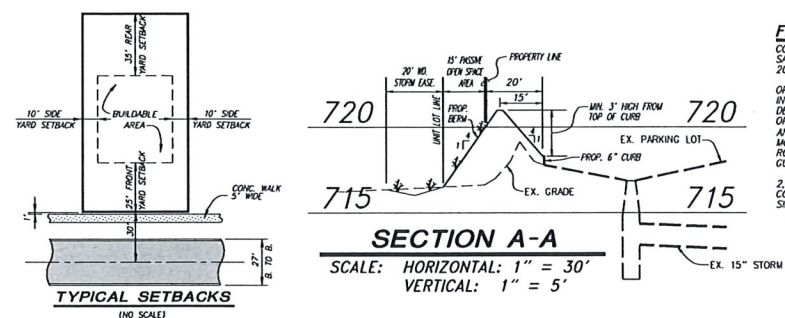




3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) for the location of underground utilities.

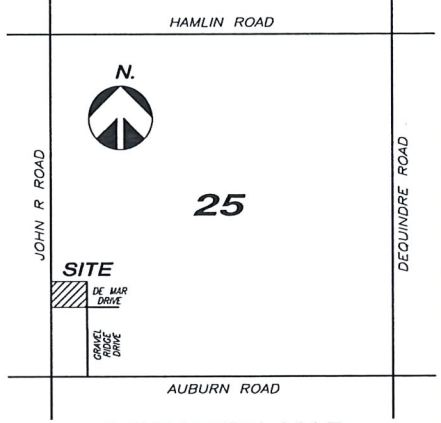
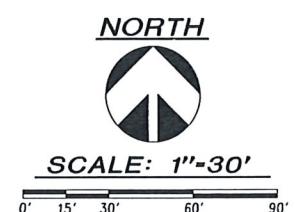
Contractor Note: The locations of existing underground utilities are shown in an approximate way only. The contractor shall determine the exact location of all existing utilities before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve any and all underground utilities.



**FIRE DEPARTMENT NOTES:**  
CONSTRUCTION SITES SHALL BE SAFEGUARDED IN ACCORDANCE WITH §C 2008 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.  
2,000 S.F. AVERAGE HOUSE SIZE CONSTRUCTED OF WOOD, BRICK, AND SANDING OF VARIOUS MATERIALS.

**PROPERTY DESCRIPTION**  
Property Description As Surveyed and Related to Edinboro Sub. No. 1 as recorded in L.H. 11 P.15-17.  
A parcel of land in the SW 1/4 of Section 25, T.3N.R.11E., City of Rochester Hills, Oakland County, Michigan is more particularly described as: Commencing at the SW Corner of Section 25; thence N.00°04'45"E., 1320.00 feet along the West line of Section 25 and the centerline of John R Road; thence N.89°25'45"E., 60.00 feet to the Point of Beginning; thence N.00°04'45"E., 330.00 feet along the East line of John R Road (120 feet wide); thence N.89°25'45"E., 574.99 feet; thence S.00°04'45"W., 330.00 feet along the West line of Gravel Ridge Drive (50 feet wide); thence S.89°25'45"W., 574.99 feet to the Point of Beginning and containing 4.356 acres.

**BENCHMARKS**  
1. CUT NAIL IN W. FACE U-POLE, EAST SIDE OF JOHN R. AT HOUSE #2731 ELEVATION=716.65 DATUM=NAVD88  
2. SAN. MH IN GRAVEL RIDGE DR. AT HOUSE #2731 ELEVATION=716.60 DATUM=NAVD88  
3. 1/4" HD AT NORTH END OF GRAVEL RIDGE DR. ELEVATION=722.78 DATUM=NAVD88  
4. 1/4" HD AT S.E. CORNER OF INTERSECTION OF GRAVEL RIDGE DR. AND DELMAR RD. ELEVATION=717.28 DATUM=NAVD88  
5. 1/4" HD ON W. SIDE OF JOHN R. 150' S. OF N. P. ELEVATION=718.79 DATUM=NAVD88



**LOCATION MAP**  
SCALE: 4" = 1 MILE

**SITE CRITERIA**  
• PARCEL IDENTIFICATION #: 15-25-351-045  
• EXISTING ZONING: R-4  
• ADJACENT ZONING: R-4  
• GROSS AREA OF SITE: 189,736 S.F. (4.356 AC.)  
• NET AREA OF SITE: 180,696 S.F. (4.138 AC.)  
• PROPOSED USE: SINGLE FAMILY SITE CONDOMINIUM w/ PUBLIC ROAD  
• UNIT SUMMARY (UNIT AVERAGING 10% REDUCTION):  
• MINIMUM UNIT SIZE: 8,640 S.F.  
• DENSITY PERMITTED: 3.4 UNITS/AC. x 4.318 AC. = 14.7 UNITS  
• DENSITY PROPOSED: 15 UNITS  
• MINIMUM UNIT FRONTAGE: 72' (MEASURED AT FRONT SETBACK LINE) (PER ZONING ORDINANCE)  
• BUILDING SETBACKS: FRONT = 25'  
REAR = 35'  
SIDE = 10'  
HEIGHT = 30' MAX.

