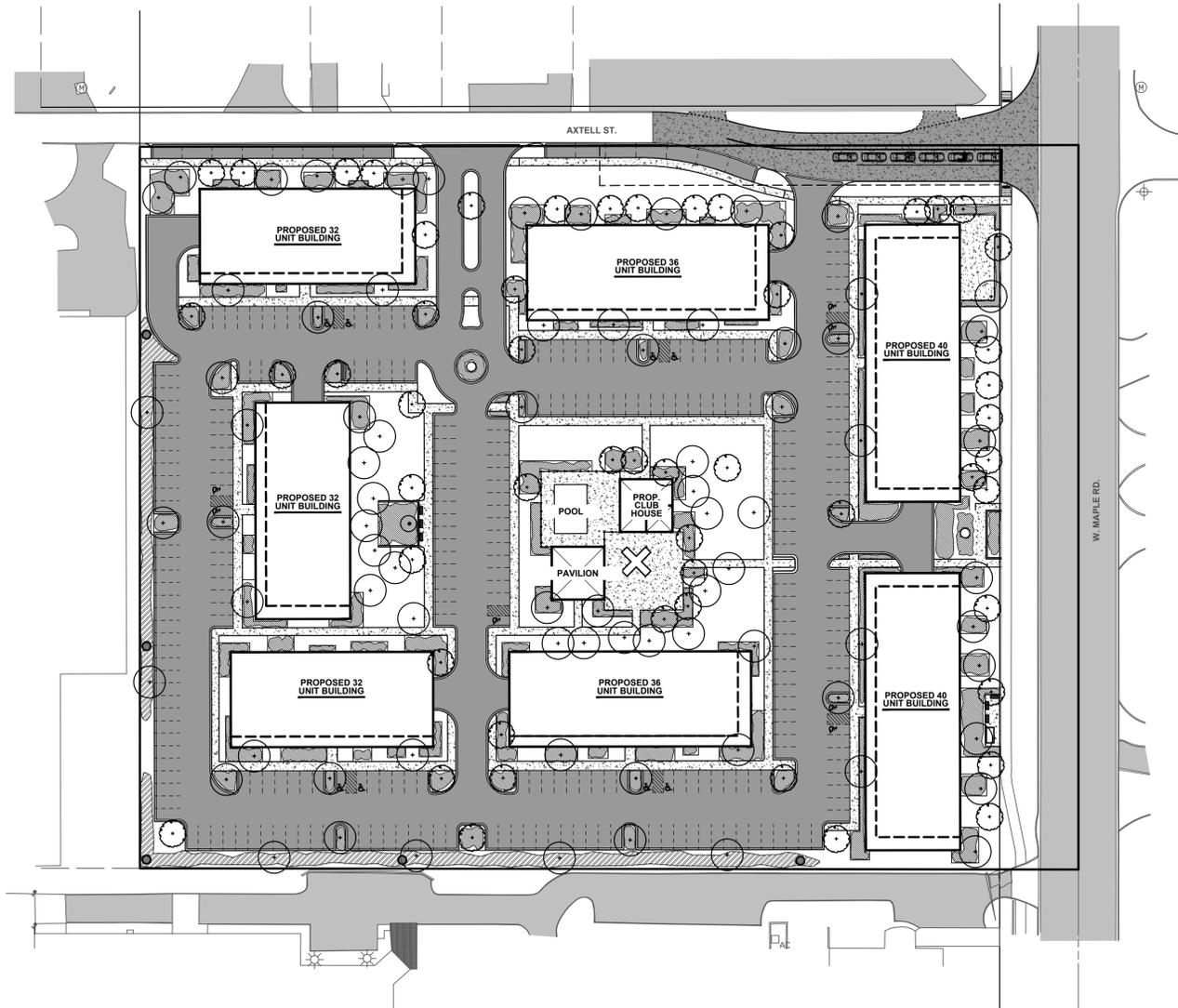
THE PROPOSED BUILDINGS WILL BE SERVICED BY PUBLIC SANITARY SEWER. THE EXISTING PUBLIC SANITARY SEWER LOCATED IN AXTELL ROAD WILL BE EXTENDED NORTH ALONG AXTELL ROAD AND ONTO THE SITE. 6" SEWER SERVICE LEADS WILL BE PROVIDED TO EACH BUILDING.

**WATER SERVICE**

THE PROPOSED BUILDINGS WILL BE SERVICED BY PUBLIC WATER MAIN. THE EXISTING PUBLIC WATER MAIN LOCATED IN AXTELL ROAD AND ALONG THE SOUTH SIDE OF W MAPLE ROAD WILL BE LOOPED THROUGH THE PROPOSED SITE. FIRE HYDRANTS WILL BE PROVIDED WITHIN 100 FT OF EACH PROPOSED BUILDING. 4" SERVICE LEADS WILL BE PROVIDED TO EACH BUILDING FOR DOMESTIC SERVICE AND FIRE PROTECTION.

**FRANCHISE UTILITIES**

THE EXISTING FRANCHISE UTILITIES CURRENTLY SERVICE THE SITE. NEW SERVICE CONNECTIONS WILL BE COORDINATED WITH THE FRANCHISE UTILITY COMPANIES.



**SHEET INDEX**

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Details and Specifications	C-500	Page 7
Tree Preservation Plan	L-101	Page 8
Landscaping Plan	L-102	Page 9
Photometric Plan	E-100	Page 10

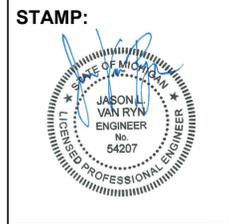
**SITE DATA**

- ZONING OF PROPERTY: I-B INTEGRATED INDUSTRIAL AND BUSINESS DISTRICT  
I-B ZONING REQUIREMENTS:
  - A) MINIMUM LOT AREA = N/A
  - B) MINIMUM LOT WIDTH = N/A
  - C) MAXIMUM LOT COVERAGE = 40%
 SETBACKS:
  - A) FRONT YARD = 30 FT.
  - B) SIDE YARD = 10 FT.
  - C) REAR YARD = 20 FT.
- SUMMARY OF LAND USE:
  - A) TOTAL ACREAGE = 8.01 ACRES (349,233 SQ. FT.) (EXCLUDING R.O.W.)
  - B) NUMBER OF UNITS = 248 UNITS
  - C) AREA OF PROPOSED BUILDINGS = 95,640 SQ. FT.
  - D) BUILDING HEIGHT = APPROX. 50 FT.
  - E) LOT COVERAGE = 27%
  - F) GROSS PAVEMENT AREA = APPROX. 112,441 SQ. FT.
  - G) GROSS CONCRETE AREA = APPROX. 33,620 SQ. FT.
  - H) ZONING OF PARCELS TO NORTH AND WEST = I-B - MAPLE ROAD  
ZONING OF PARCELS TO SOUTH AND EAST = I-B - INTEGRATED INDUSTRIAL BUSINESS DISTRICT
- PARKING REQUIREMENTS:
  - A) MINIMUM REQUIRED SPACE PER CITY = 9.5x19' (24' AISLE) (17' LONG SPACE WHEN ABUTTING 7' WALK)
  - B) TYPICAL PARKING SPACE PROVIDED = 9.5x19' (24' AISLE)
  - C) TYPICAL BARRIER FREE SPACE = 13'x20'
  - D) NUMBER OF SPACES REQUIRED = 2 SPACES PER EACH DWELLING UNIT (BASED ON TOWNSHIP REQUIREMENTS)
  - E) NUMBER OF SPACES REQUIRED = 496 SPACES
  - F) NUMBER OF SPACES PROVIDED = 190 UNDERGROUND SPACES  
305 SURFACE SPACES  
**494 TOTAL SPACES**
- THIS PROJECT IS NOT LOCATED IN THE 100 YEAR FLOOD PLAIN, BASED ON THE NATIONAL FLOOD INSURANCE PROGRAM RATE MAPS
- BEST MANAGEMENT PRACTICES WILL BE UTILIZED DURING AND AFTER CONSTRUCTION OF THE PROJECT. MEASURES WILL INCLUDE THE USE OF SEEDING AND MULCHING, SEDIMENT INLET FILTERS, COMPACTION AND PAVING. THE OWNER OF THE SUBJECT PARCEL SHALL HAVE THE RESPONSIBILITY TO MAINTAIN THE PERMANENT SOIL EROSION PROTECTION MEASURES.
- UTILITIES SHOWN ARE APPROXIMATE LOCATIONS DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.
- CONTRACTOR TO FIELD VERIFY ALL INVERTS.
- ALL LIGHTING SHALL BE SHIELDED FROM ALL ADJACENT PROPERTIES. PROPOSED LIGHTING SHALL CONSIST OF WALL-MOUNTED LIGHTS AND LIGHT POLES, BOTH FITTED WITH SHOEBOX TYPE FIXTURES.
- THE PERMANENT PARCEL NUMBER FOR THE SITE IS 20-32-126-001. THE ADDRESS OF THE PROPERTY IS 2785 W. MAPLE RD.
- THERE IS CURRENTLY A VACANT HOUSE ON THE PARCEL. THE EXISTING HOUSE WILL BE DEMOLISHED AS PART OF THIS PROJECT.
- NO FENCES OR WALLS OTHER THAN WHAT IS SHOWN ON THE SITE PLAN ARE PROPOSED AT THIS TIME.

**TITLE DESCRIPTION**

The Land referred to in this Commitment, situated in the County of Oakland, City of Troy, State of Michigan, (Provided by First American Title Insurance Company) is described as follows:  
  
The West 12 acres of the East 40 acres of the North 60 acres of the Northwest 1/4 of Section 32, Town 2 North, Range 11 East, City of Troy, Oakland County, Michigan, Except the south 275 feet thereof and Except the North 60.00 feet which was deeded for road.  
  
Also referred to as:  
Part of the Northwest 1/4 of Section 32, T2N, R11E, City of Troy, Oakland County, Michigan, described as beginning at a point located on the North line of said section 32 distant N 90°00'00" E, 889.28 feet from the Northwest corner of said Section 32; thence S 00°06'04" E, along the Eastern line of Maple Coolidge Estates, as recorded in Liber 47 of plans, Page 51, Oakland County Records; 714.46 feet; thence N 88°59'22" E, 546.65 feet; thence N 00°04'05" E, 714.36 feet to the North line of said Section 32; thence S 90°00'00" W, along said North line, 548.76 feet to the point of beginning. Parcel contains 8.98 acres of land. Subject to the rights of the public in Maple Road.

