

Owner / Developer

ROBERTSON BROTHERS CO.
6905 TELEGRAPH ROAD
SUITE 200
BLOOMFIELD HILLS, MI 48301
CONTACT:
MR. TIM LOUGHRIN
PH: 248-282-1428
FAX: 248-282-1423

Civil Engineer

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVENUE
PONTIAC, MI 48342
CONTACT:
MR. BRAD W. BRICKEL, P.E.
248-332-7931 PHONE
248-332-8257 FAX

Architect

ALEXANDER V. BOGAERS + ASSOCIATES, P.C.
2445 FRANKLIN ROAD
BLOOMFIELD HILLS, MI 48302
CONTACT:
248.334.5000 PHONE

Landscape Architect

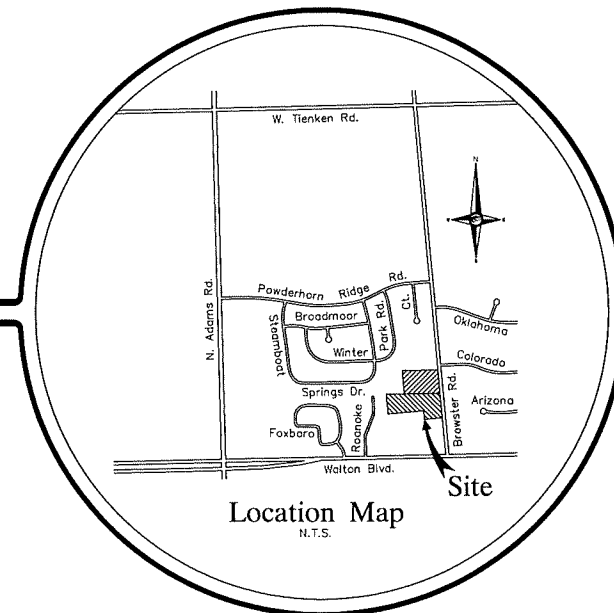
LAND DESIGN STUDIO
18161 W. THIRTEEN MILE RD., SUITE B-4
SOUTHFIELD, MI 48076
CONTACT:
MR. TAD KREAR
248.594.3220 PHONE
248.230.4168 FAX

City of Rochester Hills,
Oakland County, Michigan
PRELIMINARY SITE PLAN PACKAGE DOCUMENTS
Single Family Residential Project
Prepared For Robertson Brothers Co.

PART OF THE SW 1/4 OF SECTION 8
T.3N., R.11E., CITY OF ROCHESTER HILLS,
OAKLAND COUNTY, MICHIGAN

SHEET INDEX

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SP2	Tree List
SP3	General Site Plan
SP4	Preliminary Paving & Grading Plan
SP5	Preliminary Utility Plan
SP6	Preliminary Notes, Details & Calculations
SP7	MDOT Details
SP8	Fire Access Plan
SP9	Soil Boring Location Plan
SP10	Soil Boring Log Plan
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L-2	Detention Pond Seeding Plan
L-3	Tree Preservation Plan
L-4	Tree Survey
L-5	Tree Survey & Details
L-6	Details & Notes



LOCATION MAP

Project Name

Brewster Village

LEGAL DESCRIPTION - AS SURVEYED

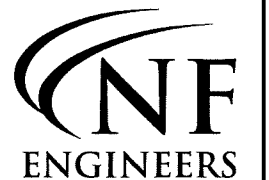
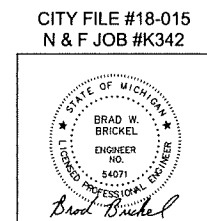
PART OF THE SOUTHWEST 1/4 OF SECTION 8, TOWN 3 NORTH, RANGE 11 EAST, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTH 1/4 CORNER OF SAID SECTION 8; THENCE SOUTH 89 DEGREES 57 MINUTES 18 SECONDS EAST, 11.55 FEET TO THE PROPERTY CONTROLLING CORNER; THENCE NORTH 04 DEGREES 03 MINUTES 10 SECONDS WEST ALONG THE PROPERTY CONTROLLING LINE BETWEEN THE SAID PROPERTY CONTROLLING CORNER AND THE CENTER POST OF SAID SECTION 8, 930.35 FEET TO THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 34 MINUTES 48 SECONDS WEST, 43.14 FEET TO A POINT ON THE WEST LINE OF BREWSTER ROAD (WIDTH VARIES); THENCE SOUTH 04 DEGREES 03 MINUTES 0 SECONDS EAST ALONG SAID WEST LINE OF BREWSTER ROAD, ALSO BEING 43 FEET WEST OF AND PARALLEL TO SAID PROPERTY CONTROLLING LINE, 313.47 FEET; THENCE SOUTH 85 DEGREES 56 MINUTES 50 SECONDS WEST, 228.50 FEET; THENCE NORTH 04 DEGREES 03 MINUTES 10 SECONDS WEST, 110.00 FEET; THENCE SOUTH 85 DEGREES 56 MINUTES 50 SECONDS WEST, 467.95 FEET; THENCE NORTH 03 DEGREES 47 MINUTES 21 SECONDS WEST, 257.86 FEET TO A POINT ON THE SOUTH LINE OF SHADOW WOODS SUBDIVISION No. 1, AS RECORDED IN LIBER 160 OF PLATS, ON PAGES 30 THROUGH 35, OAKLAND COUNTY RECORDS; THENCE THE FOLLOWING THREE (3) COURSES ALONG THE SOUTH AND EAST LINES OF SAID SHADOW WOODS SUBDIVISION No. 1: 1) SOUTH 89 DEGREES 34 MINUTES 48 SECONDS EAST, 240.52 FEET, 2) NORTH 04 DEGREES 03 MINUTES 10 SECONDS WEST, 300.91 FEET AND 3) SOUTH 89 DEGREES 34 MINUTES 48 SECONDS EAST, 500.00 FEET TO A POINT ON SAID PROPERTY CONTROLLING LINE; THENCE SOUTH 04 DEGREES 03 MINUTES 10 SECONDS EAST ALONG SAID PROPERTY CONTROLLING LINE, 300.91 FEET TO THE POINT OF BEGINNING.

OVERALL (GROSS): 335,657.20 SQ. FT. OR 7.705 ACRES
OVERALL (NET): 312,263.93 SQ. FT. OR 7.168 ACRES

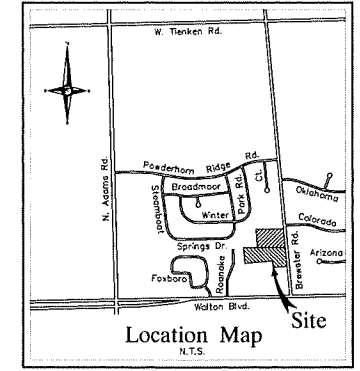
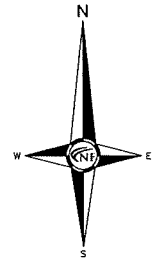
TAX ID NUMBERS:
15-08-376-015 (PARCEL 1)
15-08-331-041 (PARCEL 2)

REVISIONS:	
8-2-18	ISSUED FOR SITE PLAN REVIEW
10-12-18	ISSUED FOR SITE PLAN REVIEW
11-13-18	REVISED PER CITY REVIEW



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

CITY FILE #18-015
N & F JOB #K342



CF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

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

SEAL

PROJECT
Vacant Parcels -
Brewster Road
(N. of Walton Blvd.)
Rochester Hills, MI 48309

CLIENT
Robertson Brothers Homes
6905 Telegraph Road,
Suite 200
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
248.282.1428 - Phone
248.282.1432 - Fax

PROJECT LOCATION
Part of the SW 1/4
of Section 8
T.3N., R.11E.,
City of Rochester Hills,
Oakland County, Michigan

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



Know what's below
Call before you dig.

DATE	ISSUED/REVISED
3-30-18	SURVEY ISSUED
4-4-18	REVISED PER CLIENT
8-2-18	ISSUED FOR SITE PLAN REVIEW
10-12-18	ISSUED FOR SITE PLAN REVIEW
11-13-18	REVISED PER CITY REVIEW

DRAWN BY:
M. Carnaghi

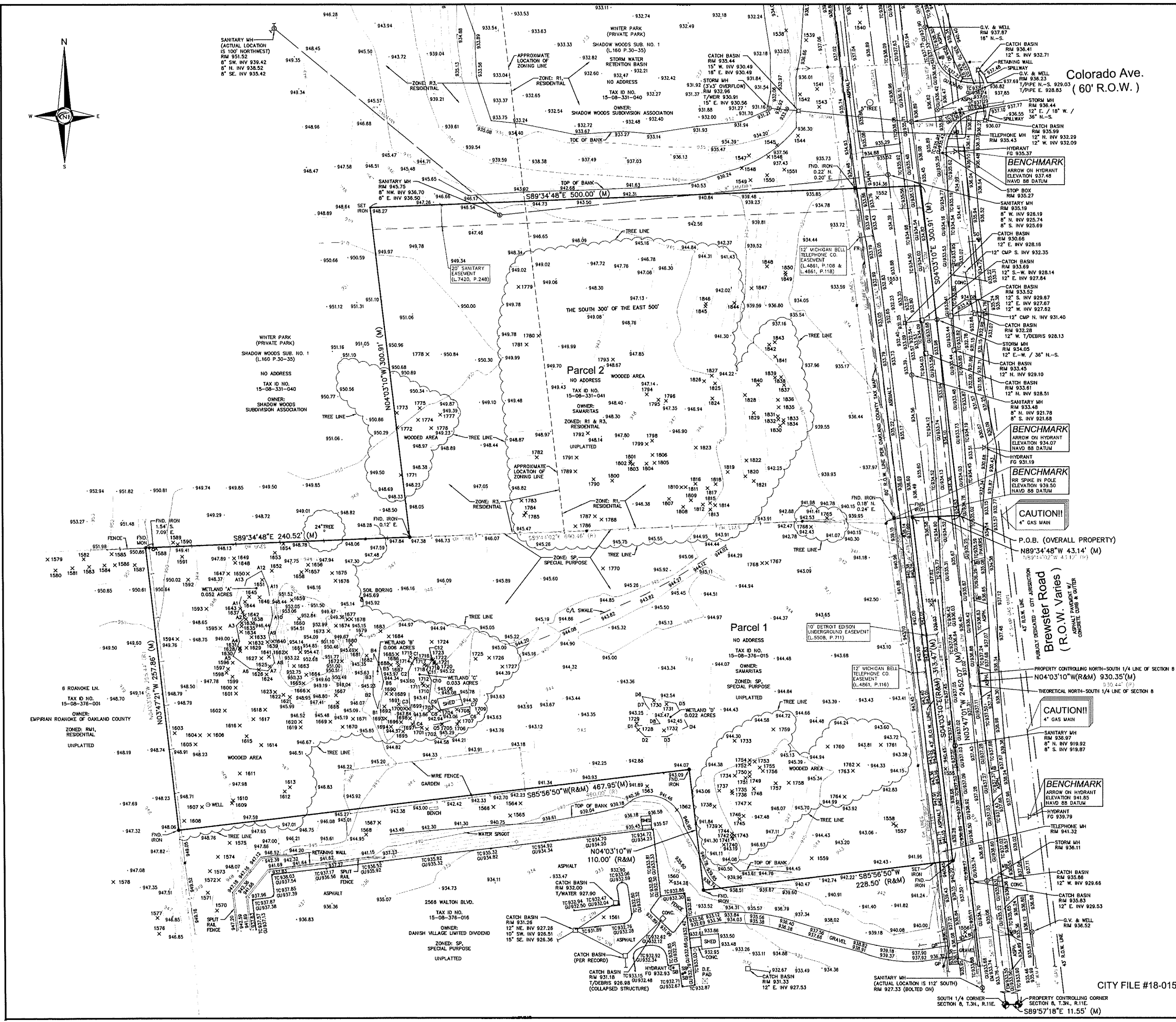
DESIGNED BY:

APPROVED BY:
K. Navaroli

DATE:
March 30, 2018

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

NFE (JOB NO.) SHEET NO.
K342 SP1



LEGEND

MANHOLE (MH)	EXISTING SANITARY SEWER
HYDRANT	EXISTING SAN. CLEAN OUT
GATE VALVE	EXISTING WATER MAIN
MANHOLE	EXISTING STORM SEWER
CATCH BASIN (CB)	EX. R.Y. CATCH BASIN
UTILITY POLE	EX. UNDERGROUND (UG) CABLE
GUY WIRE	OVERHEAD (OH) LINES
IP	LIGHT POLE
LP	SIGN
ASPH	EXISTING GAS MAIN
CONC.	ASPHALT
FD. / FND.	CONCRETE
RET. WALL	FOUND
R.O.W.	RETAINING WALL
SB	RIGHT-OF-WAY
(TRP)	STOP BOX
(R)	TYPICAL
(M)	RECORD
C/L	MEASURED
P/W	CENTERLINE
P/L	GAS METER
EV	PROPERTY LINE
FR	ELECTRIC METER
CP	FIBER OPTIC RISER
MB	GUARD POST
CR	MAIL BOX
ER	CABLE RISER
X 1500	ELECTRIC RISER
A1 / B1 / C1 / D1	TREE TAG NUMBER
	WETLAND TAG NUMBER

CITY FILE #18-015



CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOVAK & FRAUS ENGINEERS
4677 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL (248) 332-7931
FAX (248) 332-8257

JONATHAN NEUENDORFF
Registered Forester
State of Michigan ID #3301046108

PROJECT
Vacant Parcels -
Brewster Road
(N. of Walton Blvd.)
Rochester Hills, MI 48309

CLIENT
Robertson Brothers Homes
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Suite 200
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
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PROJECT LOCATION
Part of the SW 1/4
of Section 8
T.3N., R.11E.,
City of Rochester Hills,
Oakland County, Michigan

SHEET
Tree List / Survey Notes



Table with 2 columns: DATE, ISSUED/REVISED. Rows include 3-30-18 SURVEY ISSUED, 4-4-18 REVISED PER CLIENT, 8-2-18 ISSUED FOR SITE PLAN REVIEW, 10-12-18 ISSUED FOR SITE PLAN REVIEW, 11-13-18 REVISED PER CITY REVIEW.