UNIT AVERAGE	UNIT FRONTAGE	UNIT AREA (SQ. FT.)
1.	75.72'	9,038
2.	76.00'	9,120
3.	76.00'	9,120
4.	76.00'	9,120
5.	76.00'	9,120
6.	76.00'	9,120
7.	94.28'	11,361
8.	80.00'	10,788
9.	80.00'	10,788
10.	80.00'	10,788
11.	80.00'	10,788
12.	80.00'	10,788
13.	80.00'	10,863
TOTAL	1040.00'	130,116
AVERAGE	= 80.00'	10,009 S.F.

• MAXIMUM LOT COVERAGE: 2,000 S.F. AVG. HOUSE SIZE w/ 9,000 S.F. MIN. LOT SIZE = 22%  
• OPEN SPACE:  
OPEN SPACE "A": 2,700 S.F.  
OPEN SPACE "B": 10,850 S.F.  
DETENTION POND: 10,119 S.F.  
• UTILITY SUMMARY:  
• WATER MAIN: MUNICIPAL  
• SANITARY SEWER: MUNICIPAL  
• STORM SEWER: ENCLOSED PIPE WITH OUTLET TO EX. DRAIN

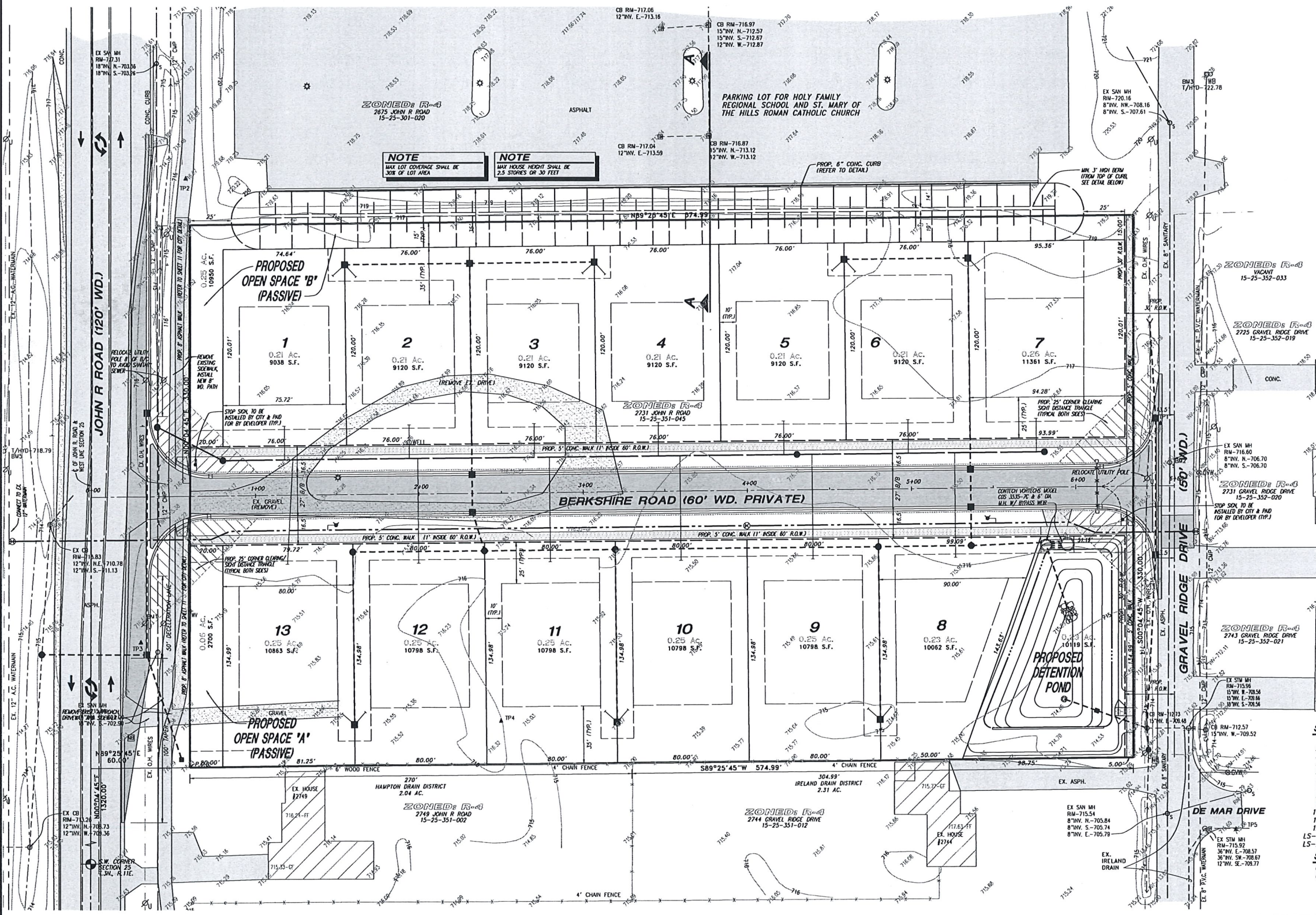
**LEGEND**

[Symbol]	EXISTING CONTOURS
[Symbol]	EXISTING GRADE
[Symbol]	EXISTING GRAVEL
[Symbol]	EXISTING PAVEMENT
[Symbol]	PROPOSED ASPHALT
[Symbol]	PROPOSED STORM
[Symbol]	PROPOSED WATERMAIN
[Symbol]	PROPOSED SANITARY