**THE MARK OF TROY**  
**Cover Sheet**  
2785 W. Maple Road  
PART OF THE NORTHWEST 1/4 OF SECTION 32, T2N, R11E,  
CITY OF TROY, OAKLAND COUNTY, MICHIGAN



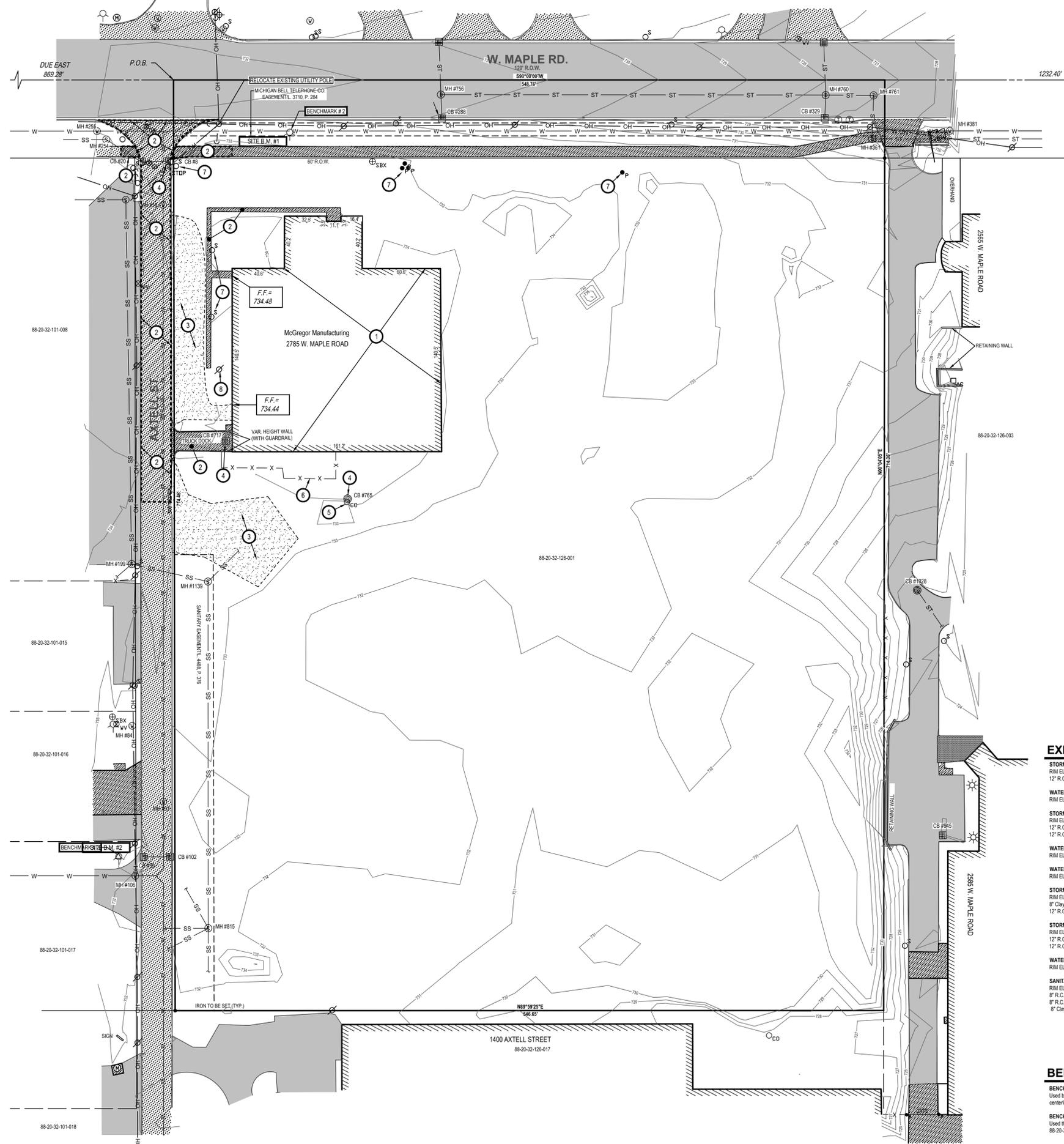
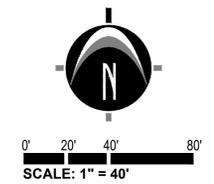
**PROJECT NO:**  
14500172  
**SHEET NO:**  
**C-100**  
**SHEET: 1 OF 10**

**NEDERVELD**  
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**PREPARED FOR:**  
 Schafer Development  
 Steve Schafer  
 29800 Middlebelt Rd. Suite 150  
 Farmington Hills, MI 48334  
 Phone: 248.932.7500

**REVISIONS:**

Title: Submitted for City review	V. Date: 12/29/14
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**REMOVAL / DEMOLITION NOTES**

- |                                   |                                |
|-----------------------------------|--------------------------------|
| 1 REMOVE EXISTING BUILDING        | 8 REMOVE EXISTING UTILITY POLE |
| 2 REMOVE EXISTING CONCRETE        | 9                              |
| 3 REMOVE EXISTING GRAVEL          | 10                             |
| 4 REMOVE EXISTING STORM STRUCTURE | 11                             |
| 5 REMOVE EXISTING CLEAN OUT       | 12                             |
| 6 REMOVE EXISTING FENCE           | 13                             |
| 7 REMOVE EXISTING POST/SIGN       | 14                             |

**EXISTING STRUCTURE LEGEND**

<b>STORM C.B. #8</b> RIM ELEV.=732.28 12" R.C.P. (W) INV.=728.58	<b>SANITARY M.H. #254</b> RIM ELEV.=733.14 12" Conc. (N) INV.=720.40 12" S.E. INV.=727.98	<b>STORM M.H. #760</b> RIM ELEV.=727.80 12" Conc. (N) INV.=720.40 12" Conc. (S) INV.=720.60 12" Conc. (E) INV.=720.30 12" Conc. (W) INV.=720.40
<b>WATER M.H. #16</b> RIM ELEV.=732.82	<b>WATER M.H. #255</b> RIM ELEV.=732.97	<b>STORM M.H. #761</b> RIM ELEV.=727.18 12" Conc. (W) INV.=719.28 12" Conc. (S) INV.=719.28
<b>STORM C.B. #20</b> RIM ELEV.=732.21 12" R.C.P. (E) INV.=726.72 12" R.C.P. (NW) INV.=727.98	<b>STORM C.B. #288</b> ELEV.=730.99 12" R.C.P. (W) INV.=727.88	<b>STORM C.B. #765</b> RIM ELEV.=734.29 (FULL OF DEBRIS)
<b>WATER M.H. #84</b> RIM ELEV.=732.60 12" R.C.P. (N) INV.=721.22	<b>STORM C.B. #329</b> RIM ELEV.=727.15 12" R.C.P. (N) INV.=721.22	<b>SANITARY M.H. #815</b> RIM ELEV.=732.36 18" ST. (S) INV.=722.67 18" ST. (N) INV.=723.26 12" Conc. (NW) INV.=725.31 12" Conc. (W) INV.=723.26 8" P.V.C. (SW) INV.=723.91
<b>WATER M.H. #93</b> RIM ELEV.=732.26	<b>STORM M.H. #361</b> RIM ELEV.=727.80 15" Conc. (N) INV.=718.42 18" Conc. (E) INV.=718.30	<b>STORM C.B. #945</b> RIM ELEV.=722.95
<b>STORM C.B. #99</b> RIM ELEV.=731.68 8" Clay (N) INV.=728.53 12" R.C.P. (E) INV.=727.38	<b>WATER M.H. #381</b> RIM ELEV.=727.74 12" C.I. (E & W) INV.=721.82	<b>STORM C.B. #1028</b> RIM ELEV.=724.46 12" Conc. (SE) INV.=721.66
<b>STORM C.B. #102</b> RIM ELEV.=731.74 12" R.C.P. (S) INV.=725.99 12" R.C.P. (W) INV.=726.44	<b>STORM C.B. #717</b> RIM ELEV.=730.12 (NOT ACCESSIBLE)	<b>SANITARY M.H. #1139</b> RIM ELEV.=733.20 6" P.V.C. (NE) INV.=726.34 8" Clay (NW) INV.=724.70 10" ST. (S) INV.=724.60
<b>WATER M.H. #106</b> RIM ELEV.=731.98	<b>STORM M.H. #756</b> RIM ELEV.=731.46	
<b>SANITARY M.H. #199</b> RIM ELEV.=733.68 8" R.C.P. (SE) INV.=726.70 8" R.C.P. (N) INV.=726.70 8" Clay (SW) INV.=727.56	<b>STORM M.H. #757</b> RIM ELEV.=727.36 12" Conc. (S) INV.=726.36 12" Conc. (E) INV.=727.66	

**LEGEND**

AC	Air Conditioner	Ⓣ	Telephone Manhole
Ⓡ	Benchmark	Ⓧ	Utility Pole
Ⓢ	Catch Basin - Round	Ⓜ	Water Manhole
Ⓢ	Catch Basin - Square	Ⓜ	Water Valve
Ⓢ	Cleanout	Ⓜ	Miscellaneous/Unknown
Ⓢ	Deciduous Tree	— OE —	Overhead Electric
Ⓢ	Evergreen Tree	— OH —	Overhead Utility
Ⓢ	Guy Anchor	— SS —	Sanitary
Ⓢ	Hydrant	— ST —	Storm
Ⓢ	Iron - Set	— W —	Watermain
Ⓢ	Iron - Found	— X —	Fence
Ⓢ	Light Pole	Ⓢ	Tree
Ⓢ	Manhole	Ⓢ	Asphalt
Ⓢ	Post	Ⓢ	Concrete
Ⓢ	Sign	Ⓢ	Gravel
Ⓢ	Sanitary Sewer Manhole	Ⓢ	Building
Ⓢ	Stormwater Manhole		

**BENCHMARKS**

**BENCHMARK #1** ELEV.=734.34 (NAV088)  
 Used tool under "E" on the hydrant located 40' South of the centerline of Maple Road and 100' East of the centerline of Axtell Street.

**BENCHMARK #2** ELEV.=734.56 (NAV088)  
 Used the arrow on the hydrant located 42' West and 118' North of the Southwest property corner of parcel 88-20-32-126-001.

**811** Know what's below.  
 CALL before you dig.  
 UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.  
 NOTE: EXISTING UTILITIES AND SERVICE LINES IDENTIFIED AS "PLANS" WERE OBTAINED FROM AVAILABLE CITY AS-BUILT RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND STATUS OF ALL UTILITIES AND SERVICE LINES PRIOR TO NEW CONNECTIONS.