CERTIFICATE OF SURVEY
CERTIFIED TO:
-ROBERTSON BROTHERS CO., A MICHIGAN CORPORATION, ON BEHALF OF AN ENTITY TO BE FORMED
-SAUMITA, A MICHIGAN NON-PROFIT CORPORATION, FORMERLY KNOWN AS LUTHERAN SOCIAL SERVICES OF MICHIGAN, A MICHIGAN NON-PROFIT CORPORATION
-FIRST AMERICAN TITLE INSURANCE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAN AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDE ITEMS 1, 2, 3, 4, 6(a), 7(a), 7(b)(1), 7(c), 8, 9, 11, 13, 14, 16, 17, 18 AND 20 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MARCH 23, 2018.

DRAWN BY:
M. Carnaghi
DESIGNED BY:
K. Navaroli

APPROVED BY:
K. Navaroli

DATE:
March 30, 2018

SCALE: N.T.S.

NFE JOB NO. SHEET NO.
CITY FILE #18-015 K342 SP2

Table with columns: Tree #, Botanical Name, Common Name, Dia., Type, Other Dia., Condition, Comments. Contains tree inventory data for trees 1741 through 1850.

Table with columns: Tree #, Botanical Name, Common Name, Dia., Type, Other Dia., Condition, Comments. Contains tree inventory data for trees 1630 through 1740.

Table with columns: Tree #, Botanical Name, Common Name, Dia., Type, Other Dia., Condition, Comments. Contains tree inventory data for trees 1533 through 1629.

LEGAL DESCRIPTION - PER TITLE COMMITMENT

LAND SITUATED IN THE COUNTY OF OAKLAND, CITY OF ROCHESTER HILLS, STATE OF MICHIGAN, IS DESCRIBED AS FOLLOWS:
PARCEL 1:
PART OF THE SOUTHWEST 1/4 OF SECTION 8, TOWN 3 NORTH, RANGE 11 EAST, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 8, 830.33 FEET TO THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 04' 00" WEST 100 FEET TO A POINT ON THE WESTERLY RIGHT-OF-WAY LINE OF BREWSTER ROAD AND THE POINT OF BEGINNING; THENCE SOUTH 04 DEGREES 03' 00" WEST, ALONG SAID RIGHT-OF-WAY LINE, 313.44 FEET; THENCE SOUTH 89 DEGREES 04' 00" WEST, 228.50 FEET; THENCE NORTH 04 DEGREES 03' 00" WEST, 110 FEET; THENCE SOUTH 89 DEGREES 04' 00" WEST, 160.00 FEET; THENCE NORTH 04 DEGREES 03' 00" WEST, 110 FEET; THENCE SOUTH 89 DEGREES 04' 00" WEST, 110 FEET TO THE POINT OF BEGINNING.

LEGAL DESCRIPTION - AS SURVEYED

PART OF THE SOUTHWEST 1/4 OF SECTION 8, TOWN 3 NORTH, RANGE 11 EAST, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 8, THENCE SOUTH 89 DEGREES 04' 00" WEST 100 FEET TO A POINT ON THE WESTERLY RIGHT-OF-WAY LINE OF BREWSTER ROAD AND THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 04' 00" WEST 100 FEET TO A POINT ON THE WESTERLY RIGHT-OF-WAY LINE OF BREWSTER ROAD AND THE POINT OF BEGINNING; THENCE SOUTH 04 DEGREES 03' 00" WEST, ALONG SAID RIGHT-OF-WAY LINE, 313.44 FEET; THENCE SOUTH 89 DEGREES 04' 00" WEST, 228.50 FEET; THENCE NORTH 04 DEGREES 03' 00" WEST, 110 FEET; THENCE SOUTH 89 DEGREES 04' 00" WEST, 160.00 FEET; THENCE NORTH 04 DEGREES 03' 00" WEST, 110 FEET; THENCE SOUTH 89 DEGREES 04' 00" WEST, 110 FEET TO THE POINT OF BEGINNING.

TITLE REPORT NOTES

REFERENCE FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NUMBER: 804189, EFFECTIVE DATE: JANUARY 22, 2018, DATE PRINTED: FEBRUARY 26, 2018.
SCHEDULE B. EXCEPTIONS:
EXCEPTIONS: 1, 2, 3, 4, 5, 12, 13, 14, 15 AND 16 REFER TO THE OWNERSHIP OF THE PROPERTY AND/OR ARE NOT PLOTTABLE.
6. TERMS AND CONDITIONS CONTAINED IN RESTRICTIONS AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 4008, PAGE 52.
7. RIGHT OF WAY IN FAVOR OF MICHIGAN BELL TELEPHONE COMPANY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 481, PAGE 08 AND IN LIBER 4861, PAGE 118, AS TO PARCEL 2, (AS PLOTTED HEREON).
8. RIGHT OF WAY IN FAVOR OF MICHIGAN BELL TELEPHONE COMPANY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 481, PAGE 08 AND IN LIBER 4861, PAGE 118, AS TO PARCEL 2, (AS PLOTTED HEREON).
9. SANITARY SEWER EASEMENT IN FAVOR OF THE TOWNSHIP OF AVON AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 7420, PAGE 248, AS TO PARCEL 2, (AS PLOTTED HEREON).
10. EASEMENT IN FAVOR OF THE COUNTY OF OAKLAND AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 5508, PAGE 711, AS TO PARCEL 1, (AS PLOTTED HEREON).
11. UNDERGROUND EASEMENT (RIGHT OF WAY) IN FAVOR OF THE DETROIT EDISON COMPANY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 17163, PAGE X OF THE FLOOD INSURANCE RATE MAP (SAID EASEMENT NOT ON OR ADJACENT TO SUBJECT PROPERTY, NOT PLOTTED).

SURVEY DATA

SITE AREA:
PARCEL 1: 185,660.41 SQ. FT. OR 4.282 ACRES
PARCEL 2: 149,996.79 SQ. FT. OR 3.443 ACRES
OVERALL (GROSS): 335,657.20 SQ. FT. OR 7.705 ACRES
OVERALL (NET): TO 43' R.O.W. LINE: 322,716.50 SQ. FT. OR 7.408 ACRES
OVERALL (NET): TO FUTURE 60' R.O.W. LINE: 312,283.93 SQ. FT. OR 7.168 ACRES
ZONED:
PARCEL 1: SP SPECIAL PURPOSE DISTRICT
PARCEL 2: R1 & R3 RESIDENTIAL DISTRICT
PARKING SPACES:
PARCEL 1: NONE (VACANT SITE)
PARCEL 2: NONE (VACANT SITE)
NOTE: A ZONING REPORT OR LETTER HAS NOT BEEN FURNISHED BY THE CLIENT TO THE SURVEYOR, THEREFORE NO ADDITIONAL ZONING INFORMATION CAN BE SHOWN.

ALTA SURVEY NOTES

THERE IS NO VISIBLE EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS, EXCEPT AS NOTED.
THERE IS NO PROPOSED CHANGES IN STREET RIGHT OF WAY LINES AND THERE IS NO EVIDENCE OF STREET RIGHT OF WAY SIDEWALK CONSTRUCTION OR REPAIR, EXCEPT AS NOTED.
THERE IS NO EVIDENCE OF SITE USE AS A SOLID WASTE DUMP, SLUMP OR SANITARY LANDFILL.
THERE IS NO VISIBLE EVIDENCE OF WETLAND AREAS, AS SHOWN HEREON.
LOCATION OF UTILITIES EXISTING ON OR SERVING THE PROPERTY IS DETERMINED BY OBSERVED EVIDENCE OR INFORMATION FROM PLANS REQUESTED BY THE SURVEYOR AND OBTAINED FROM UTILITY COMPANIES.
THE SUBJECT PROPERTY HAS ACCESS TO BREWSTER ROAD, BEING A PUBLICLY DEDICATED ROAD.

TOPOGRAPHIC SURVEY NOTES

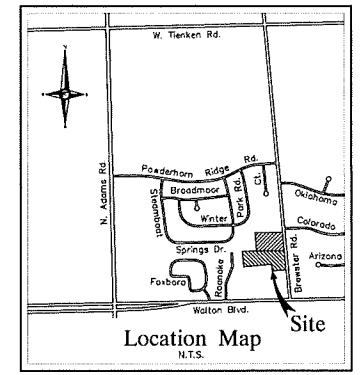
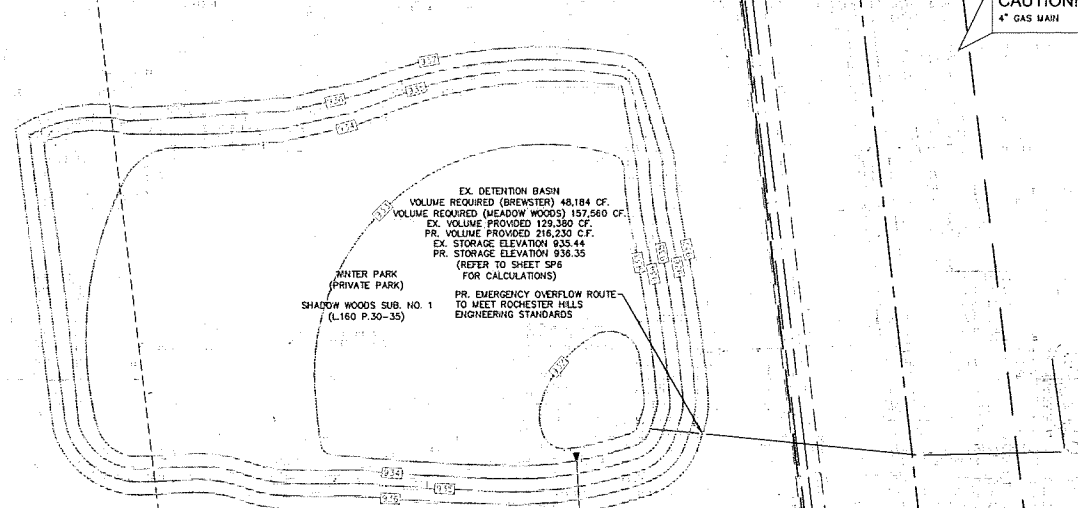
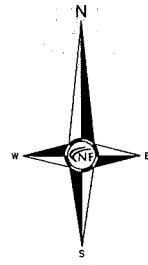
ALL ELEVATIONS ARE EXISTING ELEVATIONS, UNLESS OTHERWISE NOTED.
UTILITY LOCATIONS WERE OBTAINED FROM MUNICIPAL OFFICIALS AND RECORDS OF UTILITY COMPANIES, AND NO GUARANTEE CAN BE MADE TO THE COMPLETENESS, OR EXACTNESS OF LOCATION.
CERTIFIED TO:
-ROBERTSON BROTHERS CO., A MICHIGAN CORPORATION, ON BEHALF OF AN ENTITY TO BE FORMED
-SAUMITA, A MICHIGAN NON-PROFIT CORPORATION, FORMERLY KNOWN AS LUTHERAN SOCIAL SERVICES OF MICHIGAN, A MICHIGAN NON-PROFIT CORPORATION
-FIRST AMERICAN TITLE INSURANCE COMPANY
THIS IS TO CERTIFY THAT THIS MAP OR PLAN AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDE ITEMS 1, 2, 3, 4, 6(a), 7(a), 7(b)(1), 7(c), 8, 9, 11, 13, 14, 16, 17, 18 AND 20 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MARCH 23, 2018.