**TOPOGRAPHY LEGEND**

[Symbol]	WATER MAIN
[Symbol]	STORM SEWER
[Symbol]	SANITARY SEWER
[Symbol]	EASEMENT
[Symbol]	EX. U.G. ELEC.
[Symbol]	EX. U.G. WIRE
[Symbol]	EX. U.G. GAS
[Symbol]	ROUND CATCH BASIN
[Symbol]	SQUARE CATCH BASIN
[Symbol]	CLEAN-OUT
[Symbol]	STORM MANHOLE
[Symbol]	END OF PIPE
[Symbol]	SANITARY MANHOLE
[Symbol]	MANHOLE
[Symbol]	HYDRANT
[Symbol]	GATE VALVE WELL
[Symbol]	WATER VALVE
[Symbol]	WATER BOX
[Symbol]	VALVE
[Symbol]	LIGHT POLE
[Symbol]	AIR CONDITIONER
[Symbol]	MAL BOX
[Symbol]	FENCE POST
[Symbol]	DOWN SPOUT
[Symbol]	OUT POLE
[Symbol]	ELEC. TRANS. PAD
[Symbol]	UTILITY POLE
[Symbol]	OUT ANCHOR
[Symbol]	FISHED FLOOR
[Symbol]	GARAGE FLOOR
[Symbol]	BASEMENT FLOOR
[Symbol]	CONC. CONCRETE
[Symbol]	SET MAG. NAIL
[Symbol]	SET IRON BAR
[Symbol]	FOUND C. MONUMENT

- SHEET INDEX**
- COVER SHEET
  - EXISTING CONDITIONS
  - SECC AND GRADING PLAN
  - TREE SURVEY
  - OVERALL UTILITIES PLAN
  - STORM SEWER & PAVING PLAN
  - STORM PROFILES
  - DRAINAGE AREA & STORM CALCULATIONS
  - SANITARY & WATER MAIN PLAN
  - DETENTION PLAN
  - JOHN R IMPROVEMENTS
  - GRAVEL RIDGE ROAD IMPROVEMENTS
  - PLANT MATERIAL & PLANTING DETAILS
- SUPPLEMENTALS**  
CITY OF ROCHESTER HILLS STANDARD DETAILS  
CONTECH DETAIL SHEETS



**COVER SHEET**  
PART OF THE S.W. 1/4 OF SECTION 25  
T.11N., R.15E., CITY OF ROCHESTER HILLS,  
OAKLAND COUNTY, MICHIGAN

DATE: 170254-215  
Job No.:  
Date: 9-11-2018  
Scale: 1"=30'  
Drawn: J.M.  
Check: R.W.L.  
Sheet: 1 of 12  
Fid. Blk.

ADDITIONS AND/OR REVISIONS:

FOR:  
FRANK BARTOLOTTA  
CRESTLINE HOMES  
2553 23 MILE ROAD  
SHELBY TOWNSHIP, MI 48316  
(586) 731-1630

**PROPOSED BERKSHIRE SITE CONDOMINIUM**

URBAN LAND CONSULTANTS  
PLANNERS LAND SURVEYORS  
CIVIL ENGINEERS  
8800 23 MILE ROAD SHELBY TWP., MI 48316-4516  
PHONE: 586-731-8030  
FAX: 586-731-2605

ROBERT W. LINDH  
ENGINEER  
No. 21871

CITY FILE NO. 17-040, SECTION 25  
COVER SHEET - SHEET 1 of 12

**BENCHMARKS**

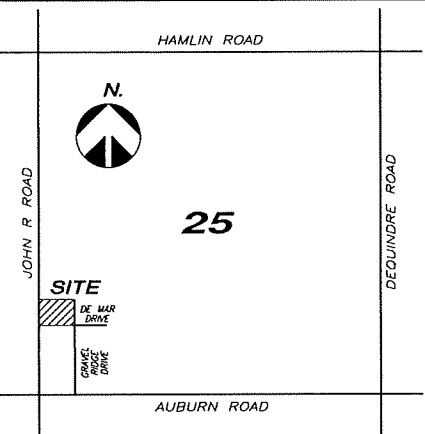
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U-POLE, EAST SIDE OF JOHN R.  
AT HOUSE #2731  
ELEVATION=716.65  
DATUM=NAVD88
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DATUM=NAVD88
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INTERSECTION OF GRAVEL RIDGE  
DR. AND DELMAR RD.  
ELEVATION=717.28  
DATUM=NAVD88
- 5. 1/4" HD ON W. SIDE OF JOHN  
R. 150' S. OF N. PL.  
ELEVATION=718.79  
DATUM=NAVD88

