

SITE PLAN FOR:

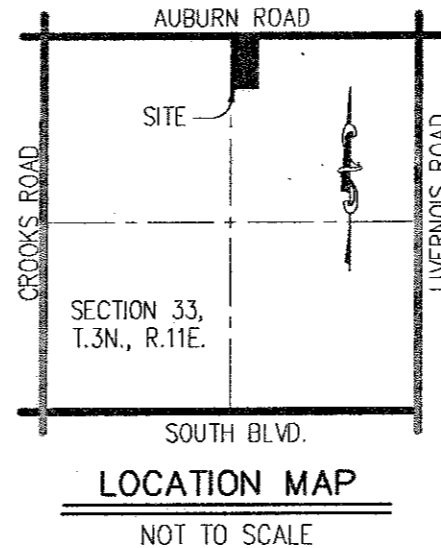
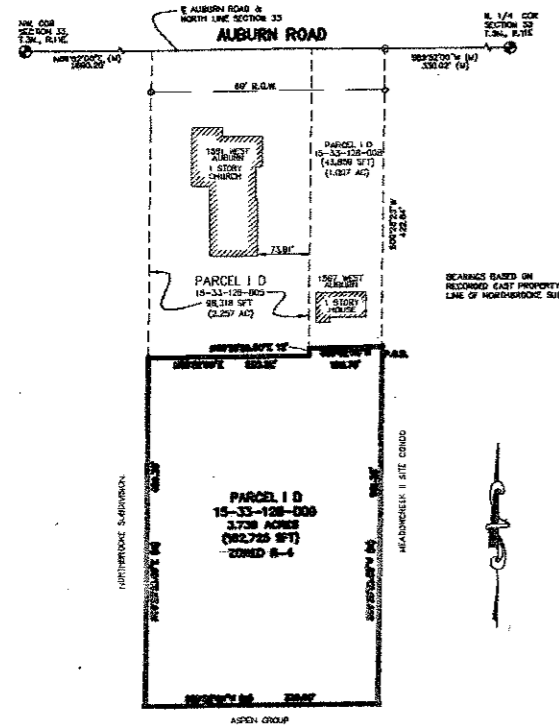
"NORTHBROOKE EAST" SITE CONDOMINIUM

(FORMERLY KNOWN AS "ORR ESTATES")
PART OF THE E 1/2 OF THE NW 1/4 OF
SECTION 33, T. 3N., R. 11E., CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

DEVELOPER
NORTHBROOKE EAST LLC
4405 TUMERIC DRIVE
STERLING HEIGHTS, MI. 48314
CONTACT: GARY TADIAN
248-892-4802

ENGINEER
JJ ASSOCIATES, INC.
1055 SOUTH BOULEVARD E., - SUITE 200
ROCHESTER HILLS, MI 48307
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FAX: (248) 852-7707
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Website: www.jjassociates.net



PROPERTY DESCRIPTION

A PARCEL OF LAND LOCATED IN THE E. 1/2 OF THE N.W. QUARTER OF SECTION 33, T.3 N., R. 11E., CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN. COMMENCING AT THE NORTH 1/4 CORNER OF SECTION 33; THENCE S89°52'00"W ALONG THE NORTH LINE OF SAID SECTION 33, 330.02 FEET; THENCE S00°28'23"W 422.64 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING S00°28'23"W 501.36 FEET; THENCE S89°52'00"W 330.00 FEET; THENCE N00°28'23"E 489.36 FEET; THENCE N89°52'00"E 226.22 FEET; THENCE N00°28'23"E 12.00 FEET; THENCE N89°52'00"E 103.78 FEET TO THE POINT OF BEGINNING.

CONTAINING 162,725 S.F. (3.736 ACRES) OF LAND, MORE OR LESS, SUBJECT TO ANY RESTRICTIONS AND EASEMENTS OF RECORD.

BENCHMARK DESCRIPTION

BENCHMARK #1
ARROW ON HYDRANT
ELEVATION 816.25 USGS

BENCHMARK #2
RM. OF SAN MH
ELEVATION 816.24 USGS

SITE DATA

ZONED R-4
TOTAL SITE AREA 3.736 ACRES

DENSITY CALCULATIONS:
PROPOSED NUMBER OF LOTS 12
PERMITTED DENSITY (3.4 UNITS/ACRE) 12.70

REQUIRED LOT SIZE:
MIN. WIDTH = 80 FT.
MIN. AREA = 9600 S.F.
(CORNER LOT 12,000 SFT, 100 FT. WIDE)

LOT AVERAGING CONCEPT USED
LOT AVERAGING REQUIREMENTS:
MIN. WIDTH = 72 FT.
MIN. AREA = 8540 S.F.
(CORNER LOT 92 FT. WIDE)

LOT SUMMARY

LOT NO	LOT AREA PROVIDED S.F.	LOT WIDTH PROVIDED LF.
1	9,720	72
2	9,720	72
3	9,720	72
4	12,588	93.25
5	9,720	72
6	9,720	72
7	9,720	72
8	12,588	93.25
9	9,909	82.5
10	9,909	82.5
11	10,165	82.5
12	10,897	82.5
TOTAL	124,376	

TOTAL AREA OF LOTS = 124,376 S.F.
AVERAGE LOT AREA = 10,364.67 S.F.
REQUIRED AVERAGE LOT SIZE = 9600 S.F.

SETBACKS:
FRONT 25.0'
SIDE MIN 10.0'
TOTAL SIDE 20.0'
REAR 35.0'

NOTE
CONSTRUCTION TYPE IS SINGLE FAMILY RESIDENTIAL

APPROXIMATE SQUARE FOOTAGE OF HOME IS 2,000-3,200 SFT

LEGEND

- SANITARY SEWER
- STORM SEWER
- WATER MAIN
- MANHOLE w/ R.Y.C.B. COVER
- STANDARD MANHOLE
- 3" DIA. R.Y.C.B.
- 2" DIA. R.Y.C.B.
- MANHOLE w/ PAVT. C.B. COVER - 2' SUMP
- STD. PAVT. CATCH BASIN - 2' SUMP
- STD. PAVT. INLET - 2' SUMP
- GATE VALVE IN WELL AND HD.
- EXISTING HYDRANT
- PROPOSED HYDRANT AND NO.
- SANITARY SEWER STRUCTURE NO.
- STORM SEWER STRUCTURE NO.
- SANITARY SEWER / WATERMAIN SHEET NO.
- STORM SEWER / PAVING SHEET NO.

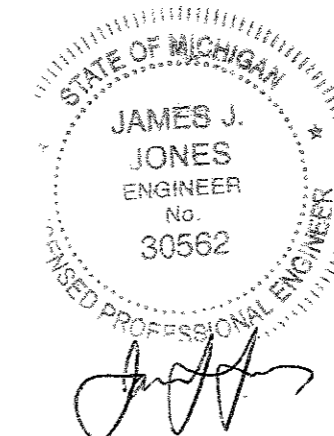
ABBREVIATIONS

- ELEVATION
- BACK TO BACK OF CURB
- TOP OF CURB
- BOTTOM OF CURB
- LOW POINT
- HIGH POINT
- CATCH BASIN
- INVERT ELEVATION
- MANHOLE
- EL
- B/B
- T/C
- LF
- HP
- CB
- IE
- MH

SHEET INDEX

- SHEET 1 TITLE SHEET
- SHEET 2 GENERAL PLAN
- SHEET 3 NOTES AND QUANTITIES
- SHEET 4 SANITARY AND WATER MAIN PLAN
- SHEET 5 STORM SEWER AND PAVING PLAN
- SHEET 6 SANITARY SEWER, STORM SEWER, & PAVING PROFILES
- SHEET 7 DETENTION PLAN
- SHEET 8 GRADING PLAN
- SHEET 9 DRAINAGE AREA MAP
- SHEET 10 SOIL EROSION AND SEDIMENTATION CONTROL PLAN

TOPOGRAPHIC SURVEY (AS PREVIOUSLY APPROVED, AND ON FILE WITH THE CITY OF ROCHESTER HILLS)
LANDSCAPE PLAN (AS PREVIOUSLY APPROVED AND ON FILE WITH THE CITY OF ROCHESTER HILLS)



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

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXISTENCE AND EXACT LOCATION OF ALL EXISTING UTILITIES (WHETHER SHOWN OR NOT SHOWN ON THIS DRAWING) BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

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DATE	REV. DATE	DESCRIPTION
04/30/2012	US/14/2012	REV. PER CITY

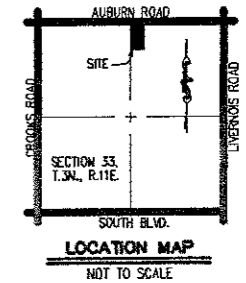
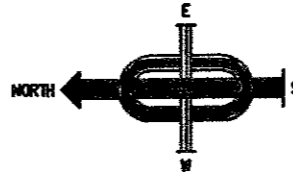
"NORTHBROOKE EAST CONDOMINIUM"
 PART OF THE E 1/2 OF SECTION 33,
 T. 3N., R. 11E., CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN.

SCALE: NO SCALE
CITY: 00-037.2
DRAWING: P-12-701
1 of 10

PROPERTY DESCRIPTION

A PARCEL OF LAND LOCATED IN THE E. 1/2 OF THE N.W. QUARTER OF SECTION 33, T.3 N., R. 11E., CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, COMMENCING AT THE NORTH 1/4 CORNER OF SECTION 33; THENCE S89°52'00"W ALONG THE NORTH LINE OF SAID SECTION 33, 330.02 FEET; THENCE S00°28'23"W 422.64 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING S00°28'23"W 501.36 FEET; THENCE S89°52'00"W 330.00 FEET; THENCE N00°28'23"E 489.36 FEET; THENCE N89°52'00"E 226.22 FEET; THENCE N00°28'23"E 12.00 FEET; THENCE N89°52'00"E 103.78 FEET TO THE POINT OF BEGINNING.

CONTAINING 182,725 S.F. (3.736 ACRES) OF LAND, MORE OR LESS, SUBJECT TO ANY RESTRICTIONS AND EASEMENTS OF RECORD.



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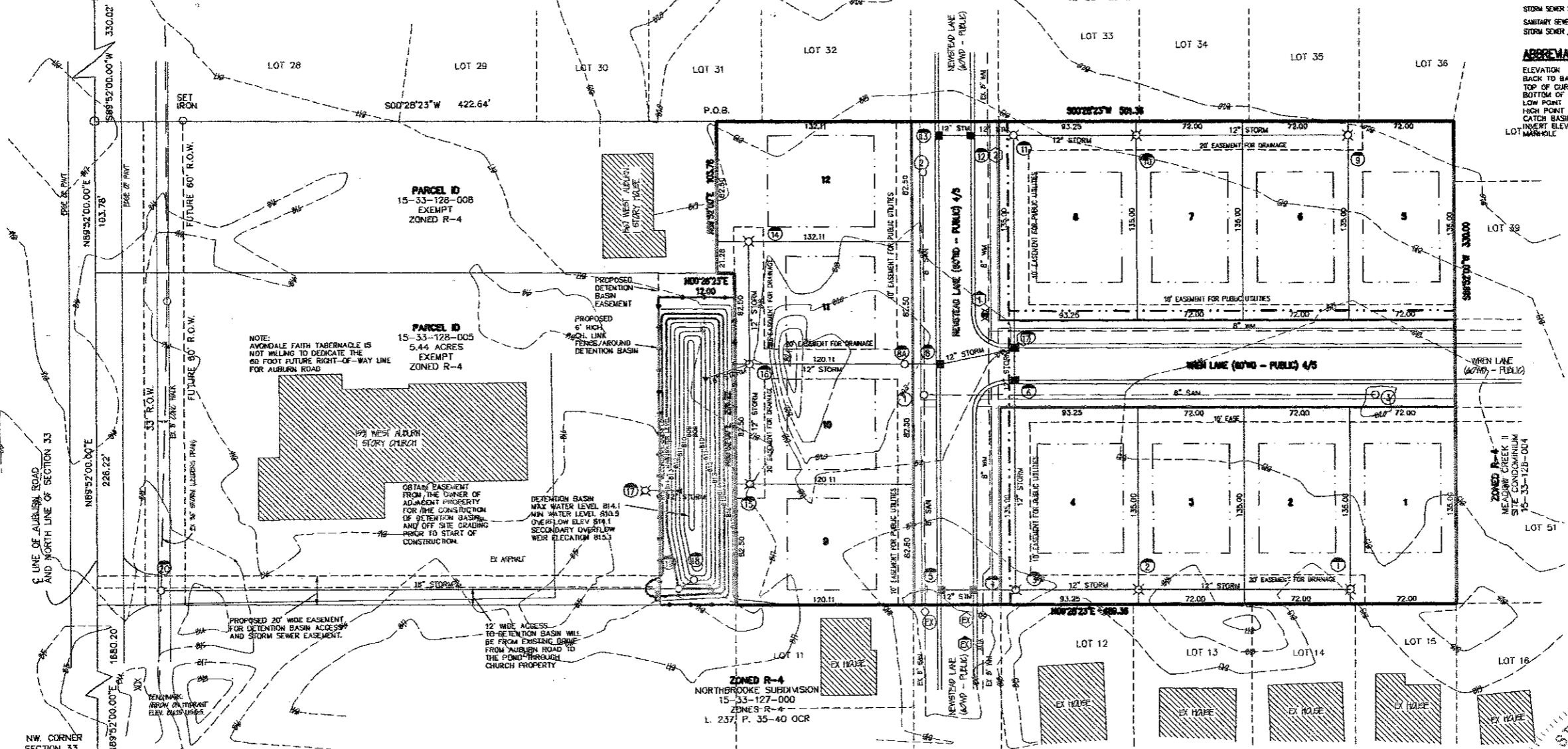
LEGEND

- SANITARY SEWER
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- WATER MAIN
- MANHOLE w/ R.Y.C.B. COVER
- STANDARD MANHOLE
- 2" DIA. R.Y.C.B.
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- MANHOLE w/ PAINT. CB. COVER - 2" SLUMP
- STD. PAVI. CATCH BASIN - 2" SLUMP
- STD. PAVI. RILEY - 2" SLUMP
- GATE VALVE IN WELL AND NO.
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ABBREVIATIONS

- ELEVATION
- BACK TO BACK OF CURB
- TOP OF CURB
- BOTTOM OF CURB
- LOW POINT
- HIGH POINT
- CATCH BASIN
- INSERT ELEVATION
- LOT MANHOLE
- EL. @/B
- T/C
- GU
- LP
- HP
- CB
- LE
- WH

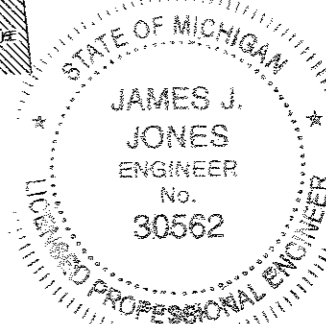
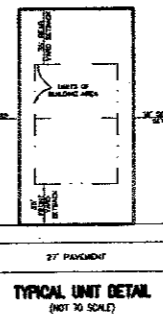
NORTH 1/4 SECTION 33, T.3N., R.11E.