**THE MARK OF TROY**  
**Existing Conditions / Demolition Plan**  
 2785 W. Maple Road  
 PART OF THE NORTHWEST 1/4 OF SECTION 32, T2N, R1E,  
 CITY OF TROY, OKLAND COUNTY, MICHIGAN

**STAMP:**

**PROJECT NO:**  
14500172

**SHEET NO:**  
**C-201**

**SHEET: 2 OF 10**

**PREPARED FOR:**  
 Schafer Development  
 Steve Schafer  
 29800 Middlebelt Rd, Suite 150  
 Farmington Hills, MI 48334  
 Phone: 248.932.7500

**REVISIONS:**

Title: Submitted for City review	V. Date: 12/29/14
Drawn: GAN	Checked: JVR
Title: Submitted for City review	V. Date: 01/13/15
Drawn: GAN	Checked: JVR
Title: Submitted 1 for City review	Date: 01/30/15

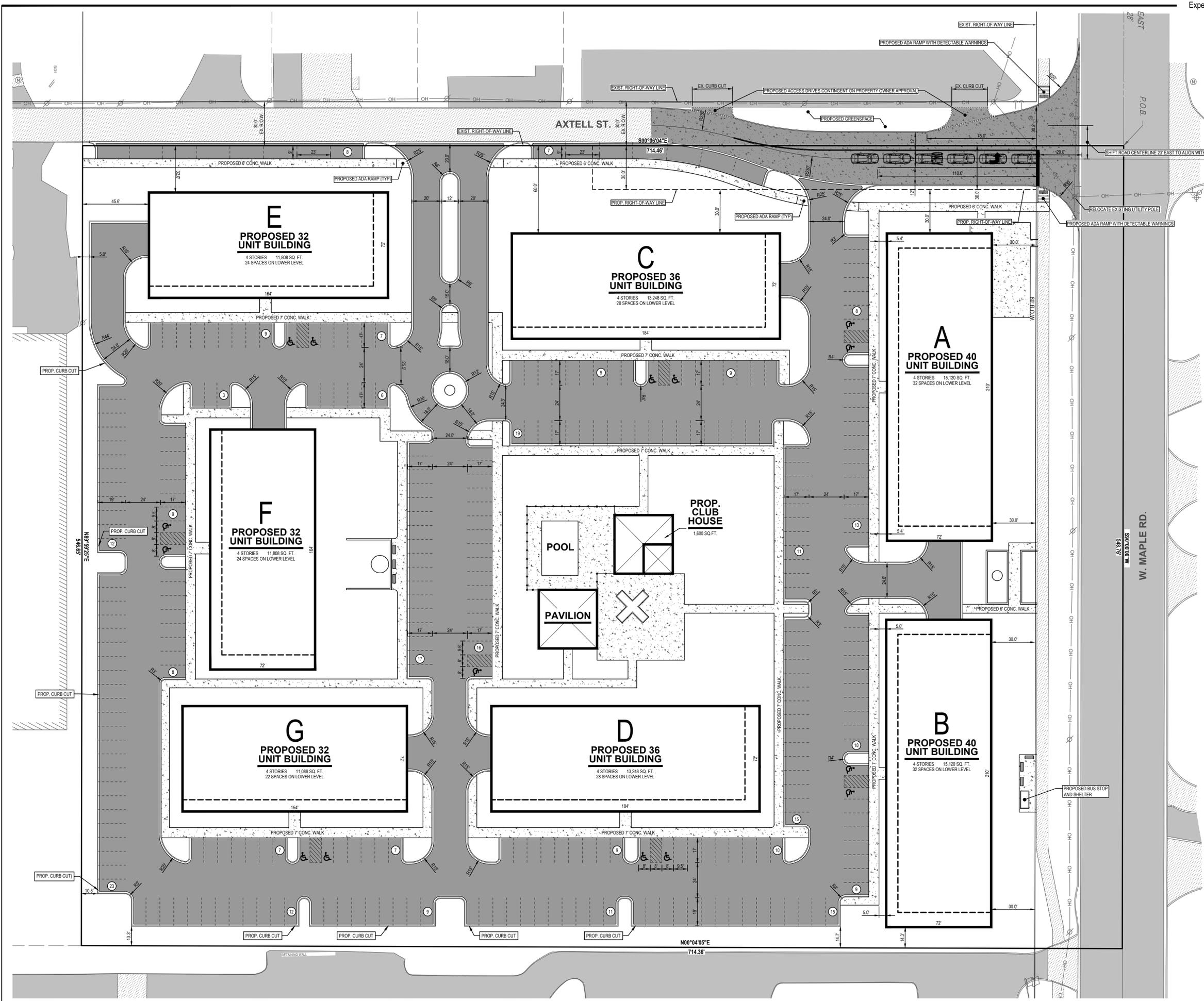


**LEGEND**

- EXISTING BITUMINOUS
- EXISTING CONCRETE
- PROPOSED BITUMINOUS (STANDARD DUTY)
- PROPOSED CONCRETE (STANDARD DUTY)
- PROPOSED CONCRETE (HEAVY DUTY)

**SITE PLAN NOTES**

1. BUILDING ADDRESS SHALL BE CLEARLY VISIBLE WHEN APPROACHING THE BUILDING.
2. GARBAGE AND RECYCLING CONTAINERS WILL BE LOCATED WITHIN THE FIRST FLOOR PARKING AREAS.
3. SITE DIMENSIONS ARE TO FACE OF CURB OR FACE OF WALK, UNLESS OTHERWISE NOTED.
4. THE CONSTRUCTION OF THE SITE WILL BEGIN IMMEDIATELY PENDING CITY APPROVALS AND PERMITS.
5. THE PROJECT WILL BE COMPLETED IN 1 PHASE.
6. THE PROPOSED PROJECT IS NOT LOCATED WITHIN THE 100 YEAR FLOOD PLAIN.



**THE MARK OF TROY**

**Site Layout Plan**

2785 W. Maple Road  
 PART OF THE NORTHWEST 1/4 OF SECTION 32, T2N, R17E,  
 CITY OF TROY, OKLAND COUNTY, MICHIGAN

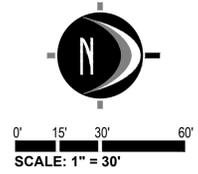
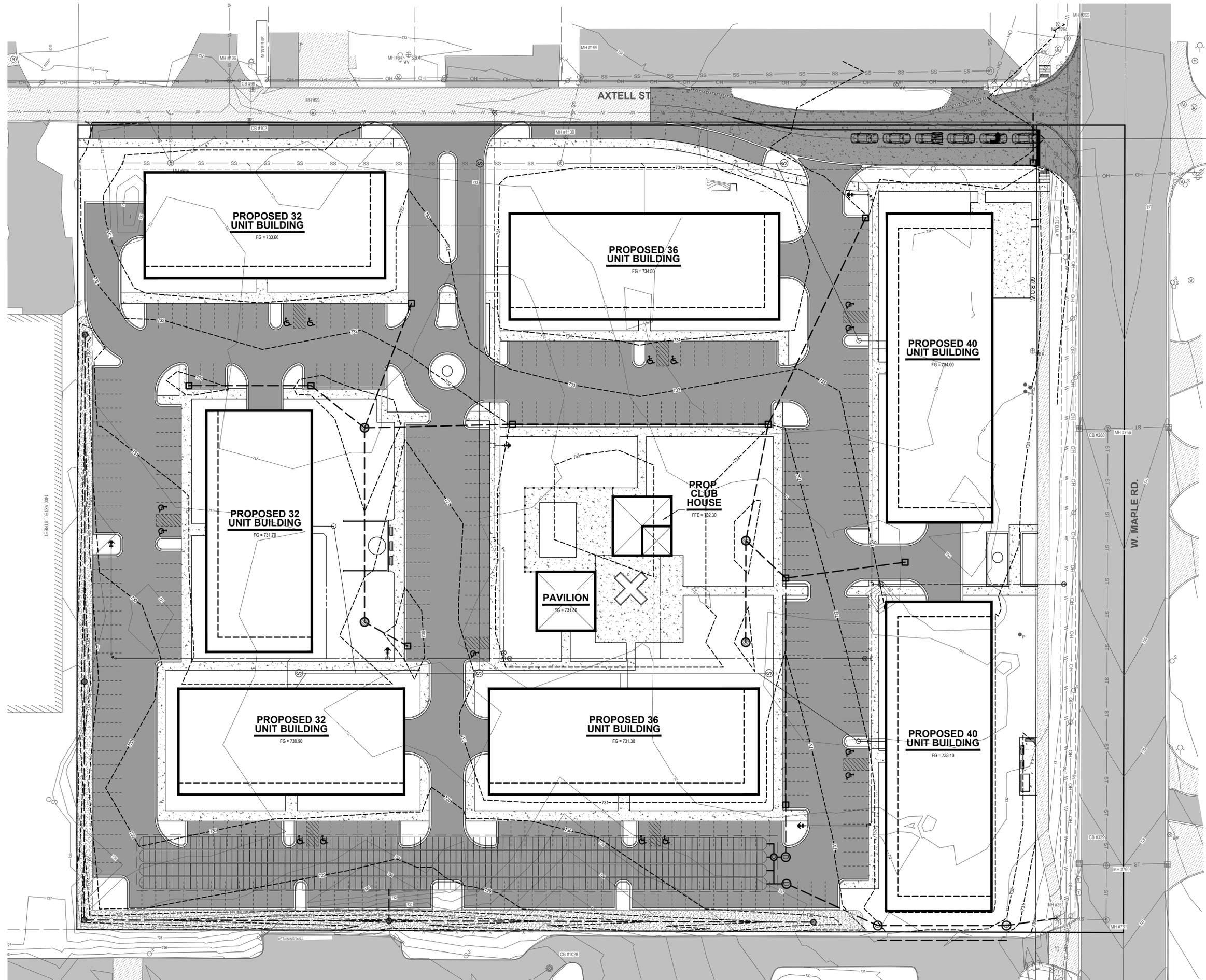
**STAMP:**

**PROJECT NO:**  
 14500172

**SHEET NO:**  
**C-205**

**SHEET: 3 OF 10**

**811** Know what's below.  
 CALL before you dig.  
UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.  
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**NEDERVELD**  
 www.nederveld.com  
 800.222.1868  
**ANN ARBOR**  
 3025 Miller Rd.  
 Ann Arbor, MI 48103  
 Phone: 734.929.6963  
 CHICAGO  
 COLUMBUS  
 GRAND RAPIDS  
 HOLLAND  
 INDIANAPOLIS  
 ST. LOUIS

**PREPARED FOR:**  
 Schafer Development  
 Steve Schafer  
 29800 Middlebelt Rd, Suite 150  
 Farmington Hills, MI 48334  
 Phone: 248.932.7500