**NORTH**



**SCALE: 1"=30'**

HAMLIN ROAD



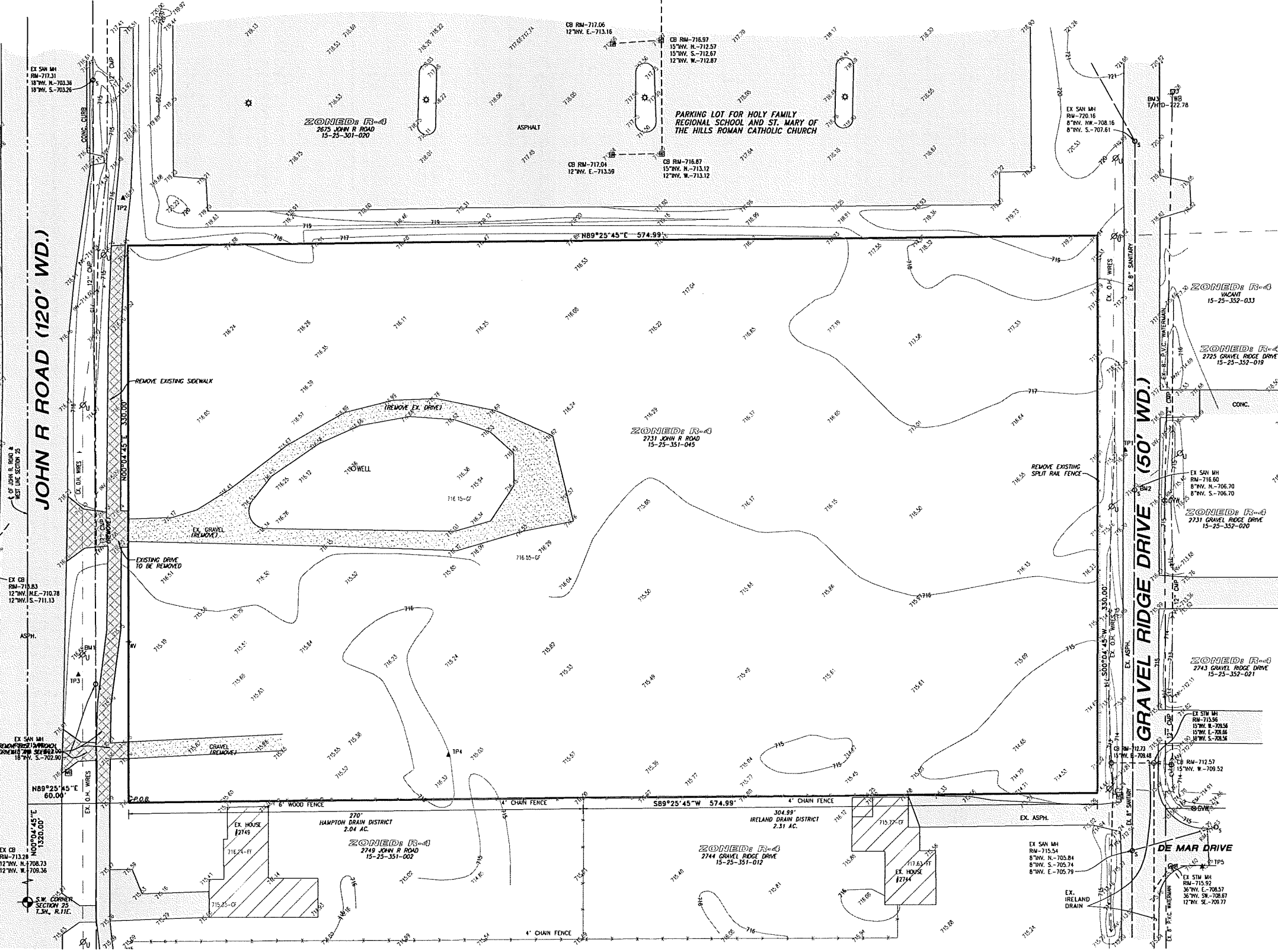
**LOCATION MAP**  
SCALE: 4" = 1 MILE

**SITE CRITERIA**

- PARCEL IDENTIFICATION #: 15-25-351-045
- EXISTING ZONING: R-4
- ADJACENT ZONINGS: R-4
- GROSS AREA OF SITE: 188,736 S.F. (4.356 AC.)
- NET AREA OF SITE: 188,066 S.F. (4.318 AC.)

**PROPERTY DESCRIPTION**

Properly Description As Surveyed and Related to Edinboro Sub.  
No. 1's as recorded in L. 141 P. 15-17  
A parcel of land in the SW 1/4 of Section 25, T.3N, R.11E, City of Rochester Hills, Oakland County, Michigan is more particularly described as: Commencing at the SW Corner of Section 25; thence N.00°04'45"E., 1320.00 feet along the West line of Section 25 and the centerline of John R Road; thence N.89°25'45"E., 60.00 feet to the Point of Beginning; thence N.00°04'45"E., 330.00 feet along the East line of John R Road (120 feet wide); thence N.89°25'45"E., 574.99 feet; thence S.00°04'45"W., 330.00 feet along the West line of Gravel Ridge Drive 150 feet wide; thence S.89°25'45"W., 574.99 feet to the Point of Beginning and containing 4.356 acres.



**LEGEND**

- 100 EXISTING CONTOURS
- EXISTING DRIVE
- EXISTING GRAVEL
- EXISTING PAVEMENT

**TOPOGRAPHY LEGEND**

- WATER MAIN
- STORM SEWER
- SANITARY SEWER
- EASEMENT
- EX. U.G. ELEC.
- EX. U.G. TELE.
- EX. U.G. GAS
- ROUND CATCH BASIN
- SQUARE CATCH BASIN
- UTILITY MANHOLE
- STORM MANHOLE
- END OF PIPE
- SANITARY MANHOLE
- CLEAN-OUT
- MANHOLE
- HYDRANT
- GATE VALVE WELL
- WATER VALVE
- WATER BOX
- VALVE
- LIGHT POLE
- AIR CONDITIONER
- MAL BOX
- FENCE POST
- DOWN SPOUT
- SOIL BORING
- ELEC. TRANS. PAD
- UTILITY POLE
- CUT ANCHOR
- CUT POLE
- SKIN POST
- SPRINKLER HEAD
- GAS METER
- TELEPHONE RISER
- ELECTRICAL RISER
- CABLE TV RISER
- FINISHED FLOOR
- GARAGE FLOOR
- BASEMENT FLOOR
- CONC. CONCRETE
- CONC. SET W/IG. WALL
- SET IRON BAR
- FOUND IRON BAR
- FOUND C. MONUMENT