- NOTES:**
- THE SITE IS ZONED R-4, RESIDENTIAL. ALL LOTS MEET R-4 (AVERAGE LOT SIZES) SIZE AND DENSITY REQUIREMENT IN ACCORDANCE WITH SECTION 138-1112.
 - ALL LOTS WILL BE SERVED WITH PUBLIC SANITARY SEWER AND PUBLIC WATER.
 - WATER SUPPLY WILL BE PROVIDED BY CONNECTING TO THE EXISTING 8" STUB ON NEWSHEAD LANE ON BOTH SIDES & WREN LANE.
 - SANITARY SEWER WILL BE PROVIDED BY CONNECTING TO THE EXISTING 8" SANITARY STUB ON NEWSHEAD LANE.
 - STORM SEWER DRAINAGE WILL BE PROVIDED PER CITY OF ROCHESTER HILLS ENGINEERING DEPARTMENT AND OAKLAND COUNTY WATER RESOURCE COMMISSION REQUIREMENTS. OFFSITE DETENTION BASIN WILL BE PROVIDED WITH PERMITTED RESTRICTED FLOW TO LUEDERS DRAIN.
 - SOIL EROSION CONTROL WILL BE PROVIDED PER OAKLAND COUNTY WATER RESOURCE COMMISSION REQUIREMENTS.
 - EASEMENTS WILL BE PROVIDED TO SERVE ALL PUBLIC UTILITIES AND WILL BE ADDED TO THE FINAL ENGINEERING PLANS.
 - PAVING WILL BE PROVIDED PER CITY OF ROCHESTER HILLS ENGINEERING DEPARTMENT REQUIREMENTS.
 - ALL SANITARY SEWER WILL BE 8" PVC TRUSS PIPE AND ALL WATERMAIN WILL BE 8" DUCTILE IRON CLASS 54 PIPE.
 - PERMITS WILL BE REQUIRED FROM OAKLAND COUNTY WATER RESOURCE COMMISSION, MICHIGAN DEPARTMENT OF TRANSPORTATION AND MICHIGAN DEPARTMENT OF NATURAL RESOURCES FOR WORK ON THIS PROJECT.
 - THE PROJECT WILL CONFORM TO THE REQUIREMENTS OF THE ROCHESTER HILLS TREE CONSERVATION ORDINANCE.
 - THE PROPOSED ELEVATIONS WILL MATCH EXISTING ELEVATIONS AT THE PROPERTY LINES UNLESS GRADING EASEMENTS OR RETAINING WALLS ARE PROVIDED. ANY REQUIRED TRANSITIONS TO THE PROPERTY LINES WILL NOT EXCEED A SLOPE IN THE RATIO OF 1 VERTICAL TO 3 HORIZONTAL.
 - THIS DEVELOPMENT WILL NOT CONTAIN SIGNAGE, STREET LIGHTING OR TRANSFORMER PAD SIZING.
 - PROPOSED BARRICADES AND SIGNS WILL BE REMOVED UPON COMPLETION OF THE CONNECTING STREETS WITHIN NORTHERNWOOD MEADOWS.
 - A LAND IMPROVEMENT PERMIT (LIP) WILL BE SECURED FROM ENGINEERING SERVICES PRIOR TO DOING ANY WORK ONSITE.
 - REASON FOR THE SCHEME CHOSEN: ADJACENT DEVELOPMENTS ALLOW CONTINUITY OF PUBLIC ACCESS THROUGH THE SITE.
 - PROPOSED STREETS ARE CORRECTLY ALIGNED WITH THOSE WITHIN MEADOW CREEK II SITE CONDOMINIUM DEVELOPMENT TO THE SOUTH AND EAST.
 - AN OFF-SITE EASEMENT WILL BE REQUIRED FOR THE DETENTION BASIN.
 - PRIOR APPROVAL IS REQUIRED TO PLANT ANY TREE OR SHRUB ON THE PUBLIC R.O.W. ALL TREES AND SHRUBS MUST BE PLANTED AT LEAST 10' FROM THE EDGE OF THE PUBLIC ROAD. SHADE TREES AND SHRUBS MUST BE PLANTED AT LEAST 5' FROM THE EDGE OF THE PUBLIC WALKWAY. EVERGREEN AND ORNAMENTAL TREES MUST BE PLANTED AT LEAST 10 FEET FROM THE EDGE OF THE PUBLIC WALKWAY. NO TREES OR SHRUBS MAY BE PLANTED WITHIN THE TRIANGULAR AREA FORMED AT THE INTERSECTION OF ANY STREET R.O.W. LINES AT A DISTANCE ALONG EACH LINE OF 25 FEET FROM THEIR POINT OF INTERSECTION. NO TREES OR SHRUBS MAY BE PLANTED IN THE TRIANGULAR AREA FORMED AT THE INTERSECTION OF ANY DRIVEWAY WITH A PUBLIC WALKWAY AT A DISTANCE ALONG EACH LINE OF 15' FROM THEIR POINT OF INTERSECTION. ALL TREES AND SHRUBS MUST BE PLANTED AT LEAST 10' FROM ANY FIRE HYDRANT. SHADE AND EVERGREEN TREES MUST BE PLANTED AT LEAST 15' AWAY FROM THE NEAREST OVERHEAD WIRE.
 - PRIOR TO THE RELEASE OF THE PERFORMANCE BOND, THE CITY OF ROCHESTER HILLS FORESTRY DIVISION NEEDS TO INSPECT ALL TREES, EXISTING OR PLANTED, TO IDENTIFY ANY THAT POSE A HAZARD TO THE SAFE USE OF THE PUBLIC RIGHT-OF-WAY. FORESTRY MAY REQUIRE THE DEVELOPER TO REMOVE, AND POSSIBLY REPLACE, ANY SUCH TREES.
 - ALL TREES BEING SAVED WILL BE IDENTIFIED BY PAINTING, FLAGGING, OR SOME OTHER APPROVED METHOD, AND, WHERE PROTECTIVE BARRIERS ARE NECESSARY, THEY WILL BE ERRECTED BEFORE WORK BEGINS.
 - AUBURN ROAD IS UNDER THE JURISDICTION OF THE MICHIGAN DEPT. OF TRANSPORTATION. A PERMIT WILL BE REQUIRED FROM M.O.D.T. FOR ALL WORK WITHIN THE AUBURN RD. R.O.W.
 - PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES (IN CONFLICT WITH THE CONSTRUCTION OF PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD.
 - DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR OVERHEAD AND/OR BURIED UTILITIES. CALL MISS DIG 3 DAYS PRIOR TO START OF CONSTRUCTION FOR LOCATING UNDERGROUND UTILITIES.
 - THE APPLICANT WILL FURNISH ALL OFFSITE EASEMENTS INCLUDING THE POND, OUTLET, AND MAINTENANCE ROAD, PRIOR TO ISSUANCE OF A LAND IMPROVEMENT PERMIT (LIP).
 - PROPOSED 20' WIDE STORM SEWER EASEMENT SHOWN ON THESE PLANS WILL BE DEDICATED TO THE PROPOSED HOME OWNERS ASSOCIATION AS THE CITY OF ROCHESTER HILLS DOES NOT MAINTAIN THE STORM SEWER SYSTEM.
 - ALL STORM SEWER PIPES SHALL BE SIZED FOR A 10 YR. STORM AND MINIMUM SIZE IS 12". ALL PIPE SHALL BE CONCRETE PIPE AND ALL PIPE UNDER PAVEMENT OR ON 1-0-1 PAVEMENT INFLUENCE SHALL BE CLASS IV.
 - THE CONSTRUCTION DRAWINGS WILL ESTABLISH A DETAILED CONSTRUCTION SEQUENCE THAT WILL PROVIDE FOR THE EXCAVATION OF THE DETENTION BASIN.
 - ALL PROPOSED EASEMENT AGREEMENTS SHALL BE REVIEWED AND APPROVED BY THE CITY PRIOR TO FINAL SITE PLAN CONSIDERATION.
 - NO TRANSFORMERS CAN BE SHOWN AT THIS TIME.
 - THE ENTIRE SITE SHALL BE GRADED TO WITHIN 1" OF PROPOSED GRADE PRIOR TO CONSTRUCTION OF ANY PERMANENT IMPROVEMENTS.
 - THE SIDEWALK RAMPS SHALL MEET ADA COMPLIANCE, INCLUDING A DETECTABLE WARNING SURFACE IN CONTRASTING COLOR PER THE ATTACHED DETAIL RAMP DETAIL, 8-28-6.
 - SANITARY SEWER LEADS SHALL EXTEND 2' BEYOND EASEMENT LINES.

FIRE DEPARTMENT NOTES:
 CONSTRUCTION SITES SHALL BE SAFEGUARDED IN ACCORDANCE WITH FC 2006 CHAPTER 14.

OPEN 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. FIRE PREVENTION ORDINANCE CHAPTER 58, SEC. 307.6.2 & 307.6.2.5



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NORTHBROOKE EAST CONDOMINIUM
 PART OF THE E. 1/2 OF SECTION 33,
 T. 34, R. 11E., CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN.
GENERAL PLAN

SCALE: 1"=40'
 CITY: 00-037.2
 DRAWING: P-12-701
2 of 10

DATE	04/30/2012	DRAWN BY	J.J.J.	CHECKED BY	J.J.J.
REV. DATE	05/14/2012	REV. PER CITY			

SANITARY SEWER

ESTIMATED	QUANTITY	MEASURED
1	604 LF 8" PVC TRUSS PIPE	
2	3 EA STD. MANHOLE (COMPLETE)	
3	1 EA DROP CONNECTION TO EX. MANHOLE	
4	416 LF 6" HOUSE CONNECTION P.V.C. SDR 23.5	
5	12 EA CLEANOUT	

SANITARY SEWER BASIS OF DESIGN

SERVING AREA 12 UNITS
 TOTAL SANITARY FLOW = (12)(3.5 PEOPLE PER UNIT)(1000.00 GPCD) = 4,200 GALLONS PER DAY
 $4,200 \text{ GALLONS} / (7.5 \times 24 \times 3600) = 0.0065 \text{ CFS}$
 PEAK FACTOR = $[18 + P^{1/2}] / [4 + P^{1/2}] = [18 + 0.0042^{1/2}] / [4 + 0.0042^{1/2}] = 4.44$
 PEAK FLOW = $0.0065 \times 4.44 = 0.0289 \text{ CFS}$
 CAPACITY OF 8" SEWER = 0.77 CFS

SANITARY SEWER NOTES:

- All construction shall conform to the current standards and specifications of local unit of government and the Oakland County Water Resource Commission (O.C.W.R.C.). All sanitary sewer construction shall have competent full-time inspection supervised by a professional engineer provided by, or caused to be provided by, the local unit of government.
- At all connections to O.C.W.R.C. sewers or extensions, and before start of construction, the Contractor must obtain a Sewer Inspection Permit issued by O.C.W.R.C. Gravity sewer permit charges are \$250 for each connection plus \$25 for each manhole constructed. Pressure sewer permit charges are \$250 per 2480 L.L. of force main with a minimum permit fee of \$250. Failure to pass any test segment will result in an additional charge to the Contractor for each retest, in accordance with the above price schedule. The Contractor shall also have posted with O.C.W.R.C. a \$5,000 surety bond and \$500 cash deposit. The Contractor shall notify the local unit of government and the O.C.W.R.C. 24 hours prior to the beginning of any construction. Final or tests must be witnessed by County personnel and must be scheduled in advance.
- No sewer installation shall have an infiltration exceeding 100 gallons per inch diameter per mile of pipe per 24 hour period and no single run of sewer between manholes shall be exceed 100 gallons per inch diameter per mile. All tests in lieu of infiltration tests shall be as specified in the O.C.D.P.W. "Acceptance tests", dated September 1972. Only pipe and pipe joints approved by O.C.W.R.C. may be used for sanitary sewer construction.
- At all connections to an existing O.C.W.R.C. sewer, or extension thereto, a watertight bulkhead with a capped one inch diameter pipe to permit measuring infiltration shall be provided. A temporary 12" deep sump shall be provided in the first manhole above the connection which will be filled in after successful completion of any acceptance test up to the standard fill provided for the flow channel.
- All building leads and risers shall be 6 inch SDR 23.5 PVC Solid Wall pipe with chemically fused joints or an approved equal pipe and joint. Building leads to be finished with removable airtight and watertight stoppers.
- All rigid sewer pipe shall be installed on Class "B" bedding or better. All flexible, semi-flexible, or composite sewer pipe shall be installed in conformance to O.C.W.R.C. specifications.
- All new manholes shall have O.C.W.R.C. approved flexible, watertight seals where pipes pass through walls. Manholes shall be of precast sections with modified groove tongue and rubber gasket type joints. Precast manhole cone sections shall be O.C.W.R.C. approved modified eccentric cone type. All manholes shall be provided with bolted, watertight covers.
- At all connections to manholes on O.C.W.R.C. sewers, or extensions thereto, drop connections will be required when the difference in invert elevations exceeds 18 inches. Only outside drop connections will be approved.
- Taps to existing manholes shall be made by coring. The contractor shall place a KOR-N-SEAL boot (or O.C.W.R.C. approved equal) after coring is completed. Blind drilling will not be permitted in lieu of coring.
- New manholes constructed directly on O.C.W.R.C. sewers shall be provided with covers reading "Oakland County-Sanitary" in raised letters. New manholes built over an existing sanitary sewer shall have manhole poured bottoms.
- No ground water, storm water, construction water, downspout or seep tile drainage shall be allowed to enter any sanitary sewer installation.
- Prior to any excavation, the Contractor shall telephone "MISS DIG" (811) for the location of underground pipeline and cable facilities and shall also notify representatives of other utilities located in the vicinity of the work.
- A 18 inch minimum vertical separation and 10 foot minimum horizontal separation must be maintained between sanitary sewer and water main.
- Indicates compacted sand backfill within the 1 on 1 influence of the roadway.
- The sanitary sewer standard details and specifications of the local unit of government and/or Oakland Co. Department of Public Works are incorporated as part of these plans.
- The sanitary sewer must be 100% inspected by TV camera - per the City of Rochester Hills specifications.
- All house leads are to extend a minimum of 2 ft. past the property line or to the easement line. House leads to be PVC SDR 23.5 pipe with chemical welded joints, and must be placed with a minimum slope of 1.00%.
- Connection to existing manholes to be incidental to the job.
- Manholes shall be provided with bolted, water-tight covers.
- See sanitary sewer detail sheet for specification for Truss pipe.
- All PVC Joints shall be chemically welded.

WATER MAIN

ESTIMATED	QUANTITY	MEASURED
1	649 LF 8" DUCTILE IRON CL. 54 WATER MAIN	
2	1 EA STANDARD 6" HYDRANT (COMPLETE)	
3	3 EA CONNECT TO EXISTING WATER MAIN	

WATER MAIN DESIGN:

POPULATION
 12 x 3.5 PEOPLE/UNIT = 42
 AVERAGE FLOW
 $42 \times 150 \text{ GAL/CAP/DAY} = 0.0097 \text{ CFS}$
 $7.48 \times 60 \times 60 \times 24$
 WATER USAGE
 AVERAGE = $0.0471 \text{ CFS} \pm 0.84632 \text{ MG/D/CFS} = 0.0063 \text{ MGD}$
 MAXIMUM = $0.0304 \text{ MGD} \times 2.0 = 0.0608 \text{ MGD}$
 MAXIMUM DESIGN FIRE FLOW
 (PER INSURANCE SERVICES OFFICE)
 BASED ON HOUSE SEPARATIONS 11-30 FEET
 1000 GPM FOR 2 HOURS

WATER MAIN NOTES:

- All water mains shall be installed with a minimum cover of 6 ft.
- All necessary tees, crosses and bands required to construct the proposed water mains are to be incidental to the job.
- Proposed hydrant elevations shown are finished ground elevations.
- All gate valves shall be City of Rochester Hills standard.
- Maintain 1.50 ft. vertical clearance between water main and sewers.
- Where water mains must dip to pass under a storm sewer, the sections which are deeper than normal shall be kept to a minimum length by the use of vertical 11-1/4" bands properly anchored.
- See water main details for additional notes.
- Do not break joints in pipe for deflections, use fitting necessary.
- Fire hydrants are to be located 6 ft. from back of curb, and 3 feet from the edge of sidewalk.
- Watermains shall be cement-lined (ductile thickness), ductile iron pipe, class 54. Polyprop is required for all ductile iron water main.
- Gate valves shall be resilient wedge or socket type gate valves (E.J.L.W. or U.S. Pipe), left hand open.
- Restrained joints shall be used at all vertical bends. The number of restrained joints required shall be determined by the manufacturer, subject to approval by the City engineer.

GENERAL NOTES:

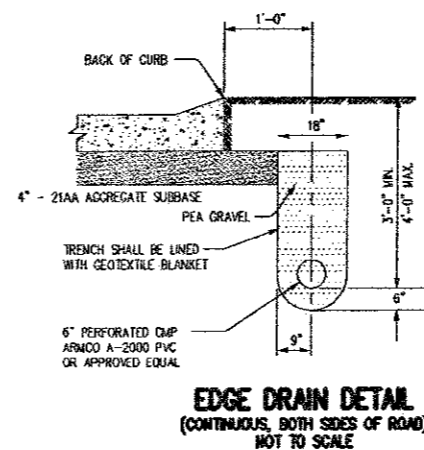
- All workmanship and materials shall be in accordance with the current standards and specifications of the City of Rochester Hills and the Oakland County Road Commission. It shall be the contractor's responsibility to verify and/or obtain any information necessary regarding the presence of underground utilities which may affect construction of this job. For utility protection, 3 working days before you dig, dial "MISS DIG" (1-800-482-7171).
- Indicates power compacted sand backfill.
- Notify the City of Rochester Hills Engineering Department (248-656-4640) 48 hours prior to the start of construction. Borrow pits, when necessary, shall be excavated only at such locations and to such depths as approved and staked by the engineer. Such borrow pits shall be refilled and graded. Each contractor shall grade all dirt piles or excavations caused by his work before leaving the site or considering his work complete. The paving contractor shall also backfill all curbs and grade the entire right-of-way before his work complete.
- All properties or facilities in the surrounding areas, public or private, destroyed or otherwise disturbed due to construction, shall be replaced and/or restored to the original condition by the contractor.
- Storm sewer, sanitary sewer, drain tile and house lead trenches below pavement or within a one-on-one slope of back of curb shall be backfilled with sand or gravel mechanically compacted in layers of 6" to 95% maximum density.
- Contractors must be bonded and registered with the City of Rochester Hills.
- Positive provisions shall be made to insure that all sand backfilled utility trenches within pavement areas are free draining. This may require additional edge drains in utility trenches under or adjacent to paved areas as determined by the Department of Public Works or the City of Rochester Hills.
- Manhole rims, catch basin rims, elevations must be checked and approved by the engineer before the sewer contractor's work is considered complete.
- Contractor's shall exercise due caution when working in wooded areas throughout the subdivision so as to disturb existing trees as little as possible.
- Maintain 10 ft. clear horizontal clearance between all utilities. Maintain 18" vertical clearance between all utilities at crossings.
- All offsite improvements will become public property.
- Proposed utility covers/grates will be provided as required on the City of Rochester Hills Standard Detail Sheets.

