



**PLANNING COMMISSION
MEETING AGENDA
SPECIAL/STUDY MEETING**

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

Donald Edmunds, Chair, Philip Sanzica, Vice Chair
Karen Crusse, Steve Gottlieb, Michael W. Hutson, Tom Krent
Gordon Schepke, Thomas Strat and John J. Tagle

October 28, 2014

7:00 P.M.

Council Board Room

1. ROLL CALL
2. APPROVAL OF AGENDA
3. MINUTES – October 14, 2014 Regular Meeting
4. PUBLIC COMMENT – For Items Not on the Agenda
5. ZONING BOARD OF APPEALS (ZBA) REPORT
6. DOWNTOWN DEVELOPMENT AUTHORITY
7. PLANNING AND ZONING REPORT

POSTPONED ITEM

8. PRELIMINARY SITE PLAN REVIEW (File Number SP 1000) – Proposed Penske Automotive Group Parking Lot Expansion, North side of Maple, West of Stephenson (1225 East Maple), Section 26, Currently Zoned IB (Integrated Industrial and Business) District

OTHER BUSINESS

9. POTENTIAL ZONING ORDINANCE TEXT AMENDMENT – Mineral Extraction
10. PUBLIC COMMENT – Items on Current Agenda
11. PLANNING COMMISSION COMMENT

ADJOURN

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

Chair Edmunds called the Regular meeting of the Troy City Planning Commission to order at 7:00 p.m. on October 14, 2014 in the Council Chamber of the Troy City Hall.

1. ROLL CALL

Present:

- Karen Crusse
- Donald Edmunds
- Steve Gottlieb
- Michael W. Hutson
- Tom Krent
- Philip Sanzica
- Gordon Schepke
- John J. Tagle

Absent:

- Thomas Strat

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-2014-10-052

- Moved by: Tagle
- Seconded by: Krent

RESOLVED, To approve the Agenda as printed.

- Yes: All present (8)
- Absent: Strat

MOTION CARRIED

3. APPROVAL OF MINUTES

Resolution # PC-2014-10-053

- Moved by: Gottlieb
- Seconded by: Hutson

RESOLVED, To approve the minutes of the September 23, 2014 Special/Study meeting and October 1, 2014 Special meeting as published.

- Yes: All present (8)
- Absent: Strat

MOTION CARRIED

4. PUBLIC COMMENTS – Items not on the Agenda

There was no one present who wished to speak.

PRELIMINARY SITE PLAN REVIEW

5. PRELIMINARY SITE PLAN REVIEW (File Number SP 1000) – Proposed Penske Automotive Group Parking Lot Expansion, North side of Maple, West of Stephenson (1225 East Maple), Section 26, Currently Zoned IB (Integrated Industrial and Business) District

Mr. Carlisle reviewed the Preliminary Site Plan application. He specifically addressed stormwater management, landscaping and the photometric plan. Mr. Carlisle recommended approval of the application with the conditions as identified in his report dated September 26, 2014.

Present were Jason Longhurst, project engineer, and Gary Baise, representative of Penske Automotive Group.

Mr. Longhurst addressed the following:

- Stormwater management with respect to the existing Sunoco pipeline that bisects the parking lot expansion.
- Landscaping and buffer along the westerly portion of property abutting residential.
 - Six foot high wood obscuring fence to run along the entire westerly property line that would replace existing chain link fence (circulated photograph).
 - Removal of a number of existing mature trees; replace with parking lot trees.
- Submission of revised Photometric plan that meets Zoning Ordinance requirements.

Mr. Baise gave an explanation of the facility operations on site indicating the majority of the work would be related to new vehicle retrofit and some custom work. Mr. Baise said the number of vehicles on site is indeterminate; possibly 20 haulers a day bringing in 300 vehicles with 20 vehicles in the shop. He said the turnover of vehicles would be fast.

There was discussion on:

- Stormwater management; creativity.
- Number of parking spaces; validation.
- Landscaping buffer to west (residential); maintenance of fence, ownership of trees, existing fence.

Resolution # PC-2014-10-054

Moved by: Sanzica
 Seconded by: Gottlieb

RESOLVED, To table the proposed site plan for the reasons of asking the applicant to:

1. Provide validation of the number of parking spaces proposed for the development.
2. Provide an explanation of sustainable stormwater management and look at alternatives for the site plan.
3. Look at alternative screening of the fence along the westerly property line.
4. Confirm that pole height does not exceed 25 feet.
5. Provide lighting cut sheets to confirm that the fixtures are fully shielded or full cut off.
6. Provide a tree buffer of 1 large evergreen per 10 lineal feet, or 1 narrow evergreen per 5 lineal feet on the outside of the detention pond fence, or alternative if so applicable.
7. Supplement the existing landscape buffer along the western property line with additional trees where there are existing gaps.

Yes: Crusse, Edmunds, Gottlieb, Krent, Sanzica, Tagle
 No: Hutson, Schepke
 Absent: Strat

MOTION CARRIED

OTHER BUSINESS

6. POTENTIAL PRELIMINARY SITE PLAN APPLICATION – Potential Multifamily Residential Development, Southeast corner of Maple Road and Axtell (2785 West Maple), Section 32, Currently Zoned IB (Integrated Industrial and Business) District

Mr. Carlisle introduced a potential Preliminary Site Plan application for the redevelopment of a 9-acre site at the southeast corner of Maple and Axtell. Mr. Carlisle specifically addressed two points identified in his report dated October 3, 2014; orientation/layout of the site and the proposed development’s image and presentation on Maple.

Present were Steven Schafer of Schafer Development and Mark Abanatha of Alexander Bogaerts and Associates.

There was discussion on:

- Site layout.
- Building orientation.
- Retail and/or mixed use.
- Pedestrian, walkable design.
- Urban streetscape.
- Courtyard.
- Naturalized stormwater management.

7. PUBLIC COMMENT – Items on Current Agenda

There was no one present who wished to speak.

8. PLANNING COMMISSION COMMENT

General Planning Commission comments followed.

The Regular meeting of the Planning Commission adjourned at 8:45 p.m.

Respectfully submitted,

Donald Edmunds, Chair

Kathy L. Czarnecki, Recording Secretary

G:\Planning Commission Minutes\2014 PC Minutes\Draft\2014 10 14 Regular Meeting_Draft.doc

DATE: October 22, 2014

TO: Planning Commission

FROM: R. Brent Savidant, Planning Director

SUBJECT: PRELIMINARY SITE PLAN REVIEW (File Number SP 1000) – Proposed Penske Automotive Group Parking Lot Expansion, North side of Maple, West of Stephenson (1225 East Maple), Section 26, Currently Zoned IB (Integrated Industrial and Business) District

The petitioner Nowak & Fraus, on behalf of property owner Penske Automotive Group, submitted the above referenced Preliminary Site Plan application for a proposed parking lot expansion.

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 Planning Commission considered this item at the October 14, 2014 Regular meeting and postponed the item. The attached draft minutes summarize the 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. Report prepared by Carlisle/Wortman Associates, Inc.
3. Minutes from October 14, 2014 Planning Commission Regular meeting (draft).

G:\SITE PLANS\SP 1000 Penske Automotive Group Sec 26\SP-1000 PC Memo 10 28 2014.docx

PROPOSED RESOLUTION

PRELIMINARY SITE PLAN REVIEW (File Number SP 1000) – Proposed Penske Automotive Group Parking Lot Expansion, North side of Maple, West of Stephenson (1225 East Maple), Section 26, Currently Zoned IB (Integrated Industrial and Business) District

Resolution # PC-2014-10-

Moved by:

Seconded by:

RESOLVED, That Preliminary Site Plan Approval, pursuant to Article 8 of the Zoning Ordinance, as requested for the proposed Penske Automotive Group Parking Lot Expansion, located on the north side of Maple, west of Stephenson (1225 East Maple), Section 26, within the IB (Integrated Industrial and Business) District, be granted, subject to the following:

1. All repair and maintenance activities shall be performed entirely within the enclosed building.
2. Dismantled, wrecked, or inoperable vehicles or any vehicle parts or scrap of any kind shall not be stored outdoors.

_____) or

(denied, for the following reasons: _____) or

(postponed, for the following reasons: _____)

Yes:

No:

MOTION CARRIED/FAILED



Legend:

- Tax Parcel
- Road Centerline Text

417 0 208 417 Feet

Scale 1: 2,500



Legend:

- Tax Parcel
- Road Centerline Text
- Form Based Zoning 2
 - (PUD) Planned Unit Development
 - (CF) Community Facilities District
 - (EP) Environmental Protection District
 - (BB) Big Beaver Road
 - (MR) Maple Road
 - (NN) Neighborhood Nodes (A-U)
 - (CB) Community Business
 - (GB) General Business
 - (IB) Integrated Industrial Business District
 - (O) Office Building District
 - (OM) Office Mixed Use
 - (P) Vehicular Parking District
 - (R-1A) One Family Residential District
 - (R-1B) One Family Residential District
 - (R-1C) One Family Residential District
 - (R-1D) One Family Residential District
 - (R-1E) One Family Residential District
 - (RT) One Family Attached Residential District
 - (MF) Multi-Family Residential
 - (MHP) Manufactured Housing
 - (UR) Urban Residential
 - (RC) Research Center District
 - (PV) Planned Vehicle Sales

467 0 233 467 Feet

Scale 1: 2,800



CARLISLE

WORTMAN
associates, inc.

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

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

Date: October 20, 2014

Preliminary Site Plan Review For City of Troy, Michigan

Applicant:	Penske Automotive Group, LLC
Project Name:	1225 East Maple Road.
Plan Date:	October 17, 2014
Location:	1225 East Maple Road. North side of Maple Road, between Stephenson Highway and Rochester Road
Zoning:	IB, Integrated Industrial and Business District
Action Requested:	Preliminary Site Plan Approval

PROJECT AND SITE DESCRIPTION

The applicant is requesting approval of a preliminary site plan for a 565 parking space vehicle storage area addition to the existing 255 space parking lot. The only other additional site plan improvement is the construction of a detention pond.

The vehicle storage area addition is accessory to the principal use of the building for automobile customization. The applicant receives finished vehicles and customizes them based on customer demand. All vehicle customization should be performed entirely within the building and the applicant should not store dismantled, wrecked, or inoperable vehicles or any vehicle parts or scrap of any kind outdoors.

The location of the vehicle storage area addition is in the rear of the site, behind the existing building. The area is currently grass with some trees. The applicant proposes a stormwater management area as a buffer between the single-family homes and the new parking area.

Figure 1
Aerial Image of Subject Site and Vicinity



Surrounding Property Details

Direction	Zoning	Use
North	IB, Integrated Industrial and Business	Light Industrial/Warehouse
South	IB, Integrated Industrial and Business	Light Industrial/Warehouse
East	IB, Integrated Industrial and Business	Light Industrial/Warehouse
West	RT, One-Family Attached Residential	Residential

The Planning Commission last considered this matter at the October 14, 2014 meeting. Please review our previous memo for a complete site plan review.

At the October 14, 2014 meeting, the Planning Commission discussed:

1. Site operations and need for 565 additional spaces

The applicant has submitted a letter outlining site operations. They note that the lot capacity and flexibility of 1225 Maple Road provides a key to their growth plan.

2. Stormwater Management

The Planning Commission discussed the use of more naturalized stormwater management best practices on site. The applicant has amended their plan to provide a 6-on-1 basin. By reducing the slope of the basin, the fencing around the basin will be removed. To amend the proposed basin the applicant has removed one (1) proposed parking spaces.

The applicant has amended to plan to sheet drain most of the parking lot to vegetative swales that run east/west along the northern property line. The Engineering Department has preliminary reviewed the plans and notes that the swale will pretreat the water before it enters the basin.

3. Landscaping

The applicant has submitted a revised landscape plan. Changes to the landscape plan include:

- Providing additional native landscaping along the basin for water filtration.
- Relocating 14 proposed interior parking lot trees to the parking lot perimeter. The total number of trees complies with ordinance requirement. The Planning Commission has the authority to permit changes in parking lot landscaping locations.
- Providing a six-foot high wood fence along the western property line. Fence details have been provided on the plans.
- Providing evergreen and deciduous trees along western property line that is adjacent to residential to provide additional screening and meet interior parking lot planting requirements.
- Providing a new six-foot high chain link fence with black obscuring strips along the north and east property line.

<u>Parking Lot Landscaping:</u> 1 tree for every 8 parking spaces. Trees may be located adjacent to parking lot with planning commission approval.	565 spaces / 8 spaces per tree = 71 trees	24 trees in parking lot and 47 along perimeter.	The total number complies, but the location along the perimeter requires Planning Commission approval
<u>General Site Landscaping:</u> 20% of site area shall be landscaped	656,586 sq ft x 20% = 131,289 sq ft	140,106 sq ft = 21.3%	Complies
<u>Screening:</u> Opaque fence, wall, or 1 large evergreen per 10 lineal feet or 1 narrow evergreen per 5 lineal feet, or fence, or combination.	Opaque fence, wall, or 1 large evergreen per 10 lineal feet, 1 narrow evergreen per 5 lineal feet along western property line, fence, or combination	Fence and landscaping	Complies with Planning Commission approval.

4. Photometrics

The applicant has revised their Photometric Plan and lighting details. The applicant has confirmed the pole height to 25-feet. The photometrics comply with all ordinance requirements.

RECOMMENDATIONS

We recommend preliminary site plan approval, with the following conditions:

1. *All repair and maintenance activities shall be performed entirely within the enclosed building.*
2. *Dismantled, wrecked, or inoperable vehicles or any vehicle parts or scrap of any kind shall not be stored outdoors.*



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

PRELIMINARY SITE PLAN REVIEW

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Present were Jason Longhurst, project engineer, and Gary Baise, representative of Penske Automotive Group.

Mr. Longhurst addressed the following:

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- Number of parking spaces; validation.
- Landscaping buffer to west (residential); maintenance of fence, ownership of trees, existing fence.

Resolution # PC-2014-10-054

Moved by: Sanzica

Seconded by: Gottlieb

RESOLVED, To table the proposed site plan for the reasons of asking the applicant to:

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Yes: Crusse, Edmunds, Gottlieb, Krent, Sanzica, Tagle

No: Hutson, Schepke

Absent: Strat

MOTION CARRIED



Fleet solutions that drive results.

QEK Global Solutions is a US based company that specializes in five key areas:

- Vehicle Lifecycle Management inclusive of proprietary software
- Engineering/Mechanical Services
- Paint
- Fabrication
- Vehicle Event Services

Ninety percent of our clients are in the OEM automotive space. They are GM, Chrysler, Ford, Toyota, BMW, Honda, VW, Nissan, and Hyundai just to name a few. Our executive clients both locally and globally are regularly in our office as we work on items specific to their business needs.

Our employment base is 705 throughout the US and Canada and many team members travel globally should they be needed by our clients.

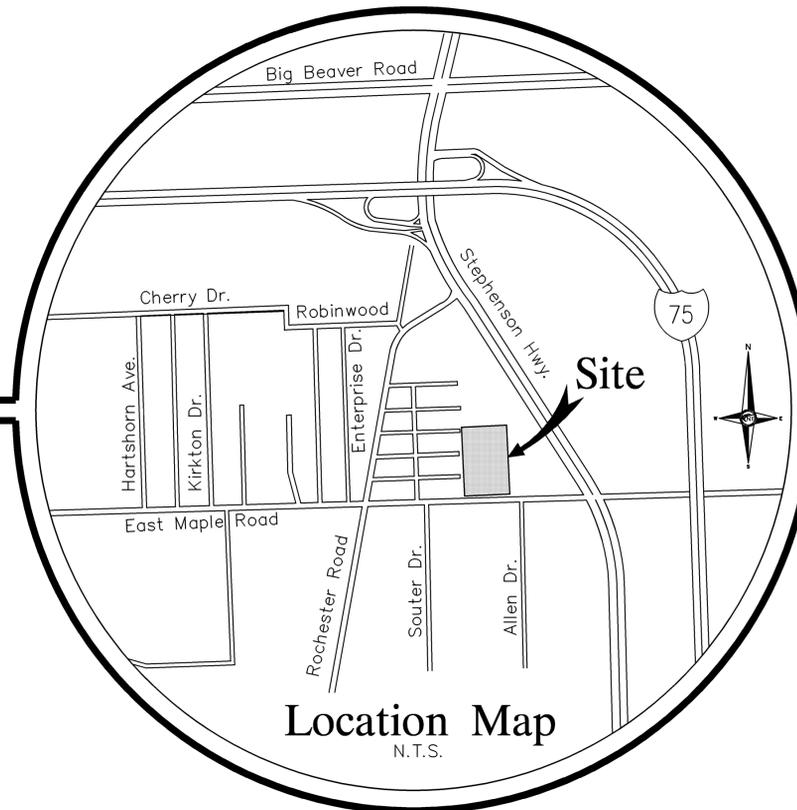
Our business has been on a growth trajectory and we have outgrown our current HQ location from a parking standpoint. As we meet the needs of our growing client base we became intrigued with the 1225 Maple property given the parcel two expansion opportunity. The opportunity to construct additional on-site parking was the key reason we proceeded with the transaction. We are proud to be meeting the many needs of the various OEMs who are travelling to Michigan to meet with us. The lot capacity and the flexibility it provides is key to our growth plans.

The Maple location will become our Corporate Headquarters. Given this strategic move, our Accounting, HR and IT team which includes our software developers will be relocating to the 1225 Maple location. In addition, our technical talent that resides at our current HQ location will be relocating as well.

City of Troy,
Oakland County, Michigan

CONSTRUCTION PLAN PACKAGE

Prepared For:
PENSKE AUTOMOTIVE GROUP, LLC.



REVISIONS:	
09-26-14	ISSUED FOR ENGINEERING REVIEW
10-17-14	REVISED PER CITY REVIEW

Owner

PENSKE AUTOMOTIVE GROUP
2555 TELEGRAPH ROAD
BLOOMFIELD HILLS, MICHIGAN 48302
CONTACT:
MR. JEFF ANDERSON
PHONE: (248) 648-2574

Civil Engineer

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVENUE
PONTIAC, MICHIGAN 48342
CONTACT:
MR. JEFFREY J. HUHTA P.E., P.S.
PHONE: (248) 332-7931
FAX: (248) 332-8257

Landscape Architect

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVENUE
PONTIAC, MICHIGAN 48342
MR. GEORGE OSTROWSKI, R.L.A.
PHONE: (248) 332-7931
FAX: (248) 332-8257

SHEET INDEX

- C-0 COVER SHEET
- C-1 BOUNDARY, TOPOGRAPHIC, AND TREE SURVEY
- C-2 DEMOLITION PLAN
- C-3 ENGINEERING PLAN
- C-4 UTILITY PROFILES AND DETAILS
- C-6 NOTES AND DETAILS PLAN
- C-7 SOIL EROSION AND SEDIMENTATION CONTROL PLAN

- L-1 TREE PRESERVATION PLAN
- L-2 LANDSCAPE PLAN

1 of 1 PHOTOMETRIC PLAN

CITY OF TROY - STORM DETAIL SHEET
CITY OF TROY - SOIL EROSION DETAIL SHEET

Project Name:

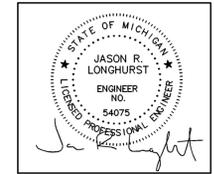
1225 East Maple Road

LEGAL DESCRIPTION

PARCEL 1 (TAX ITEM NO. 20-26-351-024):
PART OF THE SOUTHWEST 1/4 OF SECTION 26 AND A PART OF THE SOUTHEAST 1/4 OF SECTION 27, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE SOUTHEAST CORNER OF SECTION 27; THENCE NORTH 00 DEGREES 13 MINUTES 23 SECONDS EAST A DISTANCE OF 43.00 FEET TO THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 45 MINUTES 00 SECONDS WEST, A DISTANCE OF 106.51 FEET; THENCE NORTH 29 DEGREES 36 MINUTES 52 SECONDS WEST, A DISTANCE OF 67.03 FEET; THENCE NORTH 00 DEGREES 11 MINUTES 45 SECONDS EAST, A DISTANCE OF 327.77 FEET; THENCE NORTH 50 DEGREES 11 MINUTES 46 SECONDS EAST, A DISTANCE OF 20.61 FEET; THENCE NORTH 00 DEGREES 11 MINUTES 46 SECONDS EAST, A DISTANCE OF 137.20 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 14 SECONDS EAST, A DISTANCE OF 124.62 FEET; THENCE NORTH 50 DEGREES 11 MINUTES 46 SECONDS EAST, A DISTANCE OF 58.95 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 14 SECONDS EAST, A DISTANCE OF 74.42 FEET; THENCE NORTH 00 DEGREES 11 MINUTES 46 SECONDS EAST, A DISTANCE OF 45.57 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 14 SECONDS EAST, A DISTANCE OF 80.28 FEET; THENCE NORTH 00 DEGREES 11 MINUTES 46 SECONDS EAST, A DISTANCE OF 23.43 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 14 SECONDS EAST, A DISTANCE OF 333.50 FEET; THENCE SOUTH 00 DEGREES 11 MINUTES 46 SECONDS WEST, A DISTANCE OF 23.43 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 14 SECONDS EAST, A DISTANCE OF 64.12 FEET; THENCE SOUTH 00 DEGREES 01 MINUTES 44 SECONDS WEST, A DISTANCE OF 619.94 FEET TO A POINT ON THE NORTH RIGHT OF WAY OF MAPLE ROAD (86 FEET WIDE); THENCE NORTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 599.85 FEET TO THE POINT OF BEGINNING.

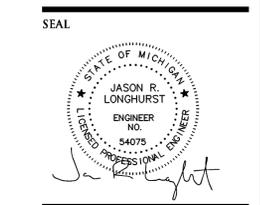
PARCEL 2 (TAX ITEM NO. 20-26-351-023):
PART OF THE SOUTHWEST 1/4 OF SECTION 26 AND PART OF THE SOUTHEAST 1/4 OF SECTION 27, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE SOUTHEAST CORNER OF SECTION 27; THENCE NORTH 00 DEGREES 13 MINUTES 23 SECONDS EAST, A DISTANCE OF 43.00 FEET; THENCE NORTH 89 DEGREES 45 MINUTES 00 SECONDS WEST, A DISTANCE OF 106.51 FEET TO THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 45 MINUTES 00 SECONDS WEST, A DISTANCE OF 58.73 FEET TO THE POINT ON THE EASTERLY LINE OF STUMPF'S BEECH GROVE SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN LIBER 32, PAGE 11 OF PLATS, OAKLAND COUNTY RECORDS; THENCE NORTH 00 DEGREES 06 MINUTES 34 SECONDS WEST, A DISTANCE OF 856.83 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 14 SECONDS EAST, A DISTANCE OF 767.17 FEET; THENCE SOUTH 00 DEGREES 01 MINUTES 44 SECONDS WEST, A DISTANCE OF 237.10 FEET; THENCE NORTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 64.12 FEET; THENCE NORTH 00 DEGREES 11 MINUTES 46 SECONDS EAST, A DISTANCE OF 23.43 FEET; THENCE NORTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 333.50 FEET; THENCE SOUTH 00 DEGREES 11 MINUTES 46 SECONDS WEST, A DISTANCE OF 23.43 FEET; THENCE NORTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 80.28 FEET; THENCE SOUTH 00 DEGREES 11 MINUTES 46 SECONDS WEST, A DISTANCE OF 45.57 FEET; THENCE NORTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 74.42 FEET; THENCE SOUTH 50 DEGREES 11 MINUTES 46 SECONDS WEST, A DISTANCE OF 58.95 FEET; THENCE NORTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 124.62 FEET; THENCE SOUTH 00 DEGREES 11 MINUTES 46 SECONDS WEST, A DISTANCE OF 137.20 FEET; THENCE SOUTH 50 DEGREES 11 MINUTES 46 SECONDS WEST, A DISTANCE OF 20.61 FEET; THENCE SOUTH 00 DEGREES 11 MINUTES 46 SECONDS WEST, A DISTANCE OF 327.77 FEET; THENCE SOUTH 29 DEGREES 36 MINUTES 52 SECONDS EAST, A DISTANCE OF 67.03 FEET TO THE POINT OF BEGINNING.

NFE JOB # F731-02



**CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS**

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



PROJECT
 Penske - Troy
 1225 East Maple Road

CLIENT
 Penske Automotive Group
 2555 Telegraph Rd.
 Bloomfield Hills, MI 48302
 CONTACT
 Mr. Jeff Anderson
 Tel: 248-648-2574
 janderson@penskeautomotive.com

PROJECT LOCATION
 Part of the Southwest 1/4
 of Section 26
 T.2 North, R.11 East
 City of Troy, Oakland County,
 Michigan

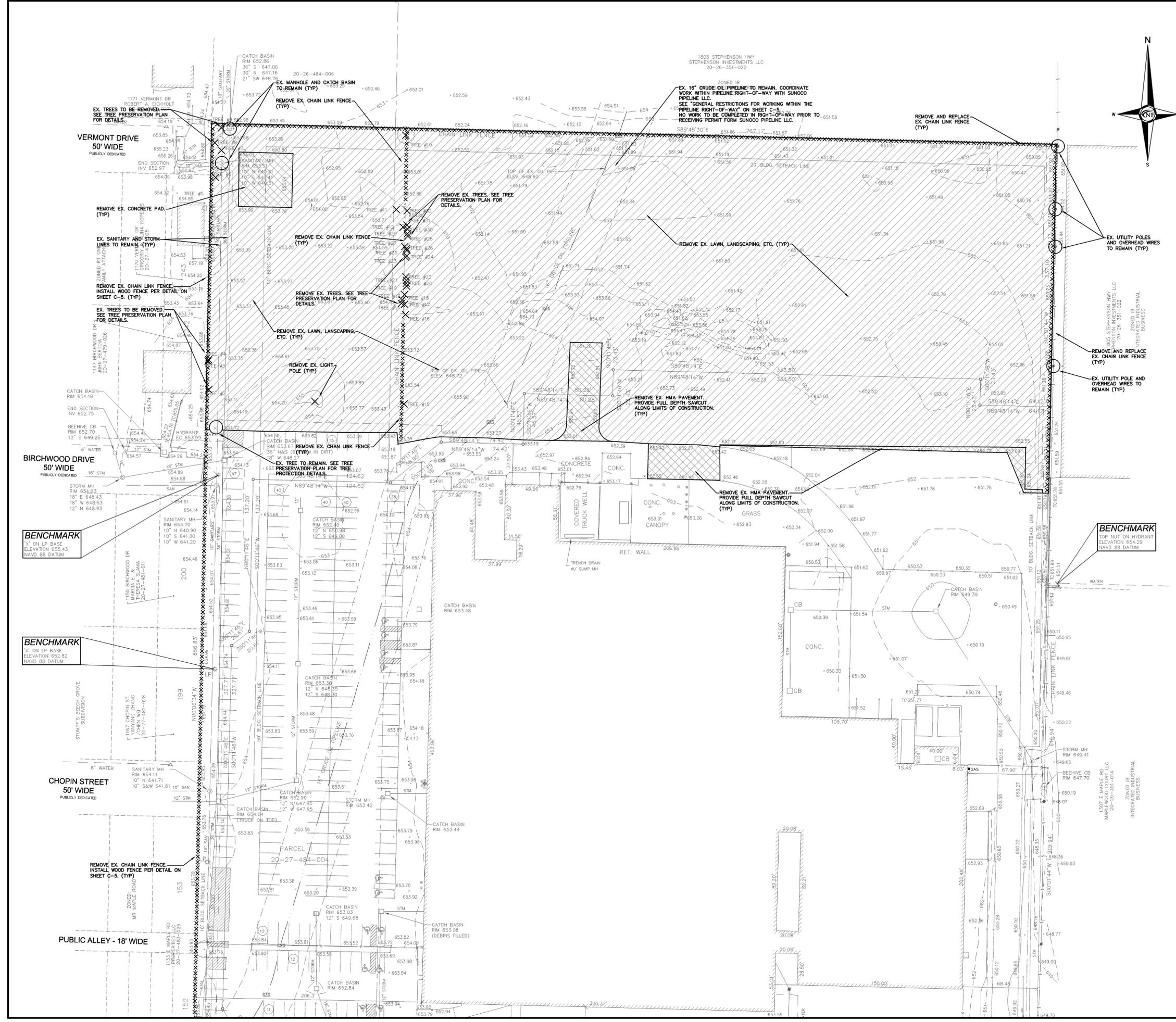
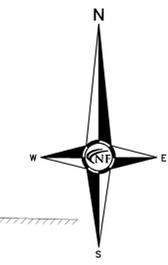
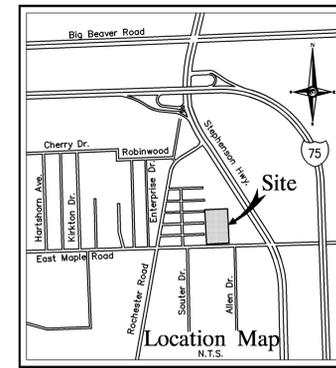
SHEET
 Demolition Plan



REVISIONS
 09-26-14 ISSUED FOR ENGINEERING REVIEW
 10-17-14 REVISED PER CITY REVIEW

DRAWN BY:
 J. Klenk
 DESIGNED BY:
 J. Longhurst
 APPROVED BY:
 J. Longhurst
 DATE:
 September 26, 2014

SCALE: 1" = 40'
 40 20 0 20 40 60
 NFE JOB NO. SHEET NO.
F731-02 C-2



DEMOLITION NOTES
 DEMOLITION OF SITE IMPROVEMENTS SHALL BE ALLOWED ONLY AFTER AN APPROVED PERMIT HAS BEEN SECURED FROM THE PUBLIC AGENCY HAVING JURISDICTION OVER SAID DEMOLITION.
 FOR ANY DEMOLITION WITHIN PUBLIC RIGHT-OF-WAY, THE CONTRACTOR SHALL PAY FOR, AND SECURE, ALL NECESSARY PERMITS AND LIKewise SHALL ARRANGE FOR ALL SITE INSPECTIONS.
 SITE DEMOLITION INCLUDES THE COMPLETE REMOVAL OF SITE IMPROVEMENTS AND OFF-SITE DISPOSAL DEBRIS SHALL BE TRANSPORTED TO AN APPROPRIATE DISPOSAL FACILITY THAT IS LICENSED FOR THAT TYPE OF DEBRIS.
 THE CONTRACTOR SHALL COORDINATE TRUCK ROUTES WITH THE MUNICIPALITY PRIOR TO COMMENCEMENT OF SITE DEMOLITION. ALL TRUCKS SHALL BE TARPED OR PROPERLY SECURED TO CONTAIN DEMOLITION DEBRIS PRIOR TO LEAVING SITE.
 EXISTING ON-SITE UNDERGROUND UTILITIES AND BUILDING SERVICES HAVE BEEN INDICATED BASED UPON THE BEST AVAILABLE UTILITY RECORDS AND/OR ON-SITE INSPECTION. NO GUARANTEE IS MADE BY THE DESIGN ENGINEER, AS TO THE COMPLETENESS OR ACCURACY OF UTILITY DATA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF UTILITY INFORMATION (THE DESIGN ENGINEER MAKES NO GUARANTEE NOR ASSUMES ANY LIABILITY AS TO THE COMPLETENESS AND/OR ACCURACY OF UTILITY DATA).
 PRIOR TO THE REMOVAL OR ABANDONMENT OF ANY EXISTING UNDERGROUND UTILITY OR BUILDING SERVICE LINES CALLED FOR IN THE PLANS OR DISCOVERED DURING EXCAVATION, THE CONTRACTOR MUST DETERMINE IF THE UTILITY LINE OR BUILDING SERVICE IS STILL IN USE. IF THE UTILITY LINE OR BUILDING SERVICE IS STILL IN USE/ACTIVE THE CONTRACTOR MUST TAKE ALL THE NECESSARY STEPS TO GUARANTEE THAT THE UTILITY LINE OR BUILDING SERVICE IS RECONNECTED WITHOUT AN INTERRUPTION IN SERVICE. THE RECONNECTION OF THE UTILITY LINE OR BUILDING SERVICE MUST BE IN ACCORDANCE WITH THE STANDARDS AND REQUIREMENTS OF THE APPROPRIATE GOVERNMENTAL AGENCY OR PRIVATE UTILITY COMPANY.
 SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED BY THE CONTRACTOR PRIOR TO SITE DEMOLITION.
 * THE CONTRACTOR SHALL NOTIFY MISS DIO ((1-800-482-7171)) A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE START OF THE SITE DEMOLITION.
 THE CONTRACTOR SHALL COORDINATE THE REMOVAL AND/OR RELOCATION OF EXISTING UTILITY POLES AND UTILITY SERVICES WITH THE APPROPRIATE UTILITY SERVICE PROVIDER. REMOVAL OF SERVICES SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND REQUIREMENTS OF THE UTILITY COMPANY.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION OF PRIVATE UTILITY COMPANIES AND COORDINATE UTILITY SERVICE SHUT OFF/DISCONNECT, PRIOR TO DEMOLITION OF EXISTING STRUCTURES OR PROPERTIES.
 ANY ON-SITE STORM SEWER FACILITIES LOCATED DURING DEMOLITION SHALL BE REMOVED AND BULK HEADED AT THE PROPERTY LINE IF INDICATED FOR REMOVAL ON THE PLANS.