**3 WORKING DAYS BEFORE YOU DIG**  
CALL MISS DIG  
1-800-482-7171  
(TOLL FREE) for the location of underground utilities

**Contractor Note:**  
The locations of existing underground utilities are shown in an approximate way only. The contractor shall determine the exact location of all existing utilities before commencing work. He agrees to be fully responsible for any and all damages which may be occasioned by his failure to exactly locate and preserve any and all underground utilities.

**EXISTING CONDITIONS and REMOVALS PLAN**  
PART OF THE S.W. 1/4 OF SECTION 25  
T.11N., R.15E., CITY OF ROCHESTER HILLS,  
OAKLAND COUNTY, MICHIGAN

DATE	ADDITIONS AND/OR REVISIONS	BY	CV
170524-215			
Job No.			
Date 9-11-2018			
Scale 1"=30'			
Drawn J.M.			
Check R.W.L.			
Sheet 2 of 12			
Fig. Bk.			

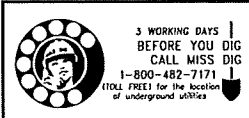
**PROPOSED BERKSHIRE SITE CONDOMINIUM**

FOR:  
FRANK BARTOLOTTA  
CRESTLINE HOMES  
2553 23 MILE ROAD  
SHELBY TOWNSHIP, MI 48316  
(586) 731-1630

PHONE 586 731-8030  
FAX 586 731-2605

**URBAN LAND CONSULTANTS**

CIVIL ENGINEERS PLANNERS LAND SURVEYORS  
8800 23 MILE ROAD SHELBY TWP., MI 48316-4516



3 WORKING DAYS BEFORE YOU DIG  
CALL MISS DIG  
1-800-482-7171  
(LOCAL PHONE) for the location of underground utilities

**Contractor Note:**  
The locations of existing underground utilities are shown in an approximate way only. The contractor shall determine the exact location of all existing utilities before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve any and all underground utilities.

**LEGEND**

	EXISTING CONTOURS		PROPOSED ASPHALT		LIMITS OF GRADING
	EXISTING GRADE		PROPOSED STORM		PROPOSED ACCESS ROAD
	EXISTING GRAVEL		PROPOSED WATERMAIN		PROPOSED SILT FENCE
	EXISTING PAVEMENT		PROPOSED SANITARY		PROPOSED GRADE
	PROP. CONC. SIDEWALK DEVELOPER'S RESPONSIBILITY		PROP. CONC. SIDEWALK BUILDER'S RESPONSIBILITY		

CONSTRUCTION TASK	CONSTRUCTION SCHEDULE											
	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
SILT FENCE												
TREE CLEARING												
STRIP SITE & LAND BALANCE												
UNDERGROUND UTILITIES												
PAVING												
FINISH GRADING												
BUILDING CONSTRUCTION												

**POND NOTES**

- SILT FENCE IS TO REMAIN AROUND DETENTION POND UNTIL POND IS STABILIZED.
- SEED & MULCH ENTIRE POND AREA. POND CANNOT BE PUT INTO SERVICE UNTIL VEGETATION IS ESTABLISHED.

**NO STOCKPILING IS ANTICIPATED**  
**NO DEWATERING IS TO TAKE PLACE ON SITE**  
**ALL DISTURBED AREAS SHALL BE SEEDED**  
**\*PARCEL ID# 15-25-351-045**

**NOTE:**  
SITE MUST BE BALANCED AND CERTIFIED BY A LICENSED PROFESSIONAL SURVEYOR WITHIN ONE FOOT (1') OF FINISHED GRADE PRIOR TO UNDERGROUND UTILITY INSTALLATION.

**BENCHMARKS**

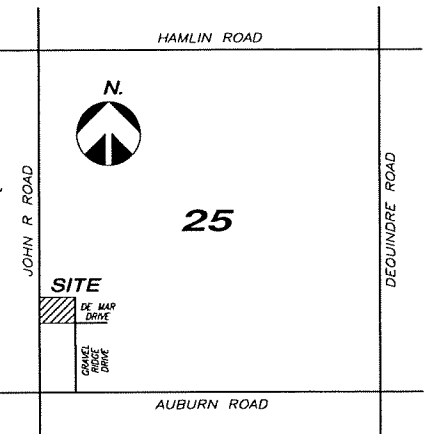
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- 1/4 HD ON W. SIDE OF JOHN R. 150' S. OF N. PL. ELEVATION=716.79 DATUM=NAVD88

- SOILS**
- 15B** SPARKS LOAMY SAND (0 TO 6% SLOPES)  
0"-8" DARK BROWN LOAMY SAND, 8"-25" PALE BROWN SAND, 25"-60" YELLOWISH-BROWN LOOSE SAND, MODERATELY RAPID PERMEABILITY, SLOW RUNOFF, LOW AVAILABLE MOISTURE CAPACITY.
- 17A** WATERS SANDY LOAM (0% TO 1% SLOPES)  
0"-15" VERY DARK GRAY SANDY LOAM, LOW 15"-30" BROWN MOTTLED, FRAGILE SANDY LOAM, 30"-60" GRAYISH BROWN, CALICHEOUS GRAVELLY SAND, THE WATERS SANDY LOAM SOIL IN BROAD FLAT AREA, MODERATELY RAPID IS PERMEABILITY.