STORM SEWER

ESTIMATED	QUANTITY	MEASURED
1	565 LF 18" C-76 CL. IV PREMIUM JOINT STORM SEWER	
2	1070 LF 12" C-76 CL. IV PREMIUM JOINT STORM SEWER	
3	1 EA TEMPORARY S-02 STRUCTURE (COMPLETE)	
4	1 EA 3" DIA OVERFLOW MANHOLE (COMPLETE)	
5	10 EA 4" DIA R.Y.C.B. (COMPLETE)	
6	7 EA 4" DIA. PAVT. CATCH BASIN (COMPLETE)	
7	1 EA 18" END SECTION	
8	1 EA 12" END SECTION	
9	1 EA CONSTRUCT 6" DIA MANHOLE OVER EXISTING 36" STORM	
10	1 EA VORTECHNICS AQUA SWIRL CHAMBER OR APP'D EQUAL	
10	LUMP SUM DETENTION BASIN (COMPLETE)	

STORM SEWER NOTES:

- All workmanship and materials shall be in accordance with the current standards and specifications of the City of Rochester Hills.
- Indicates Class II sand backfill compacted to at least 95% of maximum unit weight.
- All storm sewer to be placed on Class "B" bedding or better.
- All drainage structures to be Michigan State Highway Department Standards.
 Standard Manhole - MDOT 1A or E.J.W. 1040A or approved equal.
 Catch Basin - MDOT 1004 or E.J.W. 7066 or approved equal.
 Inlet - MDOT 904 or MDOT 12040 or E.J.W. 7066 or approved equal.
 Rear Yard Catch Basin - MDOT 9E or E.J.W. 1040-0 or approved equal.
 Standard Manhole w/Catch Basin Cover - MDOT 1E or E.J.W. 5105 or approved equal.
- Edge drain, where shown on detail, shall be 6" perforated CMP, Armo A-2000 PVC or an approved equal.
- Storm sewer pipe joints to be Modified Groove Tongue Rubber Joints (Premium Rubber Joints).
- Additional edge drains may be required other than those shown on the detail. This will be determined during construction by the City of Rochester Hills engineer.
- Exact grades and depths of sewers and water main are to be checked closely with the field engineers prior to installation.
- It is the responsibility of the storm sewer contractor to provide all tees and leads in storm sewer or in storm sewer structures where service lead for sump pump is not serviced by drain tile.
- It is the responsibility of the front/rear yard drainage contractor to install tees and leads into drain tile.
- Ends of leads shall be 3 ft. below finish ground elevations.
- All catch basins, pavement catch basins and manholes with catch basin covers are to have 2 ft. sumps.
- See storm sewer detail sheet for additional notes.
- Use E.J.W. 7065 casting for curb structures in mountable curb.
- Lump sum price for the proposed water quality basin shall include all excavation, grading, seeding and mulching, erosion mat and access road.
- Point up all 30" and larger concrete storm pipe.
- Castings which are within Type B-2 Curbs will be MDOT Type 6 (E.J.W. 7065 or equal).
- All drainage structures are 4" in dia. unless otherwise noted.

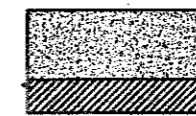


PAVING

ESTIMATED	QUANTITY	MEASURED
1	1,633 SY 8" CONCRETE W/ 4" 21AA AGGREGATE SUBBASE (PER DETAIL)	
2	816 CY EXCAVATION	
3	133 LF B-2 TYPE CURB	
4	1138 LF 4" MOUNTABLE CURB	
5	1266 LF 6" EDGE DRAIN	

PAVING NOTES:

- All workmanship and materials shall be in accordance with the current standards and specifications of the City of Rochester Hills.
- Pavement throughout subdivision to be 27" back to back.
- Pavement to be one course plain 8" uniform concrete with a 4" mountable curb placed on 4" 21AA gravel subgrade unless otherwise noted.
- All top of curb elevations as shown on the plan and profile are calculated for a 4" mountable curb unless otherwise noted.
- The Oakland County Road Commission and/or the City of Rochester Hills shall furnish and place all permanent street signs with monies paid by developer.
- All muck, soil, topsoil, stumps and all other unstable material found within the road right-of-way are to be removed and replaced granular material class II, approved by the engineer, acceptable to the City of Rochester Hills, and compacted to 95% modified proctor density.
- It shall be the responsibility of the paving contractor to adjust the top of all existing structures (sewer manholes, catch basins, gas wells, etc., but not including hydrants) within the street right-of-way within 10 ft. adjacent to the street right-of-way to the final grade as required by the City of Rochester Hills. All such adjustments (to a maximum of 6") are to be incidental to the job.
- All areas from back of curb to right-of-way limits are to be graded, topsoil applied, and seeded and mulched or sodded.
- Stabilization of existing sanitary sewer and storm sewer trenches must be accomplished prior to paving.
- The proprietor shall insure that open discharge of sump pumps to the road right-of-way does not occur.
- Expansion joints shall be placed at ends of all curbed road. Plane of weakness joints to be sawcut and sealed at 15 ft. intervals (No dummy or paper joints). Expansion joints to be placed at 500 ft. intervals.
- Sewer traverse pipes directly over storm sewer crossing between inlet and catch basins.
- Install curb cuts for sidewalk ramps with the street paving. Detectable cast-in-place warning plates are required at all sidewalk ramps. The warning plates shall be brick red in color. Acceptable products are ADA Solutions, Armor Tile, E.J.W. or approved equivalent.



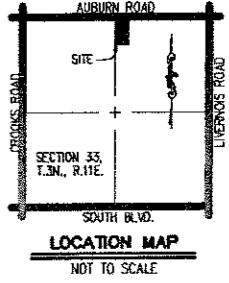
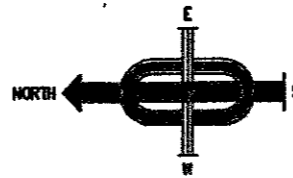
STATE OF MICHIGAN
 JAMES J. JONES
 ENGINEER
 No. 30562
 LICENSED PROFESSIONAL ENGINEER

J ASSOCIATES, INC.
 Civil Engineering and Surveying
 1005 South Boulevard E. - Suite 204, Rochester Hills, MI 48307
 Telephone (248) 738-2911 Fax (248) 868-7767
 Website: www.jassoc.com

DATE	DESCRIPTION
04/30/2012 <td>REV. PER CITY</td>	REV. PER CITY
05/11/2012 <td>REV. DATE</td>	REV. DATE
DATE <td>DRAWN BY</td>	DRAWN BY
	CHECKED BY

NOTES AND QUANTITIES

SCALE: NO SCALE
 CITY: 00-037.2
 DRAWING: P-12-701
 3 of 10



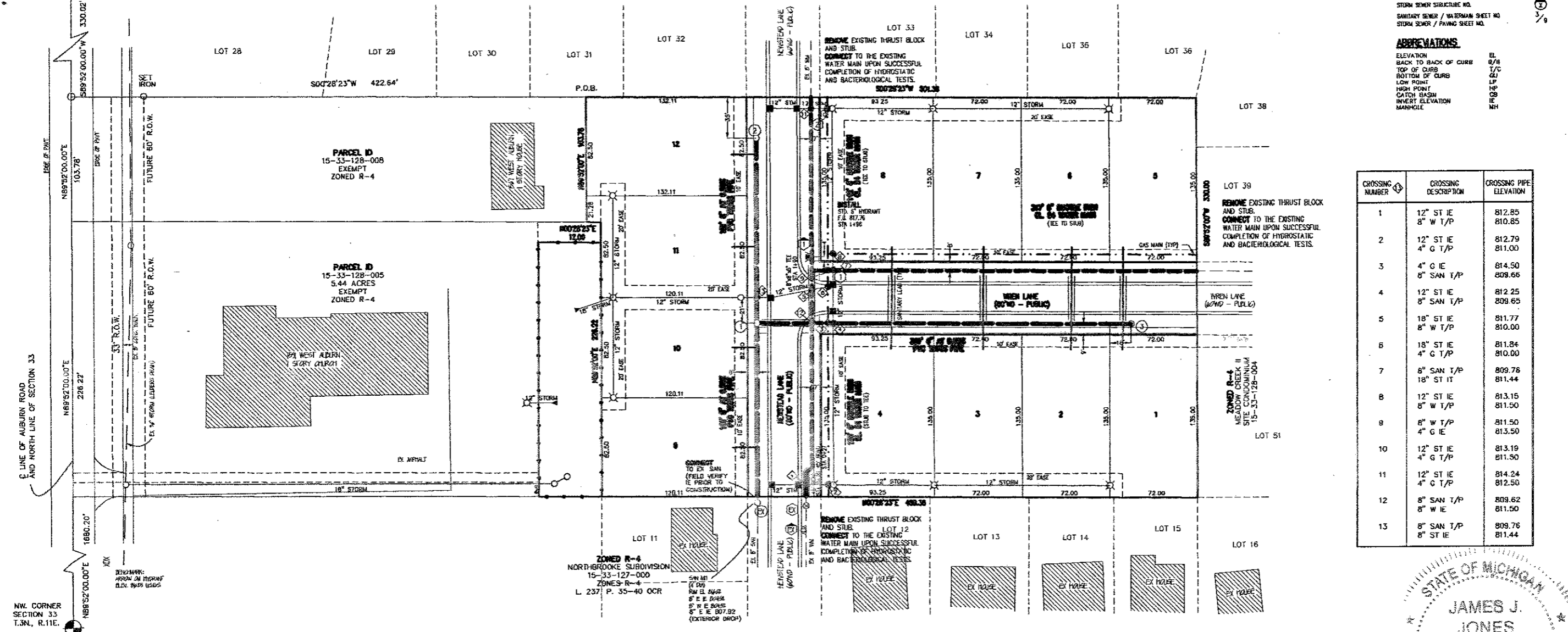
LEGEND

- SANITARY SEWER
- STORM SEWER
- WATER MAIN
- MANHOLE w/ R.Y.C.B. COVER
- STANDARD MANHOLE
- 3" DIA. R.Y.C.B.
- 2" DIA. R.Y.C.B.
- MANHOLE w/ PAVT. C.B. COVER - 2" SUMP
- STIL. PAVT. CATCH BASIN - 2" SUMP
- STIL. PAVT. INLET - 2" SUMP
- GATE VALVE IN WELL AND NO.
- EXISTING HYDRANT
- PROPOSED HYDRANT AND NO.
- SANITARY SEWER STRUCTURE NO.
- STORM SEWER STRUCTURE NO.
- SANITARY SEWER / WATERMAIN SHEET NO.
- STORM SEWER / PAVING SHEET NO.

ABBREVIATIONS

- ELEVATION
- BACK TO BACK OF CURB
- TOP OF CURB
- BOTTOM OF CURB
- LOW POINT
- HIGH POINT
- CATCH BASIN
- INVERT ELEVATION
- MANHOLE
- EL. 8"/8"
- 7"/6"
- LF
- LF
- LF
- LF
- NH

NORTH 1/4 SECTION 33 T.3N., R.11E.



CROSSING NUMBER	CROSSING DESCRIPTION	CROSSING PIPE ELEVATION
1	12" ST IE 8" W T/P	812.85 810.85
2	12" ST IE 4" G T/P	812.79 811.00
3	4" G IE 8" SAN T/P	814.50 809.66
4	12" ST IE 8" SAN T/P	812.25 809.65
5	18" ST IE 8" W T/P	811.77 810.00
6	18" ST IE 4" G T/P	811.84 810.00
7	8" SAN T/P 18" ST IT	809.76 811.44
8	12" ST IE 8" W T/P	813.15 811.50
9	8" W T/P 4" G IE	811.50 813.50
10	12" ST IE 4" G T/P	813.19 812.50
11	12" ST IE 4" G T/P	814.24 812.50
12	8" SAN T/P 8" W IE	809.62 811.50
13	8" SAN T/P 8" ST IE	809.76 811.44

NOTES

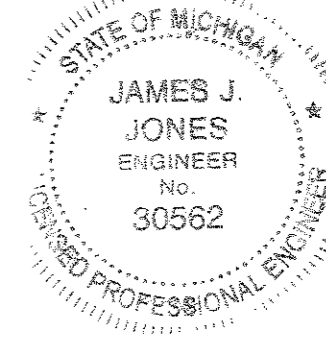
- UNTIL PLANS ARE APPROVED FOR CONSTRUCTION THESE PLANS ARE "NOT FOR CONSTRUCTION."
- PARTIAL SAND BACKFILL SHALL BE INSTALLED IN ALL TRENCHES WITHIN THE INFLUENCE OF EXISTING OR PROPOSED PAVEMENT.
- SEWER PIPE SHALL BE PLACED ON CLASS "B" BEDDING OR BETTER, AS INDICATED ON THE SEWER DETAIL SHEET.
- JOINT TYPE SHALL BE MODIFIED GROOVE TONGUE AND RUBBER GASKET.
- SANITARY SEWER LEADS SHALL BE PVC SDR 23.5 WITH CHEMICALLY WELDED JOINTS @ 1.00% SLOPE (MIN).
- THRUST BLOCKS SHALL BE INSTALLED AT ALL BENDS, DEAD ENDS, REDUCERS, AND HYDRANTS.

NOTE: SEE SHEET 5 FOR SANITARY SEWER PROFILES.

NOTE: MAINTAIN MINIMUM 18" VERTICAL CLEARANCE BETWEEN WATER MAIN AND SEWERS.

PROVIDE TEMPORARY BULKHEAD WITH 1" DIA CAPPED PIPE FOR TESTING PURPOSES. REMOVE BULKHEAD AFTER SUCCESSFUL TESTING AND ACCEPTANCE OF SEWER PER THE LATEST TEN STATE STANDARDS FOR WASTEWATER FACILITIES, HYDROSTATIC TEST. (THE LEAKAGE EXFILTRATION OR INFILTRATION SHALL NOT EXCEED 100 GALLONS PER INCH PER PIPE DIAMETER PER MILE PER DAY FOR ANY SECTION OF THE SYSTEM)

HYDRANT SHALL BE EJM COMPRESSION TYPE 58R-250.

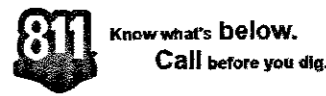


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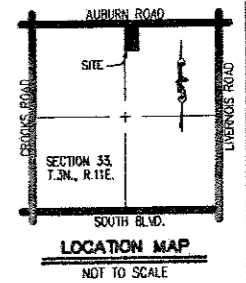
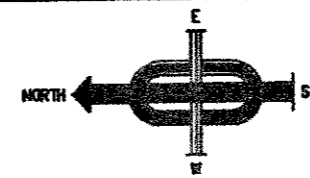
DATE	DESCRIPTION	REV. PER CITY
04/30/2012 <td></td> <td></td>		
05/14/2012 <td></td> <td></td>		

NORTHBROOKE EAST CONDOMINIUM
 PART OF THE E. 1/2 OF SECTION 33,
 T. 34 N., R. 11 E., CITY OF NORTHBROOKE, OAKLAND COUNTY, MICHIGAN.
SANITARY AND WATER MAIN PLAN

SCALE
 1"=40'
 CITY # 00-037.2
 DRAWING P-12-701
 4 of 10



NORTH 1/4 SECTION 33 T.3N., R.11E.



LEGEND

- SANITARY SEWER
- STORM SEWER
- WATER MAIN
- MANHOLE w/ R.Y.C.B. COVER
- STANDARD MANHOLE
- 3" DIA. R.Y.C.B.
- 2" DIA. R.Y.C.B.
- MANHOLE w/ PAVE. C.B. COVER - 2" SUMP
- STD. PAVL. CATCH BASIN - 2' SUMP
- STD. PAVL. BLET - 2' SUMP
- DATE VALVE IN WELL AND NO. EXISTING HYDRANT
- PROPOSED HYDRANT AND NO.
- SANITARY SEWER STRUCTURE NO.
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- SANITARY SEWER / WATERMAIN SHEET NO.
- STORM SEWER / PAVING SHEET NO.

ABBREVIATIONS

- ELEVATION
- BACK TO BACK OF CURB
- TOP OF CURB
- BOTTOM OF CURB
- LOW POINT
- HIGH POINT
- CATCH BASIN
- INVERT ELEVATION
- MANHOLE

CROSSING NUMBER	CROSSING DESCRIPTION	CROSSING PIPE ELEVATION
1	12" ST IE 8" W T/P	812.85 810.85
2	12" ST IE 4" G T/P	812.79 811.00
3	4" G IE 8" SAN T/P	814.50 809.66
4	12" ST IE 8" SAN T/P	812.25 809.65
5	18" ST IE 8" W T/P	811.77 810.00
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12	8" SAN T/P 8" W IE	809.62 811.50
13	8" SAN T/P 8" ST IE	809.76 811.44

NOTE: SEE SHEET 6 FOR STORM SEWER AND PAVING PROFILES.

NOTE: MAINTAIN MINIMUM 18" VERTICAL CLEARANCE BETWEEN WATER MAIN AND SEWERS.