**REVISIONS:**

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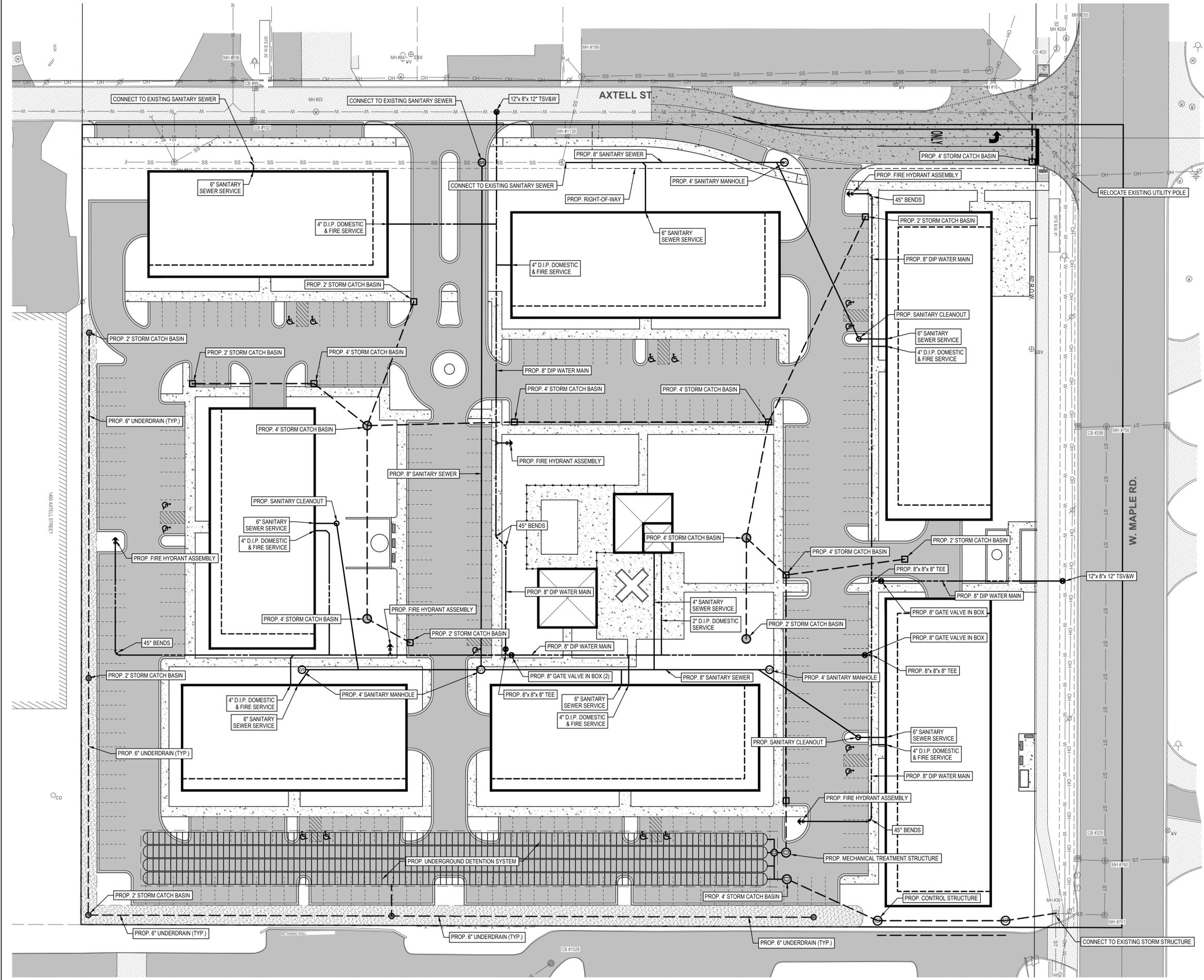
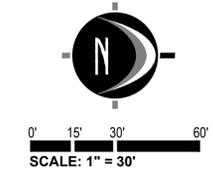
**THE MARK OF TROY**  
**Grading Plan**  
 2785 W. Maple Road  
 PART OF THE NORTHWEST 1/4 OF SECTION 32, T2N, R1E,  
 CITY OF TROY, OKLAND COUNTY, MICHIGAN

**STAMP:**

**PROJECT NO:**  
 14500172

**SHEET NO:**  
**C-300**

**SHEET: 4 OF 10**



**STORM SEWER CONSTRUCTION**

- 1) ALL CATCH BASINS SHOULD BE PROVIDED WITH A MINIMUM 2' SUMP.
- 2) ALL STORM SEWER SHALL BE SLOPP (MEETING AASHTO M252 AND M254), UNLESS OTHERWISE SPECIFIED.
- 3) 6" UNDERDRAIN SHALL BE PERFORATED PIPE WITH SOCK, MEETING THE REQUIREMENTS OF AASHTO M-252 AND THE GEOTEXTILE SHALL MEET AASHTO M-288 REQUIREMENTS

**PREPARED FOR:**  
 Schafer Development  
 Steve Schafer  
 29800 Middlebelt Rd, Suite 150  
 Farmington Hills, MI 48334  
 Phone: 248.932.7500

**REVISIONS:**

Title	Submitted for City review	V. Date
1	12/29/14	12/29/14
2	01/13/15	01/13/15
3	01/13/15	01/13/15

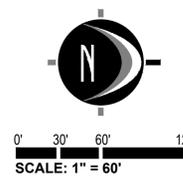
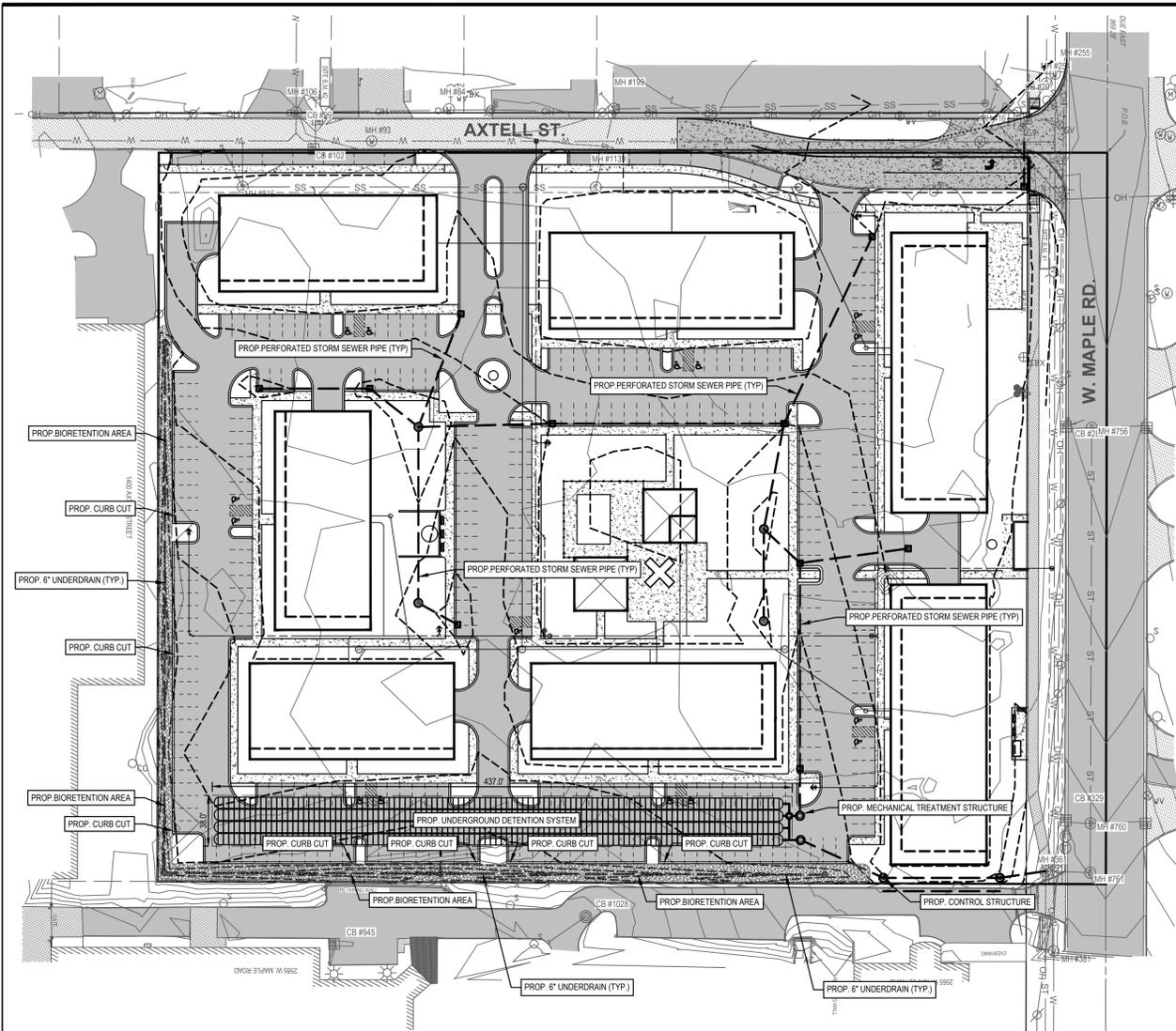
**THE MARK OF TROY**  
 Utility Plan  
 2785 W. Maple Road  
 PART OF THE NORTHWEST 1/4 OF SECTION 32, T2N, R1E,  
 CITY OF TROY, OKLAND COUNTY, MICHIGAN

**STAMP:**

**PROJECT NO:**  
14500172

**SHEET NO:**  
**C-400**

**SHEET: 5 OF 10**



### STORM WATER MANAGEMENT NARRATIVE

**EXISTING SITE**  
THIS PROJECT CONSISTS OF A 2.8 ACRE PARCEL THAT IS LOCATED ON THE SOUTH SIDE OF MAPLE ROAD, BETWEEN COOLIDGE HIGHWAY AND MAPLELAWN DRIVE, IN TROY, MICHIGAN. THE EXISTING PARCEL CURRENTLY CONSISTS OF ONE VACANT BUILDING AND ASSOCIATED PARKING AREAS ALONG AXTELL DRIVE. THE MAJORITY OF THE EXISTING SITE IS UNDEVELOPED. REFER TO EXISTING CONDITIONS PLAN AND TREE SURVEY.

PER USDA SOIL INFORMATION, THE MAJORITY OF THE PARCEL SOILS ARE CLASSIFIED AS UDDIPANSMENTS, UNULATING. THIS SOIL TYPE IS RATED IN HYDROLOGIC SOIL GROUP A. THE PERMEABILITY OF THIS SOIL IS VERY RAPID. BASED ON THE EXISTING SITE SOILS AND SITE SLOPES OF LESS THAN 4%, A RUNOFF COEFFICIENT OF 0.30 IS ASSUMED FOR SEMI-PERVIOUS AREAS OF THE SITE.

**EXISTING DRAINAGE**  
THE TOPOGRAPHIC SURVEY INDICATES THAT THIS PARCEL GENERALLY DRAINS FROM WEST TO EAST, WITH THE HIGHEST SITE ELEVATIONS ALONG AXTELL STREET. (REFER TO THE EXISTING CONDITIONS PLAN FOR SITE CONTOURS) THE ELEVATIONS ON THE SITE RANGE FROM 725 FEET AT THE HIGH POINT ALONG AXTELL TO 728 FEET AT THE EAST PROPERTY LINE. EXISTING RUNOFF FROM THE SITE DRAINS TO A SERIES OF ENCLOSED STORM SEWER PIPES LOCATED WITHIN THE AXTELL ROAD RIGHT-OF-WAY, MAPLE ROAD RIGHT-OF-WAY, AND THE ADJACENT PROPERTY TO THE EAST.