MISS DIG / UTILITY DISCLAIMER NOTE

A MISS DIG TICKET NUMBER B80750886, PURSUANT TO MICHIGAN PUBLIC ACT 174 WAS OBTAINED FOR THE SURVEYED PROPERTY, DUE TO THE EXTENDED REPORTING PERIOD FOR UNDERGROUND FACILITY OWNERS TO PROVIDE THEIR RECORDS, THE SURVEYOR MAY NOT REFLECT ALL THE UTILITIES AT THE TIME THE SURVEY WAS ISSUED ON MARCH 30, 2018. THE SURVEY ONLY REFLECTS THOSE UTILITIES WHICH COULD BE OBSERVED BY THE SURVEYOR OR OBTAINED FROM AS DETERMINED BY THE UTILITY COMPANY RECORDS FURNISH PRIOR TO THE DATE THIS SURVEY WAS ISSUED. THE CLIENT AND/OR THEIR AUTHORIZED AGENT SHALL VERIFY WITH THE FACILITY OWNER AND/OR THEIR AUTHORIZED AGENTS, THE COMPLETENESS AND EXACTNESS OF THE UTILITIES LOCATION.

FLOOD HAZARD NOTE

THE PROPERTY DESCRIBED ON THIS SURVEY DOES NOT LIE WITHIN A SPECIAL FLOOD HAZARD AREA AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY. THE PROPERTY LIES WITHIN ZONE X OF THE FLOOD INSURANCE RATE MAP (SAID EASEMENT NOT ON OR ADJACENT TO SUBJECT PROPERTY, NOT PLOTTED).

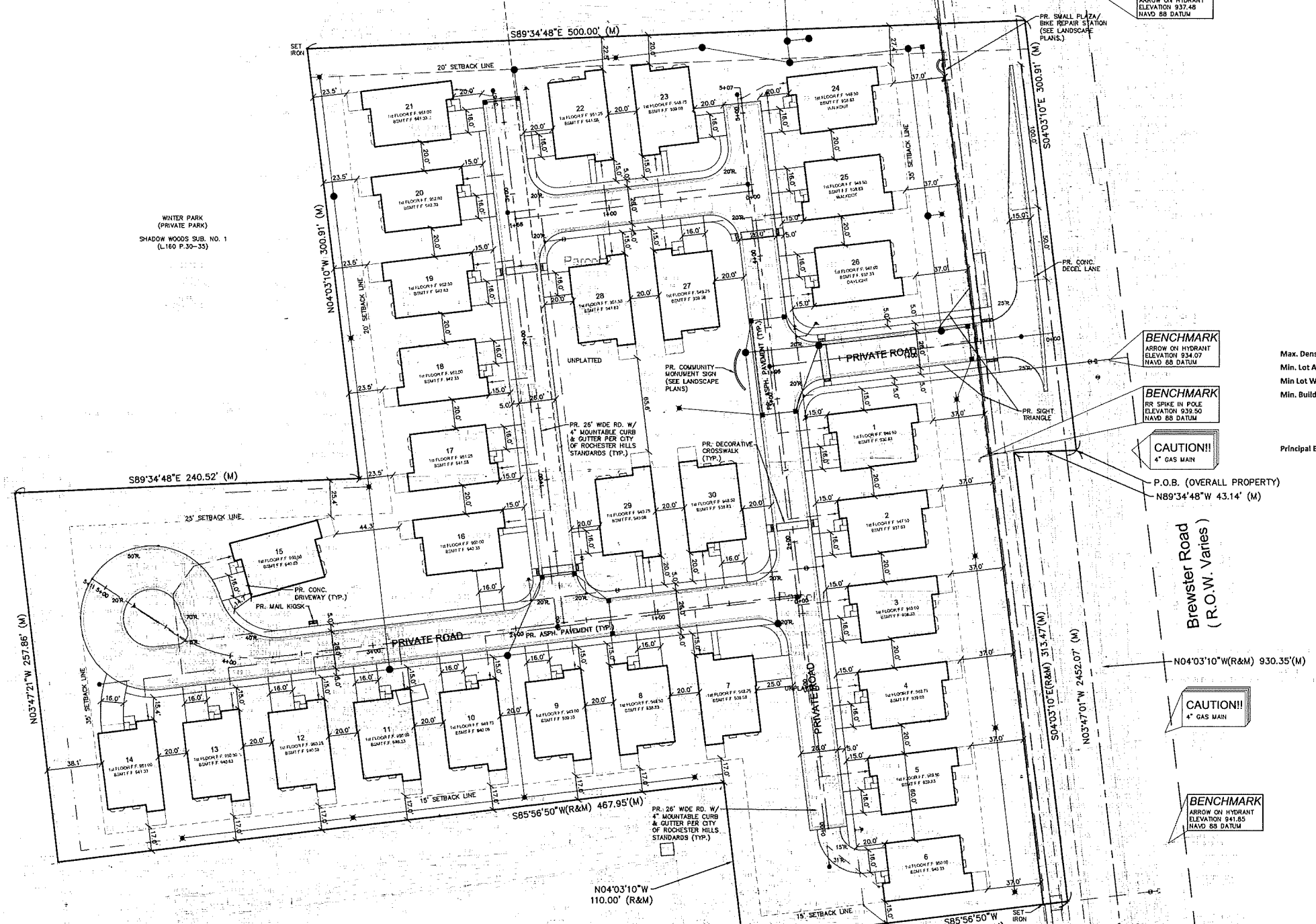
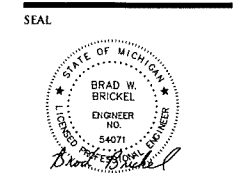


NF ENGINEERS
 CIVIL ENGINEERS
 LAND SURVEYORS
 LAND PLANNERS

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

Colorado Ave.
 (60' R.O.W.)

EXISTING DETENTION NOTE
 THE EXISTING DETENTION POND SHALL BE EXCAVATED TO REMOVE ALL CATAKALS / FRAGITE. THE BOTTOM OF THE DETENTION POND SHALL BE EXCAVATED TO AN ELEVATION THAT MATCHES THE AS-BUILT ELEVATION OF THE POND WHEN FIRST CONSTRUCTED AS PROVIDED BY THE CITY OF ROCHESTER HILLS. THE BOTTOM OF THE POND WOULD BE RE-GRADED TO ALLOW POSITIVE DRAINAGE TO THE EXISTING OUTLET STORM PIPE. THE EXISTING STORM PIPE ENTERING AND EXISTING THE POND SHALL BE CLEANED AND DEBRIS REMOVED.



Schedule of Regulations and Modifications Compared to R-1 and R-3 Brewster Village

	R-1 / R-3	Proposed Development	Deviations From R-3
Max. Density	1.7 du/ac / 2.8 du/ac	4.1 du/ac	1.3 du/ac
Min. Lot Area	20,000 sf / 12,000 sf	N/A	N/A
Min Lot Width	100' / 90'	N/A	N/A
Min. Building Setbacks			
Front Setback	40' / 30'	20' to back of curb	10'
Side Min. Principal	15' / 10'	20' Between Units	In Compliance
Side Total Principal	30' / 20'	20' Between Units	In Compliance
Rear Setback Principal	35'	15'	15'
Principal Building Height to Midpoint	2.5 stories/30 feet	1.5 stories/30 feet	In Compliance

SITE DATA

SITE AREA	335,657.20 SFT. OR 7.705 ACRES
GROSS	312,263.92 SFT. OR 7.168 ACRES
NET	
ZONING	R-1 & R-3 (ONE FAMILY RESIDENTIAL), SP SPECIAL PURPOSE
EXISTING	
PARKING REQUIRED	2 SPACES PER UNIT - 30 UNITS - 60 SPACES
PROVIDED	2 SPACES PER LINE - 30 UNITS - 60 SPACES
SITE AREA	312,263.92 SFT. 100.0%
BUILDING FOOTPRINT	66,773.70 SFT. 21.4%
PARKING & DRIVES	71,790.00 SFT. 23.0%
OPEN SPACE	173,700.22 SFT. 55.6%

PAVING LEGEND

[Symbol]	PROPOSED CONCRETE PAVEMENT
[Symbol]	PROPOSED ASPHALT PAVEMENT

LEGEND

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

PROJECT
 Vacant Parcels -
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PROJECT LOCATION
 Part of the SW 1/4
 of Section 8
 T.3N., R.11E.,
 City of Rochester Hills,
 Oakland County, Michigan

SHEET
 General Site Plan



DATE ISSUED/REVISED

3-30-18	SURVEY ISSUED
4-4-18	REVISED PER CLIENT
8-2-18	ISSUED FOR SITE PLAN REVIEW
10-12-18	ISSUED FOR SITE PLAN REVIEW
11-13-18	REVISED PER CITY REVIEW

DRAWN BY:
 J. Lawrey

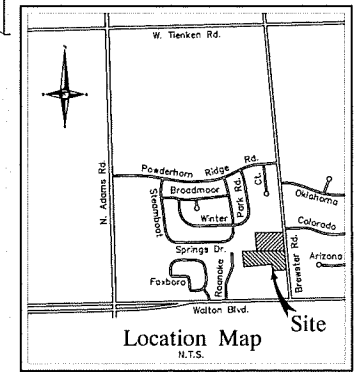
DESIGNED BY:
 B. Brickel

APPROVED BY:
 B. Brickel

DATE:
 March 30, 2018

SCALE: 1" = 40'

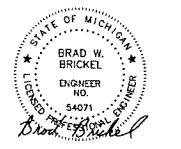
NFE JOB NO. **K342** SHEET NO. **SP3**



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SEAL



PROJECT
Vacant Parcels -
Brewster Road
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PROJECT LOCATION
Part of the SW 1/4
of Section 8
T.3N., R.11E.,
City of Rochester Hills,
Oakland County, Michigan

SHEET
Paving & Grading Plan



Know what's below
Call before you dig.

DATE	ISSUED/REVISED
3-30-18	ISSUE
4-4-18	REVISED PER CLIENT
8-2-18	ISSUED FOR SITE PLAN REVIEW
10-12-18	ISSUED FOR SITE PLAN REVIEW
11-13-18	REVISED PER CITY REVIEW

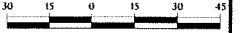
DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