STATE OF MICHIGAN
JONES
 ENGINEER
 No. 30562
 REGISTERED PROFESSIONAL ENGINEER

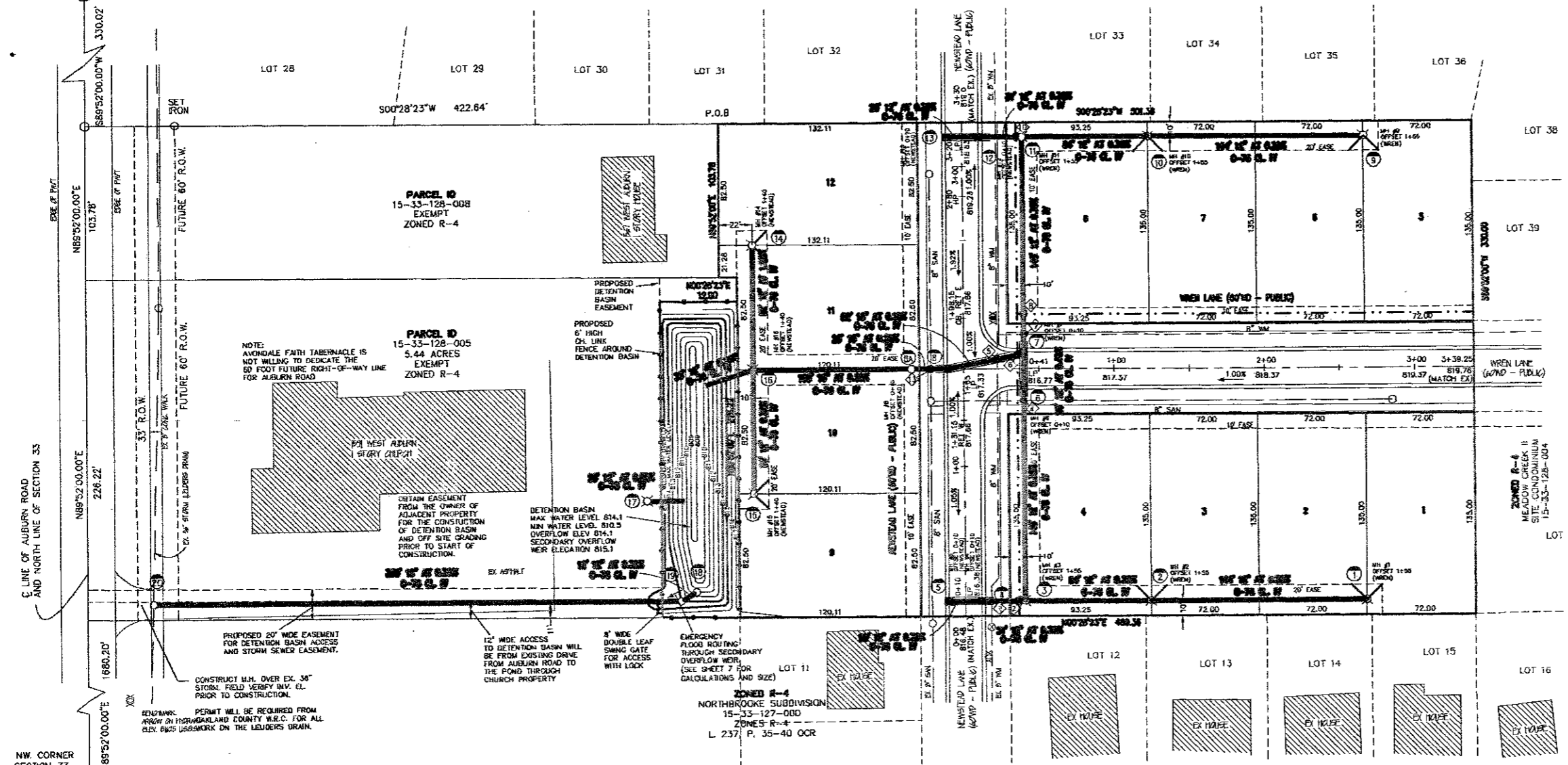
811 Know what's below. Call before you dig.

ASSOCIATES, INC.
 Civil Engineering and Surveying
 3025 South Boulevard E. - Suite 205, Rochester Hills, MI 48307
 Telephone: (248) 739-8111 Fax: (248) 820-7707
 Website: www.jonesinc.com

DATE	REV. DATE	DESCRIPTION
04/30/2012	05/14/2012	REV. PER CITY
		DRAWN BY J.L.L.
		CHECKED BY J.L.L.

WATERBROOK EAST CONDOMINIUM
 PART OF THE E. 1/2 OF SECTION 33,
 T. 34. N. R. 11. E., CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN.
STORM SEWER AND PAVING PLAN

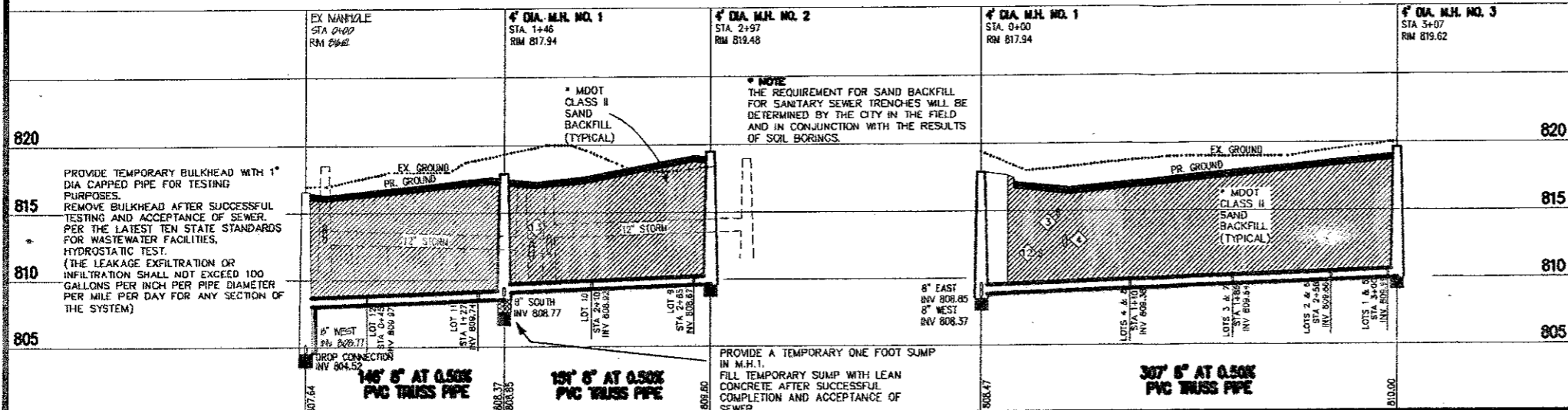
SCALE
 1"=40'
 CITY # 00-037.2
 DRAWING
 P-12-701
 5 of 10



NW CORNER SECTION 33 T.3N., R.11E.

NOTES
 CONSTRUCTION TRAFFIC SHALL ACCESS SITE BY THE TEMPORARY DRIVE OFF AUBURN ROAD.
 UNTIL PLANS ARE APPROVED FOR CONSTRUCTION THESE PLANS ARE "NOT FOR CONSTRUCTION."
 SEWER PIPE SHALL BE PLACED ON CLASS "B" BEDDING OR BETTER, AS INDICATED ON THE SEWER DETAIL SHEET.
 STORM SEWER PIPE JOINTS TO BE MODIFIED GROOVE TONGUE RUBBER JOINTS (PREMIUM RUBBER JOINTS).
 ALL STORM STRUCTURES SHALL BE CONCRETE, UNLESS OTHERWISE STATED.

STORM SEWER NOTES
 ALL STORM SEWER PIPES SHALL BE R.C.P. CL IV ASTM C-76 W/ PREMIUM JOINTS, UNLESS NOTED OTHERWISE.
 ALL 6" DRAIN TILES SHALL BE A-2000 P.V.C. OR APPROVED EQUAL.
 PROVIDE TEES IN STORM SEWERS. BREAKING INTO STORM SEWERS FOR CONNECTIONS WILL NOT BE ALLOWED.
 CASTINGS FOR CURB STRUCTURES IN MOUNTABLE CURBING SHALL BE E.J.I.W. 7066.
 EDGE DRAIN, 8 INCH IN DIAMETER, PERFORATED OR SLOTTED, SHALL BE CONSTRUCTED 1' OFF THE BACK OF THE CURB LINE FOR THE FULL LENGTH OF THE CURB. BACKFILLED WITH MDOT ZNS SAND. PERFORATED PIPE SHALL BE SMOOTH-WALL PVC PLASTIC UNDERDRAIN 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 SQUARE INCHES PER FOOT OR PIPE LENGTH.
 THE PIPE SHALL BE INSTALLED WITH PROTECTIVE SOCK.



NOTES

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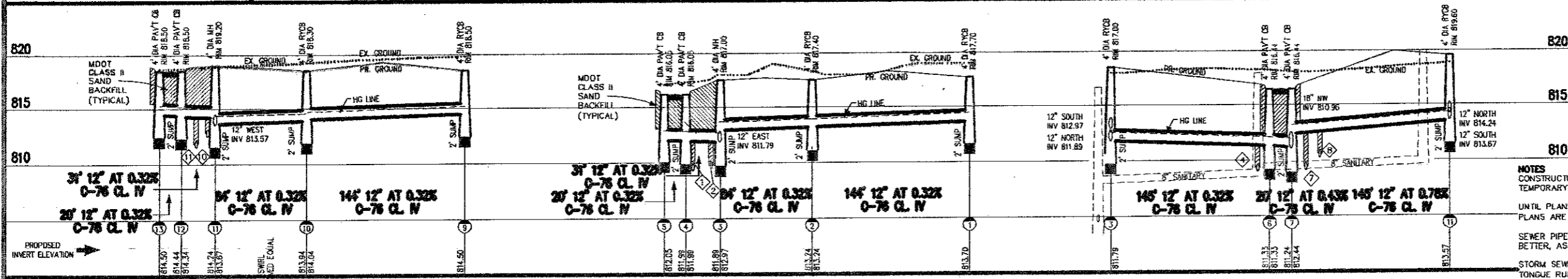
PARTIAL SAND BACKFILL SHALL BE INSTALLED IN ALL TRENCHES WITHIN THE INFLUENCE OF EXISTING OR PROPOSED PAVEMENT. SEE DETAIL ON SHEET 3.

SEWER PIPE SHALL BE PLACED ON CLASS "B" BEDDING OR BETTER, AS INDICATED ON THE SEWER DETAIL SHEET.

JOINT TYPE SHALL BE MODIFIED GROOVE TONGUE AND RUBBER GASKET.

SANITARY SEWER LEADS SHALL BE PVC SDR 23.5 WITH CHEMICALLY WELDED JOINTS @ 1.00% SLOPE (MIN).

THRUST BLOCKS SHALL BE INSTALLED AT ALL BENDS, DEAD ENDS, TEES, REDUCERS, AND HYDRANTS.



NOTES

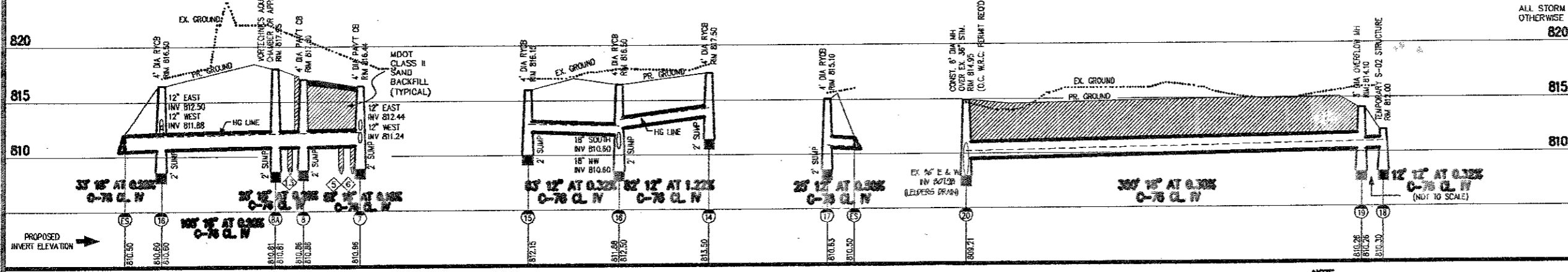
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STORM SEWER PIPE JOINTS TO BE MODIFIED GROOVE TONGUE RUBBER JOINTS (PREMIUM RUBBER JOINTS).

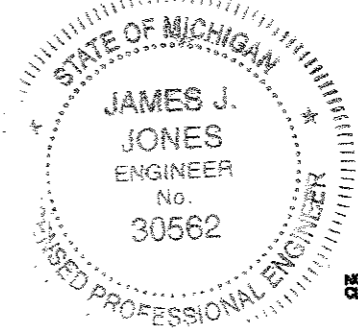
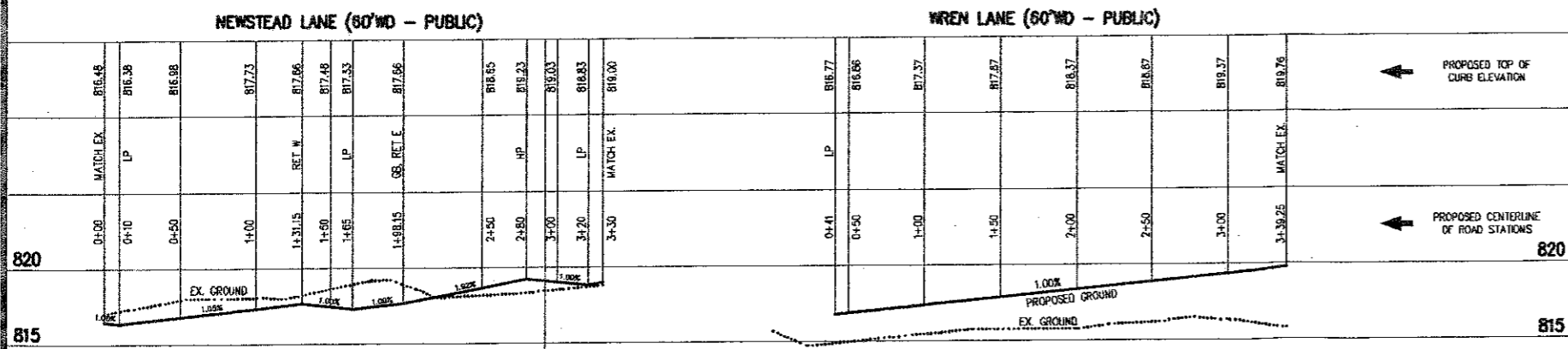
ALL STORM STRUCTURES SHALL BE CONCRETE, UNLESS OTHERWISE STATED.



NOTE

UPON COMPLETION OF THE HOUSES WITHIN THE DEVELOPMENT AND STABILIZATION OF ALL THE YARDS, THE TEMPORARY S-O2 FILTER WILL BE REMOVED AND A 12\"/>

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1	12" ST IE 8" W T/P	812.85 810.85
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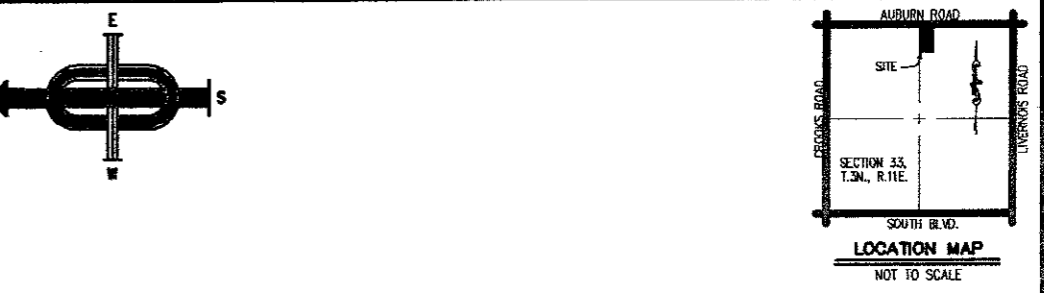
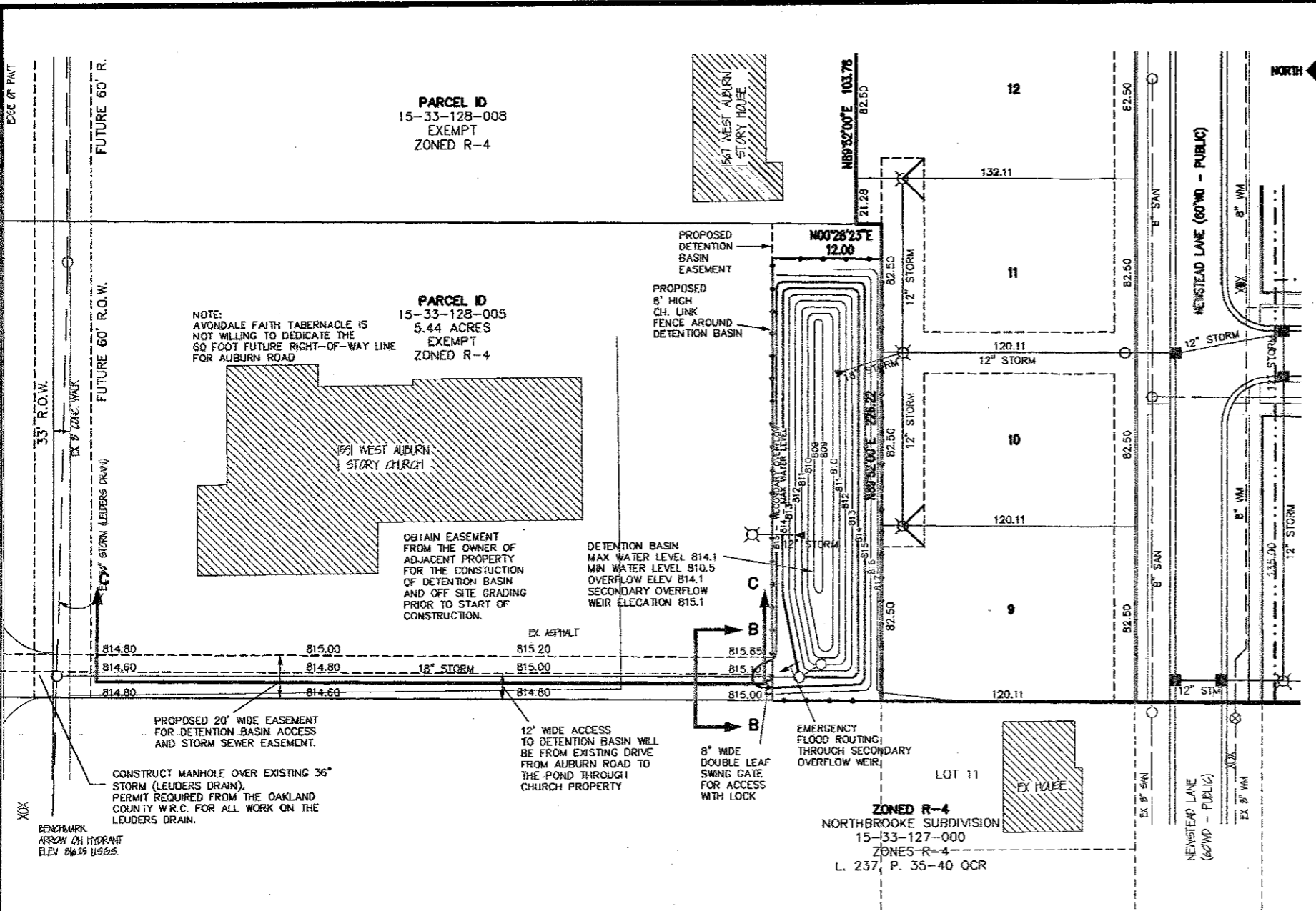
NOTE: MAINTAIN MINIMUM 18\"/>

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05/11/2012 <td></td> <td></td>		

DATE: 04/30/2012
 REV. DATE: 05/11/2012
 DRAWN BY: J.J.J.
 CHECKED BY: J.J.J.