**PROPOSED IMPROVEMENTS**  
THE PROPOSED PROJECT WILL IMPACT/DISTURB APPROXIMATELY 8 ACRES OF LAND. THE PROPOSED SITE IMPROVEMENTS WILL CONSIST OF THE CONSTRUCTION OF APPROXIMATELY 85,000 S.F. OF MULTIFAMILY RESIDENTIAL BUILDINGS, SERVICED BY A BITUMINOUS PARKING LOT.

**STORM WATER MANAGEMENT**  
THE STORM WATER MANAGEMENT SYSTEM (SMS) WILL BE DESIGNED TO OAKLAND COUNTY WATER RESOURCE COMMISSIONER AND CITY OF TROY STANDARDS AND WILL PROVIDE FLOOD CONTROL (WATER QUANTITY) AND WATER RESOURCE PROTECTION (WATER QUALITY).

THE PROPOSED STORM SEWER PIPE NETWORK WILL CONVEY STORM WATER RUNOFF TO THE PROPOSED UNDERGROUND DETENTION BASINS LOCATED ALONG THE EAST BOUNDARY OF THE SITE. DUE TO THE HIGH PERMEABILITY OF THE EXISTING SITE SOILS, THE PROPOSED STORM SEWER PIPES WILL BE PERFORATED TO FURTHER PROMOTE THE INFILTRATION OF STORM RUNOFF. THE PROPOSED STORM SEWER WILL BE SIZED TO CONVEY A 10-YEAR RAIN EVENT.

PRIOR TO STORM WATER ENTERING THE PROPOSED DETENTION BASIN, THE STORM RUNOFF WILL BE DIRECTED THROUGH A STORM WATER QUALITY DEVICE OR BIO-RETENTION AREA. THESE SYSTEMS ARE DESIGNED TO REMOVE POINT SOURCE POLLUTANTS SUCH AS COARSE SEDIMENT, OIL AND GREASE, LITTER AND FLOATABLE DEBRIS.

THE PROPOSED UNDERGROUND DETENTION BASINS WILL BE DESIGNED TO DETAIN THE 25-YEAR STORM EVENT PER CITY STANDARDS. AN OUTLET CONTROL STRUCTURE WILL BE INSTALLED ON THE DOWNSTREAM SIDE OF THE UNDERGROUND DETENTION BASIN TO RESTRICT AND DETAIN RUNOFF FOR AN EXTENDED PERIOD OF TIME, REDUCING DOWNSTREAM FLOODING AND FURTHER ENHANCING THE SETTLEMENT PROCESS OF SUSPENDED SOLIDS IN THE STORM RUNOFF. PERFORATED UNDERGROUND DETENTION PIPES WILL ALSO BE INSTALLED TO PROMOTE INFILTRATION OF THE DETAINED RUNOFF INTO THE SURROUNDING SOILS.

THE PROPOSED UNDERGROUND DETENTION BASIN WILL OUTLET TO THE PUBLIC STORM SEWER SYSTEM LOCATED IN W MAPLE ROAD. THE RESTRICTED RELEASE RATES WILL NOT ADVERSELY IMPACT THE EXISTING STORM SEWER NETWORK WITHIN THE PUBLIC ROAD RIGHT-OF-WAY.

"BEST MANAGEMENT PRACTICES" (BMP'S) WILL BE USED DURING AND AFTER CONSTRUCTION. DURING CONSTRUCTION, BMP'S WILL BE UTILIZED TO CONTROL SOIL EROSION. SILT FENCE WILL BE INSTALLED ON THE DOWN-SLOPE SIDE OF IMPACTED AREAS TO MINIMIZE SOIL LOSS DURING CONSTRUCTION. IN ADDITION, STONE TRACKING MAT WILL BE INSTALLED TO REDUCE THE AMOUNT OF SOIL LOSS FROM VEHICLES LEAVING THE SITE. UPON THE COMPLETION OF THE STORM WATER MANAGEMENT IMPROVEMENTS, INLET FILTERS WILL BE PLACED ON ALL PROPOSED CATCH BASINS TO MINIMIZE THE AMOUNT OF SEDIMENT ENTERING THE SMS. UPON PROJECT COMPLETION, INLET FILTERS WILL BE REMOVED AND THE STORM SEWER CATCH BASINS SHALL BE CLEANED OF ALL CONSTRUCTION SEDIMENT.

THE FOLLOWING PERMANENT POST-CONSTRUCTION BMP'S WILL ALSO BE PROVIDED:

- BIO-RETENTION AREAS ALONG SOUTH AND EAST BOUNDARIES OF THE PROPOSED PARKING AREA TO PROMOTE INFILTRATION AND REDUCE RUNOFF.
- STORM WATER QUALITY DEVICE TO REMOVE POINT SOURCE POLLUTANTS FROM STORM SEWER SYSTEM.
- PERFORATED UNDERGROUND DETENTION BASINS TO PROMOTE INFILTRATION, PROVIDE FLOOD CONTROL, AND IMPROVE WATER QUALITY OF SITE DISCHARGE.

### STORM WATER MANAGEMENT CALCULATIONS

Design Basis: Use the Oakland County Water Resources Commission Design Criteria for the 25 year storm event.

**I. Total Volume of Detention Area: 25 Year storm**

Surface	Area (sq. ft)	C Factor	Weighted C
Developed Area contributing runoff (a)			8.23 acres
Building	85,120	0.95	0.23
Pavement	148,835	0.95	0.42
Grass	118,612	0.30	0.10
	358,367	0.74	

Developed Runoff Coefficient (c) = 0.74

2) Maximum Allowable Runoff, Q<sub>a</sub> = (local req'ts)  
Q<sub>a</sub> = a \* 0.15 cblacoe = 1.23 cfs

3) Calculate Q<sub>0</sub> = Q<sub>a</sub> / (a x c)  
(max. outflow per acre impervious) = 0.20 cfs/acre imperv.

4) Max. Storage Time, T<sub>25</sub> = -25 + sqrt(8,062.5/Q<sub>0</sub>) = 174.23 minutes

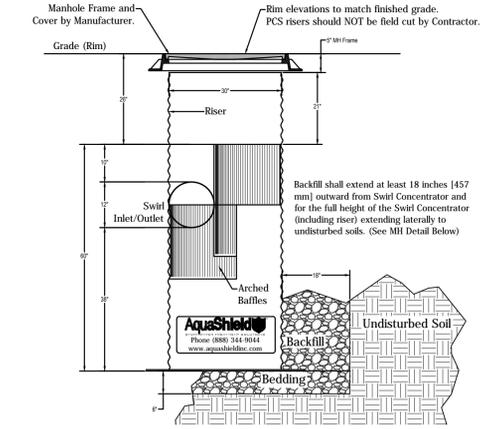
5) Max. Storage Required, V<sub>25</sub> = ((12,900 x T) / (T + 25)) - 40 Q<sub>0</sub> T<sub>25</sub> = 9,866 cf / acre imperv.

6) Total Storage Required, V<sub>25</sub> = V<sub>25</sub> x (A) x (c) = 89,940 cf

**II. Storage Provided - Underground Detention**

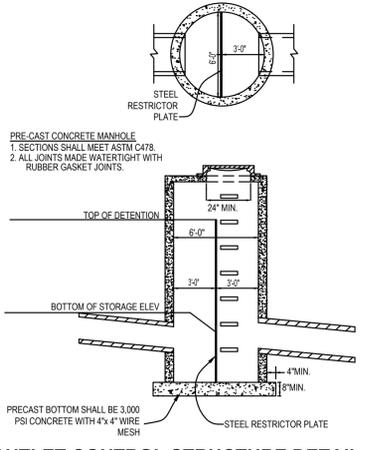
Chamber Model: MC-4500  
Number of Chambers: 420  
Number of End Caps: 8  
Void in Stone (Porosity): 25%  
Base of Stone Elevation: 719.30  
Area of System: 16,605 sf

Elevation (feet)	Height of System (inches)	StormTech MC-4500 Cumulative Storage Volumes				Total Volume (cubic feet)
		Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch. EC and Stone (cubic feet)	
726.05	81	0.00	0.00	325	325	60,111
725.97	80	0.00	0.00	325	325	59,786
725.88	79	0.00	0.00	325	325	59,461
725.80	78	0.00	0.00	325	325	59,136
725.72	77	0.00	0.00	325	325	58,811
725.63	76	0.00	0.00	325	325	58,486
725.55	75	0.00	0.00	325	325	58,161
725.47	74	0.00	0.00	325	325	57,836
725.38	73	0.00	0.00	325	325	57,511
725.30	72	0.00	0.00	325	325	57,186
725.22	71	0.00	0.00	325	325	56,861
725.13	70	0.00	0.00	325	325	56,536
725.05	69	17.20	0.00	321	338	56,208
724.97	68	48.76	0.08	313	362	55,870
724.88	67	69.19	0.21	308	377	55,508
724.80	66	87.96	0.38	303	391	55,131
724.72	65	112.70	0.54	297	410	54,739
724.63	64	190.17	0.70	278	468	54,329
724.55	63	279.41	0.90	255	536	53,861
724.47	62	335.59	1.13	241	578	53,326
724.38	61	381.41	1.34	220	642	52,747
724.30	60	421.22	1.53	200	642	52,135
724.22	59	456.68	1.72	211	669	51,493
724.13	58	488.66	1.93	203	693	50,824
724.05	57	518.28	2.16	195	718	50,130
723.97	56	545.87	2.38	188	736	49,415
723.88	55	571.63	2.59	182	756	48,678
723.80	54	595.86	2.78	176	774	47,922
723.72	53	618.80	2.97	170	792	47,148
723.63	52	640.56	3.15	164	808	46,356
723.55	51	661.29	3.34	159	824	45,548
723.47	50	680.98	3.52	154	839	44,726
723.38	49	698.58	3.70	149	853	43,896
723.30	48	717.83	3.87	145	867	43,033
723.22	47	735.04	4.04	141	880	42,166
723.13	46	751.50	4.20	136	892	41,287
723.05	45	767.42	4.36	132	904	40,396
722.97	44	782.64	4.52	128	916	39,491
722.88	43	797.30	4.67	125	927	38,576
722.80	42	811.37	4.81	121	937	37,648
722.72	41	824.91	4.96	118	948	36,711
722.63	40	837.95	5.10	115	958	35,763
722.55	39	850.50	5.25	111	967	34,806
722.47	38	862.59	5.39	108	976	33,839
722.38	37	874.23	5.52	105	985	32,862
722.30	36	885.39	5.66	103	994	31,877
722.22	35	896.22	5.79	100	1,002	30,884
722.13	34	905.84	5.92	97	1,010	29,882
722.05	33	916.67	6.05	95	1,017	28,872
721.97	32	926.32	6.17	92	1,025	27,855
721.88	31	935.61	6.30	90	1,032	26,830
721.80	30	944.53	6.41	88	1,038	25,799
721.72	29	953.13	6.57	85	1,045	24,760
721.63	28	961.37	6.73	83	1,051	23,715
721.55	27	969.30	6.77	81	1,057	22,664
721.47	26	976.80	6.87	79	1,063	21,606
721.38	25	984.18	6.98	77	1,069	20,543
721.30	24	991.16	7.08	76	1,074	19,476
721.22	23	997.83	7.18	74	1,079	18,401
721.13	22	1,004.21	7.28	72	1,084	17,322
721.05	21	1,010.29	7.38	71	1,089	16,238
720.97	20	1,016.09	7.47	69	1,093	15,149
720.88	19	1,021.60	7.56	68	1,097	14,056
720.80	18	1,026.83	7.65	67	1,101	12,959
720.72	17	1,031.79	7.74	65	1,105	11,858
720.63	16	1,036.47	7.82	64	1,108	10,753
720.55	15	1,040.88	7.90	63	1,112	9,644
720.47	14	1,045.07	7.98	62	1,115	8,533
720.38	13	1,049.03	8.06	61	1,118	7,419
720.30	12	1,052.73	8.13	60	1,121	6,297
720.22	11	1,056.18	8.20	59	1,124	5,173
720.13	10	1,059.31	8.26	58	1,127	4,055
720.05	9	0.00	0.00	325	325	2,927
719.97	8	0.00	0.00	325	325	2,602
719.88	7	0.00	0.00	325	325	2,277
719.80	6	0.00	0.00	325	325	1,952
719.72	5	0.00	0.00	325	325	1,626
719.63	4	0.00	0.00	325	325	1,301
719.55	3	0.00	0.00	325	325	976
719.47	2	0.00	0.00	325	325	651
719.38	1	0.00	0.00	325	325	325