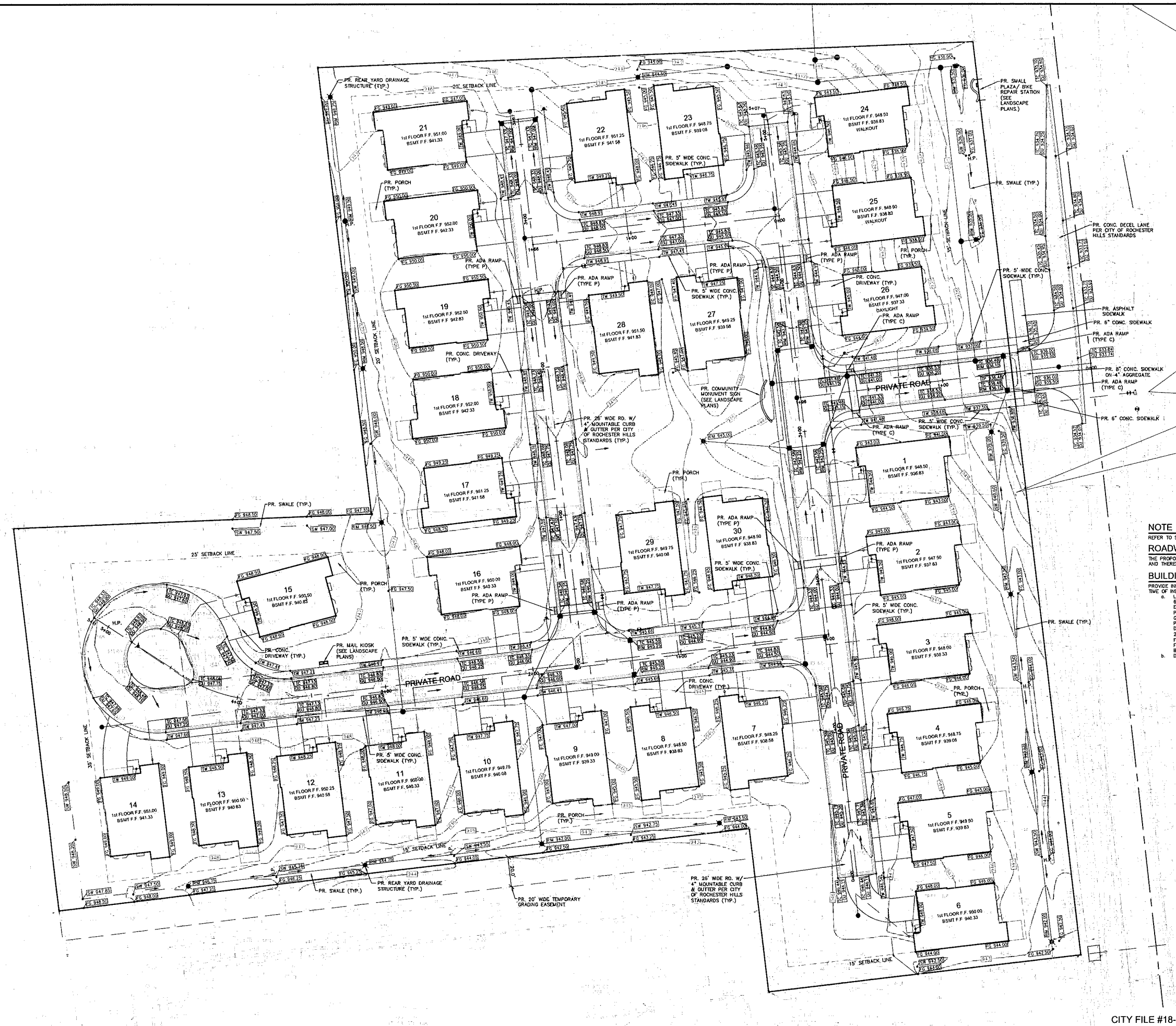
APPROVED BY:
B. Brickel

DATE:
March 30, 2018

SCALE: 1" = 30'



NFE JOB NO. SHEET NO.
K342 SP4



NOTE
REFER TO SHEET SP6 FOR ADDITIONAL NOTES & DETAILS.

ROADWAY NOTE
THE PROPOSED ROADS ARE NOT BEING CONSTRUCTED TO CITY PUBLIC ROAD STANDARDS AND THEREFORE, CANNOT BE CONVEYED TO THE CITY AS PUBLIC ROADS IN THE FUTURE.

BUILDING NOTES
PROVIDE INDIVIDUAL RESIDENCE PLOT PLANS FOR CODE COMPLIANT SITE DRAINAGE AT THE TIME OF INDIVIDUAL BUILDING PER APPLICATIONS.
a. LOTS SHALL BE GRADED TO FALL AWAY FROM FOUNDATION WALLS A MINIMUM OF 6 INCHES WITHIN THE FIRST 10 FEET.
EXCEPTION: WHERE LOT LINES, WALLS, SLOPES OR OTHER PHYSICAL BARRIERS PREVENT 6 INCHES (152 MM) OF FALL WITHIN 10 FEET (3048 MM), THE FINAL GRADE SHALL SLOPE AWAY FROM THE FOUNDATION AT A MINIMUM SLOPE OF 5 PERCENT AND THE WATER SHALL BE DIRECTED TO DRAINS OR SWALES TO ENSURE DRAINAGE AWAY FROM THE STRUCTURE. SWALES SHALL BE SLOPED A MINIMUM OF 2 PERCENT WHEN LOCATED WITHIN 10 FEET (3048 MM) OF THE BUILDING FOUNDATION. IMPERVIOUS SURFACES WITHIN 10 FEET (3048 MM) OF THE BUILDING FOUNDATION SHALL BE SLOPED A MINIMUM OF 2 PERCENT AWAY FROM THE BUILDING. SECTION R-401.3
b. DRIVEWAY SLOPES SHALL MEET THE FOLLOWING REQUIREMENTS:
i. APPROACH AND DRIVEWAY: 2% MINIMUM - 10% MAXIMUM.
ii. SIDE-ENTRY GARAGE: 2% MINIMUM, 4% MAXIMUM.
iii. SIDEWALK CROSS-SLOPE (INCLUDING PORTION IN THE DRIVEWAY APPROACH): 1% MINIMUM, 2% MAXIMUM IS ALLOWED BUT A DESIGN SLOPE 1.5% WILL ALLOW FOR CONSTRUCTION INACCURACIES.

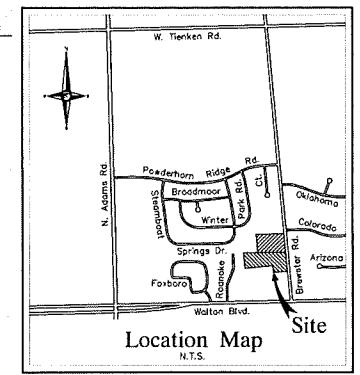
PAVING LEGEND

[Symbol]	PROPOSED CONCRETE PAVEMENT
[Symbol]	PROPOSED ASPHALT PAVEMENT

LEGEND

[Symbol]	MANHOLE	[Symbol]	EXISTING SANITARY SEWER
[Symbol]	HYDRANT	[Symbol]	SAN. CLEAN OUT
[Symbol]	MANHOLE CATCH BASIN	[Symbol]	EXISTING WATERMAIN
[Symbol]	UTILITY POLE GUY POLE	[Symbol]	EXISTING STORM SEWER
[Symbol]	GUY WIRE	[Symbol]	EX. R. Y. CATCH BASIN
[Symbol]	EXISTING GAS MAIN	[Symbol]	EXISTING BURIED CABLES
[Symbol]	C.O. MANHOLE	[Symbol]	OVERHEAD LINES
[Symbol]	HYDRANT GATE VALVE	[Symbol]	LIGHT POLE
[Symbol]	INLET C.B. MANHOLE	[Symbol]	SIGN
[Symbol]	PR. R. Y. CATCH BASIN	[Symbol]	EXISTING GAS MAIN
[Symbol]	PROPOSED LIGHT POLE	[Symbol]	PR. SANITARY SEWER
[Symbol]	PR. TOP OF CURB ELEVATION	[Symbol]	PR. WATER MAIN
[Symbol]	PR. GUTTER ELEVATION	[Symbol]	PR. STORM SEWER
[Symbol]	PR. TOP OF WALK ELEVATION	[Symbol]	PR. R. Y. CATCH BASIN
[Symbol]	PR. TOP OF PAVT. ELEVATION	[Symbol]	PR. TOP OF CURB ELEVATION
[Symbol]	FINISH GRADE ELEVATION	[Symbol]	PR. GUTTER ELEVATION
[Symbol]		[Symbol]	PR. TOP OF WALK ELEVATION
[Symbol]		[Symbol]	PR. TOP OF PAVT. ELEVATION
[Symbol]		[Symbol]	FINISH GRADE ELEVATION

CITY FILE #18-015

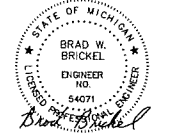


NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

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

SEAL



PROJECT
Vacant Parcels -
Brewster Road
(N. of Walton Blvd.)
Rochester Hills, MI 48309

CLIENT
Robertson Brothers Homes
6905 Telegraph Road,
Suite 200
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
248.282.1428 - Phone
248.282.1432 - Fax

PROJECT LOCATION
Part of the SW 1/4
of Section 8
T.3N., R.11E.,
City of Rochester Hills,
Oakland County, Michigan

SHEET
Utility Plan



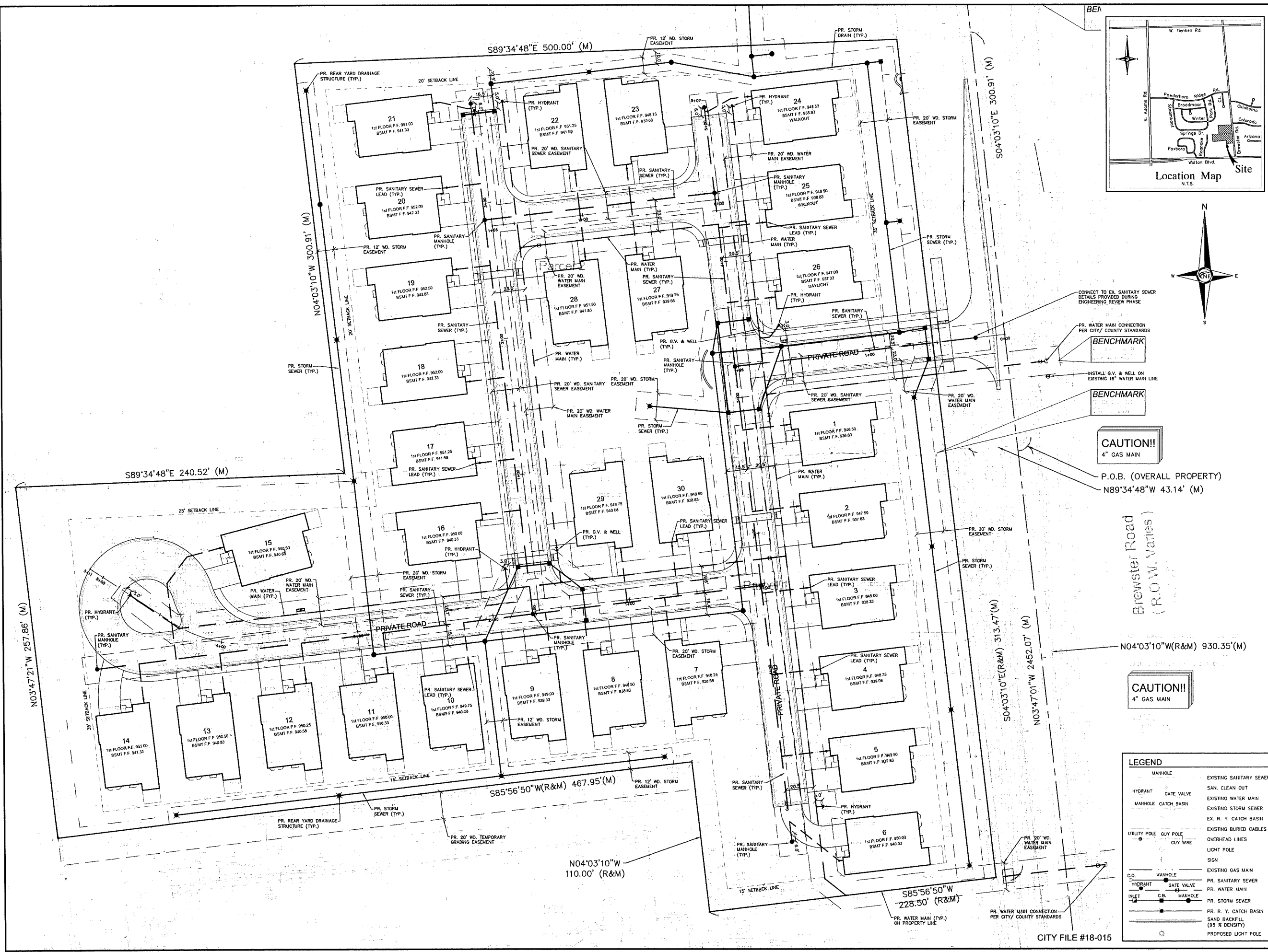
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DRAWN BY:
J. Lawrey
DESIGNED BY:
B. Brickel
APPROVED BY:
B. Brickel

DATE:
March 30, 2018

SCALE: 1" = 30'

NFE JOB NO. SHEET NO.
K342 SP5



LEGEND

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

CITY FILE #18-015

SANITARY SEWER NOTES

THE CONTRACTOR SHALL NOTIFY THE INSPECTION SECTION OF THE DETROIT WATER AND SEWERAGE DEPT. AT (313) 833-4882 AT LEAST 48 HOURS PRIOR TO THE START OF ANY SANITARY SEWER CONSTRUCTION.

ALL SEWERS TO BE PLACED ON CLASS "B" BEDDING OR BETTER.

WYES, RISERS AND HOUSE LEADS ARE TO BE PLACED AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. ALL WYES ARE INCIDENTAL.

EACH WYE OR HOUSE LEAD SHALL HAVE A PLUG OF THE SAME TYPE OF JOINT AS THE HOUSE LEAD.

HOUSE LEADS SHALL BE A MINIMUM OF 9 FEET DEEP AT THE PROPERTY LINE.