"MUNICIPALITIES MUST CONSULT"
 PART OF THE E. 1/2 OF SECTION 33,
 T. 24.1, R. 16E, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN.
SANITARY SEWER, STORM SEWER, AND PAVING PROFILES



DETENTION BASIN VOLUME

ELEVATION	AREA (SFT)	VOLUME (CFT)	CUMULATIVE VOLUME (CFT)
810.50	2,726	463	463
811	3,204	1,001	1,464
812	4,138	2,543	4,007
813	5,807	3,348	7,355
814	6,933	4,217	11,572
815	8,335	5,197	16,769

$(A1+A2+((A1+A2)*(1/2)))/3$

DETENTION BASIN DESIGN CRITERIA PER OAKLAND COUNTY STANDARDS

C-FACTOR = 0.40
SITE AREA = 4.36 ACRES
VOLUME OF STORAGE $V = C \times A = 4.320 \times 0.40 \times 4.96 = 8,571$ CFT
DEPTH OF POND = 3.6'
MEDIAN SURFACE AREA REQUIRED = $A_{1/2} = V / \text{DEPTH} = 2,380$ SFT
MEDIAN ARE OF SEDIMENTATION POND PROVIDED = 6,366 SFT

ORIFICE AREA REQUIRED

$A = 0.388 \times \sqrt{2.00 \times \text{SORT}} (1.5) / 172.800 = 0.0133$ SFT
THE AREA OF 1" DIA HOLE = 0.0056 SFT
NUMBER OF HOLES REQUIRED = $0.0133 / 0.0056 = 2.38$
USE 2 HOLES OF 1" DIA EACH (SEE DETAIL)

COMPOSITE C-FACTOR COMPUTATIONS

TOTAL AREA $864 \times 330 = 285,450$ SFT = 6.55 ACRES
PROPOSED AREA OF CONDOMINIUM = $(490 \times 330) + (12 \times 103 \times 78) = 162,945$ SFT = 3.74 ACRES

C-FACTOR FOR THE PROPOSED SITE

ON SITE PAVED AREAS:
ROAD = $27 \times (350 + 320) = 17,550$ SFT
SIDEWALK = $625 \times 5 = 3,125$ SFT
RESIDENCES = $12 \times 2,250 = 27,000$ SFT
TOTAL PAVED AREA = 47,675 SFT = 1.1 ACRES
LAWN AREAS = $(3.74 - 1.1) = 2.64$ ACRES

OFF SITE:
TOTAL OFF SITE AREA DRAINING TO THE POND, INCLUDING POND AREA = 3.22 ACRES
PAVED AREAS INCLUDING BLDG = 0.31 ACRES
LAWN AREAS = 0.91 ACRES

COMPOSITE C-FACTOR FOR PROPOSED SITE =
 $((2.64 + 0.91) \times 0.20 + ((1.1 + 0.31) \times 0.90)) / (3.74 + 1.22) = 0.40$

100 YEAR FLOW

$I = 275 / (T + 25) = 275 / (20 + 25) = 6.11$ / HOUR
 $Q = C \times A \times 0.41 \times 6.11 \times 3.74 = 9.37$ CFS

STORM WATER DETENTION COMPUTATIONS

10 YEAR STORM PER OAKLAND COUNTY STANDARDS
 $I = 275 / (T + 25)$
ALLOWABLE FLOW = 0.20 CFS/ACRE
 $Q = 0.20 \times (4.74 + 1.22) = 0.99$ CFS
 $Q_0 = 0.38 / (4.96 \times 0.4) = 0.50$ CFS/ACRE IMPERVIOUS.

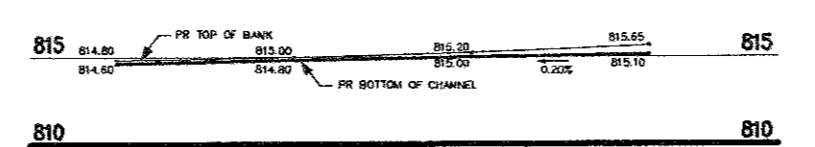
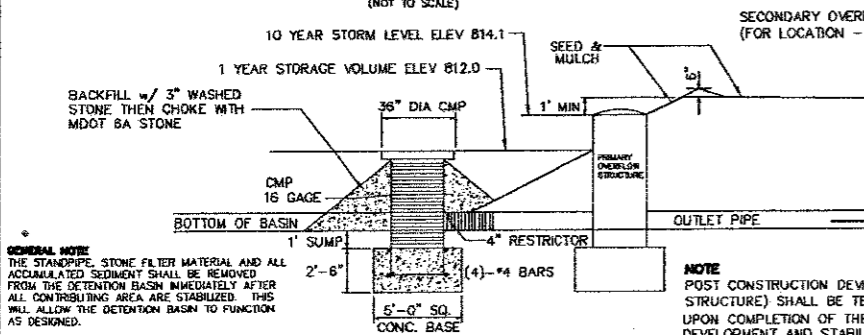
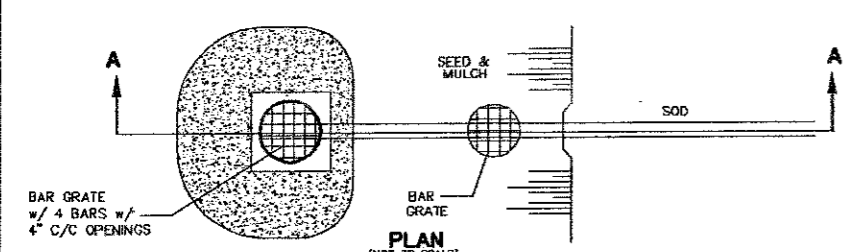
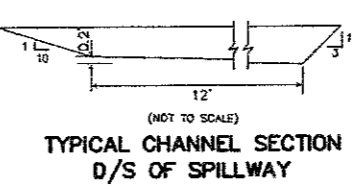
$T = -25 + (6,582.5 / Q_0^{0.5})^{1/2}$
 $T = -25 + (6,582.5 / 0.50)^{1/2} = 89.56$ MINS
 $V_{10} = 10,500 / (T + 25) = 40(Q_0)^{1/2}$
 $V_{10} = (10,500 \times 0.707) / (1.22 + 89.56) = (40 \times 0.50 \times 69.56) = 6,417.92$ CFT/ACRE IMPERVIOUS
VOLUME OF STORAGE REQUIRED = $(6,417.92 \times 0.40) = 2,567$ CFT

1 YEAR STORM PER OAKLAND COUNTY STANDARDS

$I = 72 / (T + 25)$
 $T = -25 + (2,700 / Q_0)^{1/2}$
 $T = -25 + (2,700 / 0.50)^{1/2} = 48.48$ MINS
 $V_{10} = 4,320 / (T + 25) = 40(Q_0)^{1/2}$
 $V_{10} = (4,320 \times 0.707) / (1.22 + 48.48) = (40 \times 0.50 \times 48.48) = 1,280.81$ CFT/ACRE IMPERVIOUS
 $V_{10} = 1,280.81 \times 0.40 = 512.32$ CFT

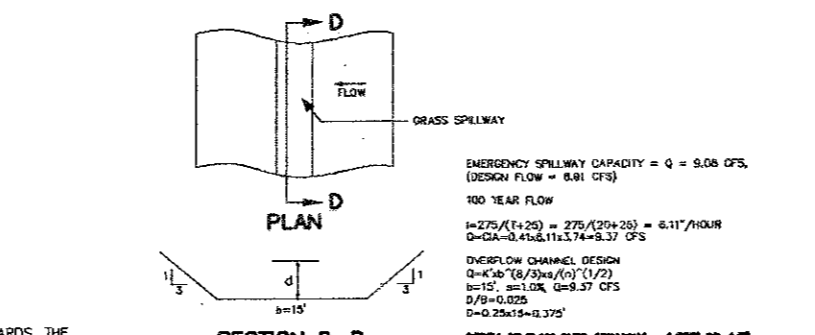
DETENTION BASIN VOLUME PROVIDED

AREA OF BASIN AT ELEV 814.20 = 7,086 SFT
AREA OF BASIN AT ELEV 810.50 = 2,726 SFT
 $H = (814.1 - 810.5) = 3.6'$
TOTAL STORAGE VOLUME PROVIDED, $V = ((A1+A2) \times \text{SORT} \times (A1+A2)) / 3 = 12,860$ CFT



SECTION B-B OVERFLOW CHANNEL PROFILE

HOR 1"=5'
VER 1"=5'



SECTION D-D GRASSED OVERFLOW SPILLWAY EMERGENCY SPILLWAY

ASSOCIATES, INC.
Civil Engineering and Surveying
305 South Boulevard E. - 3rd Fl. 300 Rochester Hills, MI 48067
Telephone: (248) 752-8111 Fax: (248) 852-7707
Website: www.jacassociates.com

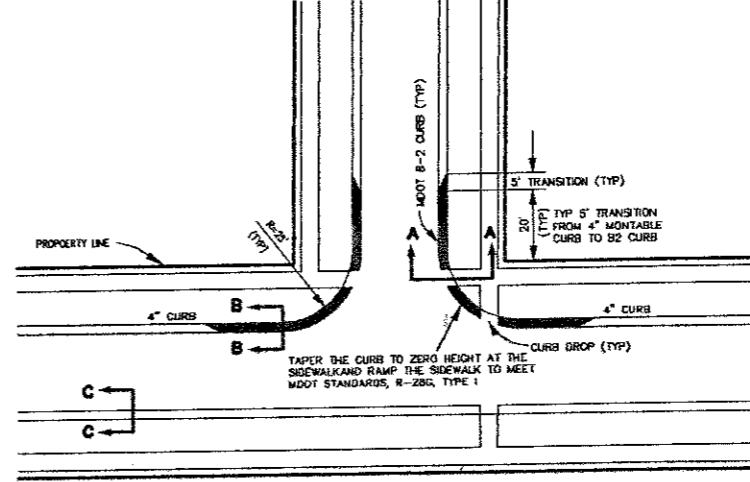
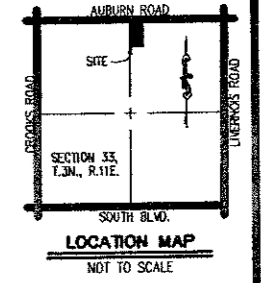
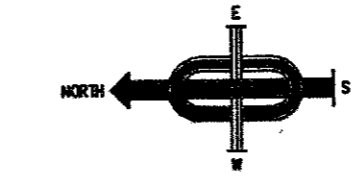
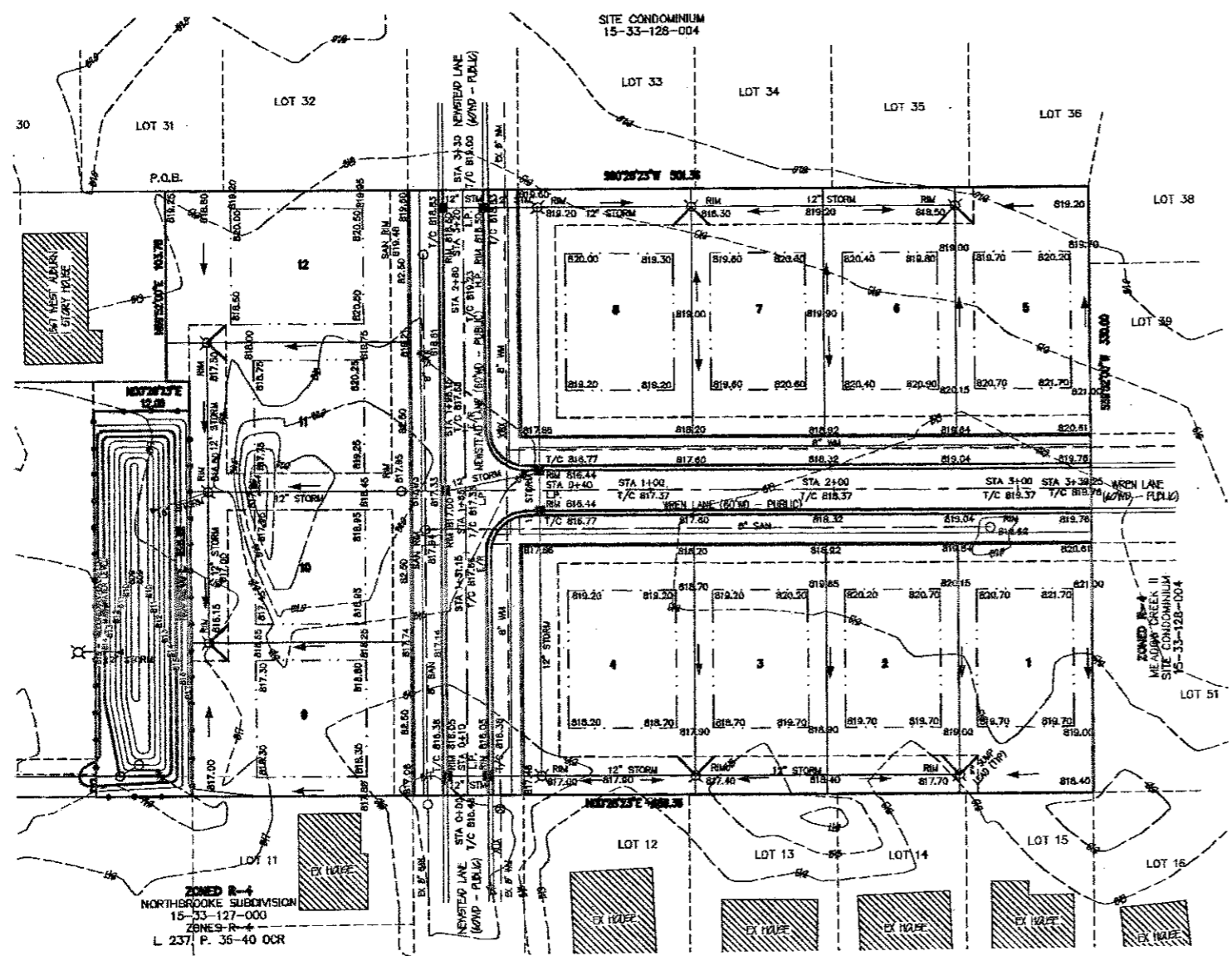
DATE: 04/30/2012
REV. DATE: 05/11/2012
DESCRIPTION:
REV. PER CITY:

SCALE: 1"=30'
CITY: 00-037.2
DRAWING: P-12-701
7 of 10

DETENTION PLAN

STATE OF MICHIGAN
JAMES J. JONES
ENGINEER
No. 30562
LICENSED PROFESSIONAL ENGINEER

15 NORTHBROOKE WEST CONDOMINIUM
PART OF THE E. 1/2 OF SECTION 33,
T. 24 S. R. 11 E., CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN.