**NORTH**



SCALE: 1"=30'



**LOCATION MAP**

SCALE: 4" = 1 MILE

**SITE CRITERIA**

- PARCEL IDENTIFICATION #: 15-25-351-045
- EXISTING ZONING: R-4
- ADJACENT ZONING: R-4
- GROSS AREA OF SITE: 189,735 S.F. (4,356 AC.)
- NET AREA OF SITE: 188,008 S.F. (4,318 AC.)
- PROPOSED USE: HOLY FAMILY SITE CONDOMINIUM w/ PUBLIC ROAD

**PROPERTY DESCRIPTION**

Property Description As Surveyed and Rotated to Townline Sub. No. 1 as recorded in L 141 P. 15-17

A parcel of land in the SW 1/4 of Section 25, T.13N., R.11E., City of Rochester Hills, Oakland County, Michigan is more particularly described as: Commencing at the SW Corner of Section 25; thence N.00°04'45"E., 1320.00 feet along the West line of Section 25 and the centerline of John R Road, thence N.89°25'45"E., 60.00 feet to the Point of Beginning; thence N.00°04'45"E., 330.00 feet along the East line of John R Road 117.00 feet wide; thence N.89°25'45"E., 574.99 feet; thence S.00°04'45"W., 330.00 feet along the West line of Gravel Ridge Drive 150 feet wide; thence S.89°25'45"W., 574.99 feet to the Point of Beginning and containing 4.356 acres.

**CITY OF ROCHESTER HILLS NOTES**

- All erosion and sediment control work shall conform to standards and specifications of the Oakland County Water Resources Commission.
- All temporary and permanent (post construction) soil erosion and sediment control measures shall conform to the City of Rochester Hills current MS4 permit. Any conflict between these standards and the MS4 permit, the permit's conditions shall take precedence.
- Daily inspections shall be made by the Contractor for effectiveness of erosion and sedimentation control measures, and any necessary repairs shall be performed without delay.
- Any sedimentation from work on this site shall be contained on the site and not allowed to collect on any off-site areas or in waterways.
- Contractor shall apply temporary erosion and sedimentation control measures when required and as directed on these plans. Temporary measures shall be removed as soon as permanent stabilization of slopes, ditches, and other earth changes have been accomplished per Oakland County Drain Commissioner's standards. This would include temporary sedimentation ponds and temporary S&Z filters.
- Sloping the work will be done by the Contractor as directed in these plans and as required to ensure progressive stabilization of disturbed earth.
- Soil erosion control practices shall be established in the early stages of construction by the Contractor. Sediment control practices will be applied as a perimeter defense against any transporting of silt off the site.
- Failure to comply with approved soil erosion and sedimentation measures may result in work stoppage by appropriate authority.
- Exceptions to timing of control measures installation will only be permitted where trees and stumps need to be removed to install soil erosion and sedimentation control measures.
- Contractor is to provide the City with permit renewals, violation corrections, and/or releases.

**SOIL EROSION AND SEDIMENTATION CONTROL AND MAINTENANCE NOTES**

SOIL TYPES: 15B, 17A

NAME OF NEAREST WATERCOURSE: GIBSON DRAIN

DISTANCE TO NEAREST WATERCOURSE IN FEET: 1,080

NAME(S) AND PHONE NUMBER(S) FOR THE PERSON(S) RESPONSIBLE FOR THE MAINTENANCE OF ALL TEMPORARY SOIL EROSION CONTROL MEASURES:  
FRANK BARTOLOTTA, (586) 731-1630

NAME(S) AND PHONE NUMBER(S) FOR THE PERSON(S) RESPONSIBLE FOR THE PERMANENT SOIL EROSION CONTROL MEASURES:  
FRANK BARTOLOTTA, (586) 731-1630