TOPOGRAPHIC SURVEY NOTES
 ALL ELEVATIONS ARE EXISTING ELEVATIONS, UNLESS OTHERWISE NOTED.
 UTILITY LOCATIONS WERE OBTAINED FROM MUNICIPAL OFFICIALS AND RECORDS OF UTILITY COMPANIES, AND NO GUARANTEE CAN BE MADE TO THE COMPLETENESS, OR EXACTNESS OF LOCATION.
 THIS SURVEY MAY NOT SHOW ALL EASEMENTS OF RECORD UNLESS AN UPDATED TITLE POLICY IS FURNISHED TO THE SURVEYOR BY THE OWNER

LEGEND

	EXISTING SANITARY SEWER
	EXISTING SAN. CLEAN OUT
	EXISTING WATER MAIN
	EXISTING STORM SEWER
	EX. R. Y. CATCH BASIN
	EXISTING BURIED CABLES
	OVERHEAD LINES
	LIGHT POLE
	SIGN
	EXISTING GAS MAIN
	EXISTING FENCE TO BE REMOVED
	INDICATES EXISTING TREE TO BE REMOVED
	INDICATES AREAS OF LAWN, LANDSCAPING, ETC. TO BE REMOVED
	INDICATES AREAS OF PAVEMENT TO BE REMOVED



NOTE

ALL REPAIR AND MAINTENANCE ACTIVITIES SHALL BE PERFORMED ENTIRELY WITHIN THE ENCLOSED BOUNDARY.

NOTE

DISMANTLED, WRECKED, INOPERABLE VEHICLES, ANY VEHICLE PARTS, OR SCRAP OF ANY KIND SHALL NOT BE STORED OUTDOORS.

NOTE

PROPOSED PERIMETER FENCING SHALL BE MAINTAINED IN GOOD CONDITION AT ALL TIMES.

SEAL



PROJECT
Penske - Troy
1225 East Maple Road

CLIENT
Penske Automotive Group
2555 Telegraph Rd.
Bloomfield Hills, MI 48302
CONTACT
Mr. Jeff Anderson
Tel: 248-648-2574
janderson@penskeautomotive.com

PROJECT LOCATION
Part of the Southwest 1/4
of Section 26
T.2 North, R.11 East
City of Troy, Oakland County,
Michigan

SHEET
Engineering Plan



REVISIONS
09-26-14 ISSUED FOR ENGINEERING REVIEW
10-17-14 REVISED PER CITY REVIEW

DRAWN BY:
J. Klenk

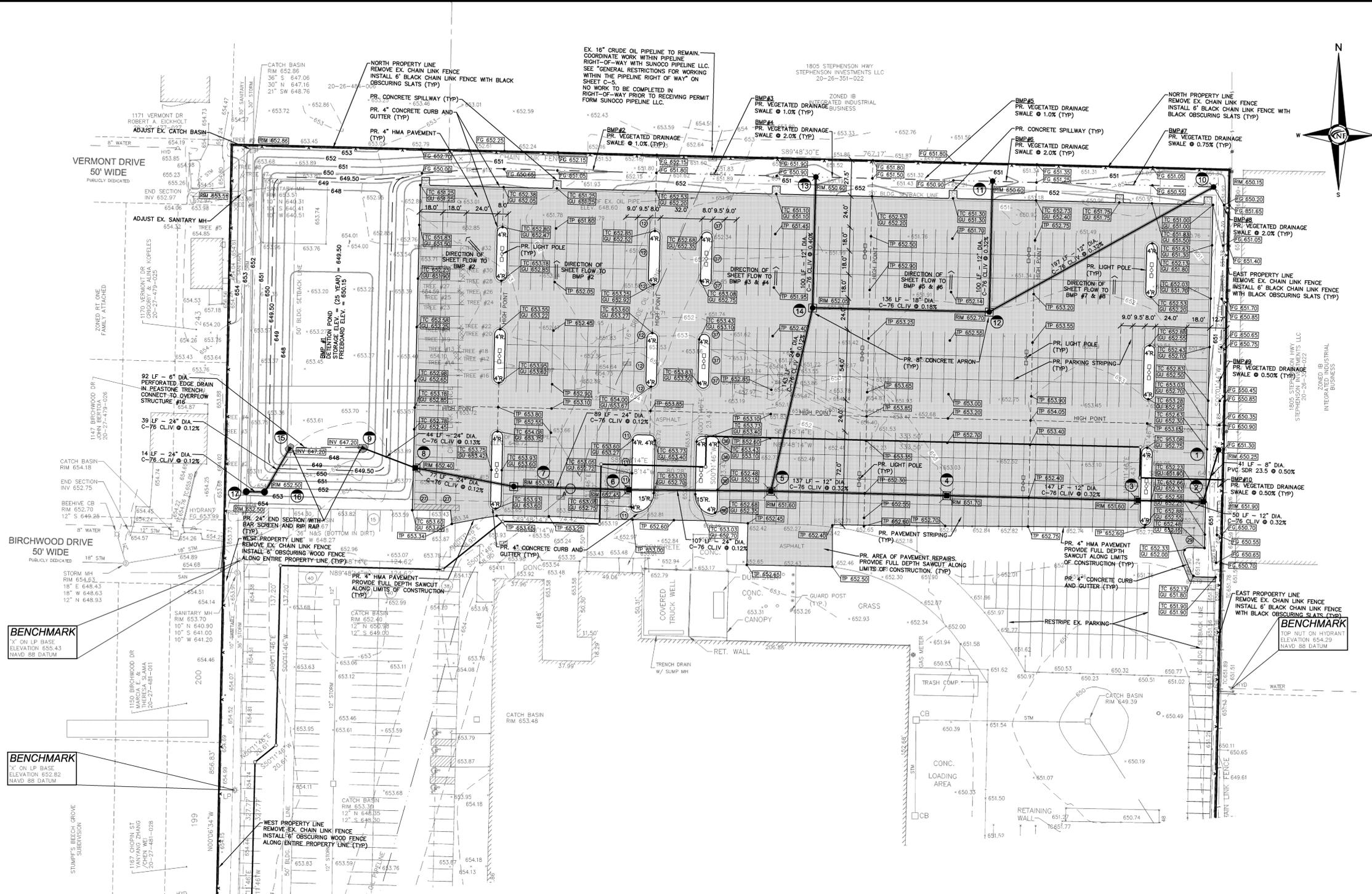
DESIGNED BY:
J. Longhurst

APPROVED BY:
J. Longhurst

DATE:
September 26, 2014

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

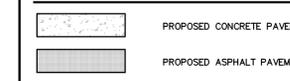
NFE JOB NO. SHEET NO.
F731-02 C-3



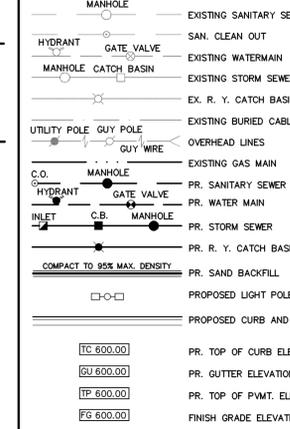
STORM STRUCTURE SCHEDULE

- 1 PR. 2" R.Y.C.B. W/ 2" SUMP AND 2" DIA. MANHOLE OVER EX. SEWER
- 2 PR. 4" DIA. CATCH BASIN W/ 2" SUMP
- 3 PR. 4" DIA. CATCH BASIN W/ 2" SUMP
- 4 PR. 4" DIA. CATCH BASIN W/ 2" SUMP
- 5 PR. 5" DIA. CATCH BASIN W/ 2" SUMP
- 6 PR. 4" DIA. CATCH BASIN W/ 2" SUMP
- 7 PR. 4" DIA. CATCH BASIN W/ 2" SUMP
- 8 PR. 4" DIA. CATCH BASIN W/ 2" SUMP
- 9 PR. 24" END SECTION W/ BAR SCREEN
- 10 PR. 2" DIA. R.Y.C.B. W/ 2" SUMP AND ESW 2850 FRAME
- 11 PR. 2" DIA. R.Y.C.B. W/ 2" SUMP AND ESW 2850 FRAME
- 12 PR. 5" DIA. MANHOLE W/ 2" SUMP
- 13 PR. 5" DIA. MANHOLE W/ 2" SUMP
- 14 PR. 5" DIA. MANHOLE W/ 2" SUMP
- 15 PR. 24" END SECTION W/ BAR SCREEN
- 16 PR. 6" DIA. OVERFLOW MANHOLE W/ 2" SUMP
- 17 PR. 6" DIA. MANHOLE OVER EX. SEWER

PAVING LEGEND



LEGEND



UTILITY CROSSING SCHEDULE

EX. 16" CRUDE OIL B/P 647.26 (V.L.F.)
PR. 24" STORM T/P 645.22

MAINTAIN 24" (MINIMUM) VERTICAL CLEARANCE BETWEEN UTILITIES PER SUNOCO PIPELINE, LLC. STANDARDS - SEE STORM SEWER PROFILES ON SHEET C4.

SITE DATA

ZONING: IB - INDUSTRIAL BUSINESS DISTRICT

MIN. YARD SETBACKS
FRONT 30.0 FT. N/A
LEFT SIDE YARD 10.0 FT. 13.0 FT.
TOTAL SIDE YARDS 20.0 FT. 41.8 FT.
REAR 20.0 FT. 27.5 FT.

REQUIRED PARKING
LIGHT INDUSTRIAL 1 SPACE / 550 SQ. FT. OF GROSS FLOOR AREA

REQUIRED SPACES = 255 SPACES
PROPOSED VEHICLE STORAGE SPACES = 565 SPACES

TOTAL PROVIDED SPACES = 820 SPACES

LOT COVERAGE
PAVEMENT: 341,858.02 SQ. FT. 52.04%
LANDSCAPE: 140,105.88 SQ. FT. 21.33%
BUILDING: 174,803.81 SQ. FT. 26.63%
TOTAL: 656,767.71 SQ. FT. 100.00%

ESTIMATED QUANTITIES PAVING

DESCRIPTION	QUANTITY	UNITS
4" ASPHALT ON 8" 21AA BASE	16,430	S.Y.
8" REINFORCED CONCRETE SPILLWAY	25	S.Y.
8" NON-REINFORCED CONCRETE BOXOUT	27	S.Y.
4" CONCRETE CURB & GUTTER	2,802	L.F.

STORM SEWER

DESCRIPTION	QUANTITY	UNITS
8" PVC. SDR 23.5, SEWER PIPE	41	L.F.
12" C-76, CLASS IV, SEWER PIPE	728	L.F.
18" C-76, CLASS IV, SEWER PIPE	136	L.F.
24" C-76, CLASS IV, SEWER PIPE	513	L.F.
2" DIA. INLET	4	EA.
4" DIA. CATCH BASIN W/ 2" SUMP	5	EA.
4" DIA. MANHOLE W/ 2" SUMP	1	EA.
5" DIA. CATCH BASIN W/ 2" SUMP	1	EA.
5" DIA. MANHOLE	2	EA.
6" DIA. MANHOLE OVER EX. SEWER	1	EA.
6" DIA. OVERFLOW MANHOLE	1	EA.
24" END SECTION W/ BAR SCREEN	2	EA.
SEWER TAP/CONNECTION	1	EA.

City of Troy, Oakland County, Michigan																						
Storm Sewer Calculations																						
Drainage Area (Location)	Manhole Number	To Manhole Number	Drainage Area (Acres)	Runoff Coefficient (C)	Equivalent Area (C * A)	Total Area (Sum C * A)	Time of Concentration (Minutes)	Rainfall Intensity (Inches/Hr.)	Actual Discharge (CFS)	Pipe Size (Inches)	Pipe Slope (% Slope)	Pipe Length (Feet)	Flow Velocity (Ft/Sec)	Time of Flow (Minutes)	Full Pipe Capacity (CFS)	H. G. Elev. Upper End (Feet)	H. G. Elev. Lower End (Feet)	H. G. Slope (% Slope)	Theoretical Velocity (Ft/Sec)	Rim Elevation (Upper)	Invert Elevation (Upper)	Invert Elevation (Lower)
A	10	12	0.620	0.730	0.453	0.453	20.00	3.889	1.760	12	0.32	197	2.566	1.28	2.02	649.97	649.49	0.2441	2.241	650.25	648.52	647.89
B	11	12	0.570	0.790	0.450	0.450	20.00	3.889	1.751	12	0.32	100	2.566	0.65	2.02	649.73	649.49	0.2416	2.230	650.60	648.21	647.89
C	13	14	0.000	0.000	0.000	0.903	21.28	3.781	3.414	18	0.18	136	2.522	0.90	4.46	649.49	649.34	0.1056	1.932	652.70	647.89	647.65
D	14	5	0.740	0.780	0.577	0.577	20.00	3.889	2.245	12	0.40	100	2.869	0.58	2.25	649.74	649.34	0.3969	2.858	650.60	648.05	647.65
E	14	5	0.000	0.000	0.000	1.480	22.18	3.709	5.490	24	0.12	143	2.494	0.96	7.84	649.34	649.26	0.0589	1.748	652.05	647.65	647.48
F	1	2	0.080	0.200	0.016	0.016	20.00	3.889	0.062	8	0.50	41	2.652	0.26	0.93	649.68	649.68	0.0023	0.178	650.25	648.75	648.55
G	2	3	0.100	0.850	0.085	0.101	20.26	3.867	0.391	5.0	0.32	5.0	2.566	0.32	2.02	649.68	649.67	0.0120	0.497	651.90	648.55	648.39
H	3	4	0.170	0.850	0.145	0.246	20.58	3.839	0.943	12	0.32	147	2.566	0.95	2.02	649.67	649.57	0.0700	1.200	651.60	647.89	647.92
I	4	5	0.240	0.850	0.204	0.450	21.54	3.760	1.690	12	0.32	137	2.566	0.89	2.02	649.57	649.26	0.2251	2.152	651.70	647.92	647.48
J	5	6	0.360	0.850	0.306	2.236	22.43	3.690	8.249	24	0.12	107	2.494	0.71	7.84	649.26	649.12	0.1330	2.626	651.60	647.48	647.35
K	6	7	0.220	0.850	0.187	2.423	23.14	3.635	8.806	24	0.12	89	2.494	0.59	7.84	649.12	648.98	0.1515	2.803	652.45	647.89	647.82
L	7	8	0.000	0.000	0.000	2.423	23.74	3.591	8.699	24	0.12	77	2.494	0.51	7.84	648.98	648.87	0.1479	2.769	653.35	647.35	647.26
M	8	9	0.120	0.850	0.102	2.525	24.25	3.553	8.970	24	0.13	44	2.596	0.28	8.16	648.87	648.80	0.1572	2.855	652.40	647.26	647.20

SEAL



PROJECT

Penske - Troy
1225 East Maple Road

CLIENT

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janderson@penskeautomotive.com

PROJECT LOCATION

Part of the Southwest 1/4
of Section 26
T.2 North, R.11 East
City of Troy, Oakland County,
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SHEET

Utility Profiles



REVISIONS
09-26-14 ISSUED FOR ENGINEERING REVIEW
10-17-14 REVISED PER CITY REVIEW

DRAWN BY:
J. Klenk

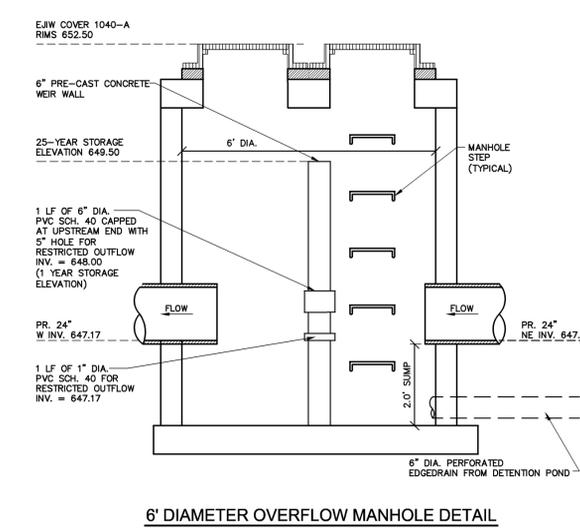
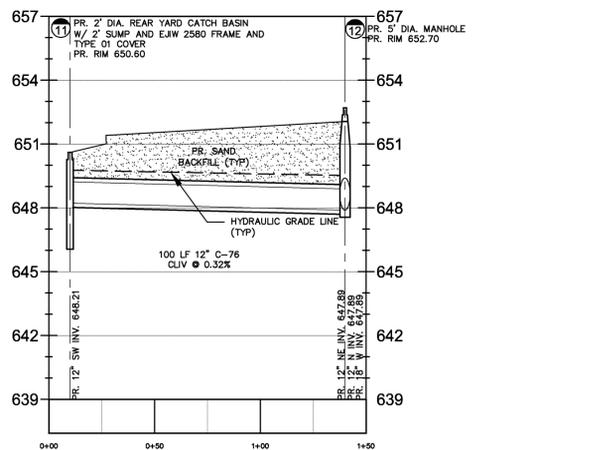
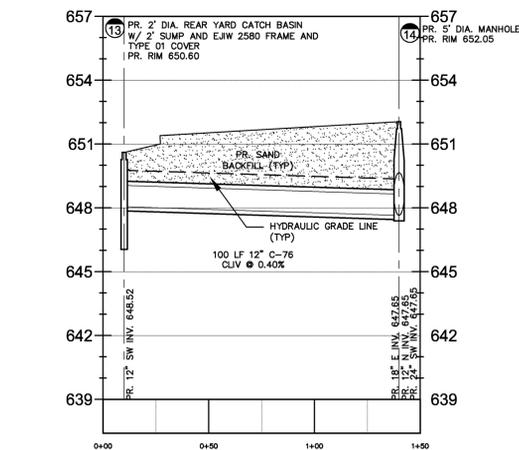
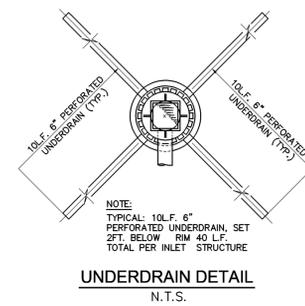
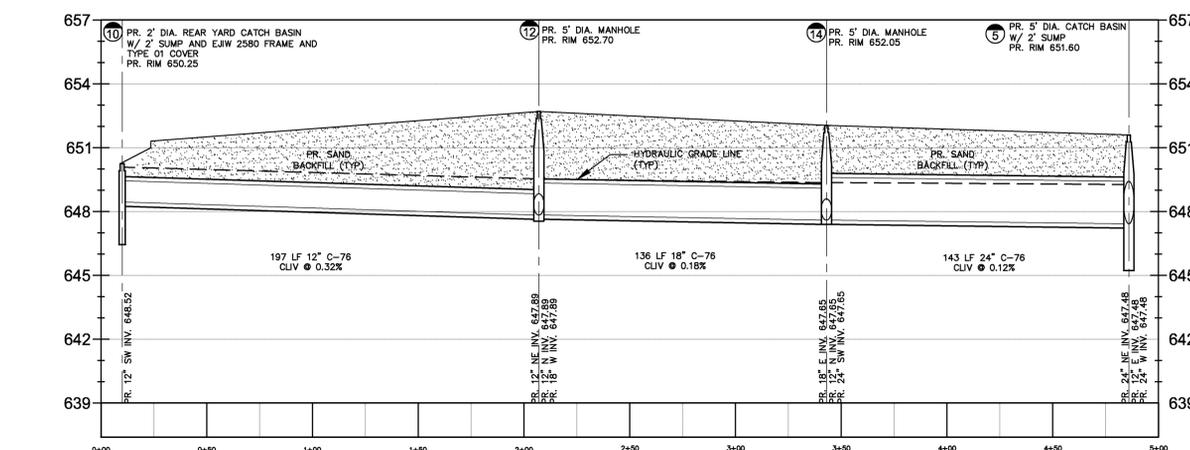
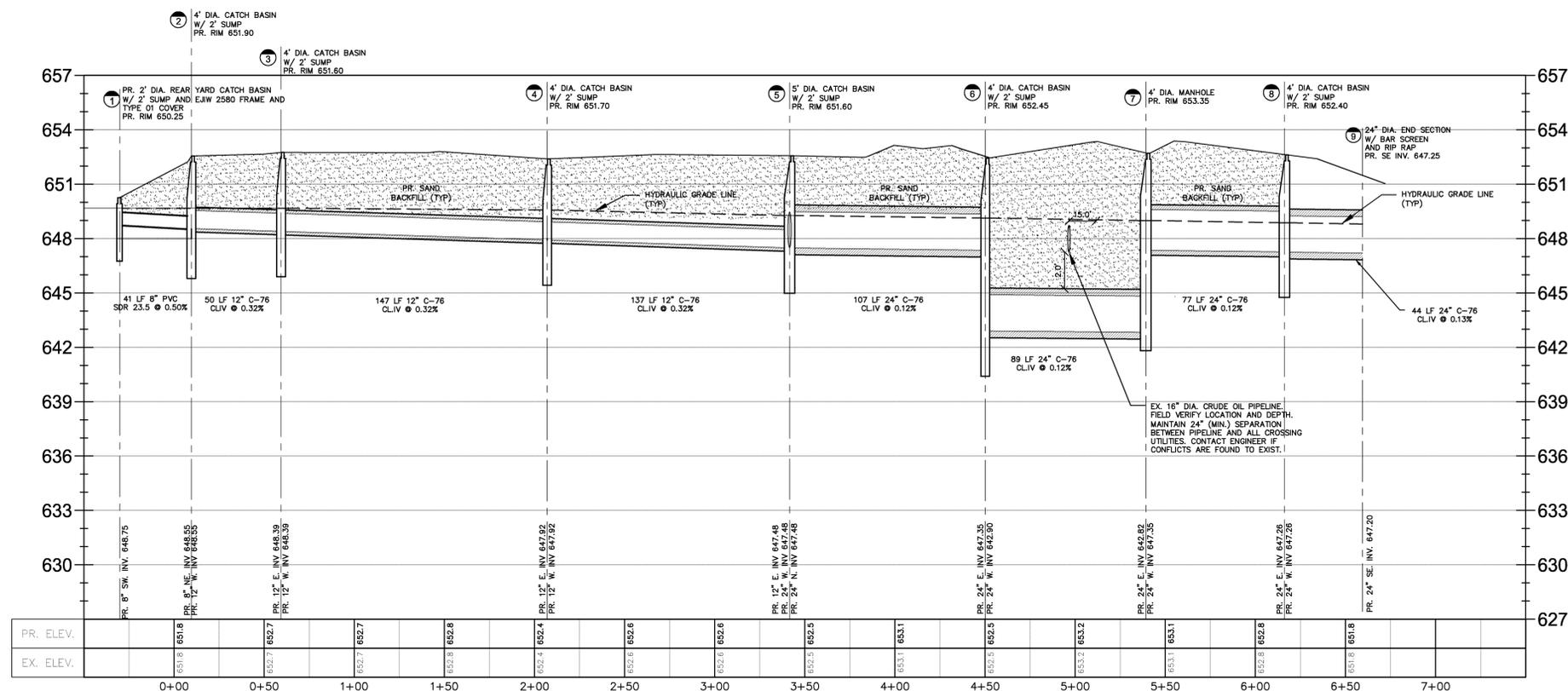
DESIGNED BY:
J. Longhurst

APPROVED BY:
J. Longhurst

DATE:
September 26, 2014

SCALE: 1" = 40' / 1" = 4'

NFE JOB NO. SHEET NO.
F731-02 C-4



City of Troy Storm Water Management Calculations - 25 Year Storm Event

Determine Site Runoff Coefficient:

Proposed Land Use:	Runoff Coefficient:	Drainage Area:
Pavement	0.90	3.380 Acres
Detention Basin	1.00	0.460 Acres
Landscape	0.20	1.110 Acres
Total Acreage:		4.950 Acres
Weighted Runoff Coefficient *C* Factor =	0.752	

Detention Calculation - Oakland County Method (Sites Less Than 5 Acres) (25 Year Storm Event)

Contributing Acreage:	4.950 Acres
Allowable Outflow, Q _s :	0.200 CFS / Acre
Runoff Coefficient, C:	0.752 Imperviousness
Maximum Allowable Outflow, Q _o :	0.266 CFS / (Acre * Imperv.)
T _s Storage Time (25 Year):	149.149 Minutes
V _s Storage Volume (25 Year):	9.462.13 CFS / (Acre * Imperv.)
V _t Total Volume (25 Year):	35.236.96 Cubic Feet
Volume Required:	35.236.96 Cubic Feet
Volume Provided:	35.666.08 Cubic Feet

Restrictor Calculation:

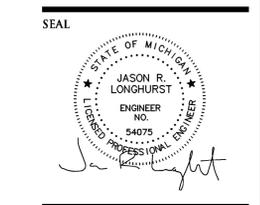
ORIFICE RESTRICTOR

FORMULA: $Q = 0.62 * A * (2gh)^{0.5}$

CONTRIBUTING ACREAGE:	4.95 ACRES
Q _s ALLOWABLE OUTFLOW:	0.20 CFS/ACRE
STORAGE ELEVATION:	649.50 FEET
OUTLET ELEVATION:	646.90 FEET
DEPTH OF STORAGE:	2.60 FEET
Q _o MAXIMUM ALLOWABLE OUTFLOW:	0.990 CFS
REQUIRED RESTRICTOR AREA:	0.123 SQUARE FEET
MAXIMUM RESTRICTOR SIZE:	4.757 INCH DIAMETER
PROVIDE 5" RESTRICTOR PIPE (SEE PLAN FOR LOCATION)	

Detention Storage Provided - Oakland County Method (25 Year Storm Event)

Elevation	Area (S.F.)	Depth (FT.)	Volume (C.F.)	Total Volume (C.F.)
649.5	20213.66	0.5	9,646.45	35,666.08
649	18372.13	1	16,636.72	26,019.64
648	14901.3	0.8	9,382.92	9,382.92
647.2	8556			
Total Vol. Provided at H.W. Elevation (649.25):			35,666.08	Cubic Feet



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City of Troy, Oakland County,
Michigan

SHEET
Notes and Details Plan



REVISIONS
09-26-14 ISSUED FOR ENGINEERING REVIEW
10-17-14 REVISED PER CITY REVIEW

DRAWN BY:
J. Klenk
DESIGNED BY:
J. Longhurst
APPROVED BY:
J. Longhurst
DATE:
September 26, 2014
SCALE: N.T.S.
NFE JOB NO. SHEET NO.
F731-02 C-5



General Restrictions For working within the Pipeline Right of Way

The enclosed Restrictions must be followed if you plan any scope of work that would encroach on the right of way of our facilities.

We operate in fifteen States under the following names:

- Sunoco Pipeline L.P.
 - Massachusetts
 - Michigan
 - New Jersey
 - New York
 - Ohio
 - Pennsylvania
 - Texas
- Mid Valley Pipeline
 - Arkansas
 - Kentucky
 - Louisiana
 - Mississippi
 - Ohio
 - Tennessee
 - Texas
- Inland Corporation
 - Ohio
- Mag Tex
 - Texas
- West Texas Gulf
 - Texas

12. State law requires you to contact your State One Call Center at least two or three days in advance, as required by your state, prior to any construction activity. The nationwide telephone number for your State One Call Center is "811". Individual State One Call Center numbers are also provided as follows:

- Arkansas 800-482-8998
- Delaware 800-282-8555
- Kentucky 800-252-6007
- Louisiana 800-272-3020
- Massachusetts 888-344-7233
- Michigan 800-482-3171
- Mississippi 800-227-6477
- New Jersey 800-272-1000
- New York 800-962-7962
- New Mexico 800-321-2327
- Ohio 800-362-2764
- Oklahoma 800-522-6543
- Pennsylvania 800-242-1776
- Pennsylvania 800-551-1111
- Texas 800-344-8377

DIG SAFELY!

- ✓ Dial 811 Call before you Dig
- ✓ Wait the required time
- ✓ Respect the marks
- ✓ Dig Safely



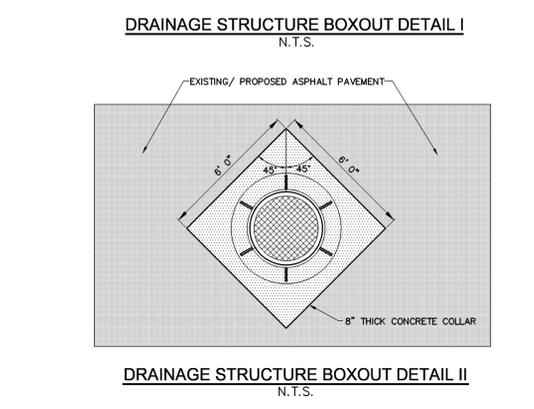
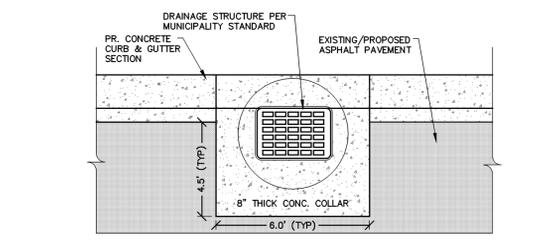
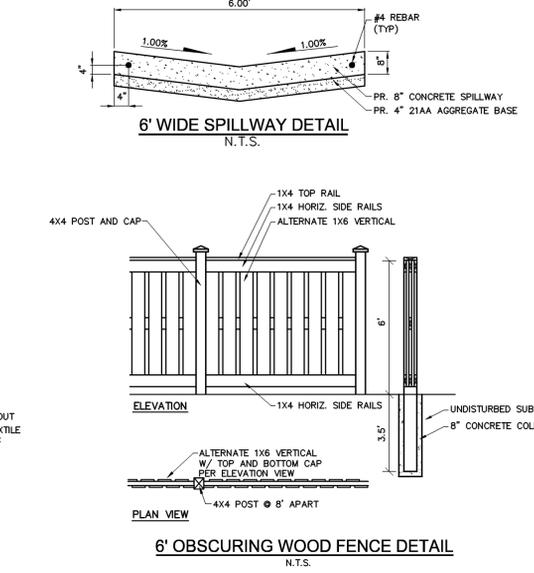
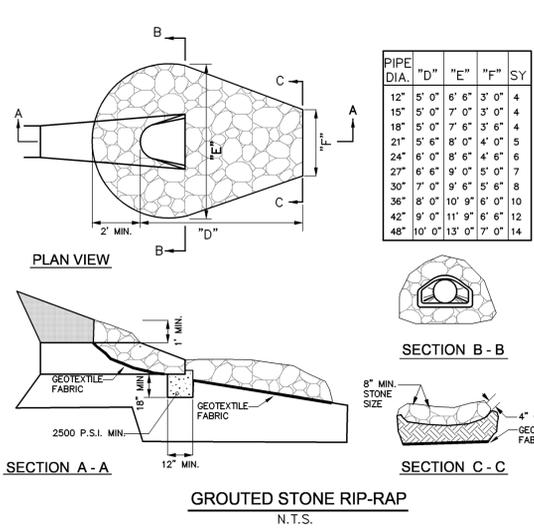
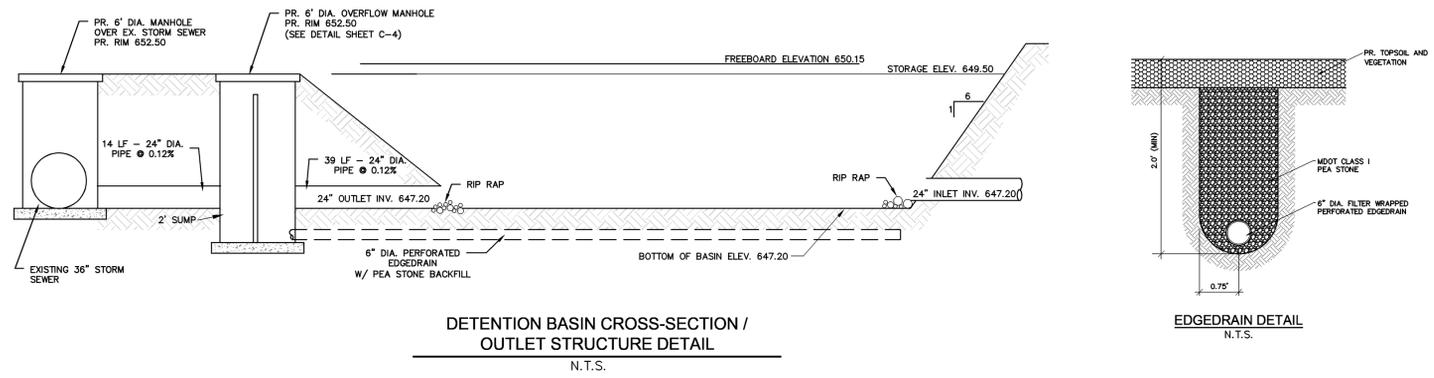
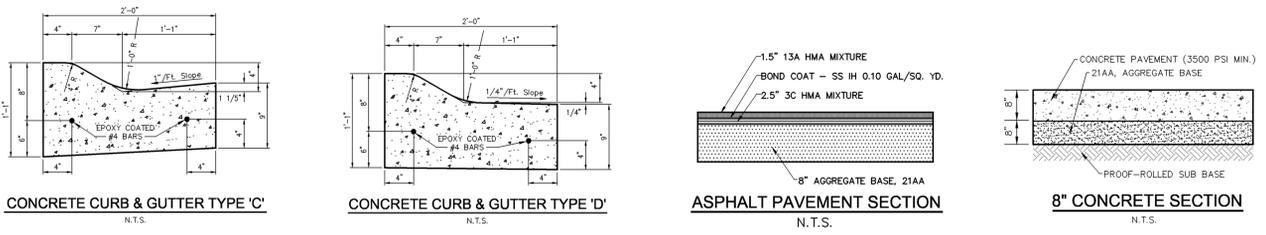
Know what's below.
Call before you dig.