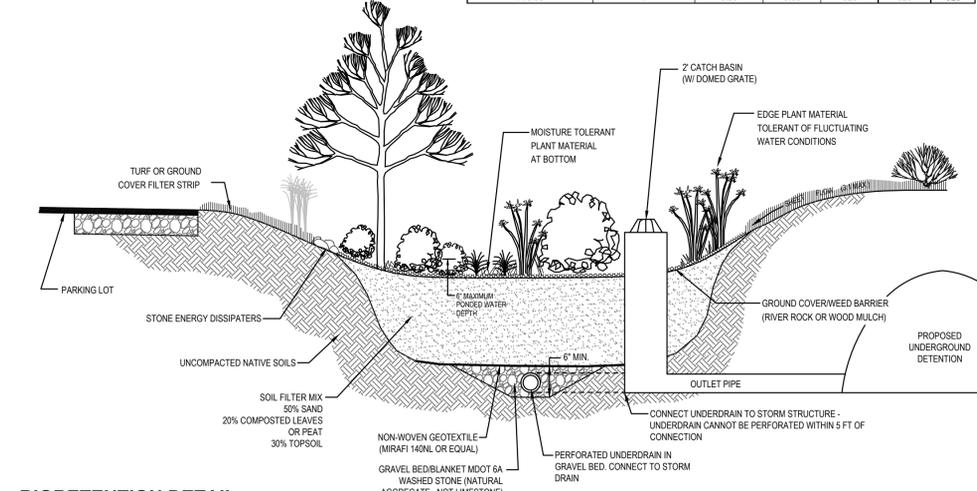


FINAL STORM WATER QUALITY UNIT SIZE AND DESIGN SHALL BE PROVIDED BY THE MANUFACTURER. THE WATER QUALITY UNIT MODEL AND DESIGN SHALL BE IN ACCORDANCE WITH CURRENT COUNTY STORM WATER DESIGN STANDARDS. SHOP DRAWINGS OF THE FINAL DESIGN MUST BE SUBMITTED TO THE ENGINEER OF RECORD AND COUNTY FOR FINAL APPROVAL, PRIOR TO INSTALLATION.

### STORM WATER QUALITY UNIT (OR APPROVED EQUAL)



OUTLET CONTROL STRUCTURE DETAIL

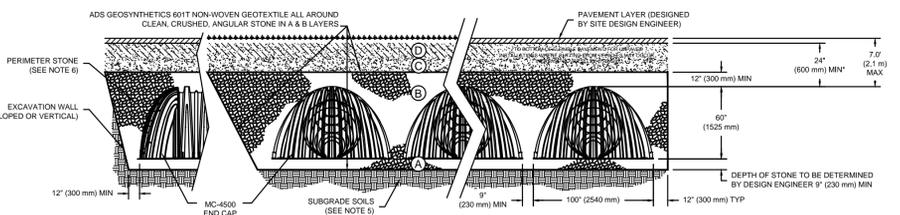


BIORETENTION DETAIL

### ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE (B) LAYER TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 <sup>1</sup> A-1, A-2.4, A-3 OR AASHTO M43 <sup>1</sup> 3, 3.57, 4, 4.67, 5, 5.6, 5.7, 6, 6.7, 6.8, 7, 7.8, 8, 8.9, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS @ 12" (300 mm) MAX LIFTS TO A MIN. 96% PROCTOR DENSITY FOR WELL GRADED MATERIAL, AND 90% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE (A) LAYER TO THE 'C' LAYER ABOVE.	AASHTO M43 <sup>1</sup> 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 <sup>1</sup> 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. 1"

PLEASE NOTE:  
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR, NO. 4 (AASHTO M43) STONE.  
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.  
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



**NOTES:**

- MC-4500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F218 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F287 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

MC-4500 STANDARD CROSS SECTION  
DATE: 11/18/14  
DRAWN: JAM  
CHECKED: JAM  
PROJECT #:

StormTech  
4640 TRUDAMAN BLVD  
TROY, MI 48068  
1-800-233-8422

ADS  
10000 WOODBURN BLVD  
TROY, MI 48068  
1-800-233-8422

SHEET 1 OF 1

**NEDERVELD**  
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Ann Arbor, MI 48103  
Phone: 734.929.6963  
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GRAND RAPIDS  
HOLLAND  
INDIANAPOLIS  
ST. LOUIS

**PREPARED FOR:**  
Schafer Development  
Steve Schafer  
29800 Middlebelt Rd., Suite 150  
Farmington Hills, MI 48334  
Phone: 248.932.7500

**REVISIONS:**

Title	Submitted for City review	Date
Drawn: GAN	Checked: JVR	S Date: 12/29/14
Title: Submitted for City review	V Date: 01/13/15	
Drawn: GAN	Checked: JVR	S Date: 01/13/15
Title: Submitted for City review	Date: 01/30/15	

**THE MARK OF TROY**  
Storm Water Management Plan  
2785 W. Maple Road  
PART OF THE NORTHWEST 1/4 OF SECTION 32, T2N, R17E,  
CITY OF TROY, OKLAHOMA COUNTY, MICHIGAN

**STAMP:**

**PROJECT NO:**  
14500172

**SHEET NO:**  
C-401

**SHEET: 6 OF 10**





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Steve Schafer

29800 Middlebelt Rd., Suite 150  
Farmington Hills, MI 48334  
Phone: 248.932.7500

**REVISIONS:**

Title: Submitted for City review V. Date: 12/29/14  
Drawn: GAN Checked: JVR S. Date: 12/29/14  
Title: Submitted for City review V. Date: 01/13/15  
Drawn: GAN Checked: JVR S. Date: 01/13/15  
Title: Submitted 1 for City review Date: 01/30/15

**THE MARK OF TROY**

**Tree Preservation Plan**

2785 W. Maple Road  
PART OF THE NORTHWEST 1/4 OF SECTION 32, T2N, R17E,  
CITY OF TROY, OKLAND COUNTY, MICHIGAN

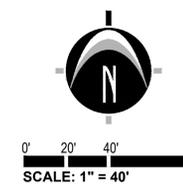
**STAMP:**

**PROJECT NO:**  
14500172

**SHEET NO:**  
**L-101**

**SHEET: 8 OF 10**

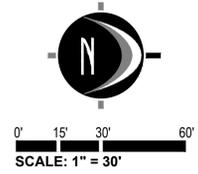
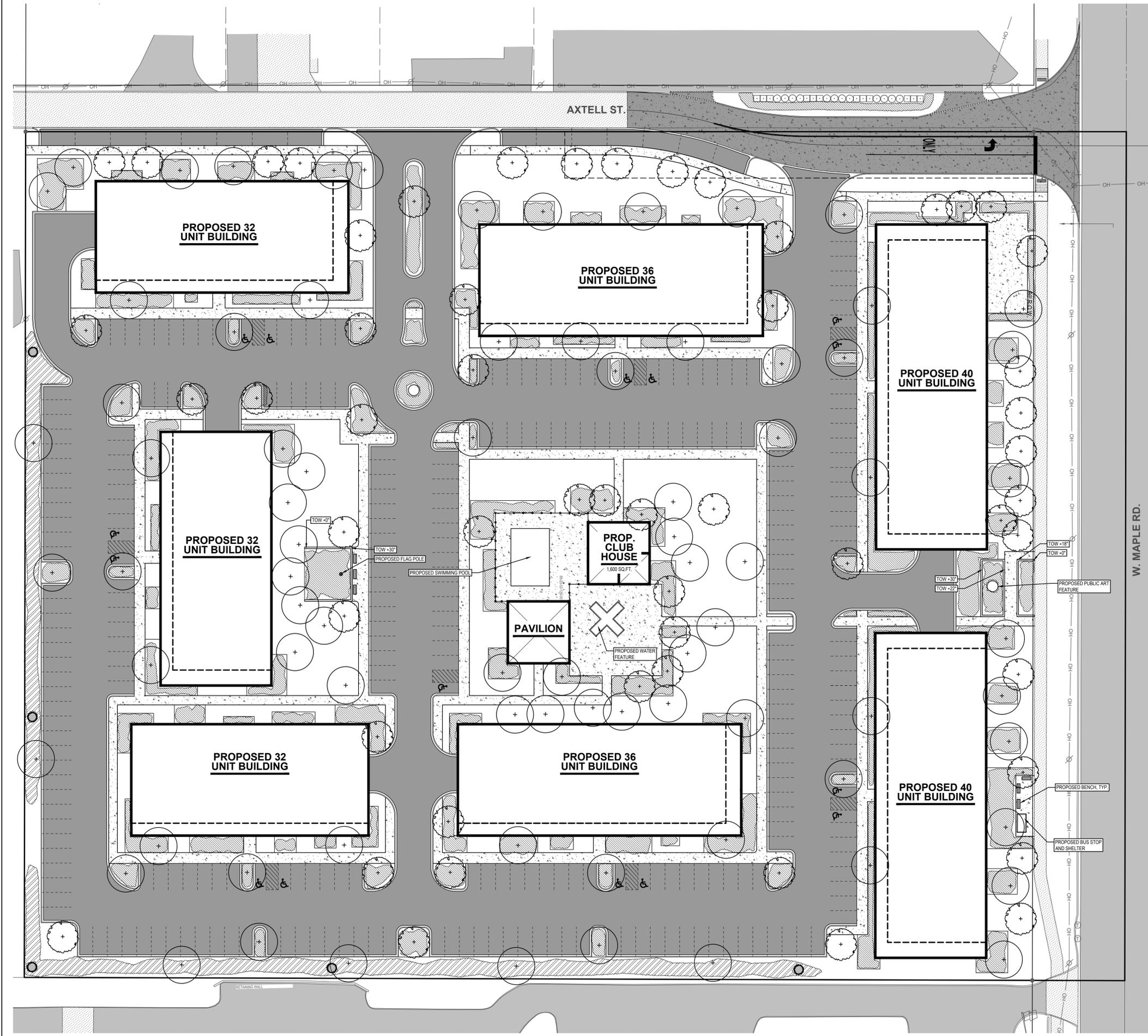
W. MAPLE RD.  
120' R.O.W.