SECTION A-A
(TYP SECTION THROUGH CURB)
NOT TO SCALE

SECTION B-B
CONCRETE CURB AND GUTTER
DETAIL B-2 (MODIFIED TO 2'-6" WIDTH)
NOT TO SCALE

SECTION C-C
(TYP 4" MOUNTABLE CURB)
NOT TO SCALE

CITY OF ROCHESTER HILLS
STANDARD DETAIL FOR STREET
INTERSECTION WITH SIDEWALK
(NOT TO SCALE)

ZONING R-4
TOTAL ACRES OF SITE AREA, GROSS 3.736 ACRES
TOTAL ACRES OF SITE, NET 2.855 ACRES
TOTAL NUMBER OF LOTS 12
MINIMUM LOT WIDTH PROVIDED (80 FT-10%) 72 LF
AVERAGE LOT SIZE PROVIDED 10,363 SFT
FRONT YARD SETBACK 25 FT
REAR YARD SETBACK 35 FT
SIDE YARD SETBACK 10 FT

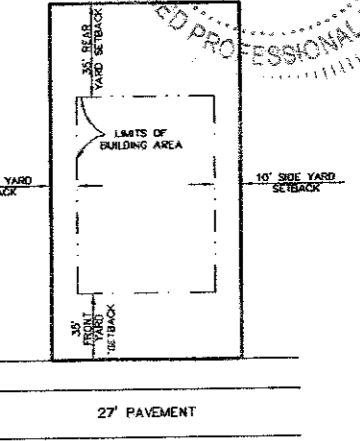
LOT NO	LOT AREA PROVIDED SFT	LOT WIDTH PROVIDED LF
1	9,720	72
2	9,720	72
3	9,720	72
4	12,588	93.25
5	9,720	72
6	9,720	72
7	9,720	72
8	12,588	93.25
9	9,909	82.5
10	9,909	82.5
11	10,165	82.5
12	10,897	82.5
TOTAL	124,376	

TOTAL AREA OF LOTS = 124,376 SFT
AVERAGE LOT AREA = 124,376/12 = 10,364.67 SFT
REQUIRED AVERAGE LOT SIZE = 9,600 SFT

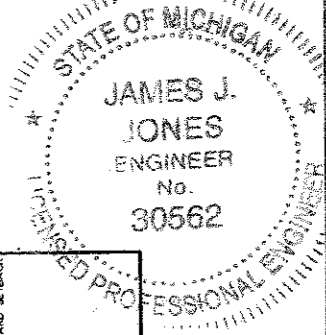
LOT AVERAGING REQUIREMENTS
MINIMUM LOT WIDTH = 72 FT
MINIMUM CORNER LOT WIDTH = 92 FT
MINIMUM LOT AREA = 8,640 SFT

FIRE LANES SHALL BE DESIGNATED BY THE FIRE CODE OFFICIAL, AND SHALL BE CONSPICUOUSLY POSTED ON BOTH SIDES OF THE FIRE LANE, AND WITH FIRE LANE SIGNS SPACED NOT MORE THAN 100 FEET APART, AND IN CONFORMANCE WITH THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, FIRE PREVENTION ORDINANCE CHAPTER 58, SECTION 901.4.2
CONSTRUCTION SHALL BE SAFEGUARDED IN ACCORDANCE WITH UNIFORM FIRE CODE ARTICLE 87 SECTION 8701.
OPEN BURNING IS NOT PERMITTED INCLUDING THE BURNING OF TRASH DEBRIS OR LAND CLEARING MATERIALS, FIRE PREVENTION ORDINANCE CHAPTER 58, SECTION 1102.6.1

- LEGEND**
- SANITARY SEWER
 - STORM SEWER
 - WATER MAIN
 - MANHOLE w/ R.Y.C.R. COVER
 - STANDARD MANHOLE
 - 3" DIA. R.Y.C.R.
 - 2" DIA. R.Y.C.R.
 - MANHOLE w/ PAVE. CO. COVER - 2' SUMP
 - STD. PAVE. CATCH BASIN - 2' SUMP
 - STD. PAVE. INLET - 2' SUMP
 - GATE VALVE IN WELL AND NO. EXISTING HYDRANT
 - PROPOSED HYDRANT AND NO.
 - SANITARY SEWER STRUCTURE NO.
 - STORM SEWER STRUCTURE NO.
 - SANITARY SEWER / WATERMAIN SHEET NO.
 - STORM SEWER / PAVING SHEET NO.
- ABBREVIATIONS**
- ELEVATION
 - BACK TO BACK OF CURB
 - TOP OF CURB
 - BOTTOM OF CURB
 - LOW POINT
 - HIGH POINT
 - CATCH BASIN
 - INVERT ELEVATION
 - MANHOLE
 - B./B.
 - R./B.
 - T./C.
 - G.U.
 - L.P.
 - H.P.
 - O.S.
 - I.E.
 - M.H.



TYPICAL UNIT DETAIL
(NOT TO SCALE)



J ASSOCIATES, INC.
Civil Engineering and Surveying
1055 South Boulevard E. - Suite 200, Rochester Hills, MI 48067
Telephone: (248) 738-8111 Fax: (248) 658-7707
Website: www.jassoc.com

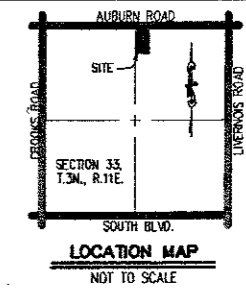
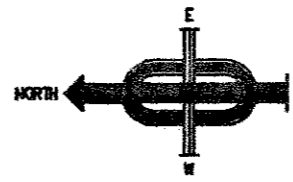
DATE	REV. DATE	DESCRIPTION	REV. PER CITY
04/30/2012	05/14/2012		

DRAWN BY: J.J.J.
CHECKED BY: J.J.J.

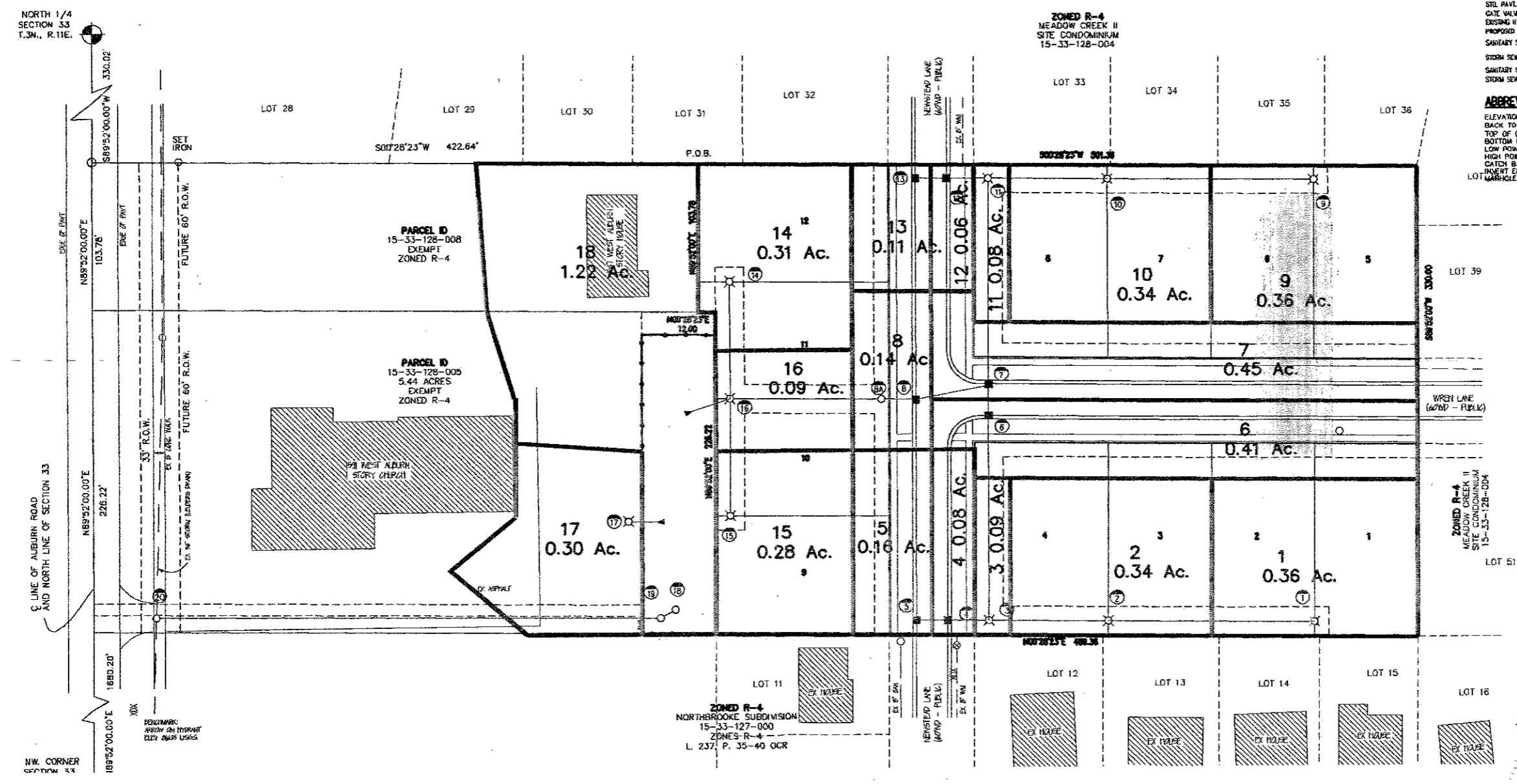
NORTHBROOKE EAST CONDOMINIUM
PART OF THE E. 1/2 OF SECTION 33,
T. 34 N., R. 11 E., CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN.
I. DALL, R. I.E.C., CITY ENGINEER

GRADING PLAN





- LEGEND**
- SANITARY SEWER
 - STORM SEWER
 - WATER MAIN
 - MANHOLE w/ R.Y.C.B. COVER
 - STANDARD MANHOLE
 - 3" DIA. R.Y.C.B.
 - 2" DIA. R.Y.C.B.
 - MANHOLE w/ PAVE. CB. COVER - 2' SAMP
 - SILT PAVE. CATCH BASIN - 2' SAMP
 - STD. PAVE. INLET - 2' SAMP
 - GATE VALVE IN WELL AND NO.
 - EXISTING HYDRANT
 - PROPOSED HYDRANT AND NO.
 - SANITARY SEWER STRUCTURE NO.
 - STORM SEWER STRUCTURE NO.
 - SANITARY SEWER / WATERMAIN SHEET NO.
 - STORM SEWER / PAVING SHEET NO.
- ABBREVIATIONS**
- ELEVATION
 - BACK TO BACK OF CURB
 - TOP OF CURB
 - BOTTOM OF CURB
 - LOW POINT
 - HIGH POINT
 - CATCH BASIN
 - INVERT ELEVATION
 - LOT MANHOLE
 - EL.
 - R/W
 - T/C
 - B/C
 - L.P.
 - H.P.
 - I.E.
 - M.H.



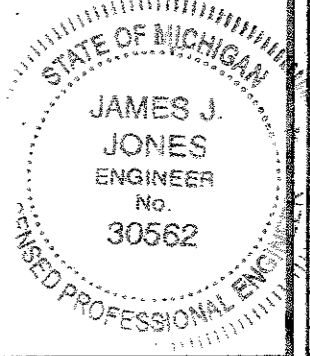
ASSOCIATES, INC.
Civil Engineering and Surveying

100 South Boulevard E. - Suite 200, Rochester Hills, MI 48307
Telephone (248) 795-8111 Fax (248) 652-7707
Website: www.jasoncollins.com

DATE	04/30/2012	DESCRIPTION	REV. PER CITY
REV. DATE	05/14/2012		
DRAWN BY	J.L.J.		
CHECKED BY	J.L.J.		

NORTHBROOKE EAST CONDOMINIUM
PART OF THE E. 1/2 OF SECTION 33,
T. 3N., R. 11E., CITY OF NORTHBROOK, OAKLAND COUNTY, MICHIGAN.

DRAINAGE AREA MAP

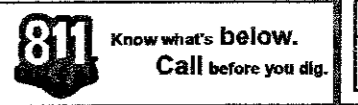


SCALE
1"=40'

CITY # 00-037.2

DRAWING P-12-701

9 of 10

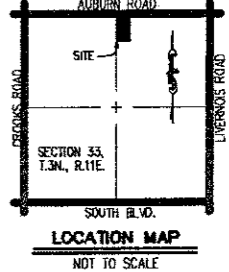
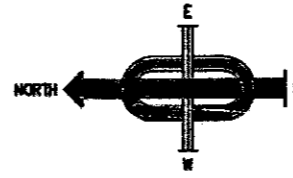


SOIL EROSION & SEDIMENTATION CONTROL NOTES

- All erosion and sediment control work shall conform to the standards and specifications of the City of Rochester Hills and Michigan Department of Environmental Quality (Part 91 of Public Act 451 of 1994).
- Inspections shall be made weekly until storm event by the contractor to determine effectiveness of erosion and sedimentation control measures and any necessary repairs shall be performed without delay.
- Erosion and sediment 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 both natural and manmade open ditches, streams, storm drains, lakes and ponds.
- Erosion and sediment control measures are to be placed prior to, or as the first step in, construction. Sediment control practices will be applied on a perimeter defense against any transporting of silt off the site.
- Contractor shall apply temporary erosion and sedimentation control measures. He shall remove temporary measures as soon as permanent stabilization of slopes, ditches and other earth changes have been accomplished and approved by the City of Rochester Hills.
- Ditch from the project shall be left on the site by delivery or construction vehicles through the use of stone exits. Should the stone become ineffective, it will be replaced. All construction traffic will use the clean stone exits.
- Earth embankment bridge placed over new pavement shall be located only at pavement high-points and shall have straw bales placed along each side of the bridge for the width of the pavement.
- Immediately after seeding, much of seeded areas with unweathered small grain straw or hay spread uniformly at the rate of 1.5 to 2 tons per acre. Anchor mat with disc-type mesh anchoring tool or other means as approved by the City of Rochester Hills.
- All mud, dirt and debris tracked or spilled onto existing roads from this site shall be promptly removed by the contractor.
- Permanent soil erosion control measures for all slopes, channels, ditches, or any disturbed land area shall be completed within fifteen (15) calendar days after final grading or final earth changes have been completed. When it is not possible to permanently stabilize a disturbed area after one day change has been completed or where significant earth change activity ceases, temporary soil erosion control measures shall be implemented immediately. All temporary soil erosion control measures shall be maintained until permanent soil erosion control measures are established. All permanent soil erosion control measures will be implemented and established before a certificate of completion is issued. All drain banks disturbed by construction shall be restored within five (5) calendar days and sold pegged in place.
- Particular care should be taken when working along the perimeter of the site in no event shall work areas extend beyond the limits indicated on the plans.
- Should be necessary for the contractor to dewater the ground in the course of constructing the proposed utility, the contractor shall construct a temporary soil erosion control device in a manner that will filter all discharged water from the dewatering operation. In no instance shall the dewatering discharge be permitted to flow unfiltered from the construction site.
- The contractor shall control the dust on the site during the life of the contract. The dust control materials and methods of application which are in accordance with the specifications and the requirements of the community. Such dust control materials shall be applied as often as is necessary in the opinion of the community to control the dust.
- Should the soil erosion control requirements be neglected or not adequately followed, the community may require the contractor to cease construction operations and to apply his entire force to meet the requirements before proceeding further with the project.
- All work connected with the soil erosion and sedimentation control, either temporary or permanent, as required by the soil erosion control permit is to be implemented during construction as stipulated in Part 91 of Public Act 452 of 1994.

ADDITIONAL NOTES:

- During the construction of the homes within the site, the builder will arrange to have the site streets swept and cleaned on a weekly basis (at a minimum) if this is not performed, the City will have the work completed and the cost deducted from the S.E.S.C. Bond.
- Soil on site is classified as sand.
- Silt fence:
 - *Used in with pea gravel in winter.
 - *Half fence behind curb if disturbed area is a potential to a waterway
 - *As soon as ground is thawed, silt fence is trenched in
 - *To be used to control sheet erosion, not concentrated flow
- Ingress/egress to individual lots shall be limited to stone drives constructed with a minimum stone size of 6A. Stone access drives shall be used for ingress/egress to sites in accordance with MDEQ SW02 BMP Manual standards and specifications.
- The contractor is required to relocate stock piles away from sensitive areas.
- Vacuuming and flushing of storm sewer system at completion and/or as needed.
- Rip rap covers of storm gutters immediately after installation.
- Removal of temporary controls only after approved permanent soil erosion controls, including established vegetation, have been inspected.
- Roadside drainage ditches and culverts must be protected as necessary.
- The builder is responsible for street cleaning for the site and any adjacent streets.
- Following authorization by the City of Rochester Hills to commence construction, the Project Developer shall notify the City a minimum of 72 hours before beginning construction to allow for scheduling of the S.E.S.C. measures inspection.
- Stone outlets need to be placed at breaks (low areas) in silt fence to allow water to drain from the site.
- Stone check dams should be installed in areas of heavy flow, e.g. saturation areas and ditches.
- The soil erosion controls will be maintained weekly and after every storm event by a representative of Todian Homes.