- Detailed plans for proposed construction in accordance with Sunoco Pipeline L.P.'s ("SPLP") Engineering Restrictions must be submitted to SPLP's Engineering Department for review and approval to determine to what extent, if any, the pipeline right-of-way will be affected by the proposed construction and/or development. Submit plans to stsdigestreviews@sunoco-logistics.com
- A driveway or roadway may cross the right-of-way and pipeline perpendicularity, but at no time will it be parallel to, over and within the right-of-way.
- Buildings, swimming pools, sheds, decks, trees, shrubs or any obstruction of a permanent nature shall not be constructed, placed or placed within the right-of-way and easement. The width of the easements vary, but typically structures closer than (25') feet to any existing pipeline (50' easement) are not permitted. You must contact SPLP's Right-of-Way Department at (610) 670-3322 (Eastern U.S.) or (281) 637-6415 (Western U.S.) to determine the easement width for a specific property.
- Well's, leach beds, cesspools or sewer systems of any type shall not be placed within the right-of-way.
- All underground facilities crossing the right-of-way shall cross under the existing pipeline with a minimum of 24-inches clearance. This includes, but is not limited to, sewer drain lines.
- The earth cover over the pipelines shall be maintained and never changed in any manner without the express written permission of SPLP.
- Any parking area placed over the pipeline with permission of SPLP shall be subject to an amendment to agreement entered into by subject parties prior to construction of same.
- If heavy equipment is to cross the existing pipeline for any reason, it will be necessary for the crossing party to provide and maintain a ramp of sufficient material to protect said pipeline. Sunoco Logistics will make the decision as to how much fill and what other type of protective structure if any, will be required for the ramp. Upon completion of the construction and discontinuation of heavy equipment passage over the pipeline, the ramp may be removed.
- A SPLP representative must be present at the time that any work is done within Sunoco Pipeline L.P.'s right-of-way.
- No blasting is permitted within 300 feet of the pipeline. Anything less than 300 feet must have written approval of and instruction from SPLP's Engineering Department.
- Should you have any questions or need additional information on the aforementioned Paragraphs 1 through 10, please call SPLP's Right-of-Way Department at (610) 670-3322 (Eastern U.S.) or (281) 637-6415 (Western U.S.).

13. In addition to the legally required notice reference above and to schedule a SPLP representative to witness work in the vicinity of the pipeline call the SPLP Office below.
Note: CONTACTING SPLP DIRECTLY DOES NOT RELIEVE OF THE LEGAL OBLIGATION TO NOTIFY YOUR STATE ONE CALL CENTER.

EASTERN U.S.	WESTERN U.S.
MASSACHUSETTS East Boston (617) 568-2249 MICHIGAN Iakster (313) 292-8850 NEW JERSEY Trenton (609) 586-1522 NEW YORK Big Flats (607) 862-8431 Caledonia (585) 338-6160 OHIO Operating at Sunoco Pipeline Fostoria (419) 435-3789 Toledo (419) 691-4554 Operating at Inland Marine Corporation Bradley Road (216) 214-5965 Cuyahoga (419) 376-8430 Lima (419) 619-2612 PENNSYLVANIA Altoona (814) 947-8300 Fort Millin (215) 365-8010 Greensburg (724) 834-2450 Jeckville (610) 942-1906 Reading/Montco (610) 703-1250 Plymouth (570) 696-1277	ARKANSAS, KENTUCKY, LOUISIANA, MICHIGAN, MISSISSIPPI, NEW MEXICO, OHIO, OKLAHOMA, TENNESSEE AND TEXAS ARIZONA, CALIFORNIA, IDAHO, ILLINOIS, INDIANA, IOWA, KANSAS, MINNESOTA, MISSOURI, NEBRASKA, NEVADA, NORTH CAROLINA, NORTH DAKOTA, SOUTH CAROLINA, TEXAS ARIZONA East Boston (419) 655-5313 Haynesville (318) 624-1766 Hibson (859) 371-4469 X10 Oxford (662) 234-4114 White Oak (903) 759-2382 OKLAHOMA Dianthight (918) 352-5889 Enid (580) 242-6614 Mayville (405) 867-5675 Noble (405) 613-6888 Seminole (405) 382-7144 TEXAS Mag Tex Line Aldine (281) 931-1021 Center (956) 240-6753 Herbert (409) 722-8432 Longview (903) 297-1311 Sourlake (409) 387-5000 Sunoco Pipeline/West Texas Gulf Blum (254) 874-5219 Breckenridge (254) 599-7526 Childress (806) 492-2350 Colo. City (325) 728-3162 Comyn (254) 892-2405 Crosstena (903) 872-2369 Hawley (325) 537-2598 Hearne (979) 280-5732 Longview (903) 295-9203 Merzen (806) 665-8082 Nederland (409) 721-4403 Robert Lee (325) 453-4315 Snyder (325) 573-3502 Sourlake (409) 287-5000

For additional information regarding pipeline safety please visit our website at www.sunoco-logistics.com/Public-Awareness or scan the below code with your smart phone.



GENERAL PAVING NOTES

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

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

ASPHALT:
BASE COURSE - MDOT BITUMINOUS MIXTURE 3C, SURFACE COURSE - MDOT BITUMINOUS MIXTURE 13A; ASPHALT CEMENT PENETRATION GRADE 85-100, BOND COAT - MDOT SS-1H EMULSION AT 0.10 GALLON PER SQUARE YARD; MAXIMUM 2 INCH LIFT.

PAVEMENT BASE SHALL BE COMPACTED TO 98% OF THE MAXIMUM DENSITY (MODIFIED PROCTOR) PRIOR TO PLACEMENT OF PROPOSED PAVEMENT. EXISTING SUB-BASE SHALL BE PROOF-ROLLED IN THE PRESENCE OF THE ENGINEER TO DETERMINE STABILITY.

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

ALL CONCRETE PAVEMENT JOINTS SHALL BE FILLED WITH HOT POURED RUBBERIZED ASPHALT JOINT SEALING COMPOUND IMMEDIATELY AFTER SAWCUT OPERATION. FEDERAL SPECIFICATION SS-3164.

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

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

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

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

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

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

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

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

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

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

UTILITIES

AT LEAST 72 HOURS (3 WORKING DAYS) PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY MISS DIG AND THE LOCAL COMMUNITY (WHERE APPLICABLE) TO STAKE LOCATIONS OF EXISTING UTILITIES.

THE CONTRACTOR SHALL EXPOSE AND VERIFY EXISTING UTILITIES FOR LOCATION, SIZE, DEPTH, MATERIAL AND CONFIGURATION PRIOR TO CONSTRUCTION. COSTS FOR EXPLORATORY EXCAVATION IS AN INCIDENTAL COST AND SHALL NOT BE CONSIDERED AN EXTRA TO THE CONTRACT.

THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY EXISTING UTILITIES WHICH DO NOT MATCH THE PLANS AND SPECIFICATIONS PRIOR TO COMMENCING WORK. ANY FIELD CHANGES OF THE PROPOSED UTILITIES SHALL BE APPROVED BY THE OWNER AND ENGINEER BEFORE THE WORK IS DONE.

THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES FROM DAMAGE. ANY SERVICE OR UTILITY DAMAGED OR REMOVED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT THE EXPENSE OF THE CONTRACTOR, IN CONFORMANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY PROVIDER.

DAMAGE TO PRIVATE PROPERTY

ALL SIDEWALKS, DRIVEWAYS, LAWNS, FENCING, TREES, SHRUBS, SPRINKLERS, LANDSCAPING, ETC., THAT ARE DAMAGED DURING CONSTRUCTION MUST BE REPAIRED OR REPLACED, IN KIND OR BETTER, BY THE CONTRACTOR. ALL STREET SIGNS, MAIL BOXES, ETC., REMOVED SHALL BE REPLACED IN KIND OR BETTER, BY THE CONTRACTOR. ALL THE REPAIRS OR REPLACEMENTS MUST TO THE CONTRACTOR'S WORK ARE TO BE INCLUDED IN THE CONTRACT PRICE(S) AND SHALL NOT BE AN EXTRA TO THE CONTRACT.

THE CONTRACTOR SHALL SECURE PERMISSION IN WRITING FROM ADJACENT PROPERTY OWNERS PRIOR TO ENTERING UPON ANY ADJOINING PROPERTIES, UNLESS OFFSITE PERMITS HAVE ALREADY BEEN OBTAINED BY THE OWNER AND ARE PART OF THE CONTRACT DOCUMENTS.

DEWATERING OF TRENCH AND EXCAVATIONS

IF NOT SPECIFICALLY PROVIDED FOR IN THE CONSTRUCTION DESIGN DOCUMENTS, THE DESIGN OR QUALITATIVE ANALYSIS OF GROUND WATER DEWATERING SYSTEMS IS BEYOND THE SCOPE OF THESE DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING AND PROVIDING APPROPRIATE EXCAVATION DEWATERING SYSTEMS FOR USE DURING CONSTRUCTION.

THE DEWATERING METHOD SELECTED BY THE CONTRACTOR WILL NOT ADVERSELY AFFECT ADJACENT PAVEMENTS OR STRUCTURES PRIOR TO BEGINNING DEWATERING CONDITIONS. MEANS AND METHODS OF DEWATERING ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. THE COST OF DEWATERING WILL BE CONSIDERED INCLUDED IN THE WORK OF CONSTRUCTING THE UNDERGROUND UTILITIES UNLESS SPECIFICALLY INDICATED OTHERWISE.

MEANS AND METHODS FOR PIPE CONSTRUCTION

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE MEANS AND METHODS FOR CONSTRUCTING THE UNDERGROUND PIPE SYSTEMS PROPOSED ON THE PLANS, INCLUDING BUT NOT LIMITED TO THE NEED FOR SHORING/BRACING OF TRENCHES, DEWATERING OF TRENCHES, SCHEDULING THE WORK AT OFF PEAK HOURS, AND/OR MAINTAINING EXISTING FLOWS THAT MAY BE ENCOUNTERED VIA PUMPING, BY-PASS PIPING OR OTHER MEANS. THE CONTRACTOR SHALL NOT BE PAID ANY ADDITIONAL COMPENSATION TO IMPLEMENT ANY MEANS AND METHODS TO SATISFACTORILY COMPLETE THE CONSTRUCTION.

PAVEMENT REMOVAL

THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE THICKNESS OF THE PAVEMENT TO BE REMOVED. PAVEMENT CORE SAMPLES ARE FOR INFORMATIONAL PURPOSES ONLY AS TO THE THICKNESS OF THE PAVEMENT AT THE LOCATION OF THE SAMPLE. THE OWNER AND ENGINEER MAKE NO REPRESENTATION, WARRANTY OR GUARANTY THAT THE SAMPLES ACCURATELY REFLECT THE PAVEMENT THICKNESS ON THE PROJECT.

IRRIGATION

THE CONTRACTOR SHALL MAINTAIN OR REPAIR ANY EXISTING IRRIGATION SYSTEMS WITHIN THE PROJECT AREA UNLESS THE DRAWINGS CALL FOR THE IRRIGATION SYSTEM TO BE REMOVED. THE OWNER AND ENGINEER MAKE NO REPRESENTATIONS, WARRANTY OR GUARANTY AS TO THE LOCATION OF THE IRRIGATION SYSTEM. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PROTECT THE IRRIGATION SYSTEM DURING CONSTRUCTION ACTIVITIES. COMPENSATION FOR MAINTAINING OR REPAIRING EXISTING IRRIGATION SYSTEMS SHALL BE CONSIDERED INCLUDED IN THE CONTRACT PRICE(S) UNLESS SPECIFIC IRRIGATION SYSTEM REPAIR ITEMS ARE INCLUDED IN THE ACCEPTED BID PROPOSAL.

SUB-SOIL CONDITIONS

IF SOIL BORING PROVIDED BY THE OWNER AND/OR ENGINEER IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THIS INFORMATION IS NOT OFFERED AS EVIDENCE OF GROUND CONDITIONS THROUGHOUT THE PROJECT AND ONLY REFLECT THE GROUND CONDITIONS AT THE LOCATION OF THE BORING ON THE DATE THEY WERE TAKEN.

THE ACCURACY AND RELIABILITY OF THE SOIL LOGS AND REPORT ARE NOT WARRANTED OR GUARANTEED IN ANY WAY BY THE OWNER OR ENGINEER AS TO THE SUB-SOIL CONDITIONS FOUND ON THE SITE. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION AND SUB-SOIL INVESTIGATION AND SECURE OTHER SUCH INFORMATION AS THE CONTRACTOR CONSIDERS NECESSARY TO DO THE WORK PROPOSED AND IN PREPARATION OF THEIR BID.

SUBGRADE UNDERCUTTING AND PREPARATION

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE ANY AND ALL SOILS WHICH DO NOT CONFORM TO THE PLANS AND SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A SUBGRADE IN CONFORMANCE WITH THE PROJECT PLANS AND/OR SPECIFICATIONS. TRENCH BACKFILL SHALL ALSO BE INSTALLED IN CONFORMANCE WITH THE PROJECT PLANS AND/OR SPECIFICATIONS. THE MEANS AND METHODS USED TO ACHIEVE THE REQUIRED RESULT SHALL REST SOLELY WITH THE CONTRACTOR.

ANY AREAS OF UNDERCUTTING THAT RESULT IN ADDITIONAL OR EXTRA WORK BECAUSE THEY COULD NOT BE IDENTIFIED BY THE CONTRACTOR'S PRE-BID SITE OBSERVATION OR ARE NOT SET FORTH IN THE PLANS AND SPECIFICATIONS, SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER BEFORE ANY EXTRA WORK IS PERFORMED. THE CONTRACTOR SHALL MAKE A REQUEST FOR ANY ADDITIONAL COMPENSATION FOR THE UNDERCUTTING IN WRITING AND THE REQUEST SHALL CONFORM TO THE CONTRACT'S CHANGE ORDER PROVISIONS.

STRUCTURE BACKFILL

STRUCTURAL BACKFILL SHALL BE PLACED IN CONFORMANCE WITH THE PROJECT PLANS, SPECIFICATIONS OR AS REQUIRED BY THE COMMUNITY, GOVERNMENT AGENCY OR UTILITY THAT HAS JURISDICTION OVER THE WORK.

TRENCH BACKFILL

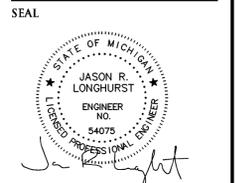
TRENCH BACKFILL SHALL BE PLACED IN CONFORMANCE WITH THE PLANS AND/OR SPECIFICATIONS. TRENCH BACKFILL SHALL ALSO BE INSTALLED IN CONFORMANCE WITH THE COMMUNITY REQUIREMENTS OR AGENCY/UTILITY GOVERNING SAID TRENCH CONSTRUCTION. IN THE CASE OF CONFLICTING REQUIREMENTS, THE MORE STRINGENT SHALL APPLY.

EARTH BALANCE / GRADING

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE WHETHER THE SITE EARTHWORK BALANCES OR NOT. ANY EXCESS CUT MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR. IN A LIKE MANNER, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO IMPORT APPROVED FILL MATERIAL AND PLACE IT AS REQUIRED TO ATTAIN THE SITE GRADE AND COMPACTION REQUIREMENTS PER THE ENGINEER'S PLAN AND ALL APPLICABLE GOVERNMENTAL STANDARDS. THE ENGINEER AND OWNER MAKE NO REPRESENTATION AS TO THE QUANTITIES THAT MAY BE NEEDED TO CREATE A BALANCED EARTHWORK CONDITION OR THAT THE SITE EARTHWORK IS BALANCED.

SOIL EROSION / SEDIMENTATION CONTROL

THE CONTRACTOR SHALL OBTAIN THE REQUIRED SOIL EROSION PERMIT AND SATISFY ALL REGULATORY REQUIREMENTS FOR CONTROLLING SOIL EROSION AND SEDIMENT TRANSPORT. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS. THE ENGINEER AND OWNER ARE NOT RESPONSIBLE FOR INSPECTION OR APPROVAL OF THE CONTRACTOR'S WORK IN CONNECTION WITH SATISFYING THE SOIL EROSION PERMIT REQUIREMENTS UNLESS SPECIFICALLY STATED IN THE CONTRACT DOCUMENTS.



PROJECT
 Penske - Troy
 1225 East Maple Road

CLIENT
 Penske Automotive Group
 2555 Telegraph Rd.
 Bloomfield Hills, MI 48302
 CONTACT
 Mr. Jeff Anderson
 Tel: 248-648-2574
 janderson@penskeautomotive.com

PROJECT LOCATION
 Part of the Southwest 1/4
 of Section 26
 T.2 North, R.11 East
 City of Troy, Oakland County,
 Michigan

SHEET
 Soil Erosion /
 Drainage Area Plan

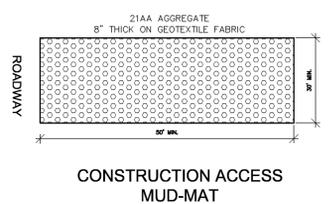
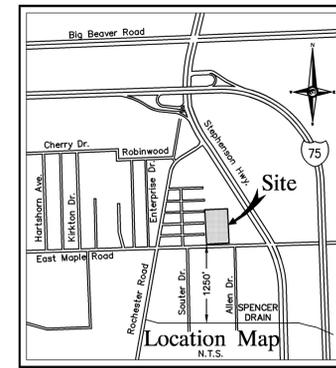


REVISIONS
 09-26-14 ISSUED FOR ENGINEERING REVIEW
 10-17-14 REVISED PER CITY REVIEW

DRAWN BY:
 J. Klenk
 DESIGNED BY:
 J. Longhurst
 APPROVED BY:
 J. Longhurst
 DATE:
 September 26, 2014

SCALE: 1" = 50'
 50 25 0 25 50 75

NFE JOB NO. SHEET NO.
F731-02 C-6



SOIL EROSION CONTROL

CUTTING, FILLING AND GRADING SHALL BE MINIMIZED AND THE NATURAL TOPOGRAPHY OF THE SITE SHALL BE PRESERVED TO THE MAXIMUM POSSIBLE EXTENT, EXCEPT WHERE SPECIFIC FINDINGS DEMONSTRATE THAT MAJOR ALTERATIONS WILL STILL MEET THE PURPOSES AND REQUIREMENTS OF THIS ORDINANCE.

DEVELOPMENT SHALL BE STAGED TO KEEP THE EXPOSED AREAS OF SOIL AS SMALL AS PRACTICABLE.

SOIL EROSION CONTROL MEASURES SHALL BE INSTALLED BEFORE THE DISTURBED AREA AND ANY WATERCOURSES, INCLUDING RIVERS, STREAMS, CREEKS, LAKES, PONDS AND OTHER WATERCOURSES, WETLANDS, OR ROADWAYS ON OR NEAR THE SITE.

SEDIMENT RESULTING FROM ACCELERATED SOIL EROSION SHALL BE REMOVED FROM RUNOFF WATER BEFORE THAT WATER LEAVES THE SITE.

TEMPORARY AND PERMANENT SOIL EROSION CONTROL MEASURES DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF WATER AROUND, THROUGH, OR AWAY FROM THE SITE SHALL BE DESIGNED TO LIMIT THE WATER FLOW TO A NON-EROSIVE VELOCITY.

TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE REMOVED AFTER PERMANENT SOIL EROSION CONTROL MEASURES HAVE BEEN IMPLEMENTED. ALL SITES SHALL BE STABILIZED WITH PERMANENT SOIL EROSION CONTROL MEASURES.

IF LAKES, PONDS, CREEKS, STREAMS, OR WETLANDS ARE LOCATED ON OR NEAR THE SITE, EROSION CONTROL MEASURES WHICH DIVERT RUNOFF AND TRAP SEDIMENT MUST BE PROVIDED AT STRATEGIC LOCATIONS. STRAW BALE BERMIS MAY BE USED AS TEMPORARY STORMWATER DIVERSION STRUCTURES, BUT WILL NOT BE CONSIDERED SUFFICIENT FOR TRAPPING SEDIMENT. THE USE OF SEDIMENT BASINS, FILTER FABRIC, VEGETATED BUFFER STRIPS, AND ROCK FILTERS IN LEU OF STRAW BALE BERMIS SHALL BE STRONGLY ENCOURAGED. OTHER MEASURES MAY BE REQUIRED IF REASONABLY DETERMINED TO BE NECESSARY TO PROTECT A WATERCOURSE OR WETLAND.

WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER AN EARTH CHANGE HAS BEEN COMPLETED OR WHEN SIGNIFICANT EARTH CHANGE ACTIVITY CEASES, TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE INSTALLED.

PERMANENT EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 15 (FIFTEEN) CALENDAR DAYS AFTER FINAL GRADING OR THE FINAL EARTH CHANGE HAS BEEN COMPLETED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED.

VEGETATED BUFFER STRIPS SHALL BE CREATED OR RETAINED ALONG THE EDGES OF ALL LAKES, PONDS, CREEKS, STREAMS, OTHER WATERCOURSES, OR WETLANDS.

EROSION AND SEDIMENTATION CONTROL MEASURES SHALL RECEIVE REGULAR MAINTENANCE TO ASSURE PROPER FUNCTIONING.

ALL GRADING PLANS AND SPECIFICATIONS, INCLUDING EXTENSIONS OF PREVIOUSLY APPROVED PLANS, SHALL INCLUDE PROVISIONS FOR EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH, BUT NOT LIMITED TO, THE STANDARDS CONTAINED IN THE "CITY OF TROY DEVELOPMENT / ENGINEERING STANDARDS".

LEGAL DESCRIPTION

PARCEL 1 (TAX ITEM NO. 20-26-351-02A):
 PART OF THE SOUTHWEST 1/4 OF SECTION 26 AND A PART OF THE SOUTHWEST 1/4 OF SECTION 27, TOWN 2 NORTH, RANGE 11 EAST, CITY OF TROY, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS:
 COMMENCING AT THE SOUTHEAST CORNER OF SECTION 27; THENCE NORTH 00 DEGREES 13 MINUTES 23 SECONDS EAST A DISTANCE OF 43.00 FEET TO THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 45 MINUTES 00 SECONDS WEST, A DISTANCE OF 106.51 FEET; THENCE NORTH 29 DEGREES 38 MINUTES 52 SECONDS WEST, A DISTANCE OF 67.03 FEET; THENCE NORTH 00 DEGREES 11 MINUTES 46 SECONDS EAST, A DISTANCE OF 327.77 FEET; THENCE NORTH 90 DEGREES 11 MINUTES 46 SECONDS EAST, A DISTANCE OF 20.61 FEET; THENCE NORTH 00 DEGREES 11 MINUTES 46 SECONDS EAST, A DISTANCE OF 137.20 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 124.52 FEET; THENCE NORTH 00 DEGREES 11 MINUTES 46 SECONDS EAST, A DISTANCE OF 45.57 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 80.28 FEET; THENCE NORTH 00 DEGREES 11 MINUTES 46 SECONDS EAST, A DISTANCE OF 23.43 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 333.50 FEET; THENCE SOUTH 00 DEGREES 11 MINUTES 46 SECONDS WEST, A DISTANCE OF 74.42 FEET; THENCE NORTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 80.28 FEET; THENCE SOUTH 00 DEGREES 11 MINUTES 46 SECONDS WEST, A DISTANCE OF 45.57 FEET; THENCE NORTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 84.12 FEET; THENCE SOUTH 00 DEGREES 01 MINUTES 44 SECONDS WEST, A DISTANCE OF 619.94 FEET TO A POINT ON THE NORTH RIGHT OF WAY OF MAPLE ROAD (86 FEET WIDE); THENCE NORTH 89 DEGREES 48 MINUTES 14 SECONDS WEST, A DISTANCE OF 599.85 FEET TO THE POINT OF BEGINNING.

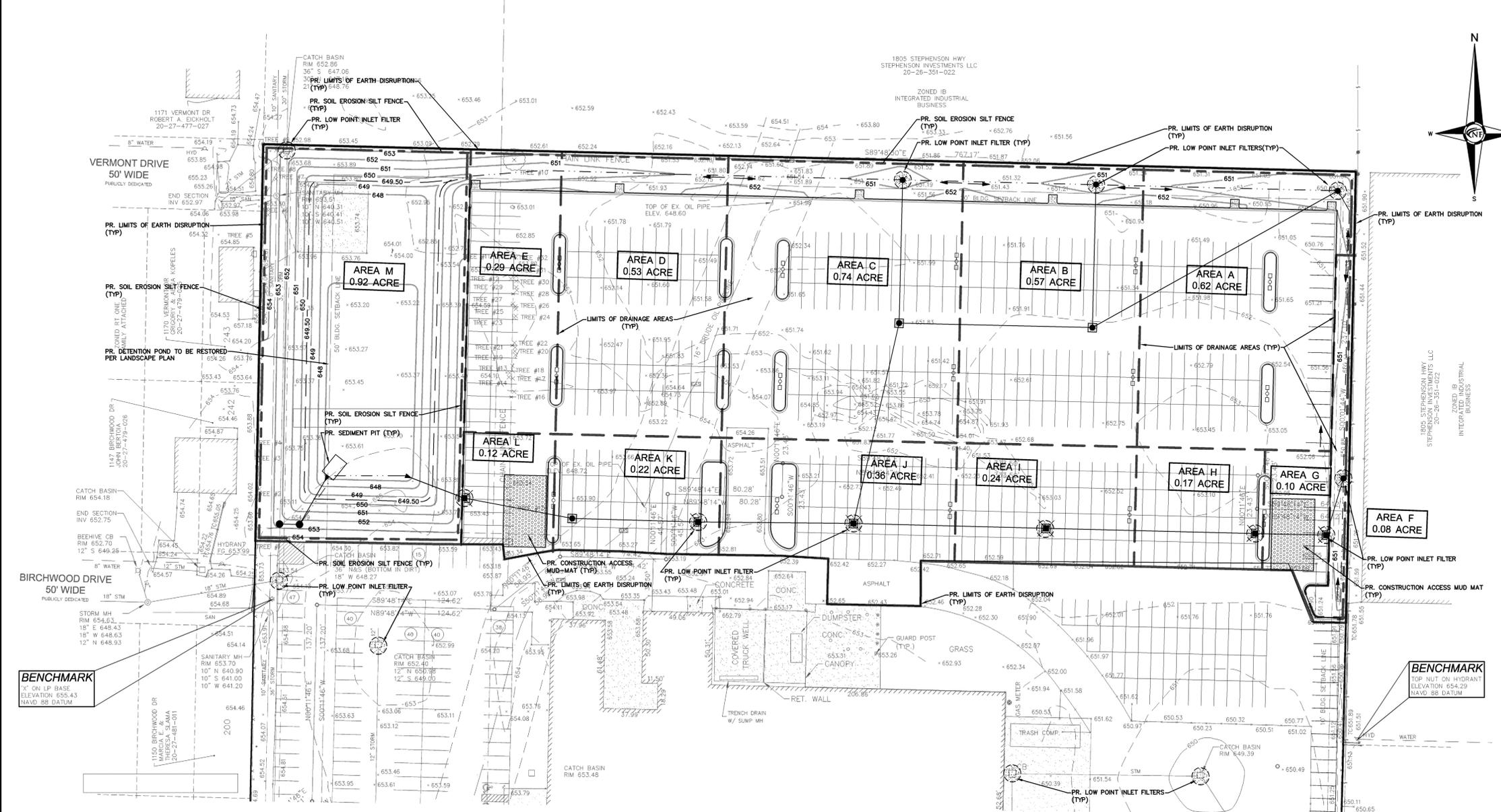
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CONSTRUCTION SEQUENCE / TIMING SCHEDULE

1. INSTALL PERIMETER FILTER FABRIC FENCING AND INLET FILTERS WHERE REQUIRED.	OCT. 2014
2. MASS GRADE SITE.	OCT. 2014
3. COMMENCE UNDERGROUND UTILITY WORK.	OCT. 2014
4. INSTALL INLET FILTERS ON PROPOSED DRAINAGE STRUCTURES.	OCT. 2014
5. FILL IN SEDIMENTATION TRAPS AND PAVE SITE.	NOV. 2014
6. COMPLETE ALL LANDSCAPING AND RESTORATION ACTIVITY.	NOV. 2015
7. JET VAC NEW STORM SEWER SYSTEM AS REQUIRED.	DEC. 2015
8. REMOVE ALL TEMPORARY SOIL EROSION MEASURES.	DEC. 2015

LEGEND

---	INDICATES LIMITS OF SILT FABRIC FENCE
- - - -	INDICATES LIMITS OF DRAINAGE DISTRICT AREA
---	INDICATES LIMITS OF SOIL DISRUPTION
○	INDICATES LOW POINT INLET FILTER
■	INDICATES DRAINAGE DISTRICT AREA



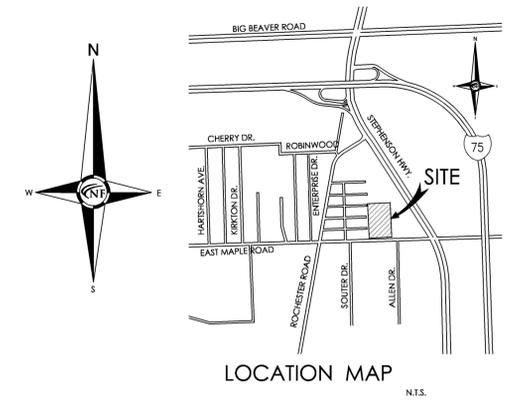
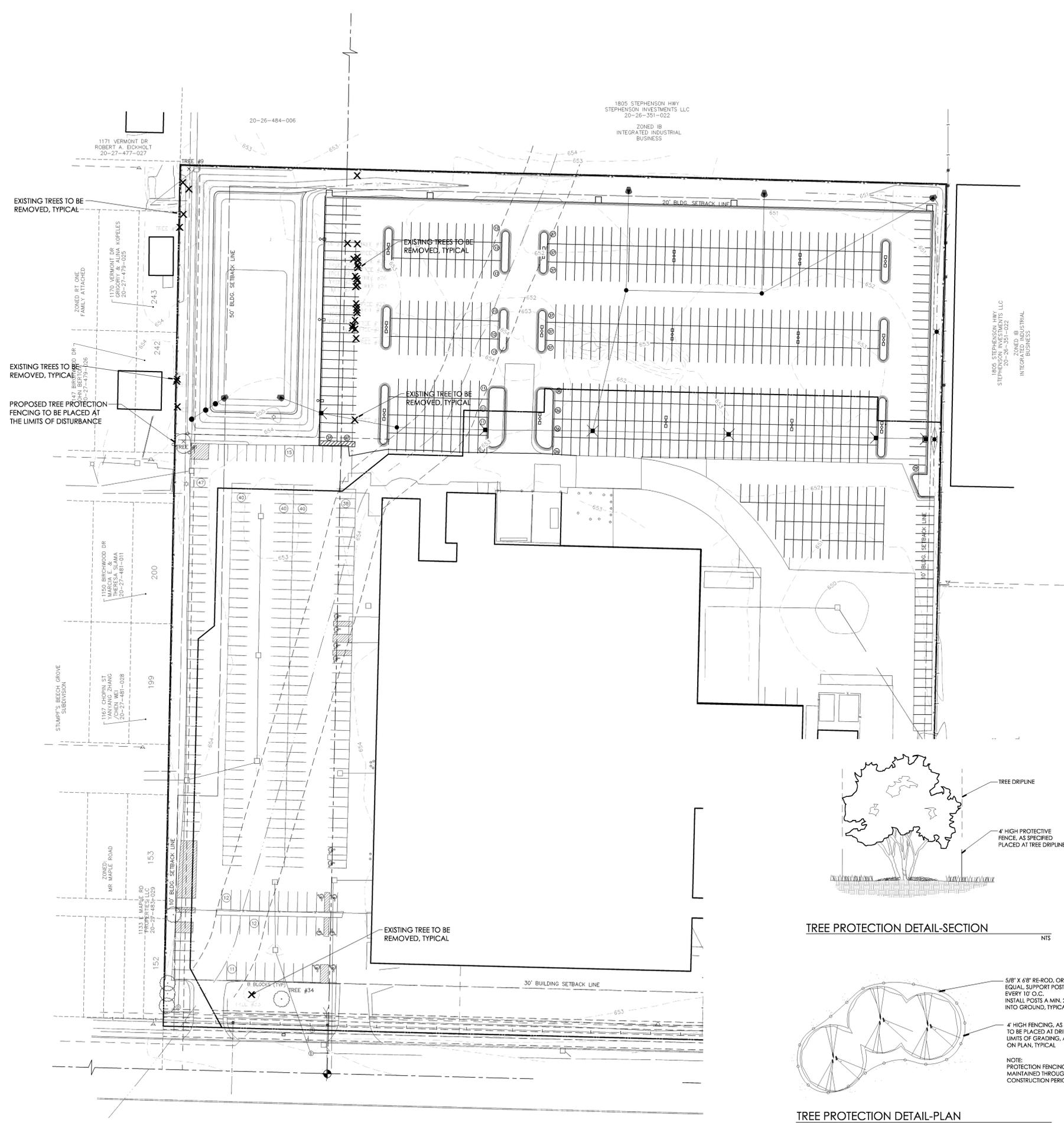
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8. REMOVE ALL TEMPORARY SOIL EROSION MEASURES.	DEC. 2015



GENERAL TREE PROTECTION NOTES

- APPROVED TREE PROTECTION SHALL BE ERRECTED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES, AND SHALL REMAIN IN PLACE UNTIL THE IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
- ALL UNDERSTORY VEGETATION WITHIN THE LIMITS OF PROTECTIVE FENCING SHALL BE PRESERVED.
- NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE DRIP LINE OF ANY TREE DESIGNATED TO REMAIN, INCLUDING BUT NOT LIMITED TO, PLACING SOLVENTS, BUILDING MATERIALS, CONSTRUCTION EQUIPMENT, OR SOIL DEPOSITS WITHIN THE DRIP LINE.
- WHERE GROUPINGS OF TREES ARE TO REMAIN, TREE FENCING SHALL BE PLACED AT THE LIMITS OF GRADING LINE.
- DURING CONSTRUCTION NO PERSON SHALL ATTACH ANY DEVICE OR WIRE TO ANY TREE, SCHEDULED TO REMAIN.
- ALL UTILITY SERVICE REQUESTS MUST INCLUDE NOTIFICATION TO THE INSTALLER THAT PROTECTED TREES MUST BE AVOIDED. ALL TRENCHING SHALL OCCUR OUTSIDE OF THE PROTECTIVE FENCING.
- SWALES SHALL BE ROUTED TO AVOID THE AREA WITHIN THE DRIP LINES OF PROTECTED TREES.
- TREES LOCATED ON ADJACENT PROPERTIES THAT MAY BE AFFECTED BY CONSTRUCTION ACTIVITIES MUST BE PROTECTED.
- ROOT ZONES OF PROTECTED TREES SHOULD BE SURROUNDED WITH RIGIDLY STAKED FENCING.
- THE PARKING OF CARS AND RUNNING EQUIPMENT SHALL BE PROHIBITED UNDER THE DRIP LINE OF PROTECTED TREES.
- THE STRIPPING OF TOPSOIL FROM AROUND PROTECTED TREES SHALL BE PROHIBITED.
- ALL TREES TO BE REMOVED SHALL BE CUT AWAY FROM TRUNKS TO REMAIN.
- THE GRUBBING OF UNDERSTORY VEGETATION WITHIN CONSTRUCTION AREAS SHOULD BE CLEARED BY CUTTING VEGETATION AT THE GROUND WITH A CHAIN SAW OR MANUALLY WITH A HYDRO-AXE.
- THE CONTRACTOR IS RESPONSIBLE FOR THE REPLACEMENT PER ORDINANCE GUIDELINES, FOR THE DAMAGE OR REMOVAL OF ANY TREE DESIGNATED TO REMAIN.
- TREES TO BE REMOVED SHALL BE FIELD VERIFIED, EVALUATED AND FLAGGED FOR REMOVAL BY THE LANDSCAPE ARCHITECT OR FORESTER, ONLY AS DIRECTED BY THE OWNER OR OWNERS REPRESENTATIVE.