WHenever existing manholes or sewer pipe are to be TAPPED, HOLES ARE TO BE DRILLED AT 4 INCH CENTER TO CENTER SPACINGS AROUND THE PERIMETER OF THE PROPOSED OPENING TO CREATE A PLANE OF WEAKNESS JOINT - A 12 INCH THICK CONCRETE COLLAR IS TO ENCASE THE NEW PIPE AND OPENING.

MAXIMUM INFILTRATION SHALL NOT EXCEED 100 GALLONS PER INCH OF DIAMETER PER MILE OF PIPE PER 24 HOURS. FOR PURPOSES OF TESTING INFILTRATION, A BULKHEAD WITH A ONE INCH DIAMETER PIPE SHALL BE PROVIDED AT THE DOWNSTREAM MANHOLE.

THE INSIDE JOINTS FOR ALL SANITARY SEWERS 30" AND LARGER SHALL BE CEMENT POINTED.

ALL SANITARY SEWER MANHOLES SHALL BE PROVIDED WITH WATER TIGHT BOLT DOWN COVERS.

ALL CONCRETE SANITARY SEWER, MANHOLE AND PIPE JOINT SHALL BE MODIFIED GROOVED TONGUE WITH RUBBER GASKETS AS REQUIRED UNDER THE CURRENT A.S.T.M. C-443.

CONTACT THE OFFICE OF THE MACOMB COUNTY PUBLIC WORKS COMMISSIONER AT 469-5325, 48 HOURS BEFORE CONSTRUCTION.

NO GROUND WATER, STORM WATER, CONSTRUCTION WATER, DOWNSPOUT OR WEEP TILE DRAINAGE SHALL BE ALLOWED TO ENTER ANY SANITARY SEWER INSTALLATION.

ALL SANITARY SEWER LEADS SHALL BE INSTALLED TO A POINT 5 FEET FROM THE PROPOSED BUILDING.

WATER MAIN NOTES

ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY. THE MUNICIPALITY STANDARD NOTES, DETAILS AND SPECIFICATIONS SHALL BE INCORPORATED AS PART OF THESE PLANS.

WATER MAIN SHALL BE OF THE TYPE, SIZE & CLASS DESIGNATION INDICATED ON THE PLANS.

THE CONTRACTOR SHALL NOTIFY MISS DIG (1-800-482-7171) A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION.

THE UNDERGROUND SITE CONTRACTOR SHALL INSTALL ALL WATER MAIN BUILDING SERVICE TO WITHIN FIVE (5) FEET OF PROPOSED BUILDING.

THE CONTRACTOR SHALL PAY FOR AND SECURE ALL NECESSARY PERMITS AND LICENSES ARRANGE FOR ALL SITE INSPECTIONS.

PROPOSED WATER MAIN SHALL BE CONFORMING TO A.N.S.I./A.W.W.A. SPECIFICATION C151/A21.51, CLASS 54, DUCTILE IRON FITTINGS SHALL CONFORM TO A.N.S.I./A.W.W.A. SPECIFICATION C110/A21.10 FOR STANDARD FITNESS OR TO A.N.S.I./A.W.W.A. SPECIFICATION C153/A21.53 FOR COMPACT FITNESS. DUCTILE IRON PIPE AND FITTINGS SHALL HAVE A DOUBLE THICKNESS CEMENT MORTAR LINING CONFORMING TO A.N.S.I. SPECIFICATION A21.4.

JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE U.S. PIPE AND FOUNDRY COMPANY "TYTON JOINT" OR APPROVED EQUAL.

ALL WATER MAIN SHALL BE INSTALLED WITH A MINIMUM COVER OF SIX (6) FEET BELOW FINISH GRADE. WHEN WATER MAINS MUST PASS UNDER A STORM SEWER OR SANITARY SEWER, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE KEPT TO A MINIMUM LENGTH BY THE USE OF VERTICAL ELBOWS AND ONE-QUARTER (1/4) DEGREE BENDS, PROPERLY ANCHORED.

ALL TRENCHES UNDER OR WITHIN THREE (3) FEET OF THE FORTY-FIVE (45) DEGREE LINE OF INFLUENCE OF EXISTING OR PROPOSED PAVEMENT, SIDEWALK OR DRIVE APPROACH SHALL BE BACKFILLED WITH SAND COMPACTED TO NINETY-FIVE (95) PERCENT OF MAXIMUM UNIT WEIGHT.

HYDRANTS SHALL BE E.J.I.W. 6 BR TRAFFIC TYPE PER MUNICIPALITY STANDARDS. HYDRANT BURY SHALL BE SIX (6) FEET.

THE CONTRACTOR WILL FILL, FLUSH, DISINFECT AND PRESSURE TEST ALL NEW WATER MAIN CONSTRUCTION, IN THE PRESENCE OF THE GOVERNING MUNICIPALITY WATER DEPARTMENT. BACTERIOLOGICAL TESTING SHALL BE PERFORMED BY THE GOVERNING MUNICIPALITY WATER DEPARTMENT.

BEFORE ANY WATER MAIN WILL BE ACCEPTED BY THE MUNICIPALITY, IT MUST PASS A PRESSURE TEST COMPLYING WITH THE CURRENT SPECIFICATIONS AND PROCEDURES OF THE MUNICIPALITY AND THE DETROIT WATER DEPARTMENT.

ALL DUCTILE IRON PIPE SHALL BE ENCASED IN POLYETHYLENE FILM CONFORMING TO A.N.S.I./A.W.W.A. SPECIFICATION A21.5/C-105, WHERE REQUIRED BY THE MUNICIPALITY.

GATE WELL COVERS SHALL BE E.J.I.W. NO. 1040 OR APPROVED EQUAL. WHERE GATE WELLS ARE LOCATED WITHIN PAVEMENT GREATER THAN SEVEN (7) INCHES THICK, THE GATE WELL COVER SHALL BE E.J.I.W. NO. 1050 OR APPROVED EQUAL.

ROADWAY NOTE

THE PROPOSED ROADS ARE NOT BEING CONSTRUCTED TO CITY PUBLIC ROAD STANDARDS, AND THEREFORE, CANNOT BE CONVEYED TO THE CITY AS PUBLIC ROADS IN THE FUTURE.

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 NO. 1100L, 20A4; SURFACE COURSE - MDOT BITUMINOUS MIXTURE NO. 1100T, 20A4; ASPHALT CEMENT PENETRATION GRADE 85-100; ROAD COAT - MDOT SS-1H EMULSION AT 0.10 GALLON PER SQUARE YARD; MAXIMUM 2 INCH LIFT.

PAVEMENT BASE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY (MODIFIED PROCTOR) PRIOR TO PLACEMENT OF PROPOSED PAVEMENT. EXISTING SUB-BASE SHALL BE PROOF-ROLLED IN THE PRESENCE OF THE ENGINEER TO DETERMINE STABILITY.

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

ALL CONCRETE PAVEMENT JOINTS SHALL BE FILLED WITH HOT POURED RUBBERIZED ASPHALT JOINT SEALING COMPOUND IMMEDIATELY AFTER SAWCUT OPERATION. FEDERAL SPECIFICATION SS-518A.

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 ARRANGE FOR ALL SITE INSPECTIONS.

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 RAMP.

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

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

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

STORM SEWER NOTES

ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY. THE MUNICIPALITY STANDARD NOTES, DETAILS AND SPECIFICATIONS SHALL BE INCORPORATED AS PART OF THESE PLANS.

ALL STORM SEWER TRENCHES UNDER OR WITHIN THREE (3) FEET OF EXISTING OR PROPOSED PAVEMENT SHOULD BE BACKFILLED WITH MDOT CLASS II MATERIAL (SAND) AND BE MACHINE COMPACTED TO A MINIMUM OF 95% OF THE MATERIAL'S MAXIMUM DENSITY. PAVEMENT SHALL INCLUDE PARKING LOTS, DRIVE APPROACHES, CURB & GUTTER AND ADJACENT WALLS.

ALL STORM SEWER PIPE SHALL BE INSTALLED ON CLASS "B" BEDDING OR BETTER UNLESS OTHERWISE INDICATED ON THE PLANS.

STORM SEWER SHALL BE OF THE TYPE, SIZE & CLASS DESIGNATION INDICATED ON THE PLANS AND SHALL BE INSTALLED AT THE PROPOSED LINE AND GRADE INDICATED.

ALL STORM SEWER PIPE SHALL BE REINFORCED CONCRETE PIPE CONFORMING TO ASTM SPECIFICATION C-76, CL. IV.

ALL MANHOLE, CATCH BASIN, INLET, REAR YARD DRAIN FRAMES AND COVERS SHALL BE AS INDICATED ON THE PLANS IN ACCORDANCE WITH MUNICIPALITY STANDARDS.

THE CONTRACTOR SHALL NOTIFY MISS DIG (1-800-482-7171) A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION.

EXACT GRADES AND INVERTS OF PROPOSED STORM SEWER ARE TO BE CHECKED WITH THE FIELD ENGINEER PRIOR AND DURING INSTALLATION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE DESIGN ENGINEER OF ANY PLAN INCONSISTENCY AND/OR UTILITY CONFLICTS.

ALL STORM SEWER PIPE JOINTS SHALL BE "PREMIUM JOINT" MODIFIED GROOVED TONGUE (M.G.T.) WITH SYNTHETIC RUBBER GASKETS CONFORMING TO ASTM SPECIFICATION C-443 & C-361 UNLESS OTHERWISE INDICATED ON THE PLANS. ALTERNATE JOINT CONNECTION MAY BE STANDARD GROOVED TONGUE WITH COLD MASTIC (DEWITT #10 JOINT COMPOUND OR EQUAL).

FACTORY MANUFACTURED PRECAST TEE SECTIONS SHALL BE USED FOR ROOF DRAINS AND/OR SUMP PLUMP LEADS AND LATERALS WHERE INDICATED ON THE PLANS. BLIND TOP CONNECTIONS INTO STORM SEWER WILL NOT BE PERMITTED BY BREAKING PIPE WALL.

THE UNDERGROUND SITE CONTRACTOR SHALL INSTALL ALL STORM SEWER BUILDING LEADS TO WITHIN FIVE (5) FEET OF PROPOSED BUILDING.

GROUNDED RIP RAP SHALL BE INSTALLED AT THE ENDS OF ALL CONVEYERS AND END SECTIONS. GROUNDED RIP RAP SHALL BE INSTALLED AT OUTLET POINTS IN DETENTION AND SEDIMENTATION FACILITY. THE MINIMUM WIDTH OF THE RIP RAP SHALL BE TWICE THE OUTSIDE DIAMETER OF THE PIPE. THE RIP RAP SHALL EXTEND FROM THE BOTTOM OF THE SLOPE TO THE PIPE INVERT.

THE CONTRACTOR SHALL PAY FOR AND SECURE ALL NECESSARY PERMITS AND LICENSES ARRANGE FOR ALL SITE INSPECTIONS.

Sanitary Sewer Basis of Design

**Brewster Village
Rochester Hills, Oakland County**

Development(s): 30.00 EA Single Family Residence

Population Equivalents: 30.00 Residence at 3.5 people per unit
105.00 People

Average Flow: 0.0162 CFS Average Flow = $\frac{\# \text{ of People} \times 100 \text{ Gal/Cap/Day}}{7.48 \times 60 \times 60 \times 24}$

Peak Flow: 0.0689 CFS Peaking Factor = $\frac{18 + (\# \text{ of People}/1000) \wedge 0.50}{4 + (\# \text{ of People}/1000) \wedge 0.50}$
Peak Flow = Average Flow x Peaking Factor

Pipe Capacity Provided: 8 In. Dia. @ 0.40 % = 1.104 CFS

Waste Generated: 0.0162 CFS * 646,272 (Gallons/Day)/CFS = 10,500 GPD - Average
0.0689 CFS * 646,272 (Gallons/Day)/CFS = 44,496 GPD - Peak

DETENTION CALCULATIONS - Oakland County Method 100 Yr. Event

CONTRIBUTING ACREAGE	7.17 ACRES
Qa ALLOWABLE OUTFLOW	0.20 CFS/ACRE
C RUNOFF COEFFICIENT	0.56 IMPERVIOUSNESS
Qa MAXIMUM ALLOWABLE OUTFLOW	0.357 CFS/ACRE*MPER
Ts STORAGE TIME (100 YEAR)	144.926 MINUTES
Vs STORAGE VOLUME	12,002.10 CFS/ACRE*MPER
Vt TOTAL VOLUME (100 YR. EVENT)	48,184.12 CUBIC FEET
TOTAL VOLUME REQUIRED (Brewster Village):	48,184 CUBIC FEET
TOTAL VOLUME REQUIRED (Meadow Woods):	157,560 CUBIC FEET
TOTAL VOLUME REQUIRED (Combined):	205,744 CUBIC FEET
100 YR. STORAGE ELEVATION:	936.35 FEET