**ALL EXISTING TREES ON SITE TO BE REMOVED**

**EXISTING TREE CHART**

TAG#	SIZE	TREE TYPE	TAG#	SIZE	TREE TYPE	TAG#	SIZE	TREE TYPE	TAG#	SIZE	TREE TYPE
123	6"	POPLAR	546	4"	POPLAR	752	6"	LOCUST	852	6"	WILLOW
124	6"	POPLAR	548	TWIN 6"	POPLAR	753	6"	WILLOW	853	6"	WILLOW
125	8"	BOX ELDER	549	4"	POPLAR	754	6"	WILLOW	854	8"	LOCUST
126	6"	BOX ELDER	550	6"	POPLAR	755	5"	LOCUST	855	6"	WILLOW
127	6"	LOCUST	551	TWIN 4"	POPLAR	756	6"	WILLOW	856	10"	WILLOW
128	6"	LOCUST	552	8"	POPLAR	757	4"	LOCUST	857	8"	WILLOW
129	6"	ELM	553	6"	POPLAR	758	TWIN 6"	WILLOW	858	6"	LOCUST
130	6"	LOCUST	554	6"	POPLAR	759	6"	WILLOW	859	6"	LOCUST
131	6"	ELM	555	6"	POPLAR	760	8"	LOCUST	860	6"	LOCUST
132	6"	ELM	556	6"	POPLAR	761	6"	WILLOW	861	6"	LOCUST
133	6"	ELM	557	6"	POPLAR	762	4"	POPLAR	862	4"	LOCUST
134	8"	ELM	558	4"	POPLAR	763	4"	POPLAR	863	6"	LOCUST
135	10"	LOCUST	559	4"	POPLAR	764	6"	LOCUST	864	6"	LOCUST
136	8"	LOCUST	560	8"	CHERRY	765	6"	LOCUST	865	6"	LOCUST
137	4"	LOCUST	561	6"	POPLAR	766	6"	LOCUST	866	6"	LOCUST
138	6"	LOCUST	562	4"	POPLAR	767	6"	POPLAR	867	6"	LOCUST
139	4"	LOCUST	563	4"	POPLAR	768	8"	LOCUST	868	8"	LOCUST
140	8"	LOCUST	564	MULTI 8" & 10"	BOX ELDER	769	8"	LOCUST	869	6"	LOCUST
141	6"	LOCUST	565	6"	POPLAR	770	4"	POPLAR	870	10"	POPLAR
142	6"	LOCUST	566	8"	POPLAR	771	4"	POPLAR	871	6"	LOCUST
143	6"	POPLAR	567	6"	POPLAR	772	6"	LOCUST	872	6"	LOCUST
144	6"	LOCUST	568	TWIN 6"	POPLAR	773	4"	POPLAR	873	8"	LOCUST
145	5"	ELM	569	6"	POPLAR	774	8"	WILLOW	874	4"	LOCUST
146	6"	LOCUST	570	6"	POPLAR	775	4"	POPLAR	875	8"	LOCUST
147	6"	POPLAR	571	4"	POPLAR	776	4"	WILLOW	876	8"	LOCUST
148	10"	POPLAR	572	4"	POPLAR	777	6"	POPLAR	877	6"	LOCUST
149	8"	LOCUST	573	6"	LOCUST	778	8"	POPLAR	878	6"	LOCUST
150	8"	POPLAR	574	6"	LOCUST	779	8"	POPLAR	879	6"	LOCUST
151	8"	POPLAR	575	TWIN 4"	CHERRY	780	6"	WILLOW	880	6"	LOCUST
152	8"	POPLAR	576	TWIN 4"	LOCUST	781	6"	POPLAR	881	6"	LOCUST
153	4"	POPLAR	577	8"	POPLAR	782	6"	WILLOW	882	8"	LOCUST
154	6"	POPLAR	578	5"	POPLAR	783	6"	WILLOW	883	8"	LOCUST
155	6"	POPLAR	579	TWIN 4"	POPLAR	784	TWIN 6"	WILLOW	884	6"	LOCUST
156	5"	POPLAR	580	6"	POPLAR	785	6"	WILLOW	885	6"	LOCUST
157	8"	POPLAR	581	4"	JUNIPER	786	8"	LOCUST	886	6"	LOCUST
158	8"	LOCUST	582	6"	POPLAR	787	TWIN 6"	WILLOW	887	8"	LOCUST
159	6"	LOCUST	583	TWIN 6"	POPLAR	788	6"	WILLOW	888	6"	LOCUST
160	10"	POPLAR	584	6"	POPLAR	789	6"	WILLOW	889	6"	LOCUST
161	6"	POPLAR	585	5"	POPLAR	790	4"	BOX ELDER	890	8"	LOCUST
162	8"	POPLAR	586	4"	POPLAR	791	6"	LOCUST	891	TWIN 6"	LOCUST
163	8"	POPLAR	587	6"	POPLAR	792	4"	WILLOW	892	6"	LOCUST
164	4"	POPLAR	588	5"	POPLAR	793	4"	WILLOW	893	10"	LOCUST
165	4"	LOCUST	589	TWIN 4"	POPLAR	794	TWIN 6"	POPLAR	894	6"	LOCUST
166	4"	POPLAR	590	5"	POPLAR	795	6"	POPLAR	895	8"	LOCUST
167	8"	POPLAR	591	6"	POPLAR	796	6"	LOCUST			
168	6"	POPLAR	592	4"	POPLAR	797	8"	LOCUST			
169	8"	ELM	593	4"	ELM	798	8"	LOCUST			
170	4"	ELM	594	4"	POPLAR	799	MULTI 4" & 7"	WILLOW			
171	8"	POPLAR	595	8"	POPLAR	800	8"	LOCUST			
172	6"	POPLAR	596	5"	POPLAR	801	6"	WILLOW			
173	10"	POPLAR	597	8"	CHERRY	802	4"	WILLOW			
174	4"	POPLAR	598	6"	POPLAR	803	6"	WILLOW			
175	8"	POPLAR	599	8"	POPLAR	804	6"	WILLOW			
176	8"	ELM	600	4"	POPLAR	805	4"	WILLOW			
177	4"	ELM	601	4"	POPLAR	806	5"	WILLOW			
178	6"	POPLAR	602	6"	ELM	807	6"	WILLOW			
179	8"	POPLAR	603	8"	POPLAR	808	8"	WILLOW			
180	8"	POPLAR	604	8"	CHERRY	809	TWIN 6"	POPLAR			
181	8"	POPLAR	605	6"	POPLAR	810	6"	WILLOW			
182	8"	POPLAR	606	5"	POPLAR	811	TWIN 10"	WILLOW			
183	8"	POPLAR	607	5"	BOX ELDER	812	4"	WILLOW			
184	TWIN 8"	POPLAR	608	6"	CHERRY	813	6"	WILLOW			
185	10"	POPLAR	609	8"	POPLAR	814	8"	WILLOW			
186	10"	POPLAR	610	8"	CHERRY	815	6"	WILLOW			
187	TWIN 8"	POPLAR	611	6"	CHERRY	816	8"	WILLOW			
188	10"	POPLAR	612	6"	POPLAR	817	6"	WILLOW			
189	8"	POPLAR	613	4"	BOX ELDER	818	4"	WILLOW			
190	8"	POPLAR	614	6"	CHERRY	819	4"	WILLOW			
191	4"	POPLAR	615	10"	BOX ELDER	820	4"	WILLOW			
192	6"	POPLAR	616	8"	CHERRY	821	TWIN 6"	WILLOW			
193	6"	POPLAR	617	6"	CHERRY	822	8"	WILLOW			
194	6"	POPLAR	618	4"	CHERRY	823	4"	WILLOW			
195	6"	POPLAR	619	8"	POPLAR	824	TWIN 4"	WILLOW			
196	4"	POPLAR	620	4"	POPLAR	825	4"	WILLOW			
197	5"	POPLAR	621	8"	POPLAR	826	8"	LOCUST			
198	8"	POPLAR	622	8"	LOCUST	827	TWIN 6"	LOCUST			
199	8"	POPLAR	623	6"	LOCUST	828	6"	WILLOW			
200	8"	POPLAR	624	6"	WILLOW	829	6"	POPLAR			
201	10"	LOCUST	625	6"	TWIN 6"	830	6"	WILLOW			
202	10"	LOCUST	626	8"	LOCUST	831	10"	WILLOW			
203	8"	COTTONWOOD	627	6"	WILLOW	832	8"	WILLOW			
204	8"	LOCUST	628	5"	POPLAR	833	6"	POPLAR			
205	8"	LOCUST	629	6"	POPLAR	834	6"	POPLAR			
206	10"	LOCUST	630	6"	WILLOW	835	8"	POPLAR			
207	10"	LOCUST	631	6"	WILLOW	836	6"	BOX ELDER			
208	8"	POPLAR	632	4"	WILLOW	837	6"	WILLOW			
209	8"	POPLAR	633	8"	LOCUST	838	8"	POPLAR			
210	8"	POPLAR	634	4"	LOCUST	839	TWIN 8"	WILLOW			
211	8"	POPLAR	635	4"	LOCUST	840	6"	WILLOW			
212	8"	POPLAR	636	6"	WILLOW	841	8"	WILLOW			
213	8"	POPLAR	637	4"	BOX ELDER	842	6"	POPLAR			
214	8"	POPLAR	638	4"	WILLOW	843	6"	POPLAR			
215	8"	POPLAR	639	4"	WILLOW	844	6"	WILLOW			
216	8"	POPLAR	640	6"	CHERRY	845	8"	WILLOW			
217	8"	POPLAR	641	4"	LOCUST	846	8"	WILLOW			
218	8"	POPLAR	642	4"	LOCUST	847	10"	WILLOW			
219	8"	POPLAR	643	4"	LOCUST	848	8"	WILLOW			
220	8"	POPLAR	644	4"	WILLOW	849	6"	WILLOW			
221	8"	POPLAR	645	4"	WILLOW	850	TWIN 10"	WILLOW			
222	8"	POPLAR	646	4"	WILLOW	851	6"	WILLOW			
223	8"	POPLAR	647	4"	WILLOW						
224	8"	POPLAR	648	4"	WILLOW						
225	8"	POPLAR	649	4"	WILLOW						
226	8"	POPLAR	650	4"	WILLOW						
227	8"	POPLAR	651	4"	WILLOW						
228	8"	POPLAR	652	4"	WILLOW						
229	8"	POPLAR	653	4"	WILLOW						
230	8"	POPLAR	654	4"	WILLOW						
231	8"	POPLAR	655	4"	WILLOW						
232	8"	POPLAR	656	4"	WILLOW						
233	8"	POPLAR	657	4"	WILLOW						
234	8"	POPLAR	658	4"	WILLOW						
235	8"	POPLAR	659	4"	WILLOW						
236	8"	POPLAR	660	4"	WILLOW						
237	8"	POPLAR	661	4"	WILLOW						
238	8"	POPLAR	662	4"	WILLOW						
239	8"	POPLAR	663	4"	WILLOW						
240	8"	POPLAR	664	4"	WILLOW						
241	8"	POPLAR	665	4"	WILLOW						
242	8"	POPLAR	666	4"	WILLOW						
243	8"	POPLAR	667	4"	WILLOW						
244	8"	POPLAR	668	4"	WILLOW						
245	8"	POPLAR	669	4"	WILLOW						
246	8"	POPLAR	670	4"	WILLOW						
247	8"	POPLAR	671	4"	WILLOW						
248	8"	POPLAR	672	4"	WILLOW						
249	8"	POPLAR	673	4"	WILLOW						
250	8"	POPLAR	674	4"	WILLOW						
251	8"	POPLAR	675	4"	WILLOW						
252	8"	POPLAR	676	4"	WILLOW						
253	8"	POPLAR	677	4"	WILLOW						
254	8"	POPLAR	678	4"	WIL						