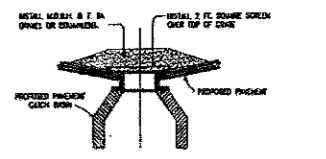


LEGEND

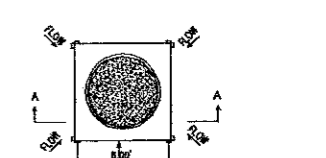
- SANITARY SEWER
- STORM SEWER
- WATER MAIN
- MANHOLE w/ R.T.C.B. COVER
- STANDARD MANHOLE
- J. SIA. R.T.C.B.
- Z. SIA. R.T.C.B.
- MANHOLE w/ PAVT. C.B. COVER - 2' SAMP
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- PROPOSED HYDRANT AND NO.
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ABBREVIATIONS

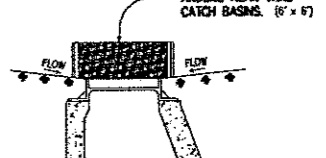
- ELEVATION BACK TO BACK OF CURB: EL. B/B
- TOP OF CURB: T/C
- BOTTOM OF CURB: B/C
- LOW POINT: LP
- HIGH POINT: HP
- CATCH BASIN INVERT ELEVATION: CB IE
- MANHOLE: MH



DETAIL OF GRAVEL INLET FILTER



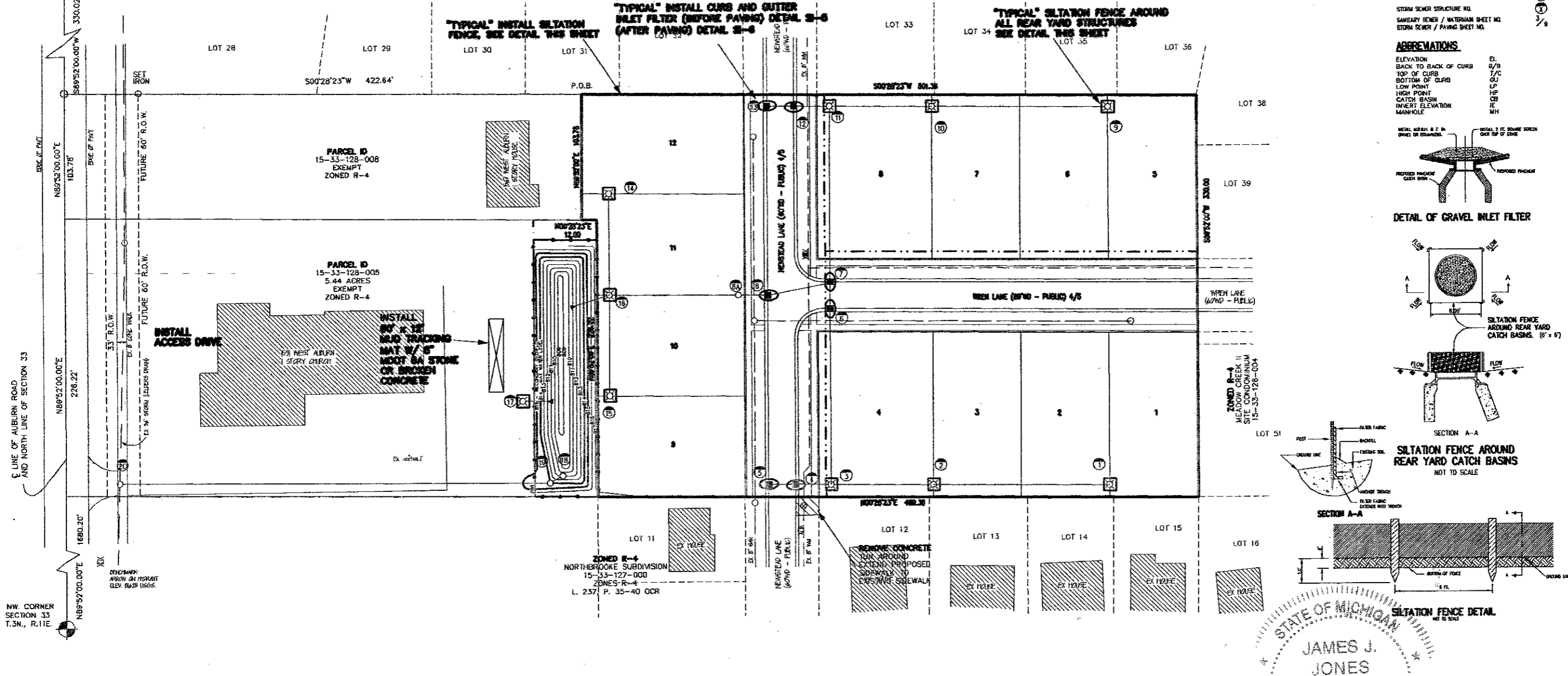
SILTATION FENCE AROUND REAR YARD CATCH BASINS



SILTATION FENCE DETAIL

NORTH 1/4 SECTION 33 T.3N., R.11E.

ZONED R-4 MEADOW CREEK II SITE CONDOMINIUM 15-33-128-004



SOIL EROSION / SEDIMENTATION CONTROL OPERATION TIME SCHEDULE

NOTE: GENERAL CONTRACTOR TO COMPLETE DATE

CONSTRUCTION OPERATION	START DATE	END DATE
INSTALL S.E.S.C. BOND		
FIELD CONSTRUCTION ACCESS		
BUILD SEWER MAIN		
ROUGH GRADE SITE		
INSTALL UTILITIES		
GRADE SITE FOR PAVING		
INSTALL PAVEMENT		
INSTALL FINISH UTILITIES		
FINISH GRADING		
LANDSCAPING / SEED / FINAL STABILIZATION		

PROPERTY DESCRIPTION

A PARCEL OF LAND LOCATED IN THE E. 1/2 OF THE N.W. QUARTER OF SECTION 33, T.3 N., R. 11E., CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, COMMENCING AT THE NORTH 1/4 CORNER OF SECTION 33; THENCE S89°52'00"W ALONG THE NORTH LINE OF SAID SECTION 33, 330.02 FEET; THENCE S00°28'23"W 422.64 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING S00°28'23"W 501.36 FEET; THENCE S89°52'00"W 330.00 FEET; THENCE N00°28'23"E 489.36 FEET; THENCE N89°52'00"E 226.22 FEET; THENCE N00°28'23"E 12.00 FEET; THENCE N89°52'00"E 103.78 FEET TO THE POINT OF BEGINNING.

CONTAINING 162,725 S.F. (3.736 ACRES) OF LAND, MORE OR LESS, SUBJECT TO ANY RESTRICTIONS AND EASEMENTS OF RECORD.

QUANTITIES

ESTIMATED	QUANTITIES	MEASURED
1.	1 EA. 60' x 12' MUD TRACKING MAT W/ 8" MOOT 6A STONE OR BROKEN CONCRETE	
2.	2063 L.F. INSTALL SILTATION FENCE	
3.	7 EA. INSTALL GRAVEL INLET FILTERS ON ALL PAVEMENT STRUCTURES	
4.	240 L.F. SILTATION FENCE AROUND ALL REAR YARD CATCH BASINS.	

STATE OF MICHIGAN
 JAMES J. JONES
 ENGINEER
 No. 30562
 LICENSED PROFESSIONAL ENGINEER

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

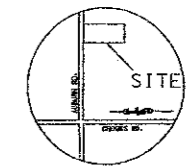
"MUDHOLE'S LAST CONDOMINIUM"
 PART OF THE E. 1/2 OF SECTION 33,
 T. 3 N., R. 11 E., CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN.

SOIL EROSION CONTROL PLAN

DATE	DESCRIPTION	REV. PER CITY
04/30/2012 <td> <td></td> </td>	<td></td>	
05/14/2012		

DRAWN BY: J.J.J.
 CHECKED BY: J.J.J.

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 Civil Engineering and Surveying
 1066 South Boulevard E. - Suite 200, Rochester Hills, MI 48307
 Telephone: (248) 778-9111 Fax: (248) 683-7707
 Website: www.jassoc.com

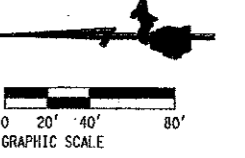


LOCATION MAP
(NOT TO SCALE)

LEGEND

- STORM MANHOLE
- SQUARE CATCH BASIN
- ROUND CATCH BASIN
- ⊕ GAS MANHOLE
- ⊕ GAS METER
- ⊕ WATER MANHOLE
- ⊕ WATER VALVE MANHOLE
- ⊕ FIRE HYDRANT
- ⊕ ELECTRIC MANHOLE
- ⊕ ELECTRIC BOX
- ⊕ TELEPHONE MANHOLE
- ⊕ TELEPHONE PEGHOLE
- ⊕ UNDERGROUND
- ⊕ OVERHEAD
- ⊕ FOUND IRON
- ⊕ SET "I" - IRON
- ⊕ TRAVELER POINT
- ⊕ BUSHES TREE
- ⊕ CONIFEROUS TREE
- BUSH
- ⊕ POST
- ⊕ SIGN
- FENCE LINE
- ⊕ UTILITY POLE
- ⊕ LIGHT POLE
- ⊕ GUY ANCHOR
- ⊕ GUY POLE
- ⊕ SANITARY SEWER MANHOLE
- ⊕ SEWER CLEANOUT
- ⊕ ELECTRIC
- ⊕ GAS
- ⊕ WATER
- ⊕ SANITARY SEWER
- ⊕ STORM SEWER
- ⊕ TELEPHONE

BENCHMARK
ARROW ON HYDRANT
LOCATED NEAR THE
NE COR. OF NORTHBROOKE SUBDIVISION
ELEVATION 816.25 USGS



Tree #	D.B.H. inches	Species	Health	Crown Spread	Notes
1	12	Cottonwood - <i>Populus deltoides</i>	Good	10	
2	7	White Ash - <i>Fraxinus americana</i>	Poor	5	
3	8	White Ash - <i>Fraxinus americana</i>	Fair	5	
4	11-11.9	Apple - <i>Malus</i> spp.	Fair	15	
5	13	Apple - <i>Malus</i> spp.	Poor	15	
6	9, 8, 7	Apple - <i>Malus</i> spp.	Fair	20	
7	24, 22, 13	Black Willow - <i>Salix nigra</i>	Very Poor	55	Severely Rot (decay at base) Pacer 4000
8	7	Silver Maple - <i>Acer saccharinum</i>	Fair	10	
9	8	Silver Maple - <i>Acer saccharinum</i>	Good	10	
10	9	Silver Maple - <i>Acer saccharinum</i>	Good	15	
11	7	White Ash - <i>Fraxinus americana</i>	Very Poor	10	Half of Tree Out- stump Damage
50	7	Green spruce - <i>Picea Glauca</i>	Good	6	
51	7	Green spruce - <i>Picea Glauca</i>	Good	6	
52	7	Green spruce - <i>Picea Glauca</i>	Good	6	
53	7	Green spruce - <i>Picea Glauca</i>	Good	6	
54	7	Green spruce - <i>Picea Glauca</i>	Good	6	

LEGAL DESCRIPTION
A parcel of land located in the E. 1/2 of the N.W. 1/4 of Section 33, T.3N., R.11E., City of Rochester Hills, Oakland County, Michigan, consisting of the N. 1/2 Cor. of Section 33; thence S89°52'00" W. along the N. 1/2 Cor. of said Section 33, 150.10 feet; thence S89°52'00" E. 42.54 feet to the point of beginning; thence continuing S00°22'23" W. 501.35 feet; thence S89°52'00" W. 330.00 feet; thence N00°28'23" E. 493.35 feet; thence N89°52'00" E. 226.22 feet; thence N89°28'23" E. 12.12 feet; thence S89°52'00" W. 103.78' to the point of beginning.

containing 162,725 sq. ft. (3.736 acres) of land, more or less, subject to any restrictions and assessments of record.

UTILITY INFORMATION DELINEATED ON THIS DRAWING WAS PROVIDED BY INDIVIDUAL UTILITY COMPANIES AND/OR VISUAL FIELD OBSERVATIONS WHERE FEASIBLE. NO GUARANTEE IS GIVEN AS TO THE COMPLETENESS OR ACCURACY THEREOF. FOR EXACT LOCATIONS PRIOR TO ANY NEW CONSTRUCTION, CONTACT "MISS DIG"



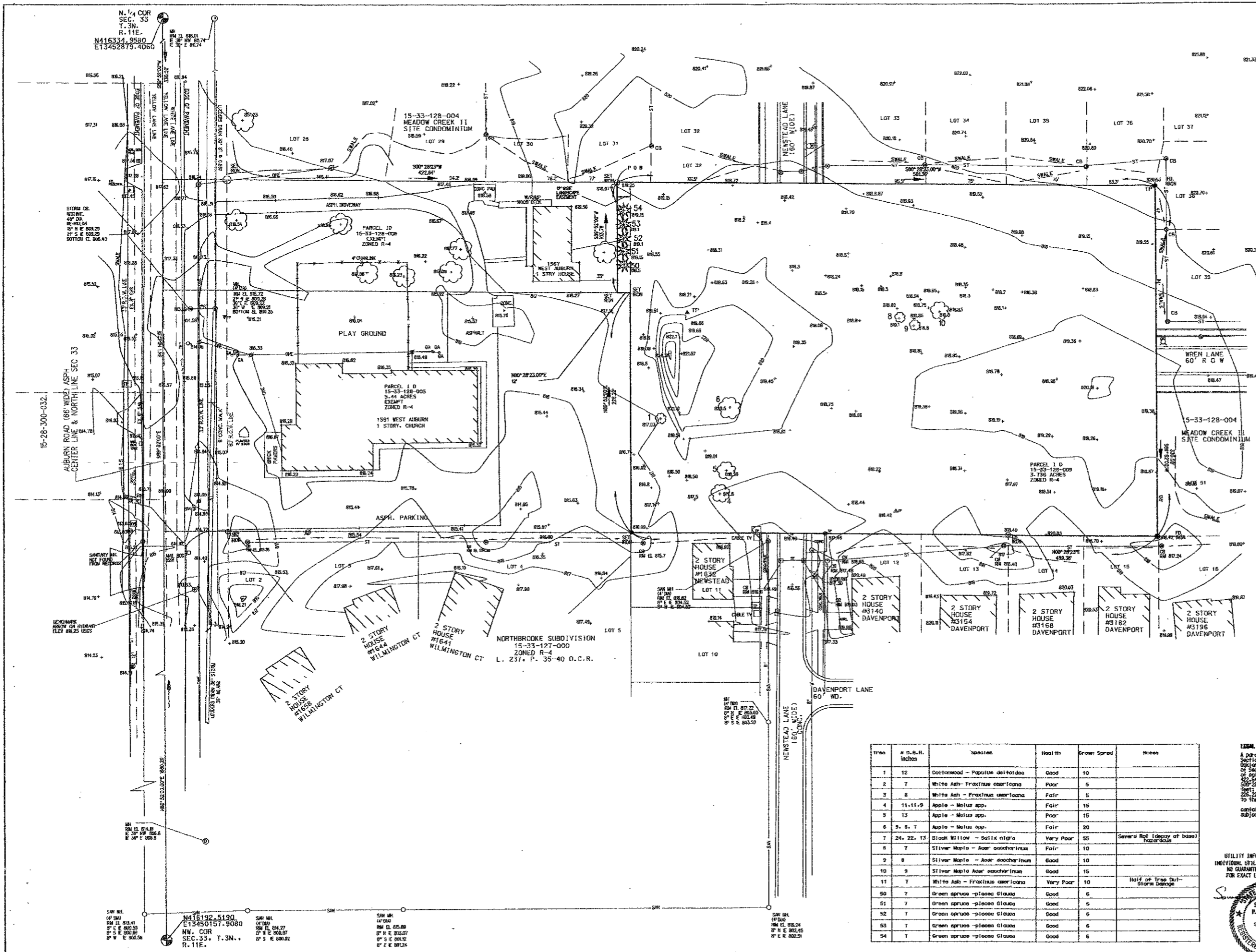
72 HOURS
BEFORE YOU
CALL MISS DIG
800-482-1111
TOLL FREE

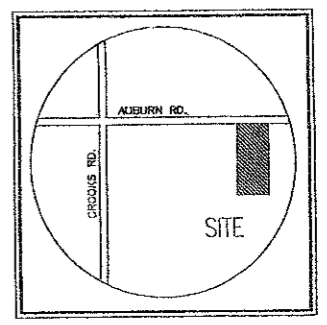
PART OF THE EAST 1/2 OF THE
NW 1/4
SEC. 33
T.3N., R. 11E.
CITY OF ROCHESTER HILLS,
OAKLAND COUNTY, MICHIGAN.