APPROXIMATE START DATE: JANUARY 2019

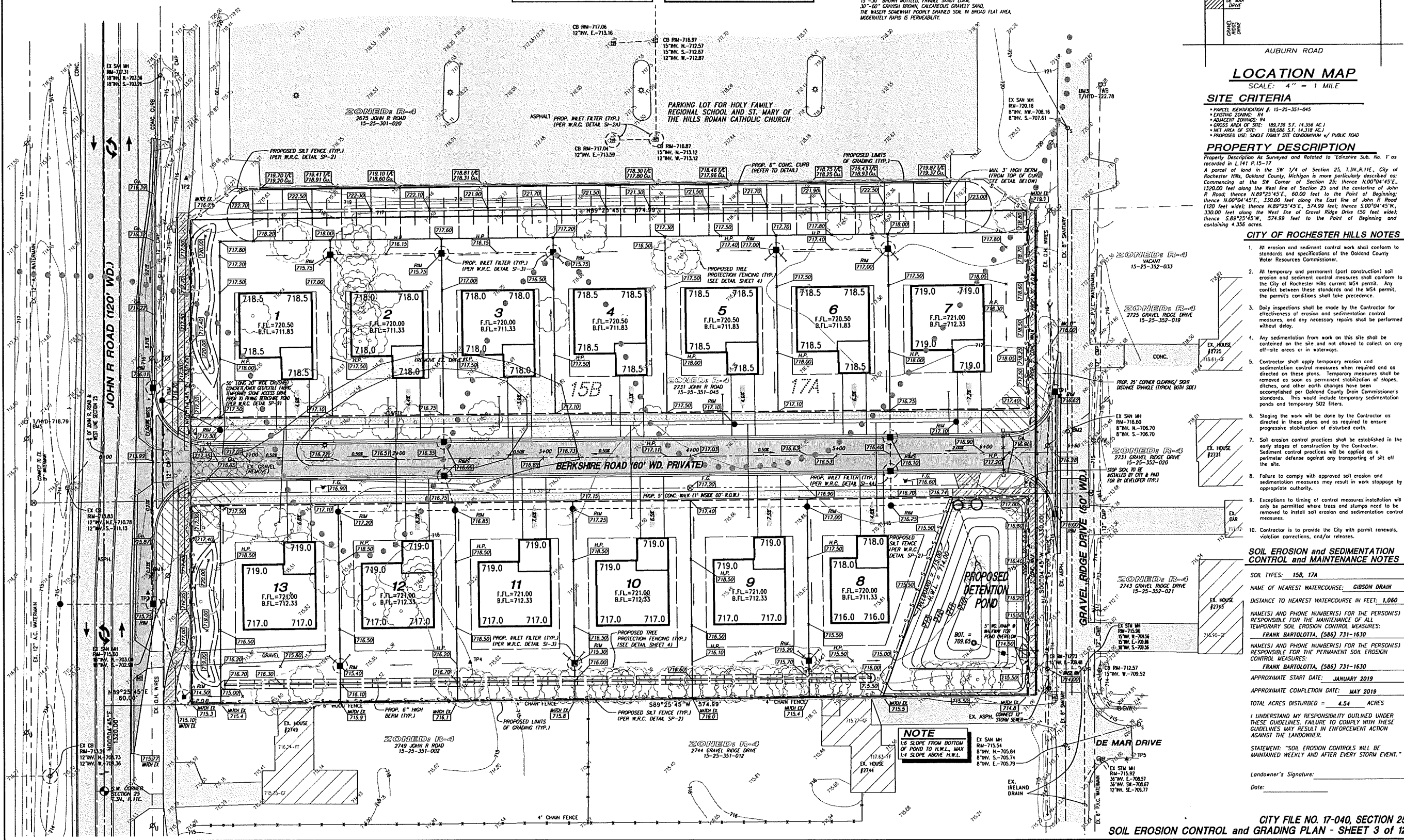
APPROXIMATE COMPLETION DATE: MAY 2019

TOTAL ACRES DISTURBED = 4.54 ACRES

I UNDERSTAND MY RESPONSIBILITY OUTLINED UNDER THESE GUIDELINES. FAILURE TO COMPLY WITH THESE GUIDELINES MAY RESULT IN ENFORCEMENT ACTION AGAINST THE LANDOWNER.

STATEMENT: "SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT."

Landowner's Signature: \_\_\_\_\_  
Date: \_\_\_\_\_



**SOIL EROSION CONTROL and GRADING PLAN**

PART OF THE S.W. 1/4 OF SECTION 25, T.13N., R.11E., CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

DATE: 11-11-2018

JOB NO.: 170254-215

DATE: 9-11-2018

SCALE: 1"=30'

DRAWN BY: J.M.

CHECK BY: R.W.L.

SHEET 3 OF 12

FIG. BL.