PROVIDED DETENTION VOLUME

ELEVATION	SURFACE AREA SF.	INCR. VOLUME CF.	CUMULATIVE VOLUME CF.
931.00	2,018		
932.00	19,739	10,879	10,879
933.00	41,920	30,830	41,708
934.00	48,503	51,249	66,920
935.00	53,995	56,769	128,189
936.00	59,582	62,273	194,957
936.35	61,978	21,273	216,230
VOLUME PROVIDED (CF):			216,230

STORAGE VOLUME PROVIDED (CF): 216,230

Weighted Run-off Coefficient Calculation

Site Area: 312,263.92 S.F. or 7.169 Acres

Surface No. 1 - Pavement: 17,790.00 S.F. or 1.648 Acres
Surface No. 2 - Building: 66,773.00 S.F. or 1.533 Acres
Surface No. 3 - Landscape: 173,700.92 S.F. or 3.988 Acres
Surface No. 4 - Other: 0.00 S.F. or 0.000 Acres

Sum of Individual Areas: 312,263.92 S.F. or 7.169 Acres

Surface No. 1 - Coefficient: 0.95
Surface No. 2 - Coefficient: 0.95
Surface No. 3 - Coefficient: 0.25 Matherton Sandy Loam 0-3%
Surface No. 4 - Coefficient: 1.00

Required Formula:
C (Average) = $\frac{\text{Area 1} \cdot \text{C1} + \text{Area 2} \cdot \text{C2} + \text{Area 3} \cdot \text{C3} + \text{Area 4} \cdot \text{C4}}{\text{Area 1} + \text{Area 2} + \text{Area 3} + \text{Area 4}}$

C (Average) = 0.56

INFILTRATION NOTE

PER MIDWELL & ASSOCIATES LETTER DATED 10/12/18, INFILTRATION IS NOT SATISFACTORY FOR THIS DEVELOPMENT.

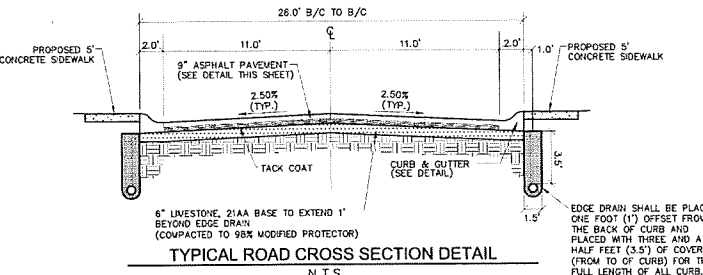
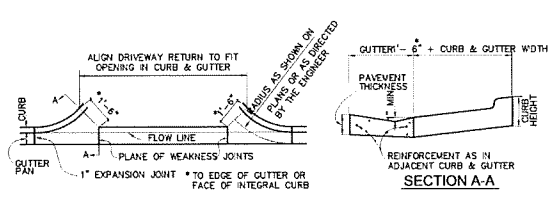
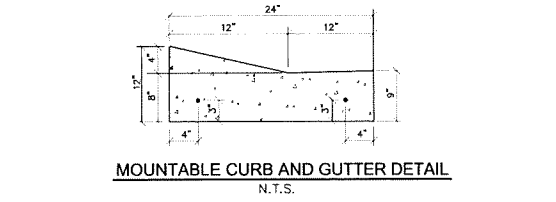
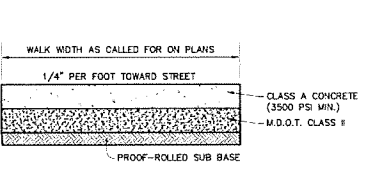
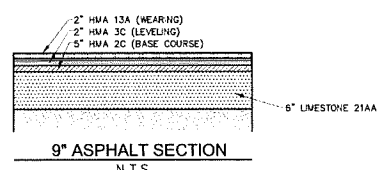
Rochester Hills - 1 Year Storm Event Infiltration Calculations

Detention Calculation - Rochester Hills Method

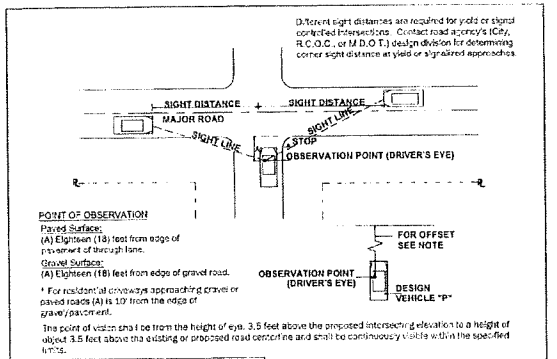
Contributing Acreage, A: 7.170 Acres
Runoff Coefficient, C: 0.560 Imperviousness

Required Volume Equation: $V = 1.815 \cdot C \cdot A$

Volume Required (V) Year = 7,287.59 Cubic Feet

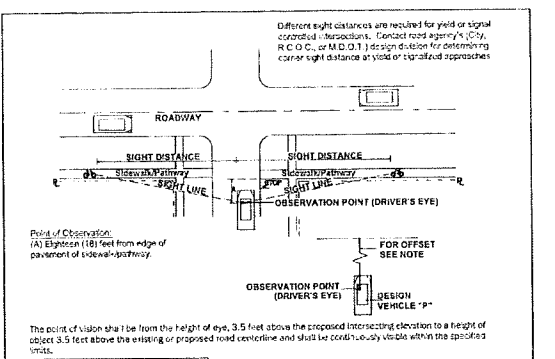


NOTE: EDGE DRAIN, SIX INCHES (6") IN DIAMETER, PERFORATED OR SLOTTED, SHALL BE CONSTRUCTED IN THE BACK OF CURB LINE FOR THE FULL LENGTH OF CURB. BACKFILLED WITH EITHER 20# SAND OR PEA STONE. PERFORATED PIPE SHALL BE SMOOTH-WALL PVC PLASTIC EDGE DRAIN WITH 3/16 INCH TO 3/8 INCH PERFORATIONS. SLOTTED PIPE SHALL BE A-2000 (CONTECH OR EQUIVALENT APPROVED BY THE CITY ENGINEER) SEWER PIPE, WITH SLOTTED PERFORATIONS OF 1.90 IN / FT OF PIPE LENGTH. THE PIPE SHALL BE INSTALLED WITH PROTECTIVE GEOTEXTILE SOCK WRAP.



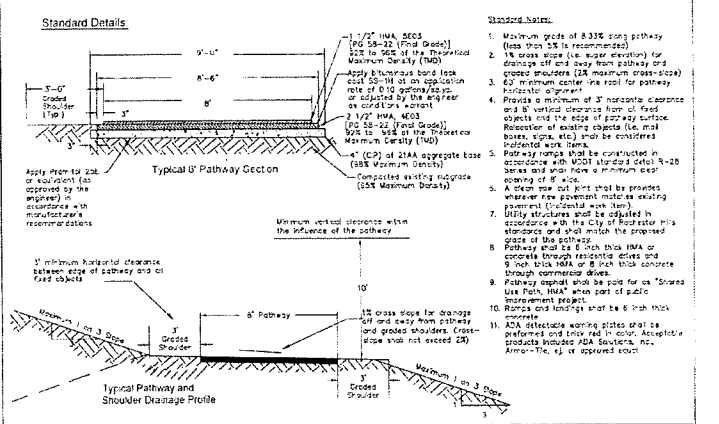
MINIMUM CORNER SIGHT DISTANCE FOR DRIVEWAYS AND STREETS AT MAJOR ROAD INTERSECTIONS FOR PASSENGER VEHICLES

MAJOR ROAD PORTED OR UNPORTED (MPH)	2 OR 3 LANE THRU ROAD IN FEET	4 OR 5 LANE THRU ROAD IN FEET
15	280	268
30	368	356
45	456	444
60	544	532
75	632	620
90	720	708



MINIMUM CORNER SIGHT DISTANCE FOR STREETS AT INTERSECTIONS

PATHWAY GRADE APPROACHING INTERSECTION (D)	MINIMUM SIGHT DISTANCE IN FEET, BOTH DIRECTIONS
0	105
-1	140
-2	175
-3	210
-4	245
-5	280
-6	315
-7	350
-8	385



CITY OF ROCHESTER HILLS STANDARD DETAIL FOR

Pathway Details:
Hot-Mixed Asphalt Pathway Construction, Extensions and Relocations

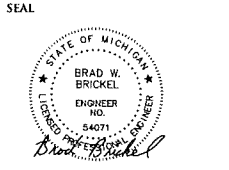
DATE: March 30, 2018

SCALE: N.T.S.



**CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS**

NOWAK & FRAUS ENGINEERS
4677 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257



PROJECT
Vacant Parcels -
Brewster Road
(N. of Walton Blvd.)
Rochester Hills, MI 48309

CLIENT
Robertson Brothers Homes
6905 Telegraph Road,
Suite 200
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
248.282.1428 - Phone
248.282.1432 - Fax

PROJECT LOCATION
Part of the SW 1/4
of Section 8
T.3N., R.11E.,
City of Rochester Hills,
Oakland County, Michigan

SHEET
Notes, Details &
Calculations Plan



DATE ISSUED/REVISED

3-30-18 SURVEY ISSUED
4-4-18 REVISED PER CLIENT
8-2-18 ISSUED FOR SITE PLAN REVIEW
10-12-18 ISSUED FOR SITE PLAN REVIEW
11-13-18 REVISED PER CITY REVIEW