STELLAR CONSULTING SERVICES, INC.
PROFESSIONAL ENGINEERS & SURVEYORS
20300 W 12 MILE ROAD, SUITE 101
SOUTHFIELD, MI 48076
PHONE 248 351 9800
FAX 248 551 9818
EMAIL: STELLAR@AOL.COM

TOPOGRAPHICAL BOUNDARY SURVEY

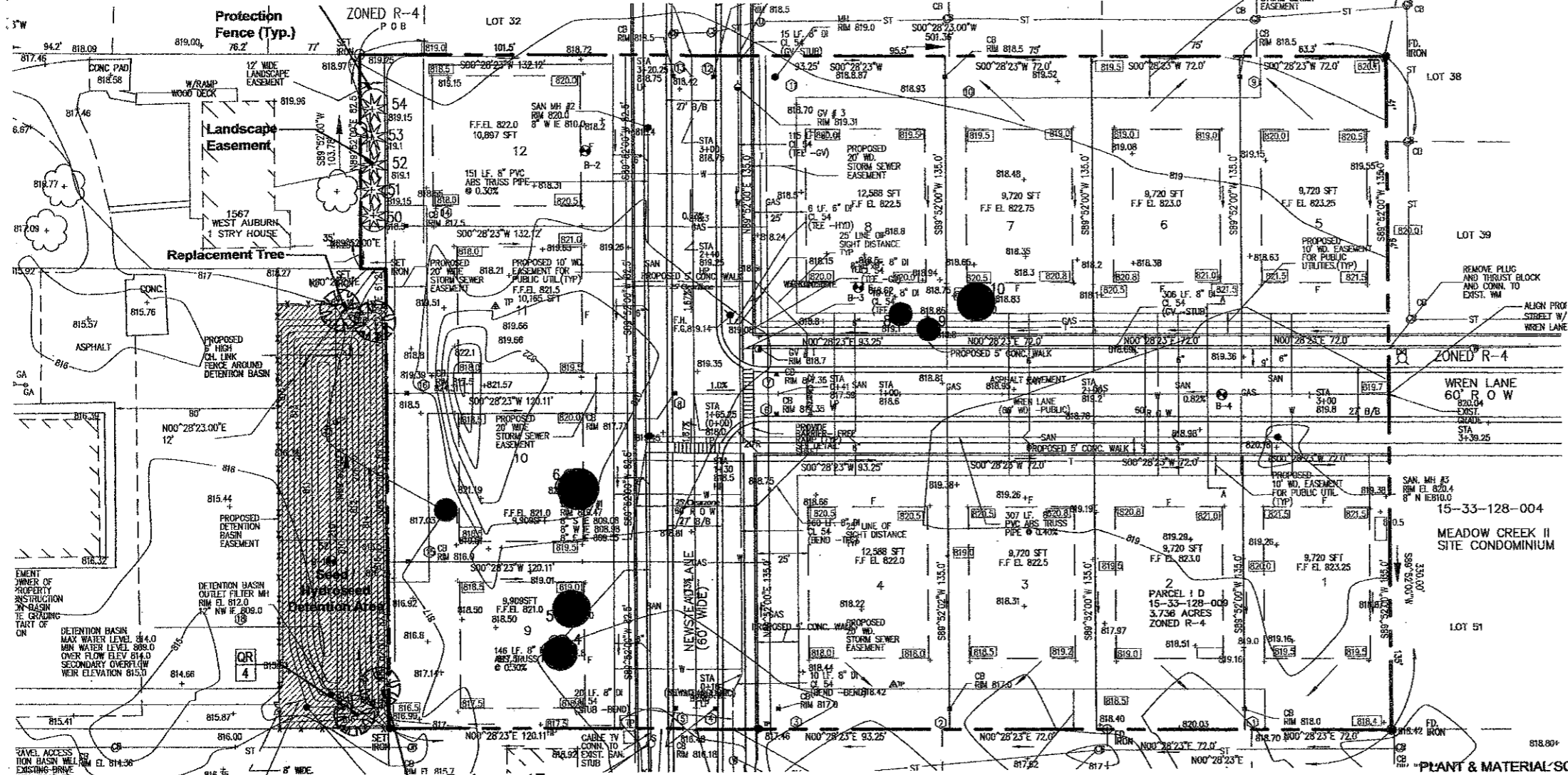
JOB# 0203 DRAWN BY: JAP/ML
C-8





Location Map
 Not To Scale

Legal Description
 A parcel of land located in the E 1/2 of the NW 1/4 of Section 33, T 3 N, R 11 E, City of Rochester Hills, Oakland County, Michigan. Commencing at the N 1/4 Cor. of Section 33, thence S89°32'00" W, 300' to the Point of Beginning, thence S00°28'23" W, 72.0' to the Point of Beginning, thence S89°32'00" W, 300' to the Point of Beginning, thence N89°32'00" W, 72.0' to the Point of Beginning, thence S89°32'00" W, 300' to the Point of Beginning, thence N89°32'00" W, 72.0' to the Point of Beginning, thence S89°32'00" W, 300' to the Point of Beginning, thence N89°32'00" W, 72.0' to the Point of Beginning, containing 162,725 sq ft (3.736 acres) of land, more or less, subject to any restrictions and easements of record. Parcel ID 15-33-128-009

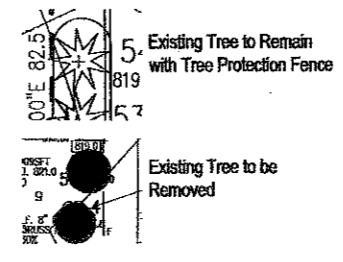


PLANT & MATERIAL SCHEDULE & COST ESTIMATE:

QTY.	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	UNIT PRICE	UNIT TOTAL
SHADE TREE							
4	QR	Quercus Rubra	Red Oak	3" CAL.	B&B	\$425.00	\$1,700.00
MATERIALS							
±3	S.F.	Seeding / Hydroseed				\$ 0.08	\$ 880.00
±3	C.Y.	Mulch				\$ 40.00	\$ 120.00
±3	C.Y.	Plant Mix				\$ 42.00	\$ 126.00
TOTAL						\$2,826.00	
FEE PAID TO THE CITY FOR STREET TREE INSTALLATION						\$2,400.00	
TOTAL ESTIMATE						\$5,226.00	

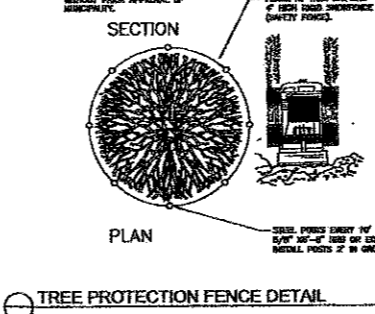
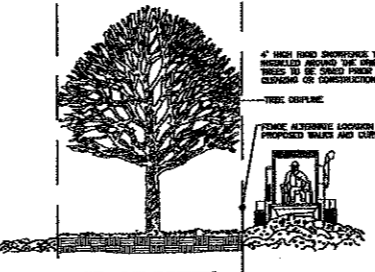
NOTES:
 1. Best information provided by Statler Consulting Services, Inc.
 2. Street Trees to be installed by City.
 3. Prior to issuance of a Land Improvement Permit, the Prescribed Fee of \$200.00 per Street Tree (i.e., \$2,400.00) will be paid to the City of Rochester Hills.
 4. Irrigation of plant material is the responsibility of each individual home owner.
 5. Prior approval is required to plant any tree or shrub on the public right-of-way. All trees and shrubs must be planted at least 10' from the edge of the public road. Shade trees and shrubs must be planted at least 5' from the edge of the public roadway. Evergreen and ornamental trees must be planted at least 10' from the edge of the public roadway. No trees or shrubs may be planted within the triangular area formed at the intersection of a street right-of-way line at a distance along each line of 25' from their point of intersection. No trees or shrubs may be planted in the triangular area formed at the intersection of any driveway with a public roadway at a distance along each line of 15' from their point of intersection. All trees and shrubs must be planted at least 10' from any fire hydrant. Shade and evergreen trees must be at least 15' away from the nearest overhead wire. Trees must be planted a minimum of 5' from an underground utility, unless the city's landscape architect requires a greater distance.
 6. Prior to the release of the performance bond, the City of Rochester Hills Forestry Division needs to inspect all trees, existing or planned, to identify any that pose a hazard to the safe use of the public right-of-way. Forestry may require the developer to remove, and possibly replace, any such tree.

Existing Tree Key



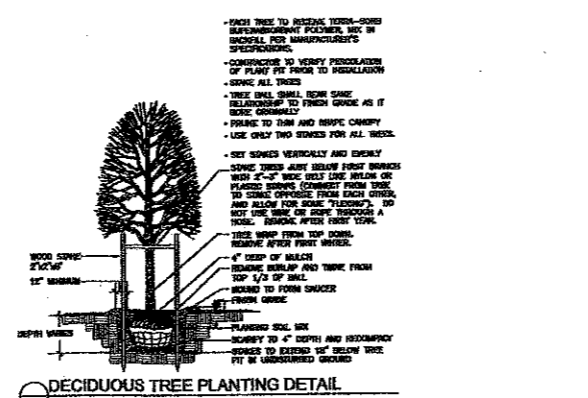
TREE PRESERVATION CALCULATIONS:

Total Number of Trees Surveyed: 16
 Number of Regulated Trees: 12
 Trees Required to be Saved: (37%) = 5
 Trees being Saved per Site Plan: 5
 Number of Trees Being Removed per Site Plan: 7
 Total Trees for Replacement at 3" Caliper: 4



TREE SURVEY:

Tree Number	D.B.H. (Inches)	Species	Health	Crown Spread	Regulation	Status
1	12	Cottonwood - Populus deltoides	Good	10	Regulated	Removed
2	7	White Ash - Fraxinus Americana	Poor	5	Non-Regulated	
3	6	White Ash - Fraxinus Americana	Fair	5	Non-Regulated	
4	11, 11, 9	Apple - Malus Spp.	Fair	15	Regulated	Removed
5	13	Apple - Malus Spp.	Poor	15	Regulated	Removed
6	9, 8, 7	Apple - Malus Spp.	Fair	20	Regulated	Removed
7	24, 22, 13	Black Willow - Salix nigra	Very Poor	55	Non-Regulated	
8	7	Silver Maple - Acer Saccharinum	Fair	10	Regulated	Removed
9	8	Silver Maple - Acer Saccharinum	Good	10	Regulated	Removed
10	9	Silver Maple - Acer Saccharinum	Good	15	Regulated	Removed
11	7	White Ash - Fraxinus Americana	Very Poor	10	Non-Regulated	
50	7	Green Spruce - Picea glauca	Good	6	Regulated	Protected
51	7	Green Spruce - Picea glauca	Good	6	Regulated	Protected
52	7	Green Spruce - Picea glauca	Good	8	Regulated	Protected
53	7	Green Spruce - Picea glauca	Good	6	Regulated	Protected
54	7	Green Spruce - Picea glauca	Good	6	Regulated	Protected



PLANTING NOTES:

- LANDSCAPE CONTRACTOR SHALL VISIT SITE, INSPECT EXISTING CONDITIONS AND REVIEW PROPOSED PLANTING AND RELATED WORK. IN CASE OF DISCREPANCY BETWEEN PLAN AND PLANT LIST, PLAN SHALL GOVERN. CONTACT LANDSCAPE ARCHITECT WITH ANY CONCERNS.
- CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ON-SITE UTILITIES PRIOR TO BEGINNING CONSTRUCTION OR BEFORE PHASE OF TWO (2) YEAR PERIOD. CALL TELEPHONE, GAS, TELEVISION MAY BE LOCATED BY CALLING MISS DIG 480-4871. ANY DAMAGE OR INTERFERENCE OF SERVICES SHALL BE THE RESPONSIBILITY OF CONTRACTOR. CONTRACTOR SHALL COORDINATE ALL RELATED ACTIVITIES WITH OTHER TRADES ON THE JOB AND SHALL REPORT ANY UNDISCOVERABLE CONDITIONS TO OWNERS REPRESENTATIVE PRIOR TO COMMENCING WORK.
- CONTRACTOR WILL SUPPLY FINISHED GRADE AND EXCAVATE AS NECESSARY TO SUPPLY 4" TOPSOIL DEPTH IN ALL PLANTING BEDS AND 4" TOPSOIL DEPTH IN ALL LAWN AREAS.
- ALL PLANT MATERIAL TO BE PROVIDED GRADENERS STOCK. PLANT MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED IN THE MOST RECENT EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK. CONTRACTOR TO SUPPLY NURSERY SOURCES FOR ALL PURCHASED MATERIAL. NO BARE ROOT OR PINK GRADE MATERIAL WILL BE ACCEPTED.
- GUARANTEE OF PLANTS FOR TWO (2) YEAR SHALL BEGIN AFTER ACCEPTANCE BY THE CITY OF ROCHESTER HILLS LANDSCAPE ARCHITECT AND THE PROJECT REPRESENTATIVE. THE CONTRACTOR SHALL GUARANTEE ALL PLANTS TO BE HEALTHY, VIGOROUS CONDITION FOR A PERIOD OF TWO (2) YEARS FOLLOWING ACCEPTANCE. CONTRACTOR SHALL REPLACE WITHOUT COST TO THE OWNER, ANY DEAD OR UNACCEPTABLE PLANTS, AS DETERMINED BY THE CITY OF ROCHESTER HILLS LANDSCAPE ARCHITECT AND THE PROJECT REPRESENTATIVE DURING AND AT THE END OF THE GUARANTEE PERIOD.
- RECTITUDE OF GRADING AND SOIL SHALL BE BY LANDSCAPE ARCHITECT AND/OR PROJECT REPRESENTATIVE. THE CONTRACTOR SHALL ASSUME MAINTENANCE RESPONSIBILITY FOR A PERIOD OF TWO (2) YEAR. MAINTENANCE SHALL INCLUDE WATERING, WEEDING, REPLACEMENT OF WEAKENED AND OVER OPERATIONS NECESSARY TO KEEP IN A TYPICAL CONDITION. UPON FINAL ACCEPTANCE BY THE CITY OF ROCHESTER HILLS LANDSCAPE ARCHITECT AND/OR PROJECT REPRESENTATIVE THE OWNER SHALL ASSUME ALL MAINTENANCE RESPONSIBILITIES.
- ALL TREES MUST BE TESTED FOR PROPER DRAINAGE PRIOR TO PLANTING TREES. ADVISORY SYSTEMS SHALL BE INSTALLED IF PLANTING POTENTIAL IS NOT SUFFICIENTLY PROVED IN HEAVY CLAY SOILS.
- ALL LANDSCAPE AREAS SHALL HAVE PROPER DRAINAGE THAT PREVENTS EXCESS WATER FROM SPREADING ON LAWN AREAS OR UNDER TREES AND SHRUBS.
- SPRINKLERS USED FOR TREE SUPPORTS SHALL POINT AWAY FROM ANY CIRCULATION ROUTES.
- REMOVE ALL TREE STRIPS AND GUY WIRES AFTER ONE YEAR.
- IN CASE OF DISCREPANCY BETWEEN PLAN AND SPECIFICATIONS, THE PLAN SHALL GOVERN OVER SPECIFICATIONS.
- RELOCATE AND WATERING OF ALL PLANTS AND TREES SHALL BE IMMEDIATELY OR WITHIN 48 HOURS AFTER INSTALLATION.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON LANDSCAPE PLAN PRIOR TO BEGINNING WORK.
- THE OWNERS REPRESENTATIVE AND THE CITY OF ROCHESTER HILLS LANDSCAPE ARCHITECT RESERVE THE RIGHT TO REMOVE ANY PLANT MATERIAL NOT MEETING SPECIFICATIONS.
- INSTALL AND MAINTAIN ALL LANDSCAPING ACCORDING TO ROCHESTER HILLS STANDARDS.
- PLANTING TO START SPRING 2025.
- PLANT TREES AND SHRUBS NO CLOSER THAN THE FOLLOWING MINIMUM DISTANCE FROM SIDEWALK, CURB, AND PARKING STRIPS:
 - A. SPREADING CANOPY TREES: 15 FEET
 - B. ORNAMENTAL/EMERGING TREES: 10 FEET
 - C. EVERGREEN TREES: 10 FEET
 - D. EVERGREEN/LOWERING SHRUBS: 10 FEET

Tree Protection Notes

- Two tree protection fences (TPF) shall be erected per the plans approved by the City of Rochester Hills Planning Department. The TPF must be in place and inspected by the City of Rochester Hills Landscaping Department prior to the start of any excavation or construction operations. It is the developer's responsibility to contact the City Planning Department at 1-248-650-4600 to schedule a TPF inspection. The TPF shall remain in place throughout the entire construction process or until the City authorizes the removal or issues a final Certificate of Occupancy, whichever occurs first.
- Upon completion of grading and soil stabilization of the construction a second TPF shall be erected around the trees designated for preservation as required by the City of Rochester Hills Landscaping Department prior to the start of any additional construction. It is the developer's responsibility to contact the City Planning Department at 1-248-650-4600 to schedule the TPF inspection.
- A final inspection by the City of Rochester Hills Landscaping Architect is required at the end of the warranty and maintenance period. The Landscaping Maintenance Bond will not be released until the inspection is complete and all related issues are resolved. It is the developer's responsibility to contact the City Planning Department at 1-248-650-4600 to schedule the inspection.
- The TPF shall be erected by the City of Rochester Hills Landscaping Architect in accordance with the City of Rochester Hills Landscaping Department and shall be maintained throughout the construction process. The TPF shall be erected by the City of Rochester Hills Landscaping Architect in accordance with the City of Rochester Hills Landscaping Department and shall be maintained throughout the construction process. The TPF shall be erected by the City of Rochester Hills Landscaping Architect in accordance with the City of Rochester Hills Landscaping Department and shall be maintained throughout the construction process.
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DesignTeam Limited
 17256 W. Ten Mile Road
 Southfield, MI 48075
 248.559.1000
 Fax: 248.559.5717
 email: dteam@aol.com

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 Development, L.L.C.
 1381 E. Square Lake Road
 Troy, Michigan 48065
 PH: 248.628.3811
 FAX: 248.628.3812

Project
Northbrooke East Condominium
 Rochester Hills,
 Oakland County,
 Michigan

Designed/Drawn: MMH/BAW
 Checked/Approved: RJM
 Job #: 0312.02
 File: 0312.02 in 11-9-05.dwg
 Date/Revision: Issued For
 1/2/05 For Site Plan Approval
 11/9/05 For Site Plan Approval
 11/13/05 For Site Plan Approval
 11/23/05 For Site Plan Approval
 11/19/05 For Site Plan Approval

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