**PROPOSED BERKSHIRE SITE CONDOMINIUM**

FOR: FRANK BARTOLOTTA  
CRESTLINE HOMES  
2553 HILLS ROAD  
SHELBY TOWNSHIP, MI 48316  
(586) 731-1630

PHONE: 586 731-8030  
FAX: 586 731-2203

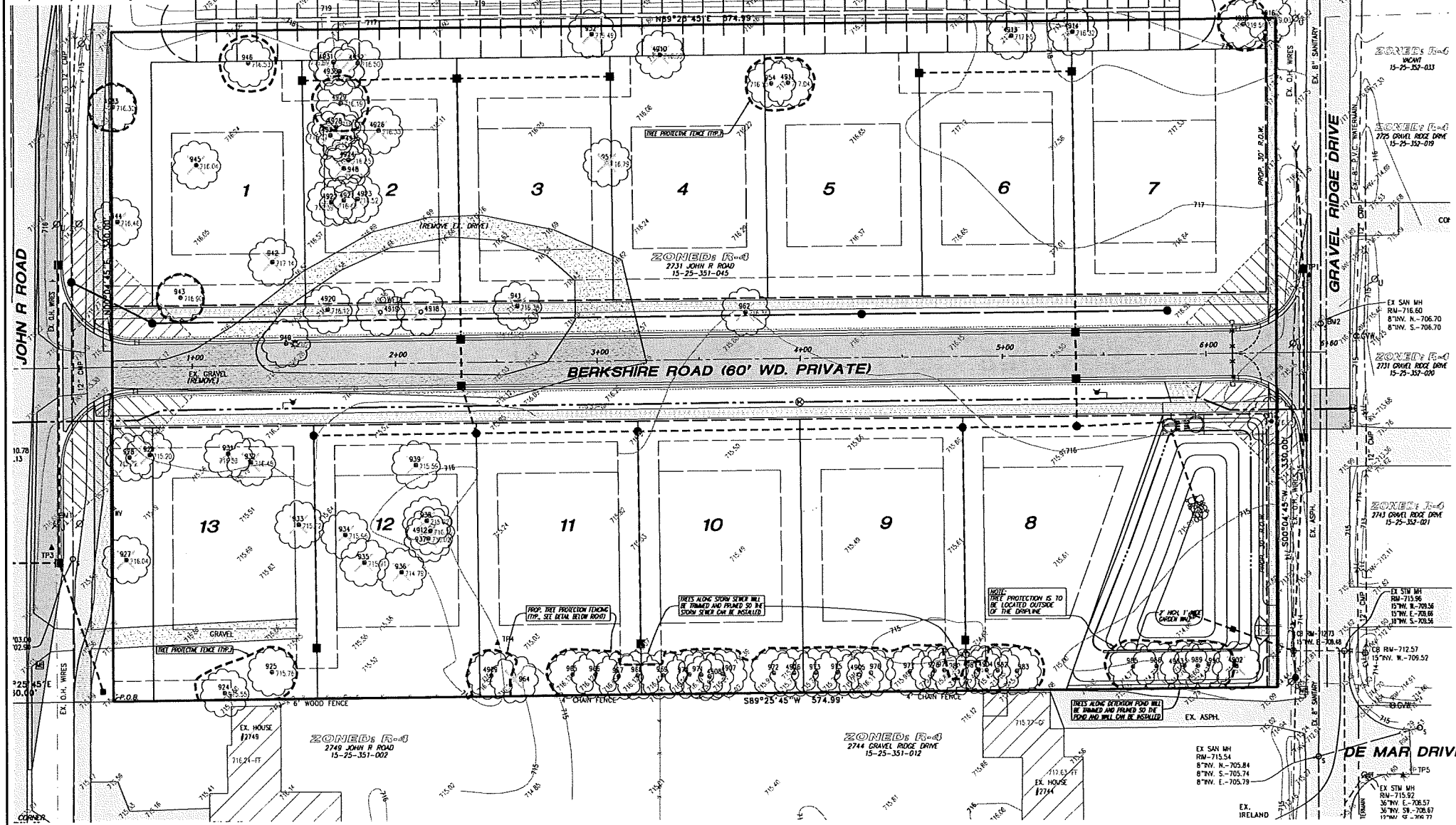
**URBAN LAND CONSULTANTS**

CIVIL ENGINEERS PLANNERS LAND SURVEYORS  
8800 23 MILE ROAD  
SHELBY TWP., MI 48318-4516

CITY FILE NO. 17-040, SECTION 25  
SOIL EROSION CONTROL and GRADING PLAN - SHEET 3 of 12



Contractor Note:  
The locations of existing underground utilities are shown in an approximate way only. The contractor shall determine the exact location of all existing utilities before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve any and all underground utilities.



NORTH

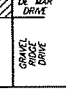


SCALE: 1"=30'

**BENCHMARKS**

- CUT NAIL IN W. FACE U-POLE, EAST SIDE OF JOHN R. AT HOUSE #2731 ELEVATION=716.65 DATUM=NAVD88
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- 1/4" HD ON W. SIDE OF JOHN R. 150' S. OF N. PL. ELEVATION=718.79 DATUM=NAVD88

**SITE**



**LOCATION MAP**  
SCALE: 4" = 1 MILE

**TREE NOTES**

- TREE IDENTIFICATION**  
ALL TREES IN OR NEAR ACTIVE CONSTRUCTION AREAS WILL BE IDENTIFIED IN THE FOLLOWING MANNER: ALL TREES TO BE REMOVED WILL HAVE AN "X" PAINTED ON THE TRUNK WITH BRIGHT ORANGE PAINT. ALL TREES TO REMAIN WILL BE FLAGGED WITH GREEN SURVEY RIBBON. ALL CONTRACTORS WILL BE NOTIFIED VERBALLY AND WITH WRITTEN MEMORANDUM PRIOR TO CONSTRUCTION.
- TREE PROTECTION**  
A. NO ACTIVITY SHALL OCCUR WITHIN DRP LINE OF ANY TREE TO REMAIN, INCLUDING, BUT NOT LIMITED TO, PLACING SOLVENTS, BUILDING MATERIALS, CONSTRUCTION EQUIPMENT OR SOIL DEPOSITS WITHIN THE DRP LINE.  
B. DURING CONSTRUCTION, NO DEVICE OR WIRE SHALL BE ATTACHED TO ANY REMAINING TREE.  
C. A FENCING OF SUITABLE MATERIAL SHALL BE ERRECTED BEFORE CONSTRUCTION COMMENCES AND MAINTAIN UNTIL THE TOWNSHIP AUTHORIZES REMOVAL OR THE DEVELOPER OBTAINS A CERTIFICATE OF OCCUPANCY. THIS FENCING IS REQUIRED FOR ALL TREES DESIGNATED TO REMAIN, EXCEPT BY THE ROAD R.O.W. OR LARGE AREAS OF TREES SEPARATE FROM THE CONSTRUCTION SITE.
- TREE REPLACEMENT (IF REQUIRED)**  
A. EACH TREE REMOVED HAVING A 6" OR GREATER D.B.H. SHALL BE REPLACED BY RELOCATED TREES OR NURSERY GROWN