TREE PRESERVATION SUMMARY

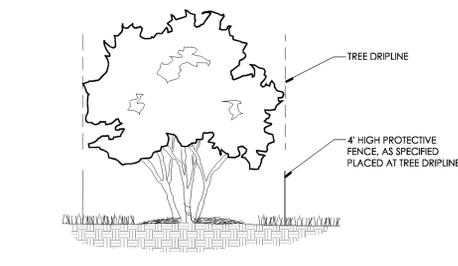
TOTAL TREES SURVEYED:	38
TOTAL TREES TO BE REMOVED:	32
MINUS DEAD TREES:	-3
NET TREES TO BE REMOVED:	29

TREE PROTECTION LEGEND

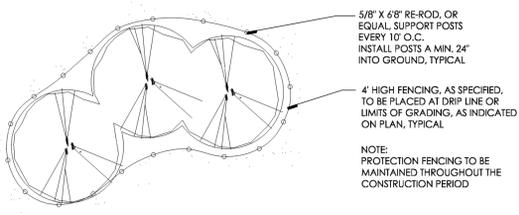
- #9 X EXISTING TREES TO REMAIN
- X EXISTING TREES TO BE REMOVED
- PROPOSED TREE PROTECTION FENCING

Tree Inventory List

Client Name:	Penske						
Job Location:	1225 E. Maple, Troy						
Date Completed:	9/3/2014						
Condition Description Notes:							
"Good" - no observed structural defects"							
"Fair" - minor structural defects, marginal form, some insect activity noted"							
"Poor" - major structural defects, poor form, insect infested"							
*Structural defects may include decayed wood, cracks, root problems, weak branch unions, cankers, poor tree architecture, dead/failed branches due to various causes.							
Tree #	Botanical Name	Common Name	Dia.	Type	Other Dia.	Condition	
1	Ulmus pumila	Siberian Elm	15			Good	
2	Acer negundo	Boxelder	10			Poor	
3	Acer negundo	Boxelder	9			Poor	
4	Acer negundo	Boxelder	10			Poor	
5	Acer negundo	Boxelder	11			Poor	
6	Acer negundo	Boxelder	9	Twin	4	Poor	
7	Ulmus pumila	Siberian Elm	8			Poor	
8	Acer negundo	Boxelder	5			Poor	
9	Acer negundo	Boxelder	5			Poor	
10	Populus deltoides	Eastern Cottonwood	13			Fair	
11	Populus deltoides	Eastern Cottonwood	18			Fair	
12	Populus deltoides	Eastern Cottonwood	15	Twin	13	Fair	
13	Populus deltoides	Eastern Cottonwood	17			Poor	
14	Populus deltoides	Eastern Cottonwood	22			Fair	
15	Ulmus pumila	Siberian Elm	10			Poor	
16	Populus deltoides	Eastern Cottonwood	18			Fair	
17	Populus deltoides	Eastern Cottonwood	15	Twin	15	Poor	
18	Populus deltoides	Eastern Cottonwood	20			Good	
19	Populus deltoides	Eastern Cottonwood	19	Multiple	16, 9	Fair	
20	Populus deltoides	Eastern Cottonwood	10			Poor	
21	Populus deltoides	Eastern Cottonwood	16			Good	
22	Populus deltoides	Eastern Cottonwood	14			Fair	
23	Populus deltoides	Eastern Cottonwood	14			Fair	
24	Populus deltoides	Eastern Cottonwood	12			Fair	
25	Populus deltoides	Eastern Cottonwood	12			Fair	
26	Populus deltoides	Eastern Cottonwood	16			Good	
27	Populus deltoides	Eastern Cottonwood	17			Fair	
28	Populus deltoides	Eastern Cottonwood	17			Dead	
29	Populus deltoides	Eastern Cottonwood	12			Dead	
30	Populus deltoides	Eastern Cottonwood	16	Twin	13	Good	
31	Populus deltoides	Eastern Cottonwood	11			Fair	
32	Populus deltoides	Eastern Cottonwood	26			Fair	
33	Acer platanoides	Norway maple	6			Dead	
34	Acer platanoides	Norway maple	8			Good	
35	Ulmus pumila	Siberian Elm	12			Fair	
36	Pinus nigra	Austrian Pine	9			Fair	
37	Pinus nigra	Austrian Pine	9			Good	
38	Pinus nigra	Austrian Pine	16			Good	



TREE PROTECTION DETAIL-SECTION N.T.S.



TREE PROTECTION DETAIL-PLAN N.T.S.



CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

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



PROJECT
Penske - Troy
1225 East Maple Road

CLIENT
Penske Automotive Group
2555 Telegraph Rd.
Bloomfield Hills, MI 48302
CONTACT
Mr. Jeff Anderson
Tel: 248-648-2574
janderson@penskautomotive.com

PROJECT LOCATION
Part of the Southwest 1/4
of Section 26
T.2 North, R.11 East
City of Troy, Oakland County,
Michigan

SHEET
Tree Preservation Plan

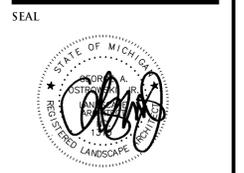


REVISIONS
09-15-2014 ISSUED FOR SITE PLAN REVIEW
10-17-2014 REVISED PER CITY REVIEW

DRAWN BY:
G.Ostrowski
DESIGNED BY:
G.Ostrowski
APPROVED BY:
G.Ostrowski
DATE:
September 15, 2014
SCALE: 1" = 50'
NFE JOB NO. SHEET NO.
F731-02 L-1



LOCATION MAP
N.T.S.



PROJECT
Penske - Troy
1225 East Maple Road

CLIENT
Penske Automotive Group
2555 Telegraph Rd.
Bloomfield Hills, MI 48302
CONTACT
Mr. Jeff Anderson
Tel: 248-648-2574
janderson@penskeautomotive.com

PROJECT LOCATION
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of Section 26
T.2 North, R.11 East
City of Troy, Oakland County,
Michigan

SHEET
Landscape Plan

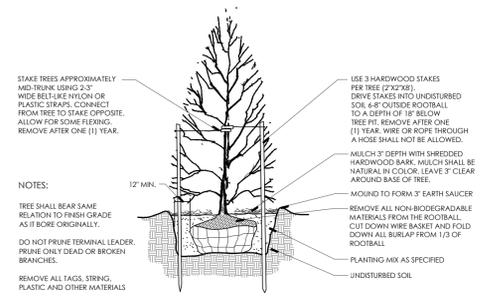
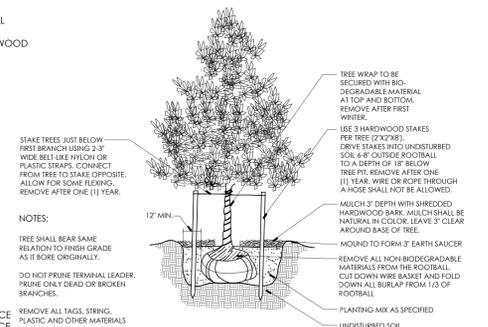


REVISIONS
09-15-2014 ISSUED FOR SITE PLAN REVIEW
10-17-2014 REVISED PER CITY REVIEW

DRAWN BY:
G. Ostrowski
DESIGNED BY:
G. Ostrowski
APPROVED BY:
G. Ostrowski
DATE:
September 15, 2014
SCALE: 1" = 50'
NFE JOB NO. SHEET NO.
F731-02 L-2

GENERAL LANDSCAPE NOTES

- LANDSCAPE CONTRACTOR SHALL VISIT SITE, INSPECT EXISTING CONDITIONS AND REVIEW PROPOSED PLANTING AND RELATED WORK. IN CASE OF DISCREPANCY BETWEEN PLAN AND PLANT USE, THE PLAN SHALL GOVERN QUANTITIES. CONTACT THE LANDSCAPE ARCHITECT WITH ANY CONCERNS.
- THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ON-SITE UTILITIES PRIOR TO BEGINNING CONSTRUCTION ON HISHER PHASE OF WORK. ANY DAMAGE OR INTERRUPTION OF SERVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- THE CONTRACTOR SHALL COORDINATE ALL RELATED ACTIVITIES WITH OTHER TRADES, AND SHALL REPORT ANY UNACCEPTABLE SITE CONDITIONS TO THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT.
- PLANTS SHALL BE FULLY WELL-BRANCHED, AND IN HEALTHY VIGOROUS GROWING CONDITION.
- PLANTS SHALL BE WATERED BEFORE AND AFTER PLANTING IS COMPLETE.
- ALL TREES MUST BE STAKED, FERTILIZED AND MULCHED AND SHALL BE GUARANTEED TO EXHIBIT A NORMAL GROWTH CYCLE FOR AT LEAST ONE (1) YEAR FOLLOWING PLANTING.
- ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED IN THE MOST RECENT EDITION OF THE AMERICAN STANDARDS FOR NURSERY STOCK.
- CONTRACTOR WILL SUPPLY FINISHED GRAZE AND LOCALITY AS NECESSARY TO SUPPLY PLANT MIX DEPTH IN ALL PLANTING BEES AS INDICATED IN PLANT DETAILS AND A DEPTH OF 4" IN ALL LAWN AREAS.
- PROVIDE CLEAN BACKFILL SOIL, USING MATERIAL STOCKPILED ON SITE. SOIL SHALL BE SCREENED AND FREE OF DEBRIS, FOREIGN MATERIAL, AND STONE. SLOW-RELEASE FERTILIZER SHALL BE ADDED TO THE PLANT FITS BEFORE BEING BACKFILLED. APPLICATION SHALL BE AT THE MANUFACTURER'S RECOMMENDED RATES.
- AMENDED PLANT MIX (PREPARED TOPSOIL) SHALL CONSIST OF 1/3 SCREENED TOPSOIL, 1/3 SAND, AND 1/3 "TANNY DOG" COMPOST, MIXED WELL AND SPREAD TO A DEPTH AS INDICATED IN PLANTING DETAILS.
- ALL PLANTINGS SHALL BE MULCHED WITH SHREDDED HARDWOOD BARK. SPREAD TO A DEPTH OF 3" FOR TREES AND SHRUBS, AND 2" ON ANNUALS, PERENNIALS, AND CROPPED PLANTS. MULCH SHALL BE FREE FROM DEBRIS AND FOREIGN MATERIAL, AND PICES ON INCONSISTENT SIZE.
- NO SUBSTITUTION OR CHANGES OF LOCATION OR PLANT TYPE SHALL BE MADE WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE.
- THE LANDSCAPE ARCHITECT SHALL BE NOTIFIED OF ANY DISCREPANCY BETWEEN THE PLANS AND FIELD CONDITIONS PRIOR TO INSTALLATION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL PLANT MATERIAL IN A VERTICAL CONDITION THROUGHOUT THE GUARANTEED PERIOD.
- THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE SHALL HAVE THE RIGHT TO REJECT ANY WORK OR MATERIAL THAT DOES NOT MEET THE REQUIREMENTS OF THE LANDSCAPE CONTRACTOR SHALL SEED AND MULCH OR SOO (AS INDICATED ON PLANS) AND/OR SPECIFICATION.
- ALL AREAS DESIGNATED AS SUCH ON THE PLANS, THROUGHOUT THE CONTRACT LIMITS, FURTHER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING AREAS DISTURBED DURING CONSTRUCTION, NOT IN THE CONTRACT LIMITS, TO EQUAL OR GREATER CONDITION.
- ALL LANDSCAPE AREAS SHALL HAVE PROPER DRAINAGE THAT PREVENTS EXCESSIVE WATER FROM PONDING ON LAWN AREAS OR AROUND TREES AND SHRUBS.
- ALL LANDSCAPE AREAS SHALL BE IRRIGATED WITH AN AUTOMATIC UNDERGROUND SYSTEM.



GENERAL SEED NOTE:

ALL LAWN AREAS DESIGNATED TO BE SEED, SHALL BE HYDRO-SEED WITH SPECIFIED BLENDS, AND STABILIZED WITH WOOD CELLULOSE FIBER MULCH (2,000 LBS PER ACRE). IN AREAS SUBJECT TO EROSION, SEEDED LAWN SHALL BE FURTHER STABILIZED WHERE NECESSARY WITH BIODEGRADABLE EROSION BLANKET AND STAKED UNTIL ESTABLISHED. ALL SEED SHALL BE APPLIED OVER A MINIMUM 2" PREPARED TOPSOIL, AND SHALL BE KEPT MOIST AND WATERED DAILY UNTIL ESTABLISHED.
SEEDING INSTALLATION SHALL OCCUR ONLY:
SPRING: APRIL TO JUNE
FALL: AUGUST 15 TO OCTOBER 15

TYPICAL SEEDED LAWN MIX:

ALL LAWN AREAS DESIGNATED TO BE SEED, SHALL BE HYDROSEED WITH TYPICAL DROUGHT TOLERANT, DURABLE BLENDED SEED MIX AT A RATE OF 220 LBS PER ACRE
MIX IS COMPOSED OF:
30% NITE HAWK PERENNIAL RYE
30% KENTUCKY BLUEGRASS
30% CREEPING RED FESCUE
10% MERI KENTUCKY BLUEGRASS
10% NEWPORT KENTUCKY BLUEGRASS

LOW-GROW LAWN MIX:

ALL LAWN AREAS DESIGNATED TO BE SEED, SHALL BE HYDROSEED WITH LOW-GROW LAWN SEED MIX, AT A RATE OF 3,850/1,000 S.F.
SEED AVAILABLE FROM:
NATIVESCAPE, LLC
1-517-456-7245
* MIX IS COMPOSED OF:
22.5% PENN LAWN RED FESCUE
22.5% CREEPING RED FESCUE
21.7% CHEWINGS FESCUE
11.8% VICTORY I CHEWINGS FESCUE
9.8% SPARTAN HEAD FESCUE
9.9% AZAY SHEEPS FESCUE

GENERAL SOD NOTE:

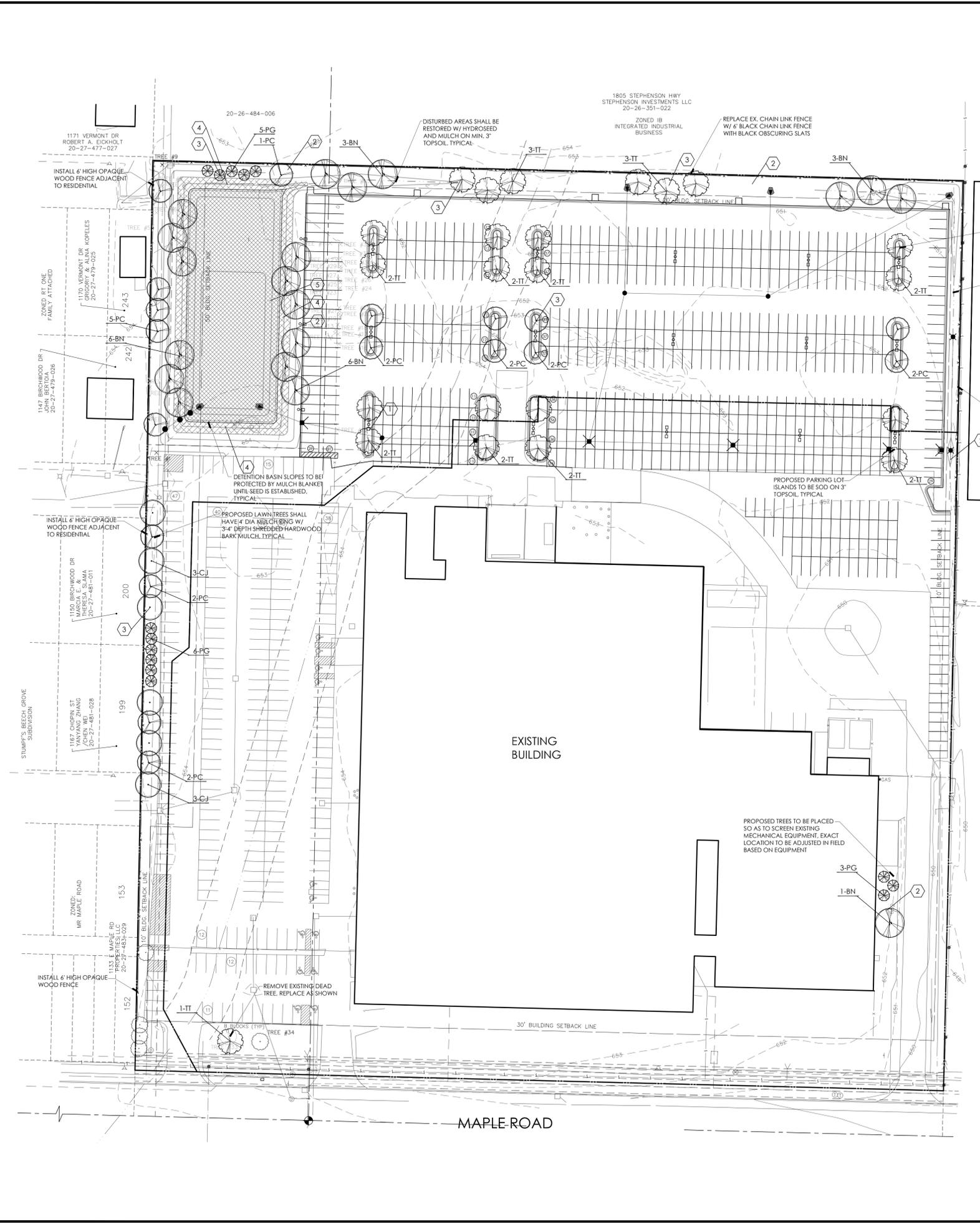
ALL LAWN AREAS DESIGNATED TO BE SODDED, SHALL BE SODDED WITH A BLENDED DURABLE BLUEGRASS SOD, TYPICALLY GROWN IN THE REGION. ALL TURF SHALL BE PLACED ON A MINIMUM 2" PREPARED TOPSOIL, AND WATERED DAILY UNTIL ESTABLISHED. IN AREAS SUBJECT TO EROSION, SODDED LAWN SHALL BE STABILIZED WHERE NECESSARY, AND Laid PERPENDICULAR TO SLOPE
SOD INSTALLATION SHALL OCCUR ONLY:
SPRING: APRIL TO JUNE
FALL: AUGUST 15 TO OCTOBER 15

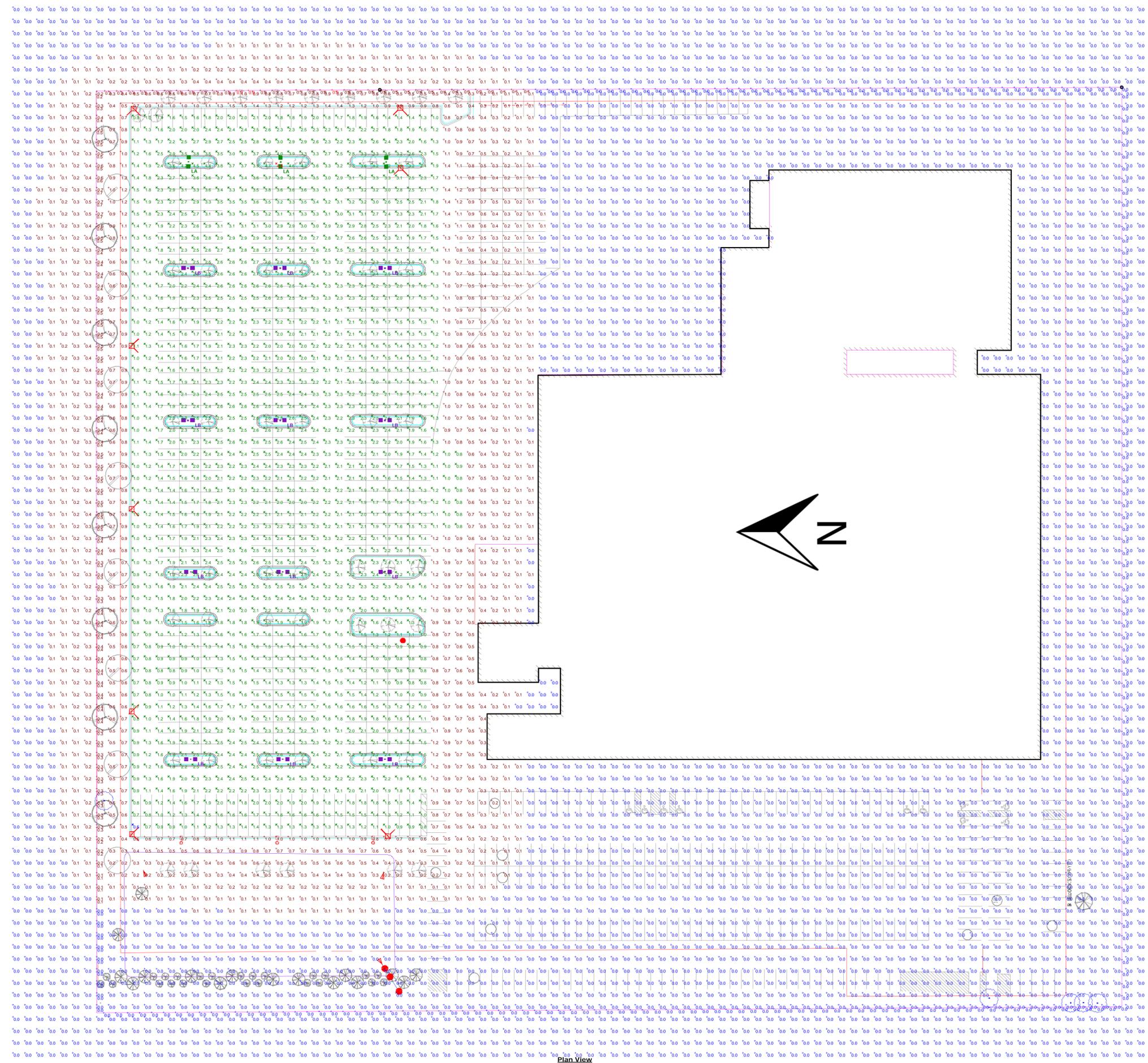
DETENTION BASIN FLOOR MIX

*CONTAINS AT LEAST 12 WILDLOWERS AND 4 GRASSES
NATIVE GRASSES:
NEW ENGLAND ASTER
PALE INDIAN PLANTAIN
JOE PYE WEED
BOHEMET
OX EYE SUNFLOWER
DENSE BLAININGSTAR
GREAT BLUE LOBELIA
CARDINAL FLOWER
GREEN HEADED CONEFLOWER
CHIFFANIT
OHIO GOLDENROD
BLUE VERVAIN
CULVERS ROOT
IRONWEED
YELLOW COCKERFLOWER
RECOMMENDED SEEDING RATE: 35-40 LBS/ACRE
SEED MIX AVAILABLE:
NATIVESCAPE, LLC
PO BOX 122
MANCHESTER, MI 48158
517-456-9696

PLANT SCHEDULE

KEY	QTY	BOTANICAL/Common NAME	SIZE	SPACING	ROOT	COMMENT
TREES						
BN	19	<i>Betula nigra</i> River Birch	14' HT	SEE PLAN	B&B	CLUMP FORM, 3 CANES
CJ	6	<i>Cercidiphyllum japonicum</i> Katsura Tree	12' HT	SEE PLAN	B&B	CLUMP FORM, 3 CANES
PG	14	<i>Picea glauca</i> 'Denata' Black Hills Spruce	8' HT	SEE PLAN	B&B	BRANCHED TO GROUND
PC	18	<i>Pyrus calleryana</i> 'Cleveland Select' Cleveland Select Pear	2.5' CAL	SEE PLAN	B&B	FULLY BRANCHED HEADS
TT	22	<i>Tilia tomentosa</i> 'Sterling' Sterling Linden	2.5' CAL	SEE PLAN	B&B	FULLY BRANCHED HEADS





Luminaire Locations					
Label	Location		MH	Orientation	Tilt
	X	Y			
LA	-1386.68	-1262.57	25.00	182.04	0.00
LA	-1309.80	-1262.79	25.00	181.03	0.00
LA	-1221.53	-1262.82	25.00	179.86	0.00
LB	-1387.12	-1351.03	25.00	270.00	0.00
LB	-1310.12	-1351.03	25.00	270.00	0.00
LB	-1222.42	-1351.03	25.00	270.00	0.00
LB	-1387.12	-1477.73	25.00	270.00	0.00
LB	-1310.12	-1477.73	25.00	270.00	0.00
LB	-1222.42	-1477.73	25.00	270.00	0.00
LB	-1384.82	-1603.83	25.00	270.00	0.00
LB	-1307.82	-1603.83	25.00	270.00	0.00
LB	-1222.42	-1603.73	25.00	270.00	0.00
LB	-1384.82	-1759.63	25.00	270.00	0.00
LB	-1307.82	-1759.63	25.00	270.00	0.00
LB	-1222.42	-1759.63	25.00	270.00	0.00

- Note**
1. SEE MH COLUMN OF LUMINAIRE LOCATIONS FOR MOUNTING HEIGHTS.
 2. SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTORS.
 3. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT GRADE
 4. LIGHT LEVELS ARE NOT TO EXCEED 20 F.C. DURING BUSINESS HOURS AND ARE NOT TO EXCEED 10 F.C. AFTER BUSINESS HOURS
 5. WHERE APPLICABLE, ALL FIXTURES ARE FULLY SHIELDED

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

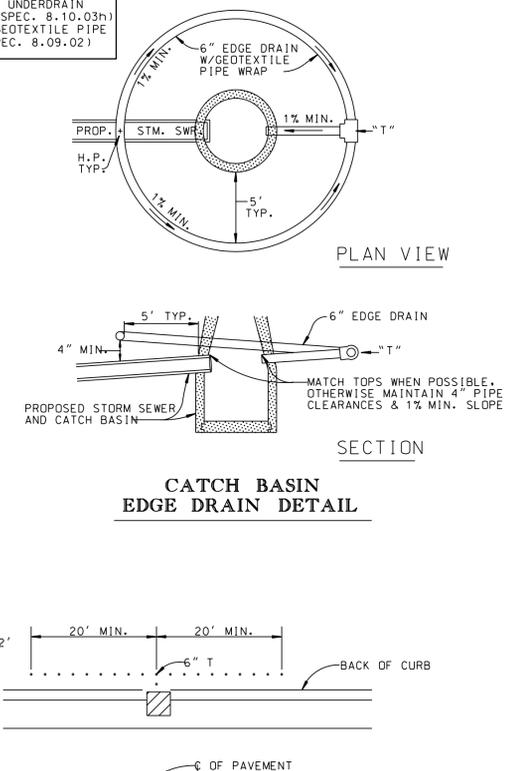
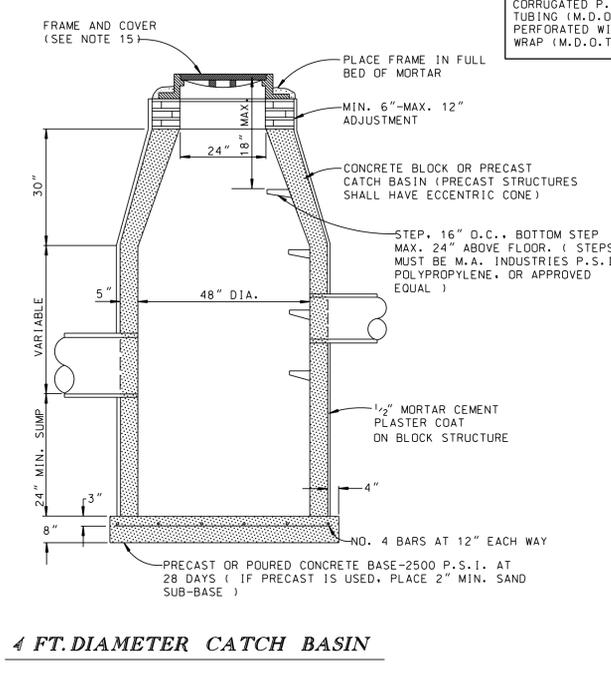
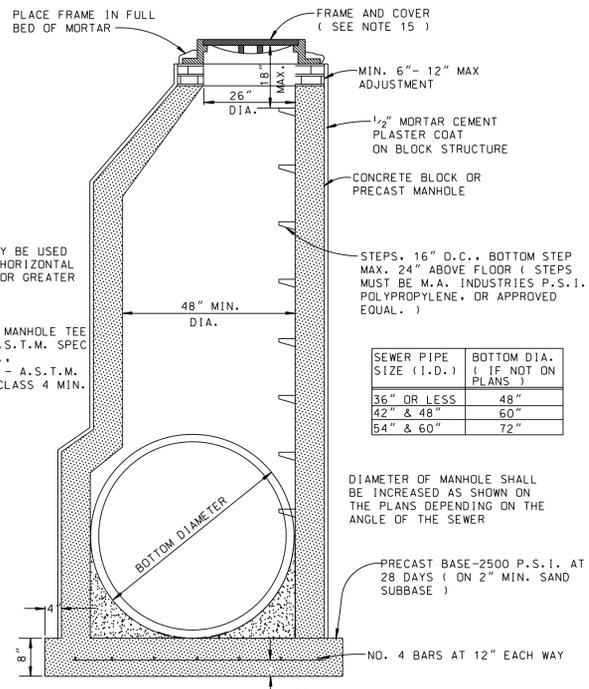
THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
OVERALL LTG VALUES	+	0.5 fc	4.8 fc	0.0 fc	N/A	N/A
PARKING LOT TLG VALUES	X	2.0 fc	4.8 fc	0.6 fc	8.0:1	3.3:1
PROPERTY LINE LTG VALUES	+	0.1 fc	0.9 fc	0.0 fc	N/A	N/A

Luminaire Schedule											
Symbol	Label	Quantity	Manufacturer	Description	Catalog Number	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
□	LA	3	Lithonia Lighting	DSXO LED WITH (2) 20 LED LIGHT ENGINE, TYPE T3M OPTIC, 5000K, @ 1000mA	DSXO LED 40C 1000 50K T3M MVOLT	LED	1	DSXO_LED_40C_1000_50K_T3M_MVOLT.fes	13168.56	0.9	276
□	LB	12	Lithonia Lighting	DSXO LED WITH (2) 20 LED LIGHT ENGINE, TYPE T5W OPTIC, 5000K, @ 1000mA	DSXO LED 40C 1000 50K T5W MVOLT	LED	1	DSXO_LED_40C_1000_50K_T5W_MVOLT.fes	13578.48	0.9	276

Plan View
Scale: 1" = 40'