**LANDSCAPE LEGEND / SCHEDULE**

TREES					
SYMBOL	ABBREVIATION	SCIENTIFIC NAME	COMMON NAME	SIZE	QUANTITY
(Circle with cross)	DT	N/A	Deciduous Tree	2 1/2' cal. min.	82
(Circle with dot)	OT	N/A	Ornamental Tree	2 1/2' cal. min.	52

SHRUBS, GRASSES, & GROUND COVER					
SYMBOL	ABBREVIATION	SCIENTIFIC NAME	COMMON NAME	SIZE	QUANTITY
(Circle)	CE	N/A	Columnar Evergreen	5 gal.	12
(Square)	LH	N/A	Large Hedge	5 gal.	12
(Hatched box)	N/A	N/A	Landscape Planting Beds*	Varies	As Needed
(Diagonal hatched box)	N/A	N/A	Storm Water Bioswale**	Varies	As Needed

\*Landscape planting beds shall be comprised of various shrubs, grasses, and ground covers per City of Troy Zoning Ordinance.  
 \*\*Storm water bioswale shall be planted with native herbaceous and woody species to perform runoff attenuation, filtration, water uptake, and purification per City of Troy Zoning Ordinance.

**LANDSCAPE NOTES**

- PLANTING NOTES:**
- ALL PLANT MATERIAL SHALL BE LOCALLY NURSERY GROWN NO. 1 GRADE AND INSTALLED ACCORDING TO ACCEPTED PLANTING PROCEDURES. ALL PLANT MATERIALS SHALL MEET CURRENT AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS. DO NOT PLANT MATERIALS UNTIL DIRECTED BY OWNER, LANDSCAPE ARCHITECT, AND/OR CONSTRUCTION MANAGER. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANT MATERIAL FOR ANY REASON BEFORE OR AFTER IT IS INSTALLED.
  - SIZES SPECIFIED ARE MINIMUM SIZES TO WHICH THE PLANTS ARE TO BE INSTALLED.
  - ANY PLANT SUBSTITUTIONS SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT.
  - MAINTENANCE OF LANDSCAPING ITEMS, TREES, AND PLANTS SHALL BE PERFORMED BY THE PROPERTY OWNER OR A QUALIFIED PROFESSIONAL. ALL LANDSCAPING SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH APPLICABLE MUNICIPAL STANDARDS AND IN ACCORDANCE WITH CURRENT INDUSTRY STANDARDS IN A NEAT, HEALTHY AND WEED FREE CONDITION. ANY DEAD, DISEASED OR DAMAGED PLANT MATERIALS ARE TO BE REPLACED IMMEDIATELY AFTER NOTIFIED TO DO SO.
  - PLANT TREES AND SHRUBS IN ACCORDANCE WITH PLANTING DETAILS. DIG TREE PITS PER DETAILS. PLANT TREES AND SHRUBS AT THE SAME GRADE LEVEL AT WHICH THEY WERE GROWN AT THE NURSERY. IF HEAVY CLAY SOILS ARE EVIDENT, PLANT TREES AND SHRUBS HIGHER, APPROX. 1/4 OF THE ROOT BALL ABOVE GRADE, AND BACKFILL TO TOP OF ROOT BALL.
  - REMOVE ALL TWINE, WIRE, NURSERY TREE GUARDS, TAGS AND INORGANIC MATERIAL FROM ROOT BALLS. REMOVE THE TOP 1/3 OF BURLAP FROM EARTH BALLS AND REMOVE BURLAP FROM AROUND TRUNK.
  - FINELY SHREDDED HARDWOOD BARK MULCH, NATURAL COLOR (NON-COLORED), IS REQUIRED FOR ALL PLANTINGS AND PLANTING BEDS. MULCH PER PLANTING DETAILS. MULCH IN PLANT BEDS SHALL BE 3" THICK AT TIME OF INSPECTION AND AFTER COMPACTED BY RAKE OR IRRIGATION. ALL PLANTING BEDS SHALL BE EDGED WITH 6" X 12 GAUGE STEEL LANDSCAPE EDGING.
  - LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERIFICATION OF ALL UNDERGROUND AND OVERHEAD UTILITIES. IF A CONFLICT WITH UTILITIES EXIST, NOTIFY OWNER/CONSTRUCTION MANAGER PRIOR TO PLANTING.
  - PLANT MATERIAL SHALL BE GUARANTEED FOR ONE YEAR AFTER PLANTING AND ACCEPTANCE.
- TOPSOIL AND SOD NOTES:**
- WHEREVER GROUND IN ITS NATURAL STATE HAS BEEN DISTURBED, APPROVED LANDSCAPING OR GRASS SHALL BE FULLY INSTALLED, AND ESTABLISHED WITHIN A REASONABLE PERIOD OF TIME, BUT NO LONGER THAN ONE GROWING SEASON (UNLESS OTHERWISE NOTED AND APPROVED).
  - DURING EXCAVATION, GRADING, AND INSTALLATION OF REQUIRED LANDSCAPING, ALL SOIL EROSION AND SEDIMENTATION CONTROL REGULATIONS SHALL BE STRICTLY FOLLOWED AND COMPLIED WITH.
  - ALL LAWN AREAS SHALL RECEIVE SOD. SOD SHALL BE GROWN ON TOPSOIL UNLESS APPROVED OTHERWISE. SOD SHALL BE 2 YEARS OLD AND STRONGLY ROOTED. PLACE SOD TIGHTLY WITH NO GAPS AND WITH GRAIN IN SAME DIRECTION. SEAMS OF SOD SHALL BE STAGGERED IN A RUNNING BOND PATTERN. SOD SHALL BE WATERED IMMEDIATELY TO AVOID DRYING OUT. DO NOT INSTALL SOD UNTIL ACCEPTANCE OF FINISH GRADE AND IRRIGATION SYSTEM IS OPERATING PROPERLY UNLESS DIRECTED IN WRITING TO DO OTHERWISE. FINISH ROLL SOD WITH A WATER FILLED LAWN ROLLER. ROLL PERPENDICULAR TO LENGTH OF SOD.
  - SOD SHALL BE INSTALLED ON A MIN. 3" OF LIGHTLY COMPACTED APPROVED TOPSOIL. TOPSOIL SHALL BE FERTILE, SCREENED, FRIABLE TOPSOIL FREE OF STONES 1/2" IN DIA. AND LARGER ROOTS, STICKS, OR OTHER EXTRANEOUS MATERIAL, INCLUDING NOXIOUS PLANTS. PH BETWEEN 6.0 AND 6.5, SALTS 500 PARTS PPM, ORGANIC CONTENT 3% MIN. DO NOT INSTALL TOPSOIL UNTIL APPROVED BY OWNER/C.M. TOPSOIL SHALL BE FINE GRADED TO A SMOOTH FINISH, FREE OF LUMPS AND DEPRESSIONS.
  - ALL LANDSCAPE ISLANDS WITHIN PARKING LOTS SHALL BE BACK FILLED WITH TOPSOIL TO A DEPTH OF 18".
- IRRIGATION NOTES:**
- ALL PLANTING AREAS, LAWN AREAS AND LANDSCAPE ISLANDS SHOWN ARE TO HAVE A COMPLETE IRRIGATION SYSTEM. THE C.C. SHALL BE RESPONSIBLE FOR RETAINING A QUALIFIED FIRM FOR THE DESIGN OF THE IRRIGATION SYSTEM. THE DESIGN MUST SHOW HOW THE SYSTEM TIES INTO THE BUILDING AND MUST SHOW ALL OF THE NECESSARY EQUIPMENT FOR A COMPLETE SYSTEM. THE C.C. SHALL SUBMIT THE IRRIGATION SYSTEM DESIGN TO THE ARCHITECT/OWNER FOR APPROVAL PRIOR TO COMMENCEMENT OF WORK.



UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.  
 NOTE: EXISTING UTILITIES AND SERVICE LINES IDENTIFIED AS 'PLANT' WERE OBTAINED FROM AVAILABLE CITY AS-BUILT RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND STATUS OF ALL UTILITIES AND SERVICE LINES PRIOR TO NEW CONNECTIONS.

**THE MARK OF TROY**  
 Landscape Plan  
 2785 W. Maple Road  
 PART OF THE NORTHWEST 1/4 OF SECTION 32, T2N, R1E,  
 CITY OF TROY, OKLAND COUNTY, MICHIGAN

**STAMP:**

**PROJECT NO:**  
 14500172

**SHEET NO:**  
**L-102**

**SHEET: 9 OF 10**