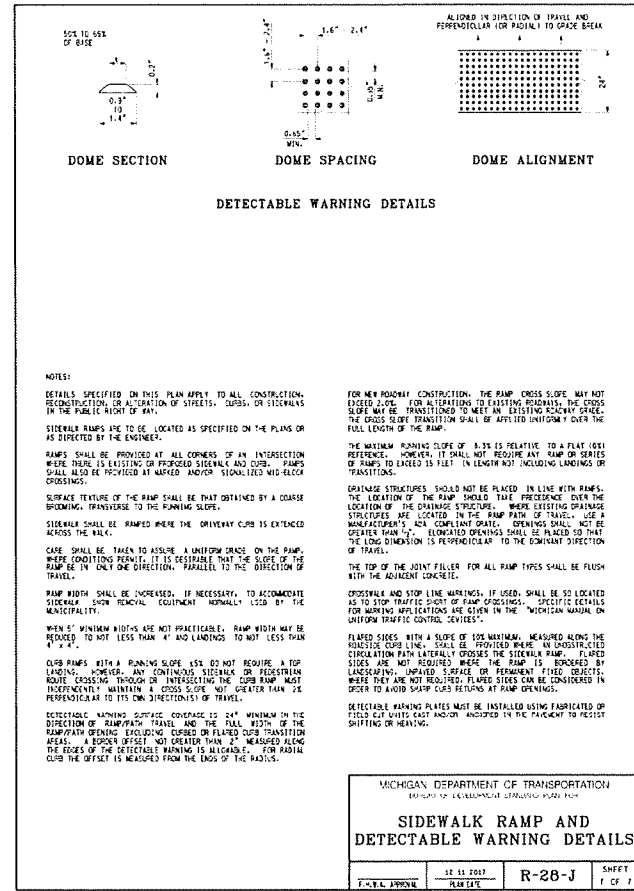
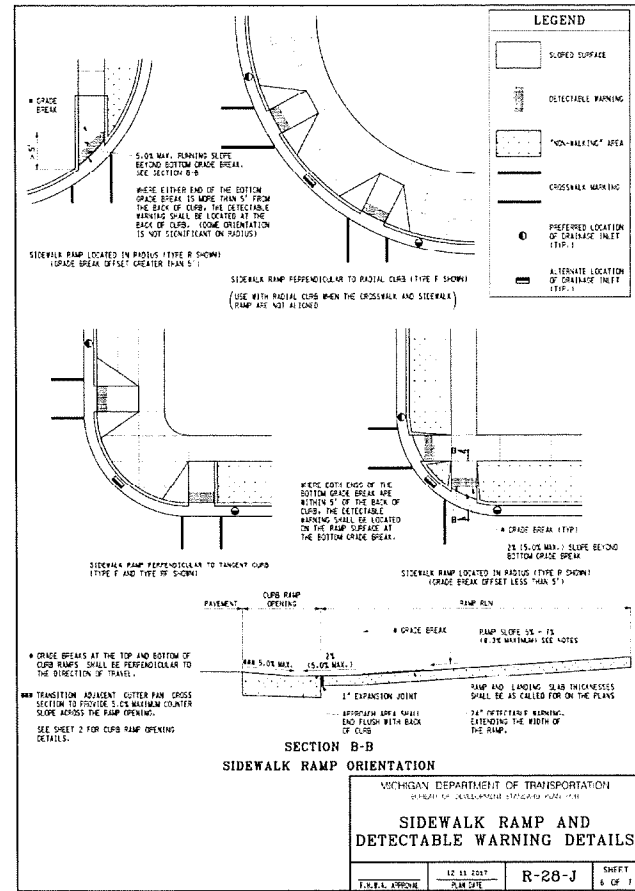
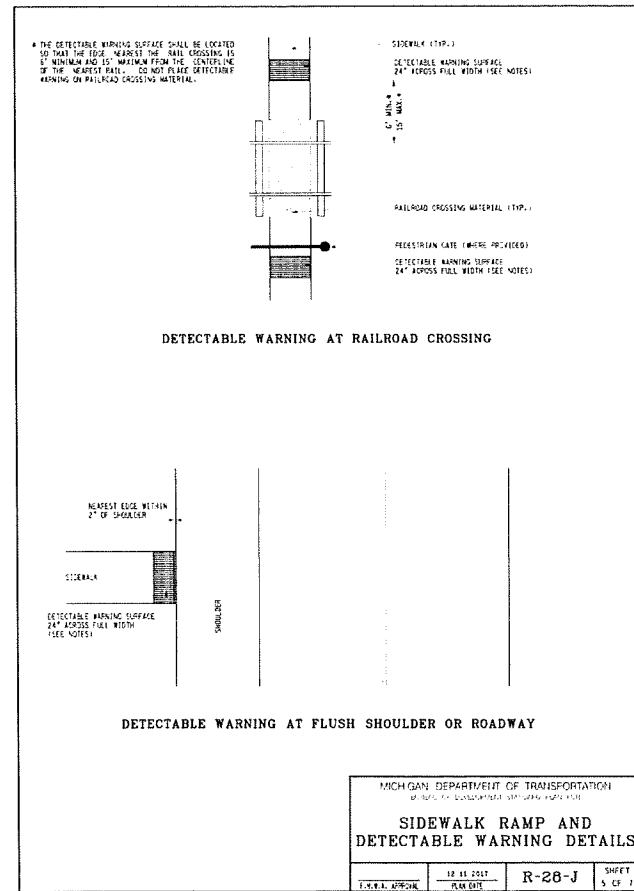
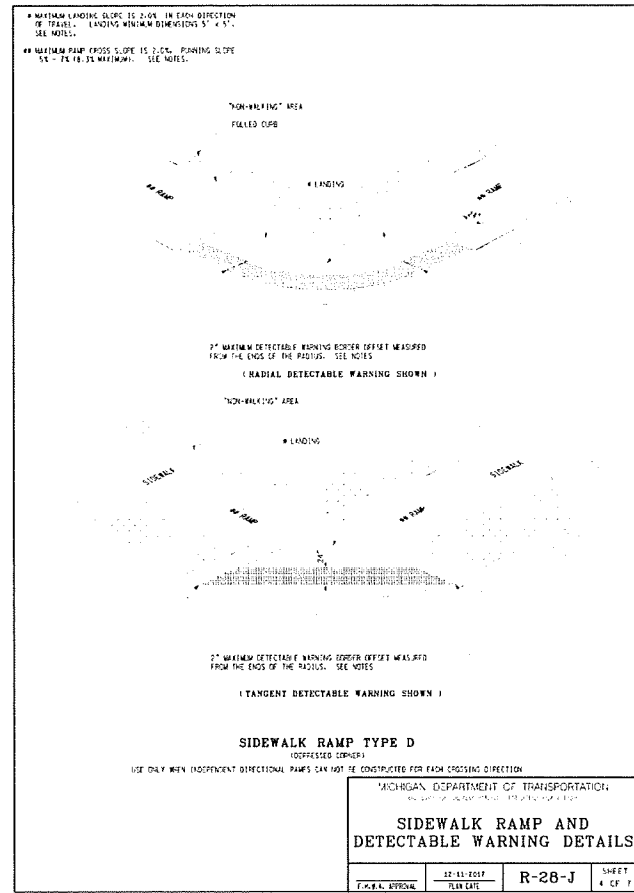
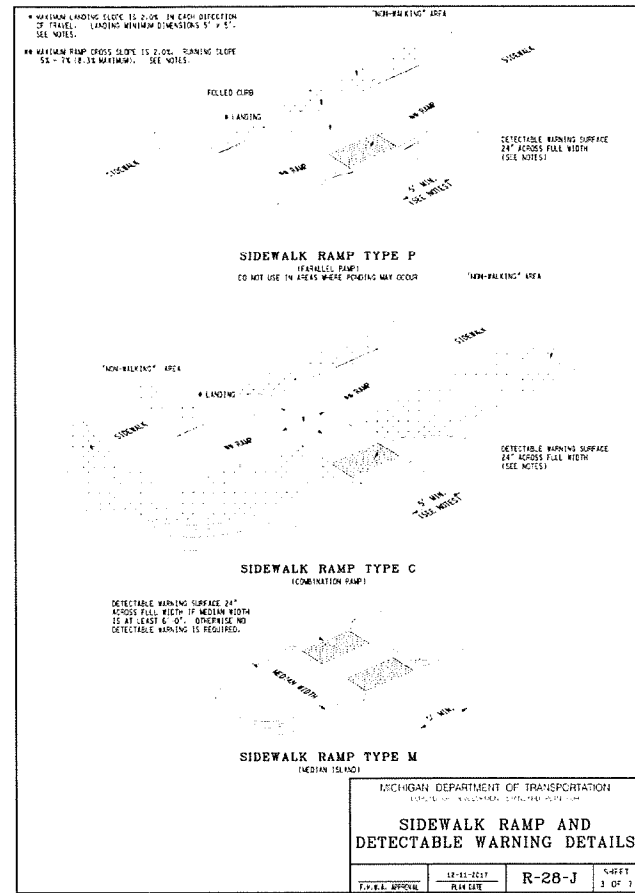
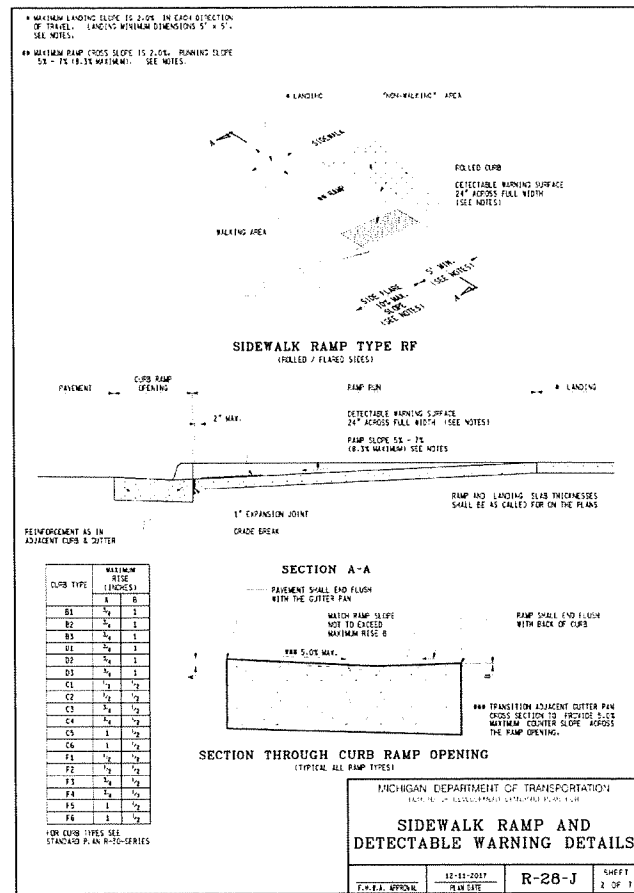
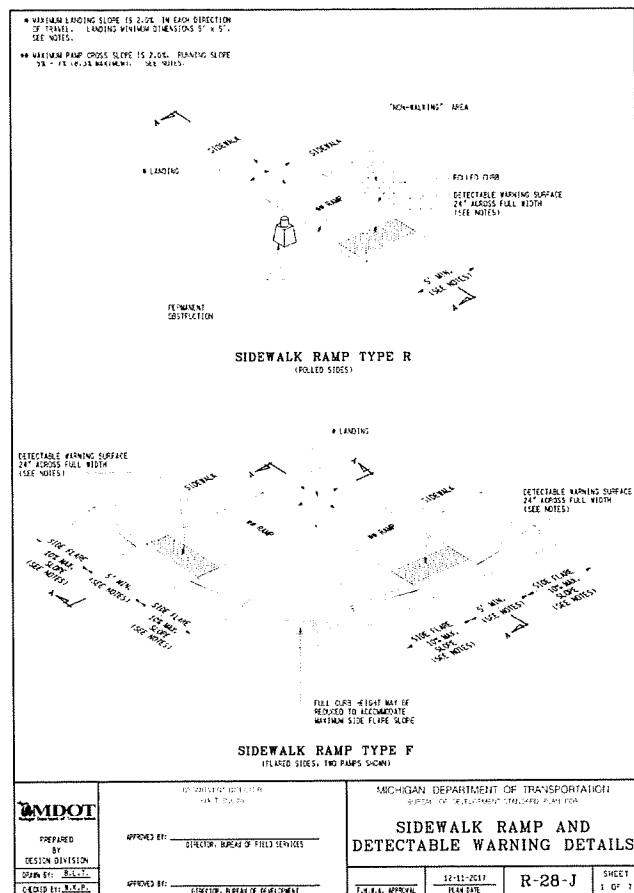
DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

APPROVED BY:
B. Brickel

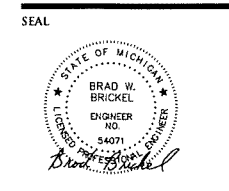
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SCALE: N.T.S.



NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

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



PROJECT
Vacant Parcels -
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(N. of Walton Blvd.)
Rochester Hills, MI 48309

CLIENT
Robertson Brothers Homes
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PROJECT LOCATION
Part of the SW 1/4
of Section 8
T.3N., R.11E.,
City of Rochester Hills,
Oakland County, Michigan

SHEET
MDOT Details



DATE ISSUED/REVISED
3-20-18 SURVEY ISSUED
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11-13-18 REVISED PER CITY REVIEW

DRAWN BY:
J. Lawrey

DESIGNED BY:
B. Brickel

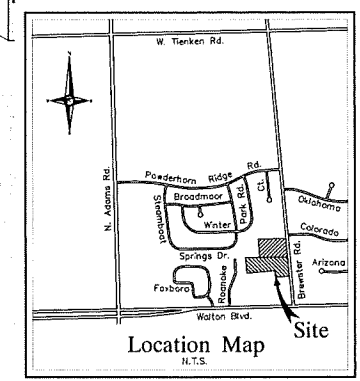
APPROVED BY:
B. Brickel

DATE:
March 30, 2018

SCALE: N.T.S.

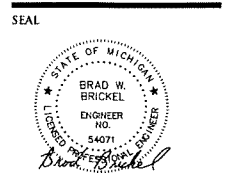
NFE JOB NO. SHEET NO.
K342 SP7

CITY FILE #18-015



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 CIVIL ENGINEERS
 LAND SURVEYORS
 LAND PLANNERS

NOWAK & FRAUS ENGINEERS
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PROJECT
 Vacant Parcels -
 Brewster Road
 (N. of Walton Blvd.)
 Rochester Hills, MI 48309

CLIENT
 Robertson Brothers Homes
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 Suite 200
 Bloomfield Hills, MI 48301

Contact: Tim Loughrin
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 248.282.1432 - Fax

PROJECT LOCATION
 Part of the SW 1/4
 of Section 8
 T.3N., R.11E.,
 City of Rochester Hills,
 Oakland County, Michigan

SHEET
 Owners & Engineers
 General Construction
 Requirements
 Contractor's Duties



DATE	ISSUED/REVISED
3-30-18	SURVEY ISSUED
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10-12-18	ISSUED FOR SITE PLAN REVIEW
11-13-18	REVISED PER CITY REVIEW

DRAWN BY:
 J. Lawrey

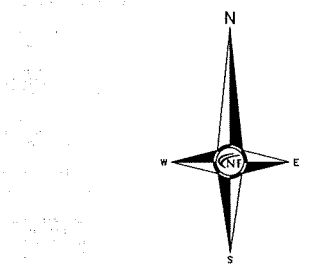
DESIGNED BY:
 B. Brickel

APPROVED BY:
 B. Brickel

DATE:
 March 30, 2018

SCALE: N.T.S.