PENSKE, TROY
 SITE PLAN: VALUES AT GRADE
 PREPARED FOR NOWAK & FRANK ENGINEERS
 GASSER BUSH ASSOCIATES



- GENERAL NOTES**
- PRIOR TO CONSTRUCTION, THE CONTRACTOR MUST HAVE IN HIS POSSESSION A COPY OF A VALID PERMIT TO CONSTRUCT A CONNECTION TO, OR AN EXTENSION OF, THE STORM WATER DRAINAGE SYSTEM.
 - PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING, AT A TIME AND PLACE AS ARRANGED BY THE ENGINEER DEPT., AT WHICH VARIOUS UTILITY COMPANIES AND GOVERNMENTAL AGENCY REPRESENTATIVES WILL BE PRESENT. THE OWNERS' ENGINEER SHALL SUBMIT APPROVED PLANS TO ALL UTILITY COMPANIES AND GOVERNMENTAL AGENCIES 10 DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING. CONSTRUCTION SHALL START WITHIN 3 WEEKS OF MEETING.
 - AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL GIVE NOTIFICATION OF HIS INTENTION TO BEGIN CONSTRUCTION TO THE CITY OF TROY FIELD ENGINEERING DEPARTMENT, 524-3409, TO THE CITY OF DEPARTMENT OF PUBLIC WORKS 524-3392, AND THE COUNTY PUBLIC WORKS COMMISSIONERS OFFICE (858-0958) AND THE COUNTY ROAD COMMISSION (858-4835) IF APPLICABLE.
 - THE CONTRACTOR SHALL SECURE PERMITS FROM THE COUNTY PUBLIC WORKS COMMISSION FOR ALL TAPS AND CROSSINGS OF COUNTY DRAINS AND SHALL PAY THE COST OF SAID PERMITS AND THE COST OF ANY INSPECTION CHARGES BY THAT AGENCY FOR WORK DONE UNDER THE PERMITS.
 - 72 HOURS PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL TELEPHONE MISS DIG (1-800-482-7171) FOR THE LOCATION OF UNDERGROUND FACILITIES, AND SHALL ALSO NOTIFY REPRESENTATIVES OF ANY OTHER FACILITIES, LOCATED IN THE VICINITY OF THE WORK, WHICH MAY NOT BE HANDLED BY MISS DIG.
 - ALL STORM WATER DRAINAGE SYSTEM CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF TROY, COUNTY ROAD COMMISSION, AND/OR COUNTY DRAIN COMMISSION AS APPLICABLE.
 - STORM SEWER PIPE SHALL BE REINFORCED CONCRETE, ASTM C-76 CLASS III OR HIGHER UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER. THE FOLLOWING STORM SEWER PIPE MATERIALS MAY BE USED ONLY WITH APPROVAL OF THE CITY ENGINEER. ISOILS PH & RESISTIVITY TESTS DEMONSTRATE A PH OF 5.0 TO 9.0 AND AN ELECTRICAL RESISTANCE OF 2000 OHM/CM/CM OR HIGHER, THEN HELICALLY CORRUGATED, FULL WELDED SEAM, AASHTO M-218 STEEL PIPE, GAUGE AS SHOWN, MANUFACTURED ACCORDING TO AASHTO M-36 WITH 2 2/3" X 1/2" OR 125MM X 25MM CORRUGATIONS, ALUMINIZED AT 1.00 OZ PER SQ. FT. PER AASHTO M-274 MAY BE USED. THE C.S.P. DIAMETER MUST HAVE THE SAME HYDRAULIC CAPACITY AS THE CONCRETE PIPE WHEN THE PIPE IS NOT SUBJECT TO CRUSHING FROM CONSTRUCTION OPERATIONS AND PROPERTY MAINTENANCE AND A MIN. 3' OF COVER CAN BE MAINTAINED ABS COMPOSITE (TRUSS) PIPE AND PVC PIPE MAY BE USED OUTSIDE PUBLIC ROAD R.O.W. WITH APPROVAL OF THE CITY ENGINEER.
 - REINFORCED CONCRETE PIPE JOINTS SHALL BE MODIFIED TONGUE & GROOVE WITH RUBBER "O" RING GASKET. CORRUGATED STEEL PIPE SHALL HAVE TWO CIRCUMFERENTIAL CORRUGATIONS ROLLED ON EACH END OF EACH SECTION. STEEL COUPLING BANDS OF THE SAME MATERIAL AS THE PIPE, FITTING THE PIPE CONFIGURATION WITH TWO "O" RING RUBBER GASKETS SHALL PRODUCE A WATERTIGHT JOINT ("HUGGER BANDS"). "PVC & TRUSS" PIPE JOINTS SHALL BE CHEMICALLY FUSED IN ACCORDANCE WITH THE MANUFACTURERS' INSTRUCTIONS.
 - UNLESS OTHERWISE INDICATED ON THE PLANS, ALL STORM SEWER BEDDING SHALL BE STANDARD BEDDING. CRUSHED STONE BEDDING SHALL BE PLACED, IF THE INSPECTOR DEEMS THAT THE INSTALLATION WARRANTS IT.
 - ALL SUMP AND BUILDING SERVICE CONNECTIONS SHALL BE 3" POLY-VINYL CHLORIDE (PVC) SEWER PIPE, SCHEDULE 40 WITH CHEMICALLY FUSED JOINTS AND CONNECT TO A CATCH BASIN OR MANHOLE. NO BLIND TAPS.
 - ALL DRAINAGE STRUCTURES SHALL CONFORM TO THE DETAILS SHOWN. ALL CATCH BASINS SHALL HAVE 2 FT. SUMP.
 - CONNECTIONS TO DRAINAGE STRUCTURES SHALL BE CORED. THE OPENING BETWEEN THE HOLE AND PIPE SHALL BE SEALED WITH A NON-SHRINK GROUT.
 - IF THE WALL OF THE STRUCTURE BEING TAPPED IS DAMAGED, THE CITY SHALL DECIDE IF IT CAN BE REPAIRED AND APPROVE THE METHOD. IF THE STRUCTURE CANNOT BE REPAIRED IT WILL BE REPLACED.
 - UNLESS OTHERWISE NOTED ON THE PLANS, STRUCTURE FRAME AND COVERS SHALL BE AS FOLLOWS:
 - MANHOLE E.J.I.W. 1000 WITH TYPE "B" PERFORATED COVER, OR EQUAL.
 - CATCH BASIN IN PAVEMENT E.J.I.W. 5080 WITH SINUSOIDAL M2 GRATE, OR EQUAL, IN RESIDENTIAL AREAS.
 - CATCH BASIN IN PAVEMENT E.J.I.W. 5105 WITH SINUSOIDAL M2 GRATE, OR EQUAL, IN NON-RESIDENTIAL AREAS.
 - CATCH BASIN NOT IN PAVEMENT E.J.I.W. 1000-01 WITH TYPE M, C, OR O1 HEAVY DUTY GRATE, OR EQUAL.
 - CATCH BASIN IN LANDSCAPE AREAS OR ROADSIDE DITCH MAY REQUIRE THE USE OF E.J.I.W. OR ONE OF THE FOLLOWING:
 - 1040 TYPE "N" OVAL GRATE OR TYPE O2 BEEHIVE GRATE
 - 1130 TYPE "N" OVAL GRATE OR TYPE O1 BEEHIVE GRATE
 - 2800 TYPE "N" OVAL GRATE OR TYPE O2 BEEHIVE GRATE
 - 6508 OR 6517

MANHOLE TEES MAY BE USED WHEN PIPE DIA. HORIZONTAL MEASURE IS 48" OR GREATER

INTEGRALLY CAST MANHOLE TEE CIRCULAR PIPE - A.S.T.M. SPEC C76 CLASS 4 MIN. ELLIPTICAL PIPE - A.S.T.M. SPEC. C 507 HE CLASS 4 MIN.

SEWER PIPE SIZE (I.D.)	BOTTOM DIA. (IF NOT ON PLANS)
36" OR LESS	48"
42" & 48"	60"
54" & 60"	72"

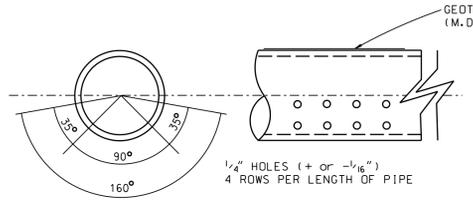
DIAMETER OF MANHOLE SHALL BE INCREASED AS SHOWN ON THE PLANS DEPENDING ON THE ANGLE OF THE SEWER

PRECAST BASE - 2500 P.S.I. AT 28 DAYS (IF PRECAST IS USED, PLACE 2" MIN. SAND SUBBASE)

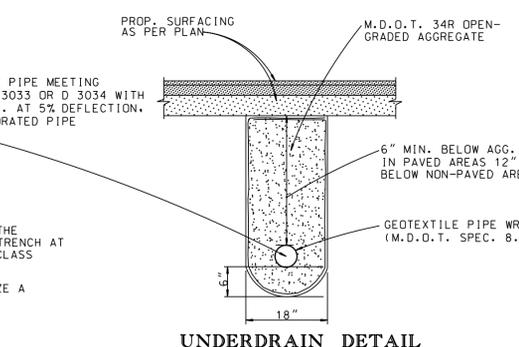
NO. 4 BARS AT 12" EACH WAY

4 FT. DIAMETER CATCH BASIN

UNDERDRAIN DETAIL FOR CATCH BASIN IN CURB FOR PAVEMENT WITHIN THE CITY R.O.W.



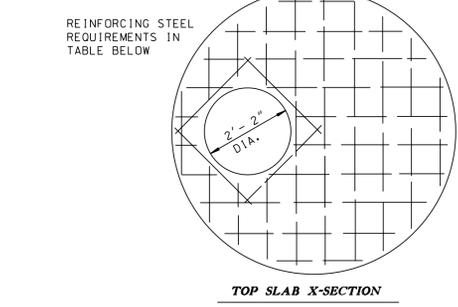
REAR YARD UNDERDRAIN CROSS SECTION



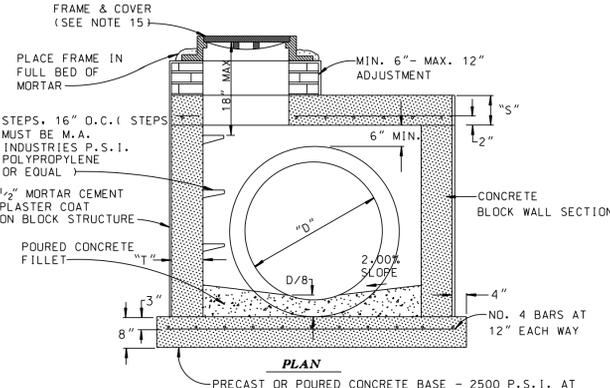
UNDERDRAIN DETAIL

GENERAL PIPE BEDDING & TRENCH NOTES

- THE CONTRACTOR SHALL INSTALL THE PIPE IN ACCORDANCE WITH THE BEDDING DETAIL REQUIRED FOR THE PIPE DEPTH (MEASURED FROM THE TOP OF THE PIPE), AND TRENCH WIDTH (MEASURED ACROSS THE TRENCH AT THE TOP OF THE PIPE) CONSTRUCTED. A CONTRACTOR MAY ALWAYS USE A HIGHER QUALITY BEDDING CLASS THAN REQUIRED. ANY OTHER VARIATIONS MUST BE APPROVED IN WRITING BY THE ENGINEER.
- CRUSHED STONE BEDDING SHALL BE UTILIZED FOR ALL DEWATERED GROUND TRENCHES AND SHALL UTILIZE A TRENCH WIDTH OF 30" (MINIMUM).
- BEDDING & BACKFILL MATERIAL SHALL BE AS FOLLOWS:
 - CRUSHED STONE BEDDING: SHALL CONSIST OF WELL GRADED CRUSHED STONE. THE STONE SHALL CONFORM TO ASTM D 448, #67. ASTM D 2487 CLASS 1, OR ALTERNATIVE APPROVED BY THE ENGINEER. ANY MATERIAL INCORPORATED SHALL PROVIDE A MINIMUM OF 90% CRUSHED MATERIAL. MDT COURSE AGGREGATES 6A, 6AA, 9A, 17A & 25 SERIES ARE ALSO APPROVED FOR USE IF THEY ARE MANUFACTURED WITH SUFFICIENT CRUSHED MATERIAL AND NO STONE IS LARGER THAN 1-1/4 INCH IN DIAMETER. SPAKING THE HAUNCH AREA IS REQUIRED, FOR DENSITY.
 - STANDARD BEDDING: SHALL CONSIST OF WELL GRADED COURSE SANDS AND GRAVEL (1-1/4 INCH MAXIMUM DIAMETER) CONTAINING A SMALL PERCENTAGE OF FINES. THE MATERIAL SHALL CONFORM TO ASTM D 2487 CLASS 11 AND SHALL INCLUDE PEA PEBBLE AND MDT AGGREGATES 20 SERIES, 21 SERIES, 22 SERIES, 23A, 26A, 28 SERIES & 31 SERIES. 90% MINIMUM DENSITY REQUIRED.



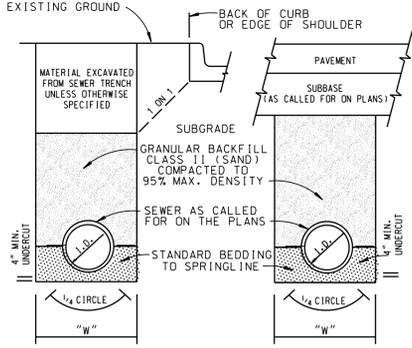
TOP SLAB X-SECTION



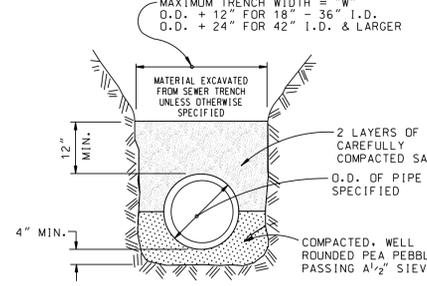
STORM SEWER MANHOLE A WITH FLAT SLAB

OUTLET "D" I.D.	M.H. I.D.	TOP SLAB "S"	WALL "T"	REINFORCING STEEL
36" OR LESS	4	9"	12"	3/4" @ 9" EA. WAY
42"	5	10"	12"	3/4" @ 9" EA. WAY
48" - 54"	6	11"	12"	7/8" @ 9" EA. WAY
	7	12"	12"	1" @ 9" EA. WAY
	8	12"	12"	1" @ 9" EA. WAY

* DIAMETER OF MANHOLE SHALL BE INCREASED AS SHOWN ON THE PLANS DEPENDING ON THE ANGLE OF THE SEWERS

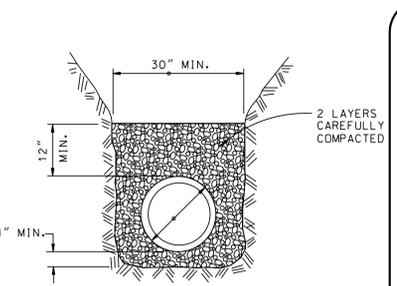


STANDARD BEDDING TRENCH DETAIL 'B'



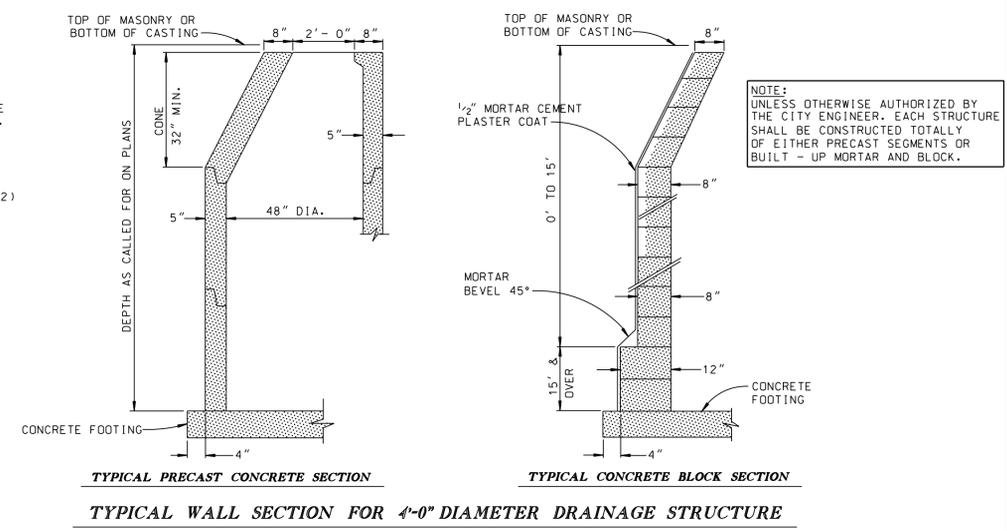
STANDARD BEDDING TRENCH DETAIL 'A'

NOTE: APPROVAL MAY BE GIVEN TO ALTERNATE MATERIALS AND METHODS TO ACHIEVE STANDARD BEDDING.



CRUSHED STONE BEDDING

NOTE: FOR ALL TRENCHES GREATER THAN 30" IN WIDTH, DEWATERED TRENCHES AND ALL TRENCHES GREATER THAN 20' IN DEPTH.



TYPICAL WALL SECTION FOR 4-0\"/>

CITY OF TROY
OAKLAND COUNTY, MICHIGAN
STANDARD STORM SEWER DETAILS

ENGINEERING DEPARTMENT

APPROVED BY: STEVEN J. VANDETTE, CITY ENGINEER DATE: JANUARY 8, 2001

DATE	REMARKS	PROJECT NO.	SHEET NO.

DRAWN BY: G.S.F. CHECKED BY: W.D.J.

STATE OF MICHIGAN
PROFESSIONAL ENGINEER
STEVEN J. VANDETTE
NO. 28197

STEVEN J. VANDETTE, P.E. 28197

GENERAL SOIL EROSION AND SEDIMENTATION CONTROL NOTES

- THE FOLLOWING ITEMS ARE INTENDED TO BE A GUIDE TO THE CONTRACTOR IN EVALUATING SOIL EROSION PREVENTION REQUIREMENTS FOR THE PROJECT. SPECIFIC SOIL EROSION PREVENTION DEVICES AND LOCATIONS ARE DETAILED ON THE PLANS. THE CONTRACTOR SHOULD ALSO NOTE THAT SOIL EROSION AND SEDIMENTATION CONTROLS ARE INCIDENTAL TO THE PROJECT UNLESS SPECIFIED OTHERWISE ON THE PLANS OR IN THE SPECIFICATIONS.
- ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO THE PERMITS AND THE STANDARDS AND SPECIFICATIONS OF THE CITY OF TROY.
 - DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR FOR EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES AND ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
 - EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS.
- WATERWAYS INCLUDE NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
- CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES WHEN REQUIRED AND AS DIRECTED ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES, AND OTHER EARTH CHANGES HAS BEEN ACCOMPLISHED.
 - STAGING THE WORK WILL BE DONE BY THE CONTRACTOR AS INDICATED ON THE SOIL EROSION PLANS AND AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED EARTH.
 - THE CONTRACTOR WILL ESTABLISH SOIL EROSION PREVENTION PRACTICES IN THE EARLY STAGES OF CONSTRUCTION. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.
 - ENGINEER AND OWNER CERTIFICATION MUST BE INCLUDED ON THE PLANS.
 - SEPARATE SHEETS SHOWING EROSION PREVENTION AND SEDIMENTATION CONTROL PLANS MUST BE PROVIDED.

- THE FOLLOWING GUIDELINES ARE TO BE IMPLEMENTED:
 - CHECK DAMS
 - STONE SIZE MUST BE INCREASED WITH INCREASED SLOPE AND VELOCITY.
 - SLOPE OF THE DAM SHOULD BE 2:1 OR FLATTER.
 - STRAW BALES ARE NOT TO BE USED FOR CHECK DAMS.
 - ADD STONES AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.
 - ANY ACCUMULATION OF SEDIMENT SHALL BE REMOVED AND STOCKPILED IN A STABILIZED AREA TO PREVENT THE MATERIAL FROM ERODING BACK INTO THE DRAINAGE COURSE.
 - VEGETATIVE BUFFER ZONES
 - VEGETATION MUST BE MAINTAINED IN A VIGOROUS CONDITION.
 - RESHAPE AND RESEED AREAS WHERE CONCENTRATED FLOW OCCURS OR VEGETATION FAILS.
 - TO BE USED FOR SHEET FLOWS ONLY.
 - NOT TO BE USED AS A ROADWAY.
 - SILT FENCE
 - MUST BE INSTALLED ALONG THE CONTOUR LINE.
 - IS NOT TO BE USED IN AREAS OF CONCENTRATED FLOW.
 - MUST BE TRENCHED AT LEAST 6" INCHES AND BACKFILLED.
 - MULTIPLE ROWS ARE TO BE USED UP A SLOPE.
 - ACCUMULATED SEDIMENT MUST BE PERIODICALLY REMOVED.
 - WHERE NECESSARY, A SUPPORT FENCE SHALL BE USED TO SUPPORT THE GEOTEXTILE FILTER FABRIC.
 - TO BE REMOVED AFTER SITE IS PERMANENTLY STABILIZED.
 - INLET SEDIMENT TRAP
 - THE SEDIMENT DEPOSITION AREA AND NONWOVEN GEOTEXTILE FILTER FABRIC SHOULD BE CLEANED OF ALL ACCUMULATED SEDIMENT AFTER EACH STORM.
 - INLET FILTERS CONTRIBUTING AREAS ARE STABILIZED, THE FILTER FABRIC WILL BE REMOVED FROM THE SEDIMENT DEPOSITION AREA, AND A SOD INLET FILTER PLACED OVER THE DISRUPTED LAWN AREA.
 - THE FILTER MATERIAL USED TO BACKFILL PARKING LOT DRAINAGE HOLES WILL BE PEASTONE. THE SIDE EXCAVATION FOR THE PLACEMENT OF THIS MATERIAL WILL NOT BE DEEPER THAN THE INVERT OF THE DRAINAGE HOLES.
 - INLET FILTERS AFTER PAVING OR GRADING
 - INLET FILTERS WILL REMAIN IN PLACE UNTIL ALL DENuded AREAS CONTRIBUTING TO THEM ARE STABILIZED WITH VEGETATION.
 - PERIODIC INSPECTION AND MAINTENANCE WILL BE PROVIDED TO INSURE THAT FILTERS ARE FUNCTIONING PROPERLY.

- SOD INLET FILTER
 - SOD INLET FILTERS WILL ONLY BE USED TO HANDLE LIGHT CONCENTRATIONS OF SEDIMENT.
 - RECOMMENDED FOR USE AFTER FINAL GRADING IS COMPLETE AND DURING THE ESTABLISHMENT OF A VEGETATIVE COVER.
 - CATCH BASIN INLET COVERS MAY BE WRAPPED IN A NON-WOVEN GEOTEXTILE FILTER FABRIC FOR ADDITIONAL FILTRATION.
 - PERIODIC INSPECTION AND MAINTENANCE MUST BE PROVIDED TO INSURE EFFICIENT OPERATION.

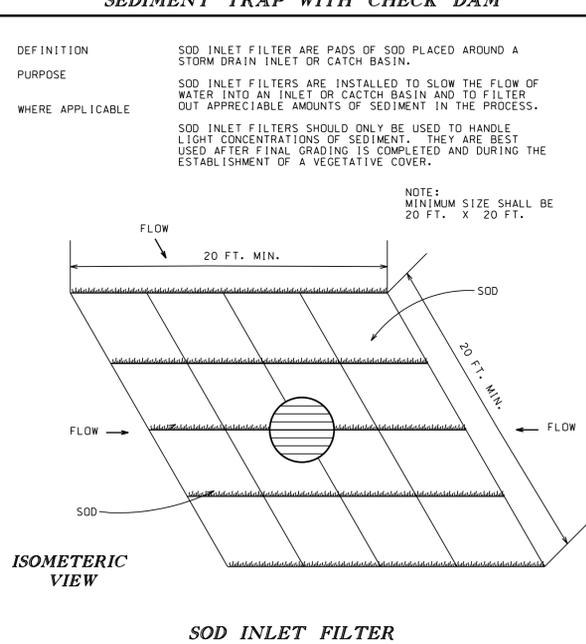
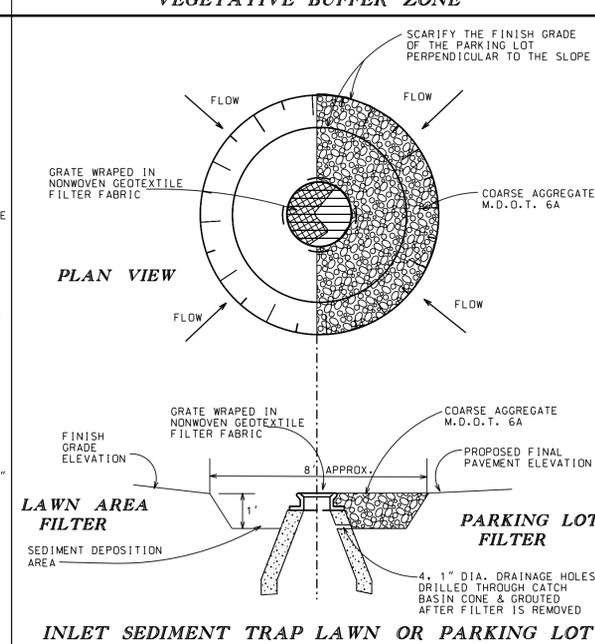
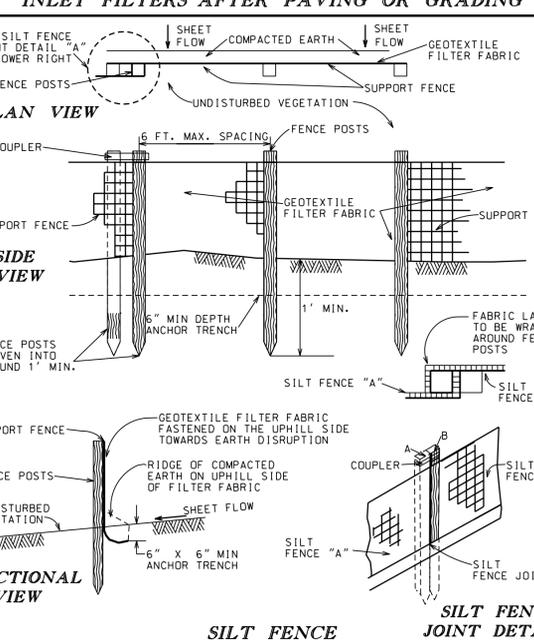
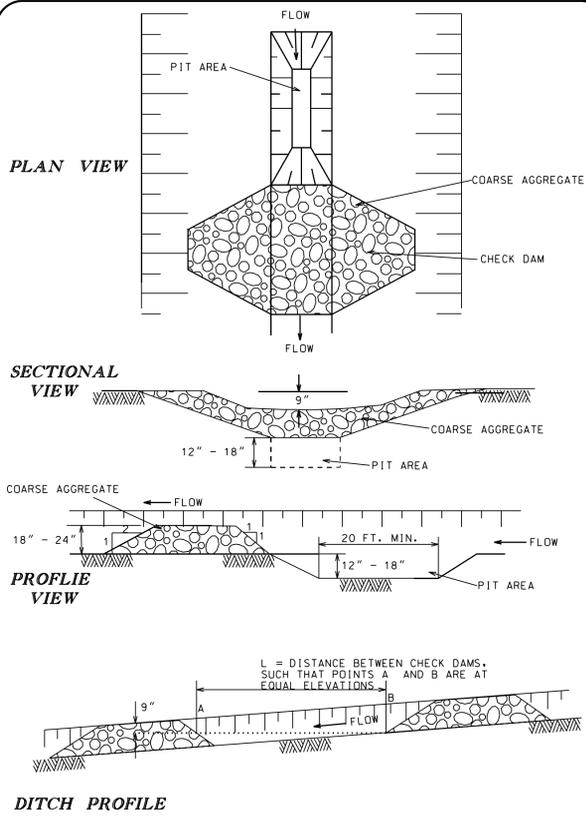
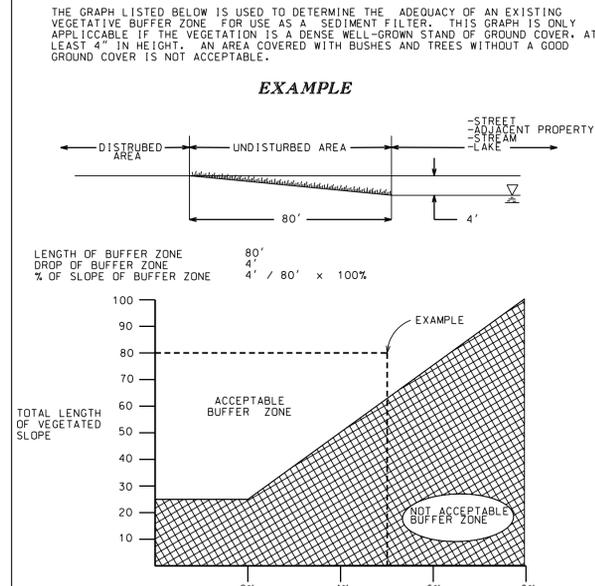
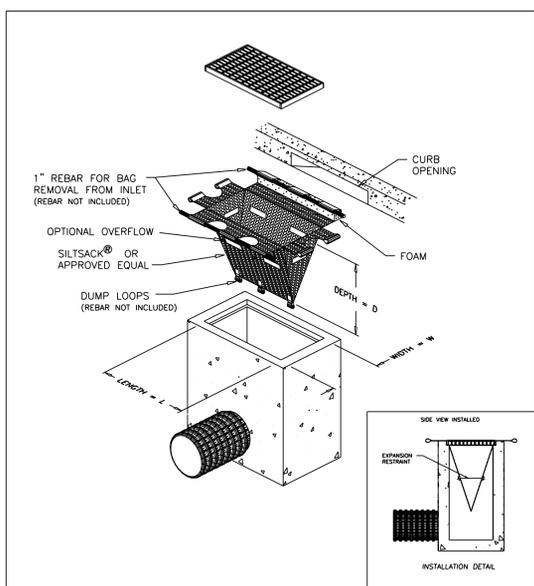
GENERAL CONSTRUCTION NOTES

THE FOLLOWING ITEMS OF WORK RELATED TO THE PROPOSED CONSTRUCTION ARE INTENDED TO ACT AS A GUIDE TO THE CONTRACTOR IN EVALUATING THE REQUIREMENTS FOR THE PROJECT. HOWEVER, THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THE PROJECT IS COMPLETED WITHIN THE DETERMINATION OF THE ITEMS OF WORK NECESSARY TO COMPLETE THE PROJECT. THE CONTRACTOR SHALL SPECIFICALLY DIRECT HIS ATTENTION TO THE EXTENT OF INCIDENTAL CONTRACT ITEMS, OR WORK IDENTIFIED AS BEING INCLUDED IN OTHER ESTABLISHED PAY ITEMS AND INCLUDE THIS WORK IN HIS BID PRICE.

- THE CONTRACTOR SHALL NOTIFY THE CITY OF TROY AT (248) 524-3409 THREE (3) WORKING DAYS PRIOR TO CONSTRUCTION.
- ALL WATER MAIN AND SANITARY SEWER CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND CITY OF TROY SPECIFICATIONS AND THE DETROIT WATER AND SEWERAGE DEPARTMENTS.
- ROAD COMMISSION FOR OAKLAND COUNTY (RCOC) PERMITS:
 - ALL ROAD CROSSINGS AND RELATED WORK IN THE COUNTY RIGHT-OF-WAYS SHALL BE PERFORMED UNDER THE SUPERVISION AND INSPECTION OF THE RCOC. ALL PERMITS SHALL BE OBTAINED BY THE CONTRACTOR, AND ALL PERMIT AND INSPECTION FEES SHALL BE PAID FOR BY THE CONTRACTOR (INCLUDED IN THE COST OF THE IMPROVEMENT). ROAD PATCHES SHALL BE AS SPECIFIED BY THE RCOC, AND ALL REMOVALS SHALL BE SAWCUT FULL DEPTH. TRAFFIC FOR ALL LOCAL RESIDENTS AND EMERGENCY VEHICLES MUST BE MAINTAINED AT ALL TIMES.
- OAKLAND COUNTY DEPT. OF PUBLIC WORKS (OCDPW) PERMITS:
 - ALL DRAIN CROSSINGS AND RELATED WORK IN THE COUNTY DRAIN RIGHT-OF-WAY AND/OR ITS EASEMENTS SHALL BE PERFORMED UNDER THE SUPERVISION AND INSPECTION OF THE OCDPW. ALL PERMITS SHALL BE OBTAINED BY THE CONTRACTOR, AND ALL PERMIT AND INSPECTION FEES SHALL BE PAID FOR BY THE CONTRACTOR (INCLUDED IN THE COST OF THE IMPROVEMENT).

THE CONTRACTOR SHALL PAY FOR ALL INSPECTION OVER EIGHT (8) HOURS PER DAY AND ALL INSPECTION ON SATURDAY AT THE CURRENT HOURLY RATE, PER MAN HOUR. THE CONTRACTOR WILL NOT BE CHARGED FOR OVERTIME ON SATURDAY IF HE HAS FIVE (5) MEN OR LESS PERFORMING CLEAN-UP WORK AND LANDSCAPE ITEMS. IN ADDITION, IF HOLIDAY OR SUNDAY WORK IS PERMITTED BY THE CITY, THE CONTRACTOR SHALL PAY FOR ALL INSPECTION AT THE CURRENT HOLIDAY RATE PER HOUR, PER MAN.

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETE RESTORATION OF THIS PROJECT TO CONDITIONS THAT ARE ACCEPTABLE TO THE JURISDICTIONAL AUTHORITY, ENGINEER AND/OR OWNER.
 - DRIVEWAYS SHALL BE RESTORED IN KIND WITH THE FOLLOWING MINIMUM MATERIAL THICKNESS, SIX (6) INCHES CONCRETE, FOUR (4) INCHES ASPHALT ON SIX (6) INCHES AGGREGATE OR EIGHT (8) INCHES OF AGGREGATE. (ALL DRIVEWAY CUT REMOVALS SHALL BE SAWCUT).
 - ALL DISTURBED LAWN AREAS SHALL BE SODDED WITH CLASS "A" SOD ON FOUR (4) INCHES OF TOPSOIL. ALL OTHER NON-RESIDENTIAL FIELD AREAS SHALL BE SEEDED, FERTILIZED AND MULCHED ON THREE (3) INCHES OF TOPSOIL (SEE SPECIFICATIONS).
 - THE TRENCH BACKFILL FOR WATER MAINS SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS AS SHOWN ON THE ATTACHED "STANDARD WATER DETAIL" SHEET. (ALL TRENCH BACKFILL FOR PROPOSED WATER MAINS SHALL BE INCLUDED IN THE COST OF THE WATER MAIN).
 - THE TRENCH BACKFILL FOR SANITARY SEWERS AND STORM SEWERS SHALL BE AS SHOWN BELOW.



THE CONTRACTOR SHALL CONTACT THE OFFICE OF THE OCDPW 48 HOURS PRIOR TO CONSTRUCTION.

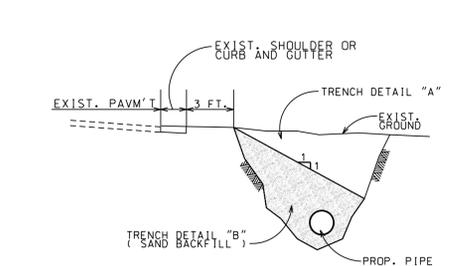
PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL TELEPHONE MISS DIG (1-800-482-7171) FOR THE LOCATION OF ALL UNDERGROUND GAS, CABLE AND OTHER UTILITIES, AND SHALL ALSO NOTIFY REPRESENTATIVES OF ALL OVERHEAD AND UNDERGROUND UTILITIES LOCATED IN THE VICINITY OF THE WORK.

THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. THE CONTRACTOR SHALL VERIFY THE EXISTING DEPTHS AND HORIZONTAL LOCATIONS OF ALL EXISTING UTILITIES BY PRE-EXCAVATING ALL CONFLICTS BEFORE ANY WORK IS STARTED. THE EXACT LOCATION OF EXISTING UTILITIES SHALL BE DETERMINED BY HAND-DIGGING. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH MATERIAL ACCEPTABLE TO THE UTILITY OWNER. ALL COST FOR LOCATING, PRE-EXCAVATING, REMOVING, AND REPLACING OR RELOCATING THESE UTILITIES SHALL BE INCLUDED IN THE COST OF THE IMPROVEMENT.

NO ADDITIONAL COMPENSATION WILL BE PAID TO THE CONTRACTOR FOR ANY DELAY OR INCONVENIENCE DUE TO MATERIAL SHORTAGES OR REASONABLE DELAYS DUE TO THE OPERATIONS OF OTHER CONTRACTORS, UTILITY COMPANIES, OR ANY PUBLIC AUTHORITY DOING THE WORK INDICATED OR SHOWN ON THE PLANS OR IN THE PROPOSAL, OR FOR ANY REASONABLE DELAY OF CONSTRUCTION DUE TO THE ENCOUNTERING OF EXISTING UTILITIES THAT MAY OR MAY NOT BE SHOWN ON THE PLANS.

THE CONTRACTOR SHALL HAVE AVAILABLE AT ALL TIMES A COMPETENT SUPERINTENDENT OR FOREMAN AUTHORIZED TO ACT FOR THE CONTRACTOR, AS HIS AGENT ON THE WORK, WHO THOROUGHLY UNDERSTANDS THE PLANS AND SPECIFICATIONS AND WHO SHALL RECEIVE INSTRUCTIONS FROM THE ENGINEER. THE SUPERINTENDENT OR FOREMAN SHALL BE DESIGNATED BY NAME PRIOR TO COMMENCEMENT OF THE WORK AND SHALL BE AVAILABLE AS REQUIRED FOR PROPERTY MANAGEMENT OF THE PROJECT FOR THE DURATION OF THE CONTRACT. PLANS AND SPECIFICATIONS SHALL BE AVAILABLE ON THE PROJECT AT ALL TIMES.

WHEN THE ENGINEER REQUIRES THE CITY OF TROY TO PERFORM EMERGENCY WORK, WITH OR WITHOUT NOTIFICATIONS TO THE CONTRACTOR OR SURETY, THE CONTRACTOR WILL BE CHARGED EQUIPMENT RENTAL RATES AS LISTED IN THE CURRENT EDITION OF "RENTAL RATES FOR CONSTRUCTION EQUIPMENT" PREPARED BY ASSOCIATED EQUIPMENT DISTRIBUTOR, AND LABOR AT THE CURRENT HOURLY RATE PER MAN HOUR. THE TIME CHARGED TO THE CONTRACTOR SHALL BE FROM THE TIME THE MAN AND EQUIPMENT LEAVE THE CITY OF TROY YARD TO THE TIME THAT IT RETURNS TO THE CITY OF TROY YARD.



TRENCH DETAIL "A" - SHALL BE BACKFILLED IN 12 INCH LAYERS AND COMPACTED TO 90% OF ITS MAXIMUM UNIT WEIGHT.

TRENCH DETAIL "B" - SHALL BE SAND BACKFILLED IN 12 INCH LAYERS AND COMPACTED TO 95% OF ITS MAXIMUM UNIT WEIGHT.

ALL TREES, SHRUBS, LANDSCAPING, MAILBOXES, FENCES, DRIVEWAYS, SIDEWALKS, CULVERTS, STORM SEWERS, DITCHES, GUARD RAILS, SPRINKLER SYSTEMS, SIGNS, YARD OR SIGN LIGHTINGS, UTILITIES AND OTHER EXISTING ITEMS ALONG THE PATH OF THE PROPOSED WATER MAIN AND/OR SANITARY SEWER SHALL BE PROTECTED AND/OR RESTORED AS DESCRIBED IN THE SPECIFICATION BOOK (INCLUDED IN THE COST OF THE IMPROVEMENT).

ALL EXISTING MAILBOXES ON THE PROJECT WILL BE TEMPORARILY RESET ALONG THE OWNER'S DRIVEWAY, OR ALONG AN INTERSECTING STREET, BEYOND THE LIMITS OF CONSTRUCTION, AS DIRECTED BY THE ENGINEER. WHEN THE PROJECT IS COMPLETED THE MAILBOXES SHALL BE RESET BY THE CONTRACTOR IN ACCORDANCE WITH LOCAL POSTAL REGULATIONS. THE TEMPORARY RESETTING AND FINAL PLACEMENT OF MAILBOXES SHALL BE INCLUDED IN THE PROJECT AND WILL NOT BE PAID FOR SEPARATELY.

THE CONTRACTOR SHALL NOT EXPAND UPON THE WORK OR DEVIATE FROM THE LOCATIONS, ELEVATIONS OR SPECIFICATIONS OF ANY WORK AS SHOWN ON THESE PLANS WITHOUT RECEIVING PRIOR APPROVAL FROM THE CITY OF TROY ENGINEERING DEPARTMENT AND/OR OTHER JURISDICTIONAL AUTHORITIES.

IN ADDITION TO THE NOTES ON THIS SHEET, THE CONTRACTOR'S ATTENTION SHALL BE DIRECTED TO THE NOTES ON THE ATTACHED "STANDARD DETAIL" SHEETS AS WELL AS ADDITIONAL CONSTRUCTION REQUIREMENTS.

CITY OF TROY
OAKLAND COUNTY, MICHIGAN

STANDARD SOIL EROSION & GENERAL CONSTRUCTION (1 OF 1)

ENGINEERING DEPARTMENT

APPROVED BY: STEVEN J. VANDETTE, CITY ENGINEER DATE: _____

REVISIONS	DATE	REMARKS	PROJECT NO.	SHEET NO.

DATE: JUNE 2007

DRAWN BY: G.S.F./M.P.B. CHECKED BY: J.E.L.

STEVEN J. VANDETTE, P.E. 28197

DATE: October 24, 2014
TO: Planning Commission
FROM: R. Brent Savidant, Planning Director
SUBJECT: POTENTIAL ZONING ORDINANCE TEXT AMENDMENT – Mineral
Extraction

The Planning Commission indicated a desire to develop language to regulate mineral extraction in the City of Troy.

The attached memo prepared by Carlisle/Wortman Associates, Inc. summarizes the issue and lays out a framework for developing standards, including several regulation options.

Please be prepared to discuss this matter at the October 28, 2014 Planning Commission Special/Study meeting.

Attachments:

1. Report prepared by CWA

G:\ZOTAs\Extraction\PC Memo 10 28 2014.doc



CARLISLE

WORTMAN
associates, inc.

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

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

TO: R. Brent Savidant, AICP, Planning Director
FROM: Ben Carlisle, AICP
DATE: October 24, 2014
RE: Extraction Ordinance

The Planning Commission has asked for consideration to adopt regulations regarding natural resource extraction, specifically oil and gas. We have completed some research regarding regulations for extraction. Most extraction ordinances that we have written and those we have researched are written toward solid extractions (gravel, soil, sand, etc). The only ordinances we have found geared specifically towards oil and gas is Rochester Hills and Auburn Hills. As far as we know these are in draft forms and have not been formally adopted by either municipality.

While cities have more control in extraction than townships and counties, all regulations must serve a public purpose and relate to the mitigation of negative impacts. We have prepared some bullet points that the Planning Commission and the city should consider and discuss in preparation of drafting an ordinance:

Purpose Statement

- Protection of health, safety, and welfare
- Protection environment
- Protect residential properties and residential property values
- Mitigate negative impacts

Approval process

- Limit extraction as permitted in specific districts; or
- Permit as extraction special use in any or limited districts.
- Require a minimum lot size for extraction operations?
- Processing shall require separate zoning consideration. Limit processing to IB as special use.

Special Zoning Provisions

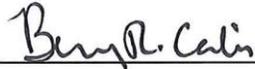
- Require minimum separation distances for all extraction operations from each other
- Require minimum separation distances for all extraction operations from residential properties, schools, and public buildings
- Require minimum distance from road right-of-way
- Require increased setbacks.
- Increased landscape, fencing, and lighting requirements.
- Stringent dust, fumes, and odors controls.
- Height controls
- Limits to hours of operation
- Limits to traffic impacts
- Limit pipeline location

- Limit injection wells

Submittal Requirements:

- Environmental Impact Statement
- Hydrogeological analysis
- Monitoring controls
- Reclamation Plan
- Operations Plan to include:
 - Site ingress/egress
 - Emergency Response Plan
 - Hours of operation
 - Haul Route Map
 - Dust Control Plan
 - Mud Control Plan
 - Noise Control Plan
 - Soil Erosion Plan
 - Odor and Fume Control Plan
 - Pollution Prevention Plan
 - Impact Mitigation Plan

Yours Truly,



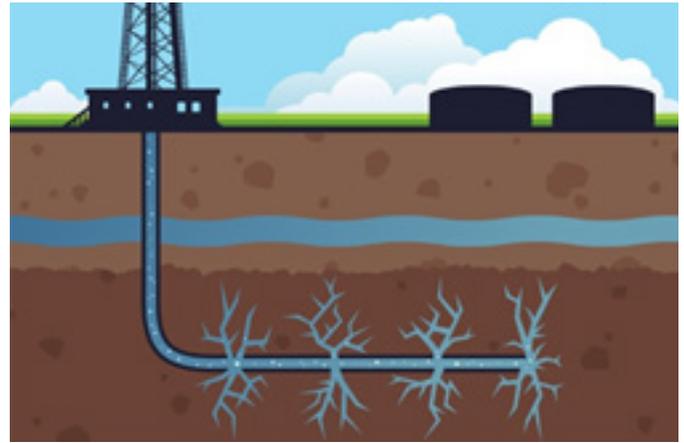
CARLISLE/WORTMAN ASSOC., INC.
Benjamin R. Carlisle, LEED AP, AICP

Attachments:

- Article: Regulating Oil and Gas in Michigan
- Rochester Hills Ordinance
- Auburn Hills Ordinance
- Link to Article: <http://energyindepth.org/michigan/local-fracking-bans-michigan-legal-review/>
- Fracking as Community Issue: Michigan Public Policy Survey

Overview of Oil and Gas Regulation in Michigan

Sally M. Elmiger, AICP, LEED AP
Carlisle/Wortman Associates, Inc.



Use of combined fracking and horizontal drilling.
Source: Center for Environment, Commerce & Energy - NC

Oil and gas production has been occurring in Michigan since the 1930's. As technological advances are made, more oil and gas can be economically extracted from the various geologic formations throughout the state. One such advance, hydraulic fracturing or "fracking," has captured a lot of attention of both residents and public officials. Municipal leaders have heard from concerned citizens about this process, and have been asked to limit any potential impacts in their community. But what can local governments do to regulate this industry? This paper provides an overall look at how oil and gas drilling and production are regulated in Michigan. It also discusses the current, and still evolving, regulatory tools that are available to local governments. **The information presented here is intended as a general discussion of the topic. Any decisions made by a local government regarding the regulation of oil and gas facilities in their community should be carefully evaluated by a municipal attorney.**

FRACKING AND HORIZONTAL DRILLING

Oil and gas previously unavailable can now be harvested through recent advances in technology. Some oil and gas reserves are trapped in "tight" rock formations and require a process called "hydraulic fracturing" or "fracking" to improve the flow of oil out of the rock and into the well. Fracking fractures the rock underground, opening natural fissures that allow the oil or natural gas in the deposit to flow more easily. The technique is commonly used in shale rock formations, which can be found in the northern part of Michigan's southern peninsula. It is also commonly used in association with "horizontal drilling." The illustration above shows the combination of the two techniques.

Fracking is generally conducted in a horizontal well. A well is drilled and at a certain point, the direction of the well is turned to a horizontal position. After the bore hole is drilled, a steel casing is inserted into the hole, and then concrete inserted between the sides of the bore hole and the casing. This seals the well to prevent any interaction between the well and neighboring aquifers. Normally, oil/gas reserves are much deeper than fresh water aquifers. However, each formation is unique.

At the end of the well casing (in the portion of the well that is horizontal) a special device is inserted into the well that blows small holes through the casing and concrete, and into the adjacent rock. Then fracking fluid is forced into the well and through the small holes in the casing. This fluid is made up mostly of water, but with added sand and chemicals that aid the process. This pressurized fluid fractures the rock, and allows oil or gas to flow into the well. The fracking process is done in intervals along the well. Once the horizontal portion of the well is fully fractured, then the oil/gas flows to the surface. A video illustrating the fracking process can be viewed on YouTube (<http://www.youtube.com/watch?v=VY34PQUiwOQ>).

These wells can have multiple drilling locations from a single well site. The wells can be as deep/long as a mile or more. The well bore can also be drilled under roads, buildings, aquifers and other places where surface conditions wouldn't make a well head practical.

MICHIGAN'S REGULATORY SYSTEM

Michigan's laws regarding all aspects of oil and gas production are mostly divided among the Michigan Department of Environmental Quality (MDEQ), the Michigan Public Service Commission (MPSC), and the US Environmental Protection Agency (US EPA).

Michigan Department of Environmental Quality

Michigan's first law regulating oil and gas production was passed in 1927 with P.A. 65. This law established the position "Supervisor of Wells," who is charged with conserving oil and gas, and preventing waste (including environmental pollution) in sinking, drilling, and abandoning of oil, gas, and test wells. As the law was amended over time, the Supervisor of Wells has been retained and now obtains authority through Part 615 of the Natural Resources and Environmental Protection Act (NREPA). MDEQ has jurisdiction over locating, drilling, deepening, re-drilling or reopening, casing, sealing, operating, and plugging oil and gas wells.

The Supervisor of Wells today is the Director of the MDEQ. He appoints an Assistant Supervisor of Wells to carry out the functions of the office. The Supervisor issues rules, orders and instructions regarding the general spacing, maximum production rates, pooling unleased interests in drilling units, variances and exceptions, and operational practices of oil and gas production. The office of Oil, Gas and Minerals (within the MDEQ) reviews and issues permits for drilling, secondary recovery, or disposal of wastes from the drilling process. In addition, permits are required for underground storage of gas or oil products, as well as surface and subsurface equipment and facilities, including pipelines.

The MDEQ has additional laws that apply to oil and gas wells through Parts 55, 301 and 303 of the NREPA regarding air pollution control, inland lakes and streams, and wetlands.

Michigan Public Service Commission

The MPSC regulates the buying, selling and transportation of natural gas. This agency obtains its authority from PA 9, of 1929. After a well is drilled, the MDEQ categorizes the well based on the petroleum product the well can produce. If the well is a natural gas well, then a permit must be obtained from the MPSC to connect the well to a pipeline system.

US Environmental Protection Agency

A number of federal laws apply to oil and gas production and the transportation of these materials through interstate pipelines. For example, the Safe Drinking Water Act requires an EPA permit to construct an injection well to dispose of fluids used in oil and gas production. (Note that this does not include fracking liquids, which, in most cases, are permitted by the MDEQ.) The Federal Energy Regulatory Commission regulates interstate pipelines in coordination with state agencies, and implements the National Environmental Policy Act through the Pipeline and Hazardous Materials Safety Administration. Other federal agencies, such as the Department of Transportation Office of Pipeline Safety, the Department of the Interior's Bureau of Land Management, the Occupational Safety and Health Administration, and the Department of Interior's Maritime Administration also have regulatory authority, among others.

Example MDEQ Rules for Oil and Gas Wells

The rules set forth by the MDEQ regarding siting of oil and gas wells are extensive. A few examples are listed below:

- Well surface location and associated facilities cannot be any closer than 300 feet from an existing recorded fresh water well used for drinking, or existing structures used for public or private occupancy.
- Wells cannot be any closer than 2,000 feet from type I and IIa public water supply wells and not less than 800 feet from type IIb and III public water supply wells.
- There is a general prohibition from using surface waters as drilling fluids (except for the surface casing).
- Wells are prohibited in the bottom lands of the Great Lakes and connecting waterways.

Michigan Zoning Enabling Act

In general, local municipalities have not been given the authority to regulate oil and gas well drilling, operation, or abandonment. However, they can use zoning to regulate the location of the processing, refining, and transport of oil and gas. Determining what facilities constitute “processing, refining, and transport” can be a complex issue and should be evaluated by a municipal attorney. However, a rule of thumb is offered by MSU’s Dean Solomon and Kurt Schindler: “drilling, completion, and operation ends at the point the meter is placed that measures how much gas and oil comes out of the well for purposes of paying royalties to the mineral owner.”¹

Note that local ordinances cannot limit the processing, refining and transport if, by doing so, it is excluding oil and gas wells from the jurisdiction. Local ordinances also need to consider that the support facilities must be placed in reasonable proximity to the wells. However, the oil resource (and thus wellheads) may not necessarily be located in the particular zoning district that allows for the support facilities. Since the make-up and structure of each community’s geology and oil/gas resources are unique, any regulations dealing with support facilities should be carefully reviewed by a municipal attorney.

Drilling, Operation and Abandonment

There are a number of laws and court cases that confirm that local governments do not have authority over oil and gas drilling, operation and abandonment:

- The Zoning Enabling Act specifically prohibits counties and townships from regulating or issuing permits for “drilling, completing, or operation of oil or gas wells or other wells drilled for oil or gas exploration purposes...”
- No such specific prohibition is stated for cities and villages. However, as with any use where there is a demonstrated need, a municipality is prohibited from exclusionary zoning.
- The Zoning Enabling Act also states that an “ordinance shall not prevent the extraction, by mining, of valuable natural resources from any property unless very serious consequences would result from the extraction of those natural resources. Natural resources shall be considered valuable for the purposes of this section if a person, by extracting the natural resources, can receive revenue and reasonably expect to operate at a profit.” Six standards to determine if “very serious consequences” would result are listed in the statute.
- The one area where the Zoning Enabling Act allows some local oversight is “reasonable regulation of hours of operation, blasting hours, noise levels, dust control measures, and traffic...” However, these ordinances cannot be in conflict with the NREPA. Also, this paragraph specifically refers to “mining.” This term is not defined in the statute, and whether this provision applies to oil and gas operations has not been clarified through the courts.
- The Michigan Supreme Court concluded that the Supervisor of Wells’ authority has precedence over local ordinances if he chooses to exercise it. While the Supervisor’s jurisdiction does not preempt local jurisdiction, it will be primary and the local ordinance would have to yield to the Supervisor’s authority. If the Supervisor chooses not to exercise his authority, then the facility would be subject to local zoning. (Note that this decision was made regarding a pipeline and processing facility in the case *Addison Twp v Gout* (1990). This same conclusion was made in a later case (*County of Alcona v Wolverine Environmental Production, Inc.* (1998)), ruling that the Secretary’s authority was primary regarding ancillary facilities. A soil erosion control permit in connection with an access road to a natural gas well issued by the Secretary was at issue in this case.)

Fracking

Since hydraulic fracturing (fracking) is used in association with drilling an oil or gas well, jurisdiction of this process lies with the MDEQ. According to their publication: *Questions and Answers About Hydraulic Fracturing in Michigan* (available at www.mdeq.state.mi.us).

michigan.gov/frackingfacts) fracking has been occurring in Michigan to facilitate oil and gas production for about 50 years, and has been used in over 12,000 wells “without any consequence to the environment or public health.” It also stresses that Michigan has strict rules about how much water can be used for fracking, how wells are constructed, how they are tested before they are employed, and how the water that flows back up through the well during the fracking process is contained and disposed of.

Public support for fracking is currently not as evident as public opposition. As of February, 2013, an initiative has been proposed to prohibit horizontal drilling/fracking, prohibit injection wells of fracking fluids, and strike language of maximizing production from the State’s existing laws. Since local governments are not authorized to regulate fracking, addressing citizens’ concerns regarding this practice may only be possible through education and information sharing on how fracking works, and how the State oversees and regulates the activity.

Other Practical Considerations

There are other issues involved in regulating oil and gas facilities that a community needs to consider. For arguments sake, let’s say a city or village decides to include performance standards in their Zoning Ordinance regarding hours of operation, noise, dust, and traffic for oil/gas well operations within its boundaries. If a proposal for a new well were to come before the Planning Commission, the municipality would have to have the political fortitude to allow the well if it meets the standards. These decisions can be very difficult politically. If the proposed well location is unpopular, political fallout could be intense. On the other hand, if the municipality were to deny the proposal, then they could be exposing themselves to a potential law suit.

Another practical issue to consider is that zoning locates the surface features of a well in a particular area. However, the underground oil or gas resources may not be located in that specific zoning district. Also, new technology enables wells to be drilled as far as a few miles from the wellhead. Therefore, the well head and accessory structures may be in the designated zoning district, but the well may be directed under other zoning districts that do not allow this use. This, again, could cause concerns for residents if they are not interested in signing an oil and gas lease for resources under their property.

Lastly, the oil and gas industry has geologic experts and deep pockets to obtain the resources they are seeking. Most local units of government do not have the extensive resource necessary to fight a proposal if it is seen to be obstructing oil and gas exploration or extraction.

CONCLUSIONS

The production of oil and gas is a very complex process that includes geology, physics, engineering, chemistry and many other areas of expertise. Because it is such a complex process, there are many different components that are regulated by a large number of state and federal agencies. Local units of government, while not having much authority in this realm, can participate in regulating the support facilities for an oil and gas operation. However, the regulation may not be done in such a way that excludes the oil and gas wells from their community. Other important considerations are the potential political economic repercussions of having regulations on the books that may need to be defended in light of public opposition for a particular project.

REFERENCES:

¹Solomon, Dean and Kurt H. Schindler, Can Local Governments Regulate Oil and Gas Development?, Michigan State University Oil & Gas Newsletter, June, 2012. (http://msue.anr.msu.edu/program/info/oil_and_gas).

Presentation by William A. Horn, Mika, Meyers, Beckett & Jones, PLC, March 14, 2013, hosted by Halfmoon Education Inc., Altoona, WI.

Presentation by Susan J. Sadler, Dawda, Mann, Mulcahy, & Sadler, PLC, March 14, 2013, hosted by Halfmoon Education Inc., Altoona, WI.

09/02/2014

ORDINANCE NO. _____

AN ORDINANCE TO ADD NEW SECTION 138-4.425 AND RE-NUMBER EXISTING SECTIONS 138-4.425 THROUGH 138-4.445 OF CHAPTER 138, ZONING, OF THE CODE OF ORDINANCES OF THE CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, TO REGULATE OIL AND GAS WELLS, REPEAL CONFLICTING OR INCONSISTENT ORDINANCES, AND PRESCRIBE A PENALTY FOR VIOLATIONS.

THE CITY OF ROCHESTER HILLS ORDAINS:

Section 1. New Section 138-4.425 shall be added to Chapter 138 of the Code of Ordinances as follows:

SECTION 138-4.425 Oil and Gas Wells.

The following requirements shall apply to the location, installation, drilling and operation of any well for the commercial extraction of oil, gas or other hydrocarbons in the City:

1. The location, installation, drilling, operation, maintenance and abandonment of oil and gas wells shall comply with all applicable federal and state laws, regulations, rules and permits.
2. Drilling units shall conform to the rules, regulations and orders of the Michigan Supervisor of Wells and Department of Environmental Quality. No new oil or gas well shall be located closer than 300 feet from any road right-of-way or from any building existing at the time actual drilling operations commence, 450 feet from residential buildings or 330 feet from an adjoining property line, unless the adjoining property is pooled with the well site property, and unless the location is at least 660 feet from another well.
3. The owner or operator of an oil or gas well shall file with the City a copy of the Environmental Impact Assessment filed with the Michigan Department of Environmental Quality in connection with a well permit under Part 615 of the Natural Resources and Environmental Protection Act, MCL 524.61501, et seq, and the administrative rules promulgated under Part 615, as amended.
4. The owner or operator of an oil or gas well shall file with the City, and keep updated, the name and contact information for an emergency contact person(s).
5. An oil or gas well site shall be completely enclosed with a fence designed to prevent unauthorized entry.

6. Adequate measures shall be implemented at the oil or gas well site to prevent and control any objectionable dust, fumes, or odors from leaving the property.
7. Exterior lighting shall comply with Chapter 2 of Article 10 of the Zoning Ordinance.
8. The installation, drilling, operation and maintenance of oil and gas wells shall conform to the Performance Standards of Section 138-10.310 of the Zoning Ordinance in regard to airborne emissions, odors, gases, noise and vibration, hazardous substances, glare, fire and explosive hazards, and waste and rubbish dumping.
9. Height limitations applicable to the zoning district where the oil or gas well is located shall apply to the production facility and completion rig located at the well site, but shall not apply to temporary drilling rigs.
10. An oil or gas well shall include measures or controls satisfactory to the City Engineer to prevent migration, run-off or discharge of any hazardous materials, including but not limited to any chemicals, oil or gas produced or used in the drilling or production of oil or gas, to adjoining property or to the City of Rochester Hills sanitary sewer system, stormwater system or any natural or artificial watercourse, pond, lake or wetland. There shall be no off-site discharge of storm water except to an approved drainage system in accordance with the City's engineering requirements.
11. All brine, mud, slush, saltwater, chemicals, wastewater, chemical, fluids or waste produced or used in the drilling or production of oil or gas shall, under the supervision of the State Supervisor of Wells, be safely, lawfully and properly disposed of to prevent infiltration of or damage to any fresh water well, groundwater, watercourse, pond, lake or wetland.
12. The oil or gas well site shall be kept in a clean and orderly condition, free of trash and debris, with weeds cut. Machinery and equipment not being used in the operation of the well shall not be stored or kept at the well site.
13. Landscaping and screening shall be provided in accordance with Article 12 of the Zoning Ordinance. A Type E buffer shall be required.
14. No drilling rigs, tanker trucks or heavy equipment used in connection with the drilling or operation of oil or gas wells in the City shall be moved over the public roads and streets under the City's jurisdiction without obtaining approval from the City's Traffic Engineer, which shall set forth the streets which may be used and any conditions that may apply.
14. No tanks or other facilities for the storage or processing of oil, gas, petroleum or hydrocarbons produced from any well within the City shall be kept, erected, operated or maintained at the oil or gas well site.

Section 2. Existing Sections 138-4.425 through 138-4.445 of the Code of Ordinances shall be renumbered as Sections 138-4.426 through 138-4.446, respectively.

Section 3. Severability. This ordinance and each article, section, subsection, paragraph, subparagraph, part, provision, sentence, word and portion thereof are hereby declared to be severable, and if they or any of them are declared to be invalid or unenforceable for any reason by a court of competent jurisdiction, it is hereby provided that the remainder of this ordinance shall not be affected thereby.

Section 4. Penalty. All violations of this ordinance shall be municipal civil infractions and upon a determination of responsibility therefore shall be punishable by a civil fine of not more than \$500, or as otherwise prescribed herein.

Section 5. Repeal, Effective Date, Adoption.

(1) Repeal. All regulatory provisions contained in other City ordinances, which are inconsistent with the provisions of this ordinance, are hereby repealed.

(2) Effective Date. This ordinance shall become effective on _____, following its publication in the *Oakland Press* on _____, 2014.

(3) Adoption. This ordinance was adopted by the City Council of the City of Rochester Hills at a meeting thereof held on _____, 2014.

Bryan K. Barnett, Mayor
City of Rochester Hills

CERTIFICATE

I HEREBY CERTIFY THAT THE FOREGOING ORDINANCE WAS ADOPTED BY THE CITY COUNCIL OF THE CITY OF ROCHESTER HILLS AT A MEETING THEREOF ON _____, 2014.

Tina Barton, Clerk
City of Rochester Hills

09/02/2014

ORDINANCE NO. _____

AN ORDINANCE TO ADD NEW ARTICLE VI PIPELINES TO EXISTING CHAPTER 94, STREETS, SIDEWALKS, AND CERTAIN OTHER PUBLIC PLACES, OF THE CODE OF ORDINANCES OF THE CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, TO REGULATE THE CONSTRUCTION AND PERMITTING OF PIPELINES IN THE CITY, REPEAL CONFLICTING OR INCONSISTENT ORDINANCES, AND PRESCRIBE A PENALTY FOR VIOLATIONS.

THE CITY OF ROCHESTER HILLS ORDAINS:

Section 1. New Article VI Pipelines shall be added to Chapter 94 of the Code of Ordinances as follows:

Article VI. Pipelines

Sec. 94-200. Definitions.

City Regulated Pipelines means those pipelines within the City that under federal and state laws and regulations are not exempt from City regulations and ordinances regarding mapping, inventorying, locating or relocating of pipelines, including, but not limited to, pipelines over, under, along, or across a public street or alley, pipelines from the well to the first point of custody transfer or in Residential Areas in the City.

Pipeline means all parts of those physical facilities through which oil, gas, other hydrocarbons, hazardous liquids, fresh water, salt water, or chemicals are transported, including but not limited to, pipe, valves, other appurtenance attached to pipe, and ancillary equipment such as pigging stations and compressors, whether or not laid in public or private easement or public or private right-of-way in the City, and also including but not limited to flow lines, gathering lines, production lines and transmission lines. This definition does not include pipelines associated with franchise utilities.

Pipeline Construction means the initiation of any excavation or other disturbance of property for the purpose of installation, construction, maintenance, repair, replacement, modification or removal of a pipeline.

Pipeline Emergency means a pipeline incident that is required to be reported to the Michigan Department of Environmental Quality, or any other federal, state, or local regulatory agency.

Pipeline Operator means any person owning, operating or responsible for operating a pipeline.

Residential Area means any area in the City zoned or used for single or multi-family residential use.

Sec. 94-201. City Regulated Pipelines – Permit Required.

(a) City Regulated Pipelines shall adhere to all standards outlined in Section 94-202. Federal and state statutory or regulatory requirements shall apply to Pipelines between the well and the point of custody transfer. Prior to the transport of gas, oil, liquids or hydrocarbons, the Pipeline Operator shall provide to the City certification from a registered professional engineer that the design and installation of the Pipelines meet all state and federal requirements.

(b) Prior to Pipeline Construction and the issuance of notice required in subsection 94-202(d) of this Article, a Pipeline Operator shall obtain a Pipeline Permit from the City Engineer for all City Regulated Pipelines. An exception to this permitting is construction necessary to respond to a Pipeline Emergency.

(c) At the same time the Pipeline Operator submits an oil or gas well drilling permit application to the State pursuant to Part 615 of the Natural Resources and Environmental Protection Act, MCL 324.61501 et seq., and the administrative rules promulgated thereunder, the Pipeline Operator shall submit to the City a proposed Pipeline route from the well bore to the transmission line, for all City Regulated Pipelines.

(d) The Pipeline Operator shall be required to submit an application for a Pipeline Permit to the City prior to making any offer or initiating any negotiation or action to acquire any easement or other property right to construct, install, maintain, repair, replace, modify, remove or operate a Pipeline in Residential Areas.

(e) The Pipeline Operator shall backfill all trenches and compact such trenches to ninety five percent (95%) standard density proctor in eight inch (8") lifts and construct the Pipeline so as to maintain a minimum depth of ten feet (10') below the finished grade except in public rights-of-way, where minimum cover to the top of the pipe shall be at the discretion of the City based on existing or planned utilities. During the backfill of any Pipeline excavations in open cut sections, the Pipeline Operator shall bury a magnetic buried pipeline warning tape one foot (1') above any such Pipeline to warn future excavators of the presence of a buried Pipeline. The City may also require that a proposed or existing Pipeline be relocated should it conflict with the proposed alignment and depth of a gravity dependent utility.

(f) The Pipeline Operator shall equip all City Regulated Pipelines with an automated pressure monitoring system that detects leaks and shuts off any line or any section of line that develops a leak. In lieu of such system, the Pipeline Operator may have twenty-four (24) hour pressure monitoring of the Pipeline system which provides monitoring of the Pipeline within the City limits.

(g) Review and approval by the City Council for all proposed Pipelines through Residential Areas shall be required prior to the issuance of a permit for the commencement of Pipeline Construction.

(h) A Pipeline Permit application shall be required as follows:

(1) Applications for a City Regulated Pipeline or other activities regulated by this Subsection shall be submitted to the City in a form prescribed by the City.

(2) Plans submitted with each application for a Pipeline Permit shall be in a format approved by the City showing the dimensions and locations of the Pipeline and related items or facilities, as well as all proposed lift stations, pumps or other service structures related to such Pipeline and the location, type and size of all existing utilities, drainage, Right-of-way and roadway improvements. The plans must additionally show the elevation and location of all known public utilities within fifteen (15) feet of the centerline of the proposed Pipeline. Any application that fails to meet these requirements will be returned unfiled to the applicant.

(3) The following information shall be provided in the application:

- a. The name, business addresses and telephone numbers of the Pipeline Operator;
- b. The names, titles and telephone numbers of the following:
- c. The person signing the application on behalf of the Pipeline Operator;
- d. The person designated as the principal contact for the submittal; and
- e. The person, located within Oakland County, Michigan, designated as the twenty-four (24) hour emergency contact;
- f. The origin point and the destination of the proposed subject Pipeline;
- g. A text description of the general location of the proposed subject Pipeline
- h. A description of the substance to be transported through the proposed subject Pipeline;
- i. A copy of the GHS safety data sheet;
- j. Engineering plans, drawings and/or maps with summarized specifications showing the horizontal location, covering depths and location of shutoff valves of the proposed subject Pipeline. To the extent that information can be obtained, drawings shall show the location of other Pipelines and utilities that will be crossed or paralleled within fifteen (15) feet of the proposed subject Pipeline Right-of-way;

- k. A description of the consideration given to matters of public safety and the avoidance, as far as practicable, of existing Habitable Structures and Private Residential Areas;
- l. Detailed cross section drawings for all public street Right-of-way and easement crossings;
- m. The proposed method or methods to be used for the installation of the Pipeline;
- n. Methods to be used to prevent both internal and external corrosion;
- o. A binder or certificates of all bonds and insurance; and
- p. A proposed alignment strip map showing name and address of all affected property owners.

Sec. 94-202. General Regulations.

(a) As determined in the sole, but reasonable, discretion of the City, Pipelines shall not interfere with or damage existing utilities, including but not limited to: water, sewer or gas lines, storm drains, electric lines, telecommunications, public lighting, traffic control devices or equipment, or the facilities of any public utilities located in public rights-of-way, utility easements or other City-owned property or in Residential Areas.

(b) The Pipeline Operator shall backfill all trenches and compact such trenches to ninety five percent (95%) standard density proctor in five inch (5") lifts and construct the Pipeline so as to maintain a minimum depth of ten feet (10') below the finished grade except in public rights-of-way, where minimum cover to the top of the pipe shall be at the discretion of the City based on existing or planned utilities. During the backfill of any Pipeline excavations in open cut sections, the Pipeline Operator shall bury a magnetic buried pipeline warning tape one foot (1') above any such Pipeline to warn future excavators of the presence of a buried Pipeline. The City may also require that a proposed or existing Pipeline be relocated should it conflict with the proposed alignment and depth of a gravity dependent utility.

(c) The Pipeline Operator shall equip all City Regulated Pipelines with an automated pressure monitoring system that detects leaks and shuts off any line or any section of line that develops a leak. In lieu of such system, the Pipeline Operator may have twenty-four (24) hour pressure monitoring of the Pipeline system which provides monitoring of the Pipeline within the City limits.

(d) The Pipeline Operator shall be responsible to grade, level and restore the property affected by Pipeline Construction to the same surface condition, as nearly practicable, as existed before operations were first commenced.

(e) The Pipeline Operator shall construct, repair and/or maintain all Pipelines so as to meet or exceed the applicable minimum criteria established by the statutory or regulatory requirements of the state and federal governments for such Pipeline.

(f) At least ten (10) days prior to the commencement of any Pipeline Construction, the Pipeline Operator shall give written mailed notification to all residents, tenants and property owners located adjacent to the proposed Pipeline.

(g) The Pipeline Operator shall provide the City the following information, including GPS information sufficient to locate the Pipelines in the future, including the beginning and end points of the Pipeline and sufficient points in between the Pipeline route and the depth of cover information. This information shall be submitted to the City in a format compatible with the City's own GIS system.

- (1) As-built or record drawings of the Pipelines. Accuracy of the record drawings shall meet a survey level of one foot (1') to fifty thousand feet (50,000'). The scale of the record drawings shall be a minimum of one inch (1") to forty feet (40'). The drawings shall also be supplied in a DFF digital file format with the location tied to at least one (1) nearby GPS (global positioning system) City monument. If the new Pipeline length exceeds one thousand feet (1,000') within the City, the Pipeline shall be tied to at least two (2) GPS City monuments;
- (2) The origin point and the destination of the Pipeline;
- (3) The substance to be transported;
- (4) A copy of the GHS safety data sheet;
- (5) Engineering plans, drawings and/or maps with summarized specifications showing the horizontal location, covering depths, and location of shutoff valves of the subject Pipeline. Drawings shall show the location of other Pipelines and utilities that are crossed or paralleled within fifteen (15') feet of the Pipeline Right-of-way;
- (6) Detailed cross-section drawings for all public rights-of-ways and easement crossings on City property as permitted by the City; and
- (7) A list of the names and mailing addresses of all the property owners, residents and tenants adjacent to the Pipeline Construction.

(h) A Pipeline Operator that transports gas, oil, liquids or hydrocarbons through a Pipeline located in the City shall be a member in good standing with the Miss Dig System or other approved excavation monitoring system as required by state law. The Pipeline Operator that transports gas, oil, liquids or hydrocarbons through a Pipeline shall contract for service with the selected underground utility coordinating system for a minimum of five (5) years unless there is an agreement to change to an alternate system between the City and the Pipeline Operator. Said Pipeline Operator shall maintain such services without interruption for the life of the Pipeline Permit and as required under this Section.

(i) At the time of permitting and each year thereafter that the Pipeline remains active, each Pipeline Operator shall provide to the Mayor, City Engineer, Fire Chief and Oakland County Sheriff the names, mailing and email addresses and telephone numbers of at least two (2) primary persons, officers or contacts who will be available on a twenty-four (24) hour basis and

at least two (2) alternative persons, officers or contacts to be reached in the event that the primary contacts are unavailable who:

- (1) Can initiate appropriate actions to respond to an emergency;
- (2) Have access to information on the location of the closest shutoff valve to any specific point in the City; and
- (3) Can furnish the common name of the material then being carried by the Pipeline.

Any change in the above information must be provided to the City by contacting the Gas Inspector prior to such change.

(j) Each Pipeline Operator shall file a copy of all initial or follow-up reports provided to state or federal agencies about unsafe Pipeline conditions, Pipeline emergencies, Pipeline releases, Pipeline safety violations or Pipeline incidents in the City concurrently with the City.

Sec. 94-203. City Engineer Review.

After the filing of an administratively complete application, the City Engineer shall review all applications. If deemed necessary by the City, a third-party technical consultant may be engaged by the City. The costs associated with the consultant shall be borne by the Pipeline Operator. Any decision by the City Engineer is final.

Sec 94-204. Abandoned Pipelines.

(a) All Pipelines shall be maintained in an active condition unless abandoned according to applicable state and federal regulations. The Pipeline Operator shall notify the City of abandonment of any Pipeline.

(b) Reactivation of abandoned Pipelines shall require notification to the City and a new permit pursuant to the standards and requirements of this Article. Reactivation shall require pressure testing for integrity and compliance with state and federal regulations.

Sec. 94-205. Emergency Response Plans and Emergency Incident Reporting.

(a) Each Pipeline Operator shall maintain written procedures to minimize the hazards resulting from an emergency. These procedures shall at a minimum provide for the following:

- (1) Prompt and effective response to emergencies including but not limited to the following:
 - a. Leaks or releases that can impact public health safety or welfare;
 - b. Fire or explosions at or in the vicinity of a Pipeline or Pipeline easement;
 - c. Natural disaster;

- d. Effective procedures and protocols to notify and communicate required and pertinent information to local fire, police, public officials and affected residents during an emergency;
- e. The availability of personnel, equipment, tools and materials as necessary at the scene of an emergency;
- f. Measures to be taken to reduce public exposure to injury and probability of accidental death or dismemberment;
- g. Emergency shut down and pressure reduction of a Pipeline;
- h. The safe restoration of service following an emergency or incident; and
- i. A follow-up incident investigation to determine the cause of the incident and require the implementation of corrective measures.

(b) Upon discovery of a Pipeline emergency or incident, any affected Pipeline Operator shall as soon as practical communicate to the City's 911 system the following information:

- (1) A general description of the emergency or incident;
- (2) The location of the emergency or incident;
- (3) The name and telephone number of the person reporting the emergency or incident;
- (4) The name of the Pipeline Operator;
- (5) Whether or not any hazardous material is involved and identification of the hazardous material so involved; and
- (6) Any other information as requested by the emergency dispatcher or other such official at the time of reporting the emergency or incident.

Sec. 94-206. Protection and Painting of Structures.

A Pipeline Operator shall keep protected and painted all Pipeline risers and all appurtenances related to Pipeline construction and operations which are composed of materials which are generally protected or painted. Such Operator shall repaint all such items at sufficiently frequent intervals to maintain same in good condition. It shall be a violation of this Article for any Pipeline Operator to permit any Pipeline riser and/or appurtenances related to Pipeline Construction and operations to be in a state of disrepair or to have chipped, peeling or unpainted portions.

Sec. 94-207. Markers.

It is the joint and several responsibility of the owner and the Pipeline Operator of any and all Pipeline to maintain markers in accordance with this Article. The location of all new or replacement pipe and Pipelines shall be marked by the owner(s) thereof or by the person installing or operating such Pipelines as follows:

(a) Marker signs shall be placed at all locations where pipe or Pipelines cross property boundary lines and at each side of a public street or road right-of-way which the pipe or Pipeline crosses;

(b) The top of all marker signs shall be a minimum of four (4) feet above ground level, and the support post must be sufficient to support the marker sign and shall be painted yellow or such other color as may be approved by the City Engineer or his designee;

(c) All marker signs shall be a minimum of twelve (12) inches square and shall be marked as "Gas Pipe Line;"

(d) All marker signs shall contain the name of the owner and operator of the Pipeline and a twenty-four (24) hour local contact number;

(e) Pipelines shall be marked along their entire length with a buried magnetic metal wire and metallic flag tape;

(f) All signs shall also contain a "Call Before You Dig" statement; and

(g) The Pipeline Operator shall annually replace signage that has been lost, damaged or removed.

Sec. 94-208. Performance Guarantee.

Prior to issuance of a Pipeline Permit, the Pipeline Operator shall provide to the City, and thereafter keep in force, a cash or surety bond or irrevocable bank letter of credit acceptable to the City as a performance guarantee that the Pipeline Operator will comply with the provisions of this Article. The City shall be authorized to draw upon the performance guarantee to recover the cost of correcting or remedying any default or violation by the Pipeline Operator of any provision of this Article.

Sec. 94-209. No Implied Grant of Use of Public Rights-of-Way, Utility Easements or other City owned Property.

Nothing in this Subsection grants permission for the use of any street, public rights-of-way, utility easements, or City-owned property. In the event a Pipeline Operator wishes to undertake any Pipeline Construction on, over, under, along, or across any public rights-of-way,

utility easements or other City-owned property, the Pipeline Operator shall apply for and execute a written agreement with the City governing the terms and conditions for such use; obtain all required permits and comply with any other applicable provisions of the City Code.

Sec. 94-210. Expiration of Pipeline Permit.

If construction of a Pipeline has not commenced within one (1) year of the date of issuance of the Pipeline Permit, or if the Pipeline has not been completed and the surface restored within two (2) years, the Pipeline Permit shall expire; provided, however, that the City Engineer may grant an extension of time not to exceed an additional one (1) year if the City Engineer determines weather or other unforeseen conditions justify such an extension.

Sec. 94-211. No Assumption of Responsibility by City; Hold Harmless.

Nothing in this Subsection shall be construed as an assumption by the City of any responsibility of a Pipeline Operator of a Pipeline not owned by the City. Further, by accepting a permit under this Chapter, the Pipeline Operator agrees to hold harmless the City from any claims or causes of action which arise out of the construction or operation of the Pipeline.

Section 2. Severability. This ordinance and each article, section, subsection, paragraph, subparagraph, part, provision, sentence, word and portion thereof are hereby declared to be severable, and if they or any of them are declared to be invalid or unenforceable for any reason by a court of competent jurisdiction, it is hereby provided that the remainder of this ordinance shall not be affected thereby.

Section 3. Penalty. All violations of this ordinance shall be misdemeanors and upon conviction thereof shall be punishable by a sentence of not more than ninety (90) days of confinement to jail or by a fine of not more than \$500, or both, in the court's discretion.

Section 4. Repeal, Effective Date, Adoption.

(1) Repeal. All regulatory provisions contained in other City ordinances, which are inconsistent with the provisions of this ordinance, are hereby repealed.

(2) Effective Date. This ordinance shall become effective on _____, 2014, following its publication in the *Oakland Press*.

(3) Adoption. This ordinance was adopted by the City Council of the City of Rochester Hills at a meeting thereof held on _____, 2014.

Bryan K. Barnett, Mayor
City of Rochester Hills

CERTIFICATE

I HEREBY CERTIFY THAT THE FOREGOING ORDINANCE WAS ADOPTED BY THE CITY COUNCIL OF THE CITY OF ROCHESTER HILLS AT A MEETING THEREOF ON _____, 2014.

Tina Barton, Clerk
City of Rochester Hills

CITY OF AUBURN HILLS

COUNTY OF OAKLAND

STATE OF MICHIGAN

ORDINANCE NO. _____

TEXT AMENDMENT TO ZONING ORDINANCE

AN ORDINANCE TO AMEND
ARTICLE XIII. I-1, LIGHT INDUSTRIAL DISTRICTS,
ARTICLE XIV. I-2, GENERAL INDUSTRIAL DISTRICTS
ARTICLE XV. I-3, HEAVY INDUSTRIAL DISTRICTS; AND
ARTICLE XVIII. GENERAL PROVISIONS TO ADD
SECTION 1835. OIL AND GAS WELLS
IN ZONING ORDINANCE NO. 372, AS AMENDED

THE CITY OF AUBURN HILLS ORDAINS

Section 1.

Section 1300, Items 5-6 of Article XIII. I-1, Light Industrial District, of Auburn Hills Zoning Ordinance No. 372, as amended, is hereby amended to add new Item 5 and renumber existing Items 5-6 and shall read as follows:

5. Oil and gas wells in accordance with the criteria set forth in Section 1835.
6. Accessory buildings and accessory uses customarily incidental to any of the above principal uses permitted; however, accessory uses shall not exceed fifty (50) percent of the gross building area (e.g., general office, child care, food service, health/workout rooms, and other similar adjunct uses provided within a facility which are intended for sole use of the workers of said facility and not the general public).
7. Uses determined to be similar to the above principal permitted uses in accordance with the criteria set forth in Section 1827 and which are not listed below as special land uses.

Section 2.

Section 1400, Items 9-10 of Article XIV. I-2, General Industrial District, of Auburn Hills Zoning Ordinance No. 372, as amended, is hereby amended to add new Item 9 and renumber existing Items 9-10 and shall read as follows:

9. Oil and gas wells in accordance with the criteria set forth in Section 1835.

10. Accessory buildings and accessory uses customarily incidental to any of the above principal uses permitted; however, accessory uses shall not exceed fifty (50) percent of the gross building area.
11. Uses determined to be similar to the above principal permitted uses in accordance with the criteria set forth in Section 1827 and which are not listed below as special land uses.

Section 3.

Section 1500, Items 14-15 of Article XV. I-3, Heavy Industrial District, of Auburn Hills Zoning Ordinance No. 372, as amended, is hereby amended to add new Item 14 and renumber existing Items 14-15 and shall read as follows:

14. Oil and gas wells in accordance with the criteria set forth in Section 1835.
15. Accessory buildings and accessory uses customarily incidental to any of the above special land uses permitted; however, accessory uses shall not exceed fifty (50) percent of the gross building area.
16. Special land uses determined to be similar to the above special land uses in accordance with the criteria set forth in Section 1828.

Section 4.

Section 1835. Oil and Gas Wells of Article XVIII. General Provisions of Auburn Hills Zoning Ordinance No. 372, as amended, is hereby added and shall read as follows:

SECTION 1835. OIL AND GAS WELLS

The drilling, completion, or operation of oil or gas wells or other wells drilled for oil or gas exploration purposes shall only be permitted in the I-1, Light Industrial, I-2, General Industrial, and I-3, Heavy Industrial districts subject to the terms and conditions of this section and shall not be permitted in any other districts. Further, hydraulic fracturing and/or fracking shall be expressly prohibited within the City.

1. Application. The petitioner shall file an application with the City describing the proposed location and activities. No drilling, completion, or operation of oil or gas wells or other wells drilled for oil or gas exploration purposes shall occur until the Community Development Department has issued a permit.
2. Compliance with Laws and Permit Issuance. The drilling, completion, or operation of oil or gas wells or other wells drilled for oil or gas exploration purposes shall be done in conformity with all State and Federal laws, statutes, rules, and regulations pertaining thereto and particularly with the State of Michigan and the regulations of its Supervisor of Wells. This shall include obtaining the required permit from the Supervisor of Wells, which permit shall be provided to the City before the City issues a permit under this section. Conformance with State and Federal laws, statutes, rules, and regulations including obtaining the required permit from the Supervisor of Wells shall also apply to, but are not limited to, the plugging of wells and all material used and work done in connection with the exploring for, producing, marketing, and transporting of petroleum products as well as the disposition and removal of any byproducts utilized and associated with said activities.
3. Associated Permits and Approvals. The permit required by this section for the drilling, completion, or operation of oil or gas wells or other wells drilled for oil or gas exploration purposes is in addition to and are not in lieu of any permit or plan which may be required by any other provision of this Zoning Ordinance, Auburn Hills City Code, Building and Fire Codes, or by any other governmental agency, unless expressly outlined.
4. Spacing and Well Setbacks. In addition to the spacing and setback requirements of the State of Michigan and the regulations of its Supervisor of Wells, the drilling, completion, or operation of oil or gas wells shall not be located within 1,000 feet of a residential zoned building used for the purposes of residing in, religious institution, public or private school, child care facility, or hospital. The measurement of the setback shall be made from the

center of the wellhead in a straight line, without regard to intervening structures or objects, to the closest exterior point of the adjacent building. This section shall not be construed to prohibit directional or horizontal drilling under said property where lawfully permitted by the Michigan Department of Environmental Quality (MDEQ). The edge of the well pad site shall meet the minimum building setback requirements of the district or Building and Fire Codes, whichever is greater.

5. Height. The completed wellhead structure shall not exceed twenty-two (22) feet in height. The temporary drilling derrick/rig shall not exceed one-hundred and ten (110) feet in height.
6. Landscaping. Staggered twelve (12) foot tall evergreen trees shall be placed around the perimeter of the well site with a minimum landscape greenbelt buffer of twenty-five (25) feet in depth within thirty (30) days of the removal of the temporary drilling derrick/rig. The landscape buffer and trees shall be irrigated and maintained.
7. Lighting. To the extent practicable, and taking into account safety considerations, site lighting shall be directed downward and internally in compliance with Section 1810. Exterior Lighting.
8. Nuisance Mitigation. The drilling, completion, or operation of oil or gas wells or other wells drilled for oil or gas exploration purposes shall comply with Section 1807. Performance Standards. Those standards address potential nuisances such as noise, smoke, dust, open storage, fire and explosive hazards, odors, wastes, and vibration. Due to the unique nature of this type of operation the following additional information and standards will be required.
 - A. Noise. Prior to the issuance of a permit and the commencement of operations, the petitioner shall submit a noise management plan, as approved by the City, detailing how the equipment used in the drilling, completion, transportation, or production of a well complies with the maximum permissible noise levels of the Zoning Ordinance. The operator shall be responsible for verifying compliance with this section and the noise management plan after the installation of the noise generating equipment. The noise management plan shall include:
 1. Identify operation noise impacts.
 2. Provide documentation establishing the ambient noise level prior to construction.
 3. Detail how the impacts will be mitigated. In determining noise mitigation, specific site characteristics shall be considered, including but not limited to the following:
 - a. Nature and proximity of adjacent development, location, and type
 - b. Seasonal and prevailing weather patterns, including wind directions
 - c. Vegetative cover on or adjacent to the site
 - d. Topography
 - B. Dust, Vibration, and Odors. All operations shall be conducted in such a manner as to minimize, so far as practicable, dust, vibration, or noxious odors, and shall be in accordance with the best accepted practices defined by the Michigan Department of Environmental Quality (MDEQ) for the production of oil, gas and other hydrocarbon substances in urban areas. All equipment used shall be constructed and operated so that vibrations, dust, odor or other harmful or annoying substances or effect will be minimized by the operations carried on at any drilling or production site or from anything incidental thereto, and to minimize the annoyance of persons living or working in the vicinity; nor shall the site or structures thereon be permitted to become dilapidated, unsightly, or unsafe.
 - C. Vehicle Routes for Truck Traffic. Construction vehicles and trucks, excluding pick-up trucks, associated with drilling and/or production operations shall be restricted to Class A roads designated by the City Department of Public Works.
 - D. Emergency Response Plan. Pursuant to State and Federal law, the operator shall provide any information necessary to assist the City Emergency Services Department with an emergency response plan and hazardous materials survey establishing written procedures to minimize any hazard resulting from the operation.

9. Permitted Construction Activity Hours. Construction activities associated with establishing of the wellhead shall be eligible for an exception by the City Manager in accordance with the City's Hours of Construction Activity Ordinance provided such activities are in compliance with applicable laws and permits.
10. Inspection. The Building Official, and any other designee of the City Manager, shall have the right and privilege at any time to enter upon the premises covered by any permit issued pursuant to this section for the purpose of making inspections thereof to determine if the requirements of this section are complied with or the requirements of any other code or ordinance of the City are met.
11. Operator Information and Incident Reporting. The operator shall notify the City of the following:
 - A. Any changes to the name, address, and phone number of the operator within five (5) working days after the change occurs.
 - B. Any changes to the name, address, and phone number of the person(s) designated to receive notices from the City within five (5) working days after the change occurs.
 - C. Any "incident reports" or written complaints submitted to the Michigan Department of Environmental Quality (MDEQ), the Supervisor of Wells, or other regulating agency within thirty (30) days after the operator has notice of the existence of such reports or complaints.
12. Injection wells. Injection wells used for brine disposal or other chemicals from production wells or from other sources shall be expressly prohibited within the City.
13. Pipelines. No operator shall excavate or construct any lines for the conveyance of fuel, water, oil, gas or petroleum liquids on, under, or through the streets, alleys or other properties owned by the City without an easement or right-of-way license from the City.
14. Oil and Gas Processing Facilities. Associated processing facilities that separate oil, gas, and brine and hold said products for transport off-site for further refinement and processing shall only be permitted as a Special Land Use Permit in the I-2, General Industrial and I-3, Heavy Industrial districts.

Section 5. Repealer.

All Ordinances or parts of Ordinances in conflict herewith are hereby repealed only to the extent necessary to give this Ordinance full force and effect.

Section 6. Severability.

If any section, clause, or provision of this Ordinance shall be declared to be unconstitutional, void, illegal, or ineffective by any Court of competent jurisdiction, such section, clause, or provision declared to be unconstitutional, void, or illegal shall thereby cease to be a part of this Ordinance, but the remainder of this Ordinance shall stand and be in full force and effect.

Section 7. Savings.

The proceedings pending and all rights and liabilities existing, acquired, or incurred at the time this Ordinance takes effect are saved and may be consummated according to the law when they were commenced.

Section 8. Effective Date.

The provisions of this Ordinance are hereby ordered to take effect upon publication in the manner prescribed by the Charter of the City of Auburn Hills.

Section 9. Adoption.

This Ordinance is hereby declared to have been adopted by the City Council of the City of Auburn Hills at a meeting thereof duly called and held on the _____ day of _____, 2014, and ordered to be given publication in a manner prescribed by the Charter of the City of Auburn Hills.

AYES:

NAYES:

ABSTENTIONS:

STATE OF MICHIGAN)

) ss.

COUNTY OF OAKLAND)

I, the undersigned, the duly qualified Clerk of the City of Auburn Hills, Oakland County, Michigan, do hereby certify that the foregoing is a true and complete copy of Ordinance No. _____ adopted by the Auburn Hills City Council on the _____ day of _____, 2014, the original of which is in my office.

TERRI KOWALL, City Clerk

The Center for Local, State, and Urban Policy

Gerald R. Ford School of Public Policy >> University of Michigan

Michigan Public
Policy Survey June 2014

Fracking as a community issue in Michigan

By Thomas Ivacko and Debra Horner

This report presents the opinions of Michigan local government leaders on issues in their communities related to the process of extracting natural gas through high-volume hydraulic fracturing and horizontal drilling of underground shale deposits, also known as “fracking.” The findings in this report are based on a statewide survey of local government leaders in the Fall 2013 wave of the Michigan Public Policy Survey (MPPS).

>> The **Michigan Public Policy Survey (MPPS)** is a census survey of all 1,856 general purpose local governments in Michigan conducted by the **Center for Local, State, and Urban Policy (CLOSUP)** at the University of Michigan in partnership with the **Michigan Municipal League, Michigan Townships Association, and Michigan Association of Counties**. The MPPS takes place twice each year and investigates local officials’ opinions and perspectives on a variety of important public policy issues. Respondents for the Fall 2013 wave of the MPPS include county administrators and board chairs, city mayors and managers, village presidents, managers and clerks, and township supervisors, managers and clerks from 1,353 jurisdictions across the state.

For more information, please contact: closup-mpps@umich.edu / (734) 647-4091. You can also follow us on Twitter @closup

CLOSUP

Center for Local, State, and Urban Policy

 Gerald R. Ford School of Public Policy

 **GERALD R. FORD SCHOOL OF PUBLIC POLICY**
UNIVERSITY OF MICHIGAN

Key Findings

- High-volume hydraulic fracking is relatively rare in Michigan. The Michigan Department of Environmental Quality (DEQ) identifies 58 active applications or permits for such fracking activity statewide since 2008. The MPPS—asking about fracking activity or planning efforts more broadly—estimates about 6% of Michigan’s local jurisdictions currently have fracking operations or some kind of activity to add such operations within their jurisdictions’ borders. When further asked if there are current or proposed fracking operations in neighboring areas that impact the respondent’s own jurisdiction, the percentage of self-reported “fracking-affected” jurisdictions is estimated at approximately 13% of Michigan’s local governments statewide.
- Among officials who have heard of fracking, 35% report that fracking is an active topic of discussion within their communities at large or specifically among their jurisdictions’ government leaders. This increases to 77% among self-reported “fracking-affected” jurisdictions.
- Where it is an active topic, local officials believe that their citizens are more likely to oppose (37%) than support (11%) fracking in their communities, and say the same regarding their local councils or boards, reporting that 29% oppose fracking compared to 16% that support it. However, the MPPS respondents themselves—the chief elected and appointed officials—are more evenly split, with 36% opposing and 31% supporting such fracking.
 - » There are significant regional differences in opinions on fracking. Local leaders’ support is highest in the Upper Peninsula (54% support, 32% oppose) and Northern Lower Peninsula (37% support, 35% oppose), and lowest in Southeast Michigan (19% support, 51% oppose).
- For jurisdictions where fracking is an active topic, 43% of local leaders say revenue for land owners is the most common factor encouraging the development of fracking in their jurisdictions, while a majority say that risks to water resources (57%) and the environment (56%) are the most common factors discouraging local fracking.
- Few Michigan local governments have adopted policies that attempt to promote, restrict, or simply regulate fracking. However, despite state law that restricts some local authority regarding fracking, 63% of responding officials say local governments should have a “great deal” of authority to regulate fracking, compared to 45% who feel that way for the state government, and just 16% for the federal government.
- Finally, the MPPS asked local leaders how much they support or oppose a range of Michigan-specific energy sources that could be developed in the state. Support for fracking ranks near last, well behind both newer renewable sources, such as wind and solar, and other sources, such as increased use of biofuels and nuclear power.

www.closup.umich.edu

Background

Hydraulic fracturing, or “fracking,” is a process used to extract natural gas and oil by pressurizing wells with water, sand, and proprietary mixtures of chemicals to break-up underground rock formations and allow the gas or oil to escape and be collected through the well. Michigan has a long history of fracking, with oil and gas operators making use of some version of the hydraulic fracturing process as far back as the 1940s.¹ However, this earlier hydraulic fracturing was undertaken with vertical drilling only and relatively small volumes of water usage. More controversy has grown recently around the use of high-volume hydraulic fracturing, which uses horizontal drilling to expand the underground area that can produce gas or oil, but which also requires much higher volumes of water, and produces higher volumes of used “fracking fluid” mixtures that must be disposed of somewhere. All of these factors have raised potential health and environmental concerns.²

In Michigan, the issue of fracking has seen a marked increase in attention. Recent state legislative sessions have had a series of bills introduced—none of which became law—addressing concerns over fracking, including a call for a state-led study of the impact of fracking on Michigan’s environment and drinking water, proposed new disclosure requirements for companies engaged in fracking, and a proposed two-year moratorium on new permits.³ In addition, there was a citizen-led effort to establish a 2012 ballot proposition that would have banned fracking in Michigan, but the petition drive failed to secure the minimum number of signatures.

Despite this increased political activity, current fracking operations remain relatively limited across the state. The Michigan Department of Environmental Quality (DEQ) reports 58 instances of high-volume hydraulic fracturing activity (active wells, pending applications, pending permits, etc.) across the state since 2008, with most of the activity in the Northern Lower Peninsula (see *Figure 1*).⁴ Much more information from the state government about hydraulic fracturing in Michigan is available on the DEQ website.⁵

When it comes to regulating fracking operations in the state, the Michigan Natural Resources and Environmental Protection Act (1994) assigns exclusive regulatory authority to the DEQ for state oil and gas issues.⁶ The DEQ recently updated their rules regarding hydraulic fracturing operations, covering issues such as water withdrawals, baseline water quality sampling, monitoring and reporting, and chemical additive disclosure, in addition to well spacing requirements and terminology describing well locations and drilling tracts.⁷

At the local level, potential regulation of fracking by Michigan’s counties and townships is limited by the Michigan Zoning Enabling Act (Public Act 110 of 2006).⁸ PA 110 prohibits counties and townships from regulating the location, drilling, operation, and abandonment of oil and gas wells within their borders. While not preempted like counties and townships by these aspects of PA 110, cities and villages can only regulate wells if their local ordinances do not conflict with state and federal requirements and are not exclusionary in nature.⁹ Still, some believe counties and townships could attempt to circumvent PA 110’s restrictions by regulating activities related to fracking, such as the construction of roads or accessory buildings needed for a fracking operation, through ordinances rather than zoning. Local jurisdictions could also attempt to regulate operations related to the processing, refining, and transportation related to the fracking operations that may happen at other locations beyond the well site.¹⁰

As high-volume hydraulic fracturing has become a higher profile issue recently, arguments that support fracking include the belief that abundant natural gas supplies will help lower energy costs, boost the economy, and reduce dependence on foreign energy sources, while causing less environmental pollution compared to burning coal. On the other hand, arguments cited to oppose fracking often focus on health risks and potential environmental damage from methane leaks, water resource depletion, water pollution both above and below ground, and more.

Anecdotes abound regarding how fracking can divide communities,¹¹ and there is some evidence showing generally mixed views among Michigan citizens on the benefits and costs of fracking. For example, a survey conducted by the National Surveys on Energy and Environment (NSEE) in 2012 found that most Michigan residents believe fracking in the state has provided more benefits (52%) than problems (24%) to the state so far, with some citizens in support of fracking for its promotion of energy independence and job creation, and other citizens voicing concern about water contamination and other health risks.¹² However, that same survey

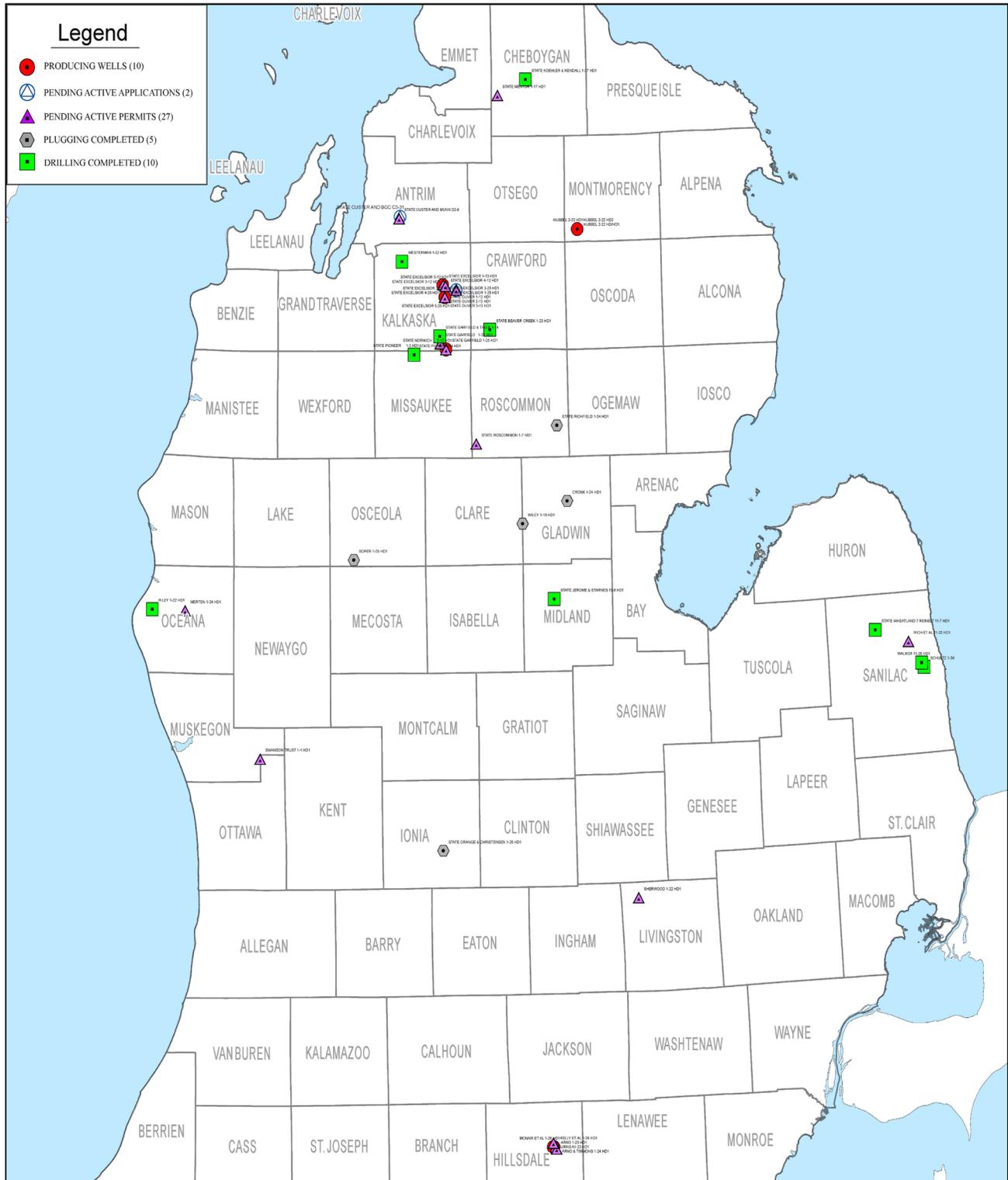


Figure 1
Michigan Department of Environmental Quality (DEQ) map of high-volume hydraulic fracturing, active applications and active permits since 2008

HIGH VOLUME HYDRAULIC FRACTURING

ACTIVE APPLICATIONS AND ACTIVE PERMITS - SINCE 2008*

AS OF 04/25/2014



Source: Michigan Department of Environmental Quality (DEQ)

(Retrieved from http://www.michigan.gov/documents/deq/High_Volume_Hydraulic_Fracturing_Activity_MAP_423435_7.pdf)

found that a majority (52%) of Michigan citizens statewide would support a moratorium on additional fracking until more is known about possible risks.