NFE JOB NO. SHEET NO.
K342 SP8



BENCHMARK

BENCHMARK

CAUTION!!
 4" GAS MAIN

P.O.B. (OVERALL PROPERTY)
 N89°34'48"W 43.14' (M)

Pumper Fire Truck	40,000#
Overall Length	8.157#
Overall Width	7.750#
Overall Body Height	0.656#
Min Body Ground Clearance	8.157#
Track Width	5.00#
Lock-to-lock time	45.00"
Max Wheel Angle	

FIRE DEPARTMENT NOTES

FIRE LANES SHALL BE DESIGNATED BY THE FIRE CODE OFFICIAL, AND SHALL BE CONSPICUOUSLY POSTED ON BOTH SIDES OF THE FIRE LANE, WITH FIRE LANE SIGNS, SPACED NOT MORE THAN 100 FEET APART. FIRE LANE SIGNS SHALL READ "NO STOPPING, STANDING, PARKING, FIRE LANE" AND SHALL CONFORM TO THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

CONSTRUCTION SITES SHALL BE SAFEGUARDED IN ACCORDANCE WITH IFC 2006 CHAPTER 14.

OPENING BURNING IS NOT PERMITTED INCLUDING THE BURNING OF TRASH, DEBRIS, OR LAND CLEARING MATERIALS. OPEN BURNING FOR WARMING OF SAND AND/OR WATER FOR THE PREPARATION OF MORTAR SHALL BE WITHIN THE CITY OF ROCHESTER HILLS BURN PERMIT GUIDELINES.

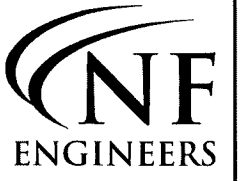
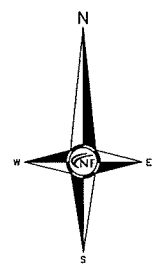
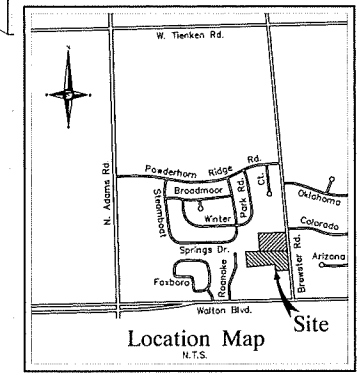
BUILDING CONSTRUCTION NOTES

USE OF OCCUPANCY WOULD BE R-1, BUILDINGS THAT DO NOT CONTAIN MORE THAN TWO DWELLING UNITS.

CONSTRUCTION TYPE WOULD BE B-5, "WOOD FRAME".

PROPOSED RESIDENCES SQUARE FEET ARE APPROXIMATELY 2,300 SF.

CITY FILE #18-015



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LAND SURVEYORS
LAND PLANNERS

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

SEAL



PROJECT
Vacant Parcels -
Brewster Road
(N. of Walton Blvd.)
Rochester Hills, MI 48309

CLIENT
Robertson Brothers Homes
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Suite 200
Bloomfield Hills, MI 48301

Contact: Tim Loughrin
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PROJECT LOCATION
Part of the SW 1/4
of Section 8
T.3N., R.11E.,
City of Rochester Hills,
Oakland County, Michigan

SHEET
Soil Boring Location Plan



DATE	ISSUED/REVISED
3-30-18	SURVEY ISSUED
4-4-18	REVISED PER CLIENT
8-2-18	ISSUED FOR SITE PLAN REVIEW
10-12-18	ISSUED FOR SITE PLAN REVIEW
11-13-18	REVISED PER CITY REVIEW

DRAWN BY:
J. Lawrey
DESIGNED BY:
B. Brickel
APPROVED BY:
B. Brickel
DATE:
March 30, 2018
SCALE: N.T.S.

NEE JOB NO. SHEET NO.
K342 SP9

CITY FILE #18-015

MA McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21555 Market Avenue • Farmdale, MI 48320
Phone: (248) 399-2056 • Fax: (248) 399-2157

LOG OF SOIL BORING NO. 1
PROJECT: Soils Investigation
LOCATION: Brewster Road Townhouse Site
Walton Boulevard and Brewster Road
Rochester Hills, Michigan

JOB NO. 18-031 DATE 2/21/2018

Depth (ft)	Depth (m)	Soil Description	Penetration (lb/ft²)	Moisture (%)	Void Ratio (e)	Unit Weight (pcf)	Unit Weight (kN/m³)	Notes
1	0.3	Moist dark brown clayey TOPSOIL						
2	0.6	Firm moist brown silty CLAY with sand and pebbles and occasional moist fine sand lenses	2	19.8	1.20			(3000)
3	0.9							
4	1.2							
5	1.5	Stiff moist brown silty CLAY with sand and pebbles and wet fine sand seams	6	11.8	1.40			(4500)
6	1.8							
7	2.1	Extremely stiff moist brown silty CLAY with sand and pebbles and moist to wet fine sand seams	9					
8	2.4							
9	2.7							
10	3.0	Extremely stiff moist brown silty CLAY with sand and pebbles and occasional stones	13					
11	3.3							
12	3.6							
13	3.9							
14	4.2	Stiff moist blue silty CLAY with sand and pebbles	5					
15	4.5							
16	4.8							
17	5.1							
18	5.4							
19	5.7							
20	6.0							
21	6.3							
22	6.6							
23	6.9							
24	7.2							
25	7.5							

Note: Used Track Rig

REMARKS: *Calibrated Penetrometer

GROUND WATER OBSERVATIONS:
G.W. ENCOUNTERED AT 3.31 6 HRS
G.W. ENCOUNTERED AT 4 FT 0 HRS
G.W. AFTER COMPLETION 4 FT 0 HRS
G.W. AFTER 12 HRS 4 FT 0 HRS
G.W. VOLUMES Heavy - Cave-in at 4'

MA McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21555 Market Avenue • Farmdale, MI 48320
Phone: (248) 399-2056 • Fax: (248) 399-2157

LOG OF SOIL BORING NO. 2
PROJECT: Soils Investigation
LOCATION: Brewster Road Townhouse Site
Walton Boulevard and Brewster Road
Rochester Hills, Michigan

JOB NO. 18-031 DATE 2/21/2018

Depth (ft)	Depth (m)	Soil Description	Penetration (lb/ft²)	Moisture (%)	Void Ratio (e)	Unit Weight (pcf)	Unit Weight (kN/m³)	Notes
1	0.3	Moist dark brown clayey TOPSOIL, fi						
2	0.6	Stiff moist discolored brown silty CLAY with topsoil and trace of vegetation, fi	3	19.9	1.20			
3	0.9							
4	1.2	Compact moist dark brown sandy TOPSOIL with moist brown fine sand seams and trace of vegetation, fi	7					
5	1.5	Stiff moist brown silty CLAY with sand and pebbles and topsoil streaks, fi	3	18.4	1.30			
6	1.8							(3000)
7	2.1	Stiff moist variegated s-s-y CLAY with sand and pebbles and moist fine sand seams	7					
8	2.4							
9	2.7							
10	3.0	Extremely stiff moist brown silty CLAY with sand and pebbles and moist fine sand seams	14					
11	3.3							
12	3.6							
13	3.9							
14	4.2							
15	4.5	Extremely stiff moist brown silty CLAY with some sand and pebbles and light stone	7					
16	4.8							
17	5.1							
18	5.4							
19	5.7							
20	6.0							
21	6.3							
22	6.6							
23	6.9							
24	7.2							
25	7.5							

Note: Used Track Rig

REMARKS: *Calibrated penetrometer

GROUND WATER OBSERVATIONS:
G.W. ENCOUNTERED AT 11 FT 6 HRS
G.W. ENCOUNTERED AT 11 FT 6 HRS
G.W. AFTER COMPLETION 11 FT 6 HRS
G.W. AFTER 12 HRS 11 FT 6 HRS
G.W. VOLUMES Heavy - Cave-in at 4'

MA McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21555 Market Avenue • Farmdale, MI 48320
Phone: (248) 399-2056 • Fax: (248) 399-2157

LOG OF SOIL BORING NO. 3
PROJECT: Soils Investigation
LOCATION: Brewster Road Townhouse Site
Walton Boulevard and Brewster Road
Rochester Hills, Michigan

JOB NO. 18-031 DATE 2/21/2018

Depth (ft)	Depth (m)	Soil Description	Penetration (lb/ft²)	Moisture (%)	Void Ratio (e)	Unit Weight (pcf)	Unit Weight (kN/m³)	Notes
1	0.3	Moist dark brown clayey TOPSOIL, fi						
2	0.6	Moist discolored brown silty CLAY with sand and pebbles and topsoil streaks, fi	3					
3	0.9							(2000)
4	1.2	Firm moist brown silty CLAY with sand and pebbles	15	13.1	1.35			
5	1.5							
6	1.8	Extremely stiff moist brown sandy CLAY with pebbles and wet fine sand seams	6					
7	2.1							
8	2.4	Extremely compact wet brown SILT	18	11.1				(3000)
9	2.7	Extremely stiff moist brown silty CLAY with sand and pebbles	18					
10	3.0	Extremely stiff moist blue silty CLAY with sand and pebbles	15					
11	3.3							
12	3.6	Extremely compact wet brown clayey fine SAND with traces of gravel and silt and occasional stones and cobbles	50					
13	3.9							
14	4.2	Extremely compact wet brown silty fine SAND with trace of gravel and occasional stones	18					
15	4.5							
16	4.8	Extremely compact wet brown clayey fine SAND with trace of gravel and occasional cobbles	50					
17	5.1							
18	5.4							
19	5.7							
20	6.0							
21	6.3							
22	6.6							
23	6.9							
24	7.2							
25	7.5							

Note: Used Track Rig

REMARKS: *Calibrated penetrometer

GROUND WATER OBSERVATIONS:
G.W. ENCOUNTERED AT 3 FT 8 HRS
G.W. ENCOUNTERED AT 6 FT 3 HRS
G.W. AFTER COMPLETION 7 FT 1 HRS
G.W. AFTER 12 HRS 7 FT 1 HRS
G.W. VOLUMES Heavy

MA McDOWELL & ASSOCIATES
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LOG OF SOIL BORING NO. 4
PROJECT: Soils Investigation
LOCATION: Brewster Road Townhouse Site
Walton Boulevard and Brewster Road
Rochester Hills, Michigan

JOB NO. 18-031 DATE 2/21/2018

Depth (ft)	Depth (m)	Soil Description	Penetration (lb/ft²)	Moisture (%)	Void Ratio (e)	Unit Weight (pcf)	Unit Weight (kN/m³)	Notes
1	0.3	Moist dark brown clayey TOPSOIL, fi						
2	0.6	Moist brown silty CLAY with topsoil streaks, fi	3					
3	0.9							
4	1.2	Stiff moist brown silty CLAY with sand and pebbles	5	21.4				(3000)
5	1.5							
6	1.8	Stiff moist brown silty CLAY with sand and pebbles and wet fine sand lenses	2	17.7	1.22			(2000)
7	2.1							
8	2.4	Firm moist variegated sandy CLAY with sand and pebbles, and occasional wet fine sand seams	2					
9	2.7							
10	3.0	Stiff moist brown sandy CLAY with silt and pebbles	5	19.4	1.33			(3500)
11	3.3							
12	3.6							
13	3.9							
14	4.2							
15	4.5	Extremely stiff moist brown silty CLAY with sand and pebbles and moist brown fine sand lenses	18					
16	4.8							
17	5.1							
18	5.4							
19	5.7							
20	6.0	Extremely compact moist brown fine to medium SAND with trace of gravel	46					(3300)
21	6.3							
22	6.6							
23	6.9							
24	7.2							
25	7.5							

Note: Used Track Rig

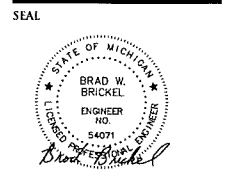
REMARKS: *Calibrated penetrometer

GROUND WATER OBSERVATIONS:
G.W. ENCOUNTERED AT 4 FT 6 HRS
G.W. ENCOUNTERED AT 6 FT 3 HRS
G.W. AFTER COMPLETION 13 FT 3 HRS
G.W. AFTER 12 HRS 13 FT 3 HRS
G.W. VOLUMES Heavy



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PROJECT LOCATION
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SHEET
Soil Boring Log Plan



DATE ISSUED/REVISED
3-30-18 SURVEY ISSUED
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11-13-18 REVISED PER CITY REVIEW

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

DATE:
March 30, 2018

SCALE: N.T.S.

NFE JOB NO. K342 SHEET NO. SP10