Meanwhile, what hasn't been known until now are the views of Michigan's local leaders. To fill this gap of knowledge, the Fall 2013 wave of the MPPS surveyed local officials across the state to get a sense of the issues regarding fracking in their jurisdictions. The survey asked local leaders to think specifically about high-volume horizontal drilling operations when responding to questions about fracking, and the rest of this report uses the term "fracking" to refer to this kind of hydraulic fracturing.

Fracking operations are relatively rare in Michigan currently

The Fall 2013 MPPS included a series of questions about local experiences with fracking across Michigan, and began by asking local officials if they were "familiar" with the process of hydraulic fracturing. Overall, 62% of Michigan local leaders report they are either very or somewhat familiar with fracking, while 27% say they are mostly unfamiliar and 8% say they are completely unfamiliar. (Respondents who reported being completely unfamiliar with fracking were not asked subsequent questions; please see the methodology section at the end of the report for more details.)

Next, officials were asked about local experiences with fracking, including the existence of any current fracking operations or potential plans to add or expand operations in the respondents' jurisdictions. The MPPS estimates that approximately 6% of Michigan's local jurisdictions overall currently have hydraulic fracturing operations within their borders, or have experienced some kind of efforts to add such fracking operations, which could range widely, including the earliest stages of interest expressed by oil and gas companies or surveyors.

However, environmental issues, such as concerns about water resource depletion or pollution, don't typically correspond to jurisdictional boundaries, and fracking operations on one side of a street, in "Jurisdiction A," might also impact residents on the other side of the street, in neighboring "Jurisdiction B." When asked if there are fracking operations or expansion efforts in neighboring jurisdictions that would impact their own community, the number of responding jurisdictions that report being "fracking-affected"—those that either have fracking themselves or are impacted by nearby fracking—is estimated at approximately 13% of Michigan's local jurisdictions statewide.



Fracking is a common topic of discussion in affected Michigan communities

To get a sense of how relevant the topic of fracking is across the state, the MPPS asked local officials (who have at least some knowledge of the term) to what extent it has been a topic of discussion, either within the community at large or among the jurisdiction’s government leaders. Overall, fracking is identified as a topic of community discussion by 35% of responding local officials, including 9% who say it is a major issue that is discussed extensively (see *Figure 2a*). By comparison, 61% of these local leaders say that fracking is not an issue at all in their jurisdictions.

Not surprisingly, the discussion of fracking is more or less common in different areas of the state. In the Northern Lower Peninsula, the region in which fracking is most common, more than half (57%) of all responding jurisdictions report that fracking is an active topic of discussion in the community at large or among local leaders (see *Figure 2b*). By contrast, in a number of regions where fracking is less prevalent, majorities of officials report it’s not an active topic of discussion at all.

Among the self-reported fracking-affected jurisdictions, 77% of local leaders say it is a topic of local discussion, and in 28% of those places it is a major topic of discussion (see *Figure 2c*). However, even in places where there is no reported fracking or nearby fracking, it is still a topic of discussion in a quarter (25%) of jurisdictions.

Figure 2a
Percentage of officials who report fracking is a topic of local discussion (among local leaders who have heard of fracking)

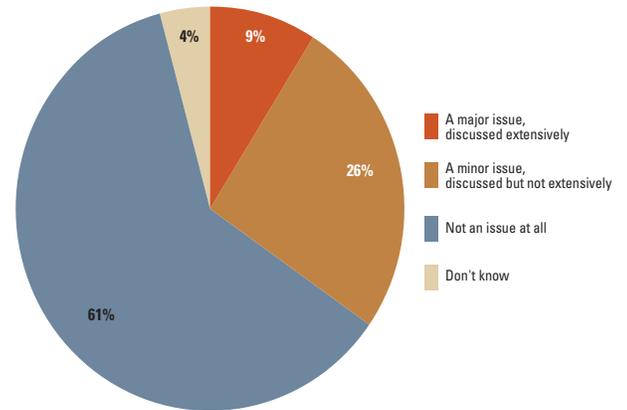


Figure 2b
Percentage of officials who report fracking is a topic of local discussion (among local leaders who have heard of fracking), by region

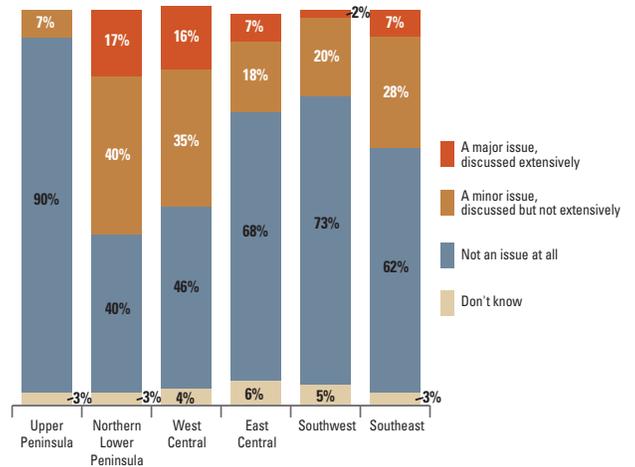
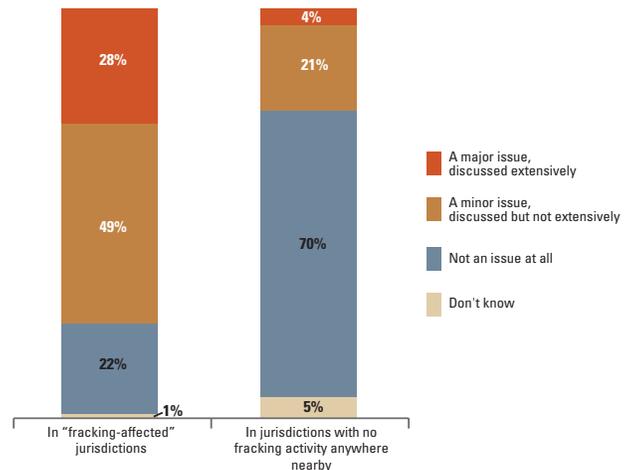


Figure 2c
Percentage of officials who report fracking is a topic of local discussion (among local leaders who have heard of fracking), by proximity to fracking operations



Local leaders see mixed fracking support and opposition among groups in Michigan communities

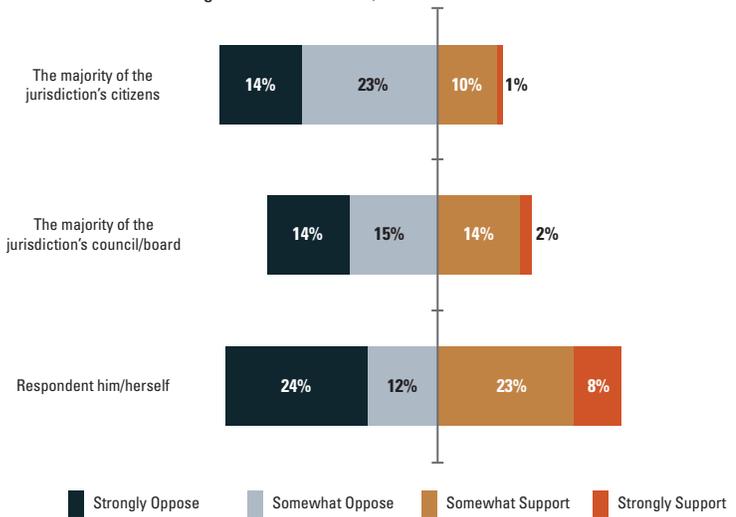
In places where fracking is a topic of discussion, the MPPS asked local officials to estimate support and opposition to fracking in their jurisdictions among different groups in their communities.

Overall, where fracking is an active topic of discussion, local leaders believe their citizens are more likely to oppose (37%) than support (11%) fracking in their jurisdictions (see *Figure 3*). Another 33% say they don't know their citizens' opinions on local fracking.

Compared to these perceived low levels of citizen support, local leaders believe there is slightly more support for local fracking among the majorities of their councils or boards. However, they still believe there is more opposition (29%) than support (16%) for fracking in their jurisdictions among the local political leadership. Another 28% say their councils or boards are neutral, while 28% don't know where the council or board stands (perhaps indicating that it has not been a particularly notable issue of governance in those locations). Interestingly though, among local government councils or boards in the Northern Lower Peninsula—where fracking is most common—perceived support for fracking in the area is a bit higher still, with 24% reported in support and 27% reported in opposition on the various boards.

Finally, as shown in *Figure 3*, opinions on local fracking are somewhat more evenly split—with higher support but still more opposition—among the MPPS' respondents themselves (the chief elected and appointed local government leaders). Overall, 31% of these local leaders say they support local fracking operations in their jurisdictions, while 36% oppose the use of fracking locally. But once again, support is at one of its highest levels where fracking is most common—in the Northern Lower Peninsula—where 37% say they support local fracking and 35% oppose it. By contrast, only 19% of leaders in Southeast Michigan say they support fracking, while 51% oppose it.

Figure 3
Local leaders' reports of support and opposition to fracking in their communities (among jurisdictions where fracking is an active issue)



Note: responses for "neither support nor oppose" and "don't know" not shown

Interestingly, levels of support and opposition to fracking among local leaders and board or council members show some significant differences when looking at self-reported fracking-affected jurisdictions versus jurisdictions where there are no reported fracking operations anywhere nearby. For instance, among Northern Lower Peninsula jurisdictions that have no reported fracking activity anywhere nearby, 23% of local leaders themselves support fracking while 40% oppose it, for a net support level of -17%. By comparison, in self-reported fracking-affected jurisdictions in the Northern Lower Peninsula, 49% of local leaders support fracking compared to 32% who oppose it, for a net support level of +17%. Support for fracking is also somewhat higher in fracking-affected jurisdictions than in non-affected jurisdictions in the Southwest and Southeast regions of the state, but conversely it is lower in the West and East Central regions. It is important to note that the numbers of reporting jurisdictions gets particularly small when breaking the data down in these ways, which calls for caution in generalizing findings from these particular estimates. Nonetheless, these findings point to potentially higher support levels among local leaders when fracking has arrived in a local jurisdiction, and may deserve more study.



Revenue for land-owners is the most common factor encouraging fracking operations, while environmental and health risks top list of discouraging factors

High-volume hydraulic fracturing appears to be a highly charged and emotional policy topic in local communities, as reported in the media, with various local entities arguing for or against fracking based on a number of possible issues.¹³ To help understand what kinds of factors may be encouraging or discouraging the development of fracking in Michigan, the MPPS presented a list of 14 factors to local leaders in communities where fracking is an active topic, and asked whether those factors were relevant in their communities.

The most common factor that local officials say is encouraging fracking operations in their communities is revenue for land-owners, with 43% identifying this factor (see Figure 4). Other factors reported to be encouraging fracking in local Michigan communities include property tax revenue for the jurisdiction (32%); potential environmental benefits from cleaner-burning natural gas instead of coal (30%); lower energy prices (29%); local economic development and jobs (24%), and the simple availability of shale gas deposits for fracking (25%).

Factors that are reported to be discouraging local fracking operations appear to be more widespread and common than those encouraging fracking. For example, more than half (57%) of responding officials cite potential risks to water resources as a factor that discourages fracking in their local communities (see Figure 5). Similarly, 56% say that potential environmental damage from fracking spills or leaks is another factor that discourages local fracking. Other factors reported to be discouraging fracking include potential health risks to citizens (47%), impacts on property values (41%), and community organizations that are active on fracking issues (31%), presumably representing citizen groups mobilizing to fight against local fracking.

Figure 4
Percentage of officials identifying various factors encouraging the use of fracking within their jurisdictions (among jurisdictions where fracking is an active issue)

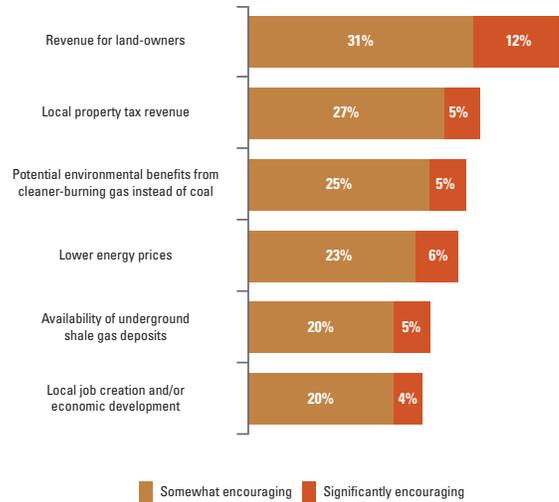
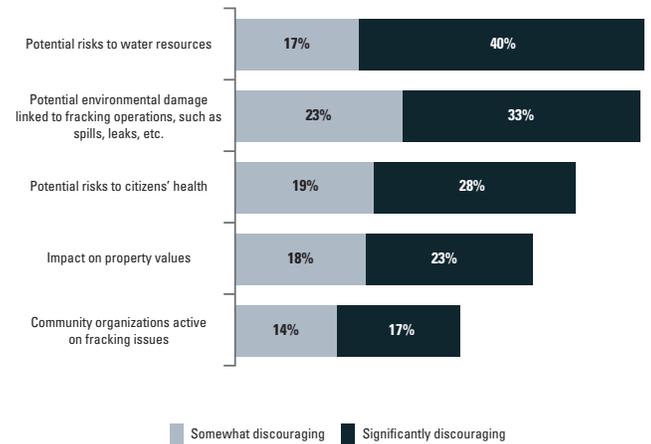


Figure 5
Percentage of officials identifying various factors discouraging the use of fracking within their jurisdictions (among jurisdictions where fracking is an active issue)



Few Michigan local governments are taking action specific to fracking, but they believe they should have the authority

Among jurisdictions where fracking is a topic of discussion, the MPPS asked whether Michigan local governments have taken any policy actions that attempt to promote, restrict, or simply regulate fracking. As described in the background section of this report, the options available to Michigan counties and townships in particular to regulate fracking operations in their communities are constrained by Michigan’s Zoning Enabling Act.

And as it turns out—even among places where fracking is currently an active issue—relatively few Michigan local jurisdictions have adopted policies related to fracking, or are likely to do so in the near future. For instance, none of these local jurisdictions report currently offering tax or other incentives targeting hydraulic fracturing operations and only 3% say they are likely to do so (see *Figure 6*). Likewise, none of these jurisdictions report currently having intergovernmental agreements with neighboring jurisdictions regarding fracking, although 9% say they are planning to adopt such agreements. A tiny fraction (2%) of these Michigan jurisdictions report having already adopted a local moratorium or ban on fracking, though 9% say they are likely to do so. Finally, almost two in ten (18%) of these jurisdictions say they are likely to adopt some kind of local ordinances or zoning codes regarding fracking, and 1% indicate they already have done so.

Although little local policy action is currently taking place in regard to fracking operations, when it comes to who should have authority to regulate fracking, local leaders believe all levels of government—local, state, and federal—have a role to play. However, by far, local officials believe the greatest amount of authority should be at the local level.

Overall, 93% of responding local officials believe local government—those closest to the ground where fracking takes place—should have some (30%) or a great deal (63%) of authority for decisions regarding fracking. By comparison, 91% believe the state government should have some (46%) or a great deal (45%) of authority, while 66% feel the federal government should have some (50%) or a great deal (16%) of authority (see *Figure 7*). Meanwhile, 28% of these local leaders say the federal government should have no authority regarding

Figure 6
Percentage of jurisdictions that have adopted or plan to adopt specific policies related to fracking (among jurisdictions where fracking is an active issue)

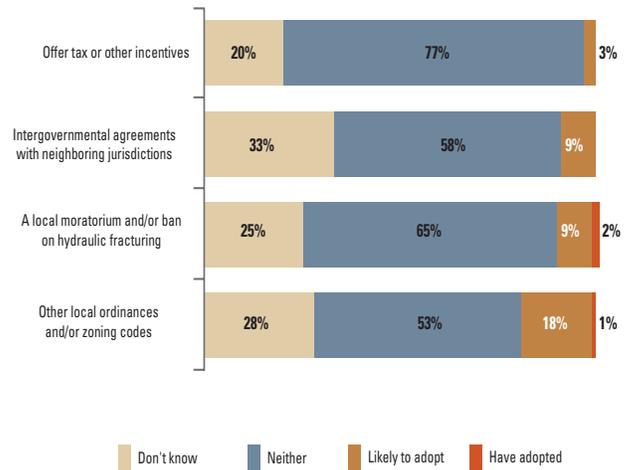
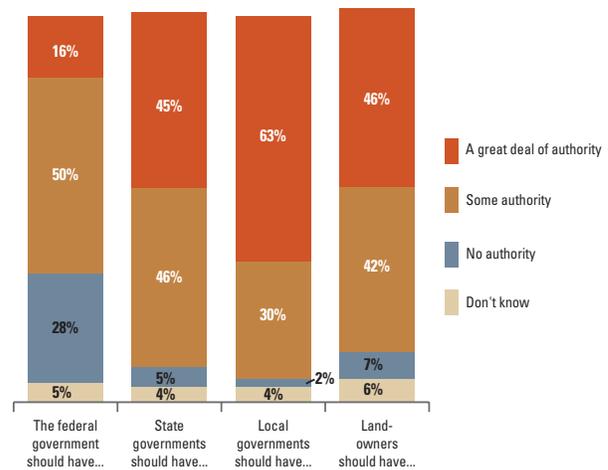


Figure 7
Local officials’ assessments of appropriate levels of control over decisions regarding fracking in local communities (among local leaders who have heard of fracking)



fracking, while just 5% feel that way toward state government, and 2% regarding local government.

Finally, 88% of local leaders believe land-owners themselves should also have some (42%) or a great deal (46%) of authority on decisions regarding fracking, while 7% believe that land-owners should have no authority over fracking regulation at all.



The MPPS also provided an open-ended question in which local leaders could identify additional issues regarding fracking in their communities. Highlights are provided below:

Voices Across Michigan

Quotes from local leaders regarding hydraulic fracturing issues in their jurisdictions

“At the county level there was an evening devoted to people from various perspectives on the fracking issue giving presentations. It was a fairly good introduction to fracking in our area. More information is better so the more that is done to educate the public the better it is.”

“Use of Michigan’s water resources for fracking are extensive (millions of gallons per well) ... The use of these large amounts of water ... should be taken as a whole and be subject to the Great Lakes Water Compact and the limitations on withdrawal & removal from the Great Lakes Basin (contaminated water does not return to the hydrologic system, therefore should be subject to water withdrawal regulations just like any other major water user.)”

“Local units of government need to receive a portion of the state’s severance tax to compensate for local costs associated with drilling operations.”

“Our watershed is of utmost importance to our community.”

“Michigan is behind the eight ball in assessing and taxation of fracking...we should be looking to Pennsylvania Act 13 as a starting point.”

“People are skeptical, don’t trust info being given.”

“Other than a few folks complaining that the heavy trucks are hurting county roads, it’s not been a problem. Frankly, our road problem is more due to a lack of funding than truck traffic.”

“The general public is not aware that hundreds of ‘fracking’ wells are already in use in the state with no or very little problems.”

“The whole process is very secretive and you have to be proactive to find out exactly what is going on in your jurisdiction.”

“Water is a huge part of our township. We encompass three bodies of water. They mean EVERYTHING to our vacationer/tourist-based tax revenue base. People visit here, and people have second homes here (these non-homesteaders pay twice the number of tax dollars as the homesteaders but get relatively little return on their “investment,” no kids in school, etc.) and they come, pay higher taxes, because of the (near-)pristine environment. Therefore protecting the water, and not removing significant amounts of water from the water table and water cycle, is paramount to our interests.”

“The whole State could benefit from the discovery of oil and gas.”

“Education is key to successful implementation of hydraulic fracturing in any area. The emotion and ‘wives tales’ must be dispelled.”

Support for fracking lags behind support for other energy sources in Michigan

So where—in the view of local leaders—does hydraulic fracturing for natural gas stand as a priority for development among a range of possible Michigan-specific energy sources? The MPPS presented eight different Michigan energy sources to local leaders and asked which they would support or oppose, as a means to address energy supply needs for the state. Local leaders clearly favor clean renewable sources, with a wide majority indicating support for increasing the use of solar (86%), hydroelectric (82%), and land-based wind power (79%) to meet the state’s energy supply needs (see *Figure 8*). There is also majority support for the increased production and use of biofuels/biomass (72%), offshore wind power (69%), and nuclear power (57%). However, fewer than half (45%) of officials surveyed say that there should be increased use of gas and oil drilling through fracking. Only the option of offshore drilling for oil and gas in the Great Lakes receives less support (37%) than fracking on land, with a majority (55%) of local officials saying they oppose this option of allowing oil and gas drilling in the Great Lakes.

However, despite the clear preference for clean renewable energy sources, Michigan’s local leaders are evenly split regarding whether the state should mandate an increase in these sources. As shown in *Figure 9*, 44% say they support a state mandate for the use of renewable energy and 45% say they oppose it (the remaining 11% are unsure). Opinions on this question in particular are strongly associated with officials’ partisan identification. Among officials who identify themselves as Republicans, more than half (54%) oppose a renewable energy mandate, while just over one-third (36%) support it. Conversely, 68% of Democratic officials support such a mandate, while only 21% oppose it. Officials who identify themselves as Independents are balanced in-between, with 44% in support of a mandate and 48% in opposition.

Figure 8
Percentage of local leaders who support or oppose the development of possible Michigan energy sources

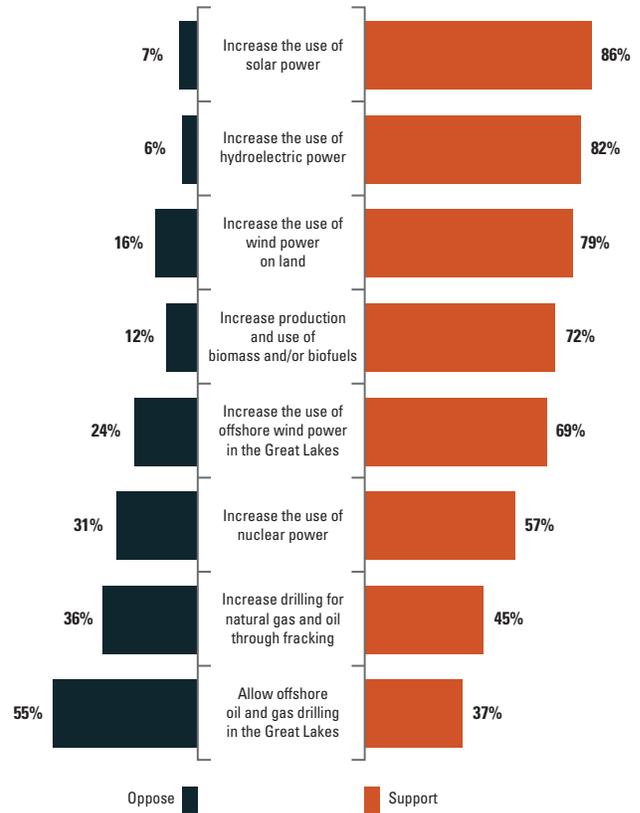
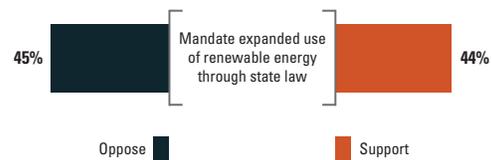


Figure 9
Percentage of local leaders who support or oppose mandates for expanded use of renewable energy through state law





Conclusion

Although fracking is relatively rare in Michigan communities today—with an estimated 6% of Michigan’s local jurisdictions reporting they currently have fracking operations or some kind of efforts to add them and approximately 13% saying they are somehow affected by fracking in their own or neighboring jurisdictions—the issue is an increasingly active topic of conversation.

Where fracking is an active topic, local leaders believe that their citizens and their boards or councils are more likely to oppose than support the use of fracking in the area, while local leaders themselves are somewhat more evenly split between support and opposition. In the Northern Lower Peninsula, where fracking operations are most common today, the data suggest that perceived support may be higher among local leaders and board or council members relative to statewide support levels.

When it comes to factors that are encouraging support for fracking in a community, 43% of responding local officials say revenue for land-owners is a primary driver, with additional encouragement coming from local issues such as property tax revenue for the jurisdiction, environmental benefits, and economic benefits such as job creation and lower energy costs. By contrast, factors discouraging support for local fracking are reported to be more common, with more than half (57%) of responding officials citing environmental concerns such as potential risks to water resources or other environmental damage, and others reporting factors such as health risks to citizens, impacts on property values, and community groups active on fracking.

While the State of Michigan has primary control over the regulation of fracking, local leaders believe local governments should have that primary responsibility, with 63% of responding officials saying local jurisdictions should have a great deal of authority, compared to 45% who believe the same for the state government, and just 16% who feel that way for the federal government. Nevertheless, few local jurisdictions have taken action so far, or expect to do so soon, to regulate fracking in any way.

Notes

1. Center for Local, State, and Urban Policy (CLOSUP) at the Gerald R. Ford School of Public Policy, University of Michigan. (2014). *CLOSUP fracking timeline*. Retrieved from <http://closup.umich.edu/fracking/timeline/>
2. Vann, A., Murrill, B. J., & Tiemann, M. (2013, November 15). *Hydraulic fracturing: Selected legal issues*. Washington, DC: Congressional Research Service. Retrieved from <http://www.fas.org/sgp/crs/misc/R43152.pdf>
3. Anders, M. (2013, July 11). Democrats’ fracking regulations would force disclosure of chemicals used. Mlive.com. Retrieved from http://www.mlive.com/business/index.ssf/2013/07/fracking_michigan_democrats.html
4. Michigan Department of Environmental Quality (DEQ). (2014, April 25). *High volume hydraulically fractured well completion active permits and applications: High volume (>100,000 gallons) hydraulic fracturing since 2008 – Active permits*. Retrieved from http://www.michigan.gov/documents/deq/High_Volume_Hydraulic_Fracturing_Activity_DATA_TABLE_423436_7.pdf
5. Michigan DEQ Office of Oil, Gas, and Minerals. (2014, May). *Rules about hydraulic fracturing to be promulgated*. Retrieved from http://www.michigan.gov/deq/0,4561,7-135-3306_57064---,00.html
6. Michigan Legislature. (n.d.) *Natural Resources and Environmental Protection Act: Act 451 of 1994*. Lansing, MI: Michigan Legislature. Retrieved from <http://legislature.mi.gov/doc.aspx?mcl-act-451-of-1994>
7. Michigan DEQ Office of Oil, Gas, and Minerals, 2014.
8. Michigan Legislature. (n.d.) *Michigan Zoning Enabling Act: Act 110 of 2006*. Lansing, MI: Michigan Legislature. Retrieved from <http://legislature.mi.gov/doc.aspx?mcl-act-110-of-2006>
9. Tip of the Mitt Watershed Council. (2014). *Regulations and exemptions: Key environmental and public health laws governing hydraulic fracturing*. Retrieved from <http://www.watershedcouncil.org/learn/hydraulic-fracturing/regulations-and-exemptions/>
10. Solomon, D., & Schindler, K. H. (2012, March 22). Can local governments regulate oil and gas development? *Michigan State University Extension*. Retrieved from http://msue.anr.msu.edu/news/can_local_governments_regulate_oil_and_gas_development
11. Laitner, B. (2013, May 6). A dilemma in metro Detroit: Welcome fracking, or fear it? *The Detroit Free Press*. Retrieved from <http://www.freep.com/article/20130506/NEWS/305050144/fracking-michigan-detroit>
12. Brown, E., Hartman, K., Borick, C., Rabe, B. G., & Ivacko, T. (2013, May). *Public opinion on fracking: Perspectives from Michigan and Pennsylvania. Issues in Environmental Policy 3*. Ann Arbor, MI: Center for Local, State, and Urban Policy at the Gerald R. Ford School of Public Policy, University of Michigan. Retrieved from <http://closup.umich.edu/files/ieep-nsee-2012-fall-fracking.pdf>

13. Abbey-Lambertz, K. (2013, August 12). Michigan fracking fight ramps up as state Chamber of Commerce fights proposed ban. *Huffington Post*. Retrieved from http://www.huffingtonpost.com/2013/08/12/michigan-fracking-ban-chamber-of-commerce_n_3745363.html

Survey Background and Methodology

The MPPS is a biannual census survey of Michigan's 1,856 units of general purpose local government (83 counties, 277 cities, 256 villages, and 1,240 townships), conducted once each spring and fall. While the spring surveys consist of multiple batteries of the same "core" fiscal, budgetary and operational policy questions and are designed to build up a multi-year time-series of data, the fall surveys focus on various other topics.

In the Fall 2013 iteration, surveys were sent by the Center for Local, State, and Urban Policy (CLOSUP) via the internet and hardcopy to top elected and appointed officials (including county administrators and board chairs, city mayors and managers, village presidents, managers, and clerks, and township supervisors, managers and clerks).

The Fall 2013 wave was conducted from October 7 to December 17, 2013. A total of 1,353 jurisdictions in the Fall 2013 wave returned valid surveys, resulting in a 73% response rate by unit. The margin of error for the survey as a whole is +/- 1.4%. The key relationships discussed in the above report are statistically significant at the $p < .05$ level or below, unless otherwise specified. Missing responses are not included in the tabulations, unless otherwise specified. Some report figures may not add to 100% due to rounding within response categories. Data are weighted to account for non-response.

The Fall 2013 wave questionnaire items on hydraulic fracturing are filtered to exclude those respondents who initially report they are "completely unfamiliar" with the terms "hydraulic fracturing" or "fracking." Several subsequent items are filtered to exclude those respondents who report that current or potential fracking is not an issue in their community at all, and that there has been no discussion of fracking in the jurisdiction now or in the recent past. CLOSUP staff calculated the percentage of estimated jurisdictions that have current or planned fracking activity by taking the total number of unique jurisdictions that reported having current or planned fracking (113) and divided it by the total number of jurisdictions in the state (1,856). Local officials who were completely unfamiliar with fracking were not asked if there were fracking operations in their jurisdictions, based on the assumption that they would have been familiar with the term "fracking" if there were such operations in their jurisdictions.

The full Fall 2013 wave questionnaire is available for review online at the MPPS homepage: <http://closup.umich.edu/mpps.php>. Contact CLOSUP staff for more information.

Detailed tables of the data analyzed in this report—by jurisdiction type (county, city, township, or village), by population size of the respondent's community, and by the region of the respondent's jurisdiction—are also available online at the MPPS homepage: <http://closup.umich.edu/mpps.php>.

The survey responses presented here are those of local Michigan officials, while further analysis represents the views of the authors. Neither necessarily reflects the views of the University of Michigan, or of other partners in the MPPS.



Previous MPPS reports

- The impact of tax-exempt properties on Michigan local governments (March 2014)
- Michigan local leaders generally support Detroit bankruptcy filing despite some concerns (February 2014)
- Michigan local governments increasingly pursue placemaking for economic development (January 2014)
- Views on right-to-work legislation among Michigan's local government leaders (December 2013)
- Michigan local governments continue seeking, and receiving, union concessions (October 2013)
- Michigan local government fiscal health continues gradual improvement, but smallest jurisdictions lagging (September 2013)
- Local leaders evaluate state policymaker performance and whether Michigan is on the right track (August 2013)
- Trust in government among Michigan's local leaders and citizens (July 2013)
- Citizen engagement in the view of Michigan's local government leaders (May 2013)
- Beyond trust in government: government trust in citizens? (March 2013)
- Local leaders support reforming Michigan's system of funding local government (January 2013)
- Local leaders support eliminating Michigan's Personal Property Tax if funds are replaced, but distrust state follow-through (November 2012)
- Michigan's local leaders satisfied with union negotiations (October 2012)
- Michigan's local leaders are divided over the state's emergency manager law (September 2012)
- Fiscal stress continues for hundreds of Michigan jurisdictions, but conditions trend in positive direction overall (September 2012)
- Michigan's local leaders more positive about Governor Snyder's performance, more optimistic about the state's direction (July 2012)
- Data-driven decision-making in Michigan local government (June 2012)
- State funding incentives increase local collaboration, but also raise concerns (March 2012)
- Local officials react to state policy innovation tying revenue sharing to dashboards and incentive funding (January 2012)
- MPPS finds fiscal health continues to decline across the state, though some negative trends eased in 2011 (October 2011)
- Public sector unions in Michigan: their presence and impact according to local government leaders (August 2011)
- Despite increased approval of state government performance, Michigan's local leaders are concerned about the state's direction (August 2011)
- Local government and environmental leadership: views of Michigan's local leaders (July 2011)
- Local leaders are mostly positive about intergovernmental cooperation and look to expand efforts (March 2011)
- Local government leaders say most employees are not overpaid, though some benefits may be too generous (February 2011)
- Local government leaders say economic gardening can help grow their economies (November 2010)
- Local governments struggle to cope with fiscal, service, and staffing pressures (August 2010)
- Michigan local governments actively promote U.S. Census participation (August 2010)
- Fiscal stimulus package mostly ineffective for local economies (May 2010)
- Fall 2009 key findings report: educational, economic, and workforce development issues at the local level (April 2010)
- Local government officials give low marks to the performance of state officials and report low trust in Lansing (March 2010)
- Local government fiscal and economic development issues (October 2009)

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The **Center for Local, State, and Urban Policy (CLOSUP)**, housed at the University of Michigan's Gerald R. Ford School of Public Policy, conducts and supports applied policy research designed to inform state, local, and urban policy issues. Through integrated research, teaching, and outreach involving academic researchers, students, policymakers and practitioners, CLOSUP seeks to foster understanding of today's state and local policy problems, and to find effective solutions to those problems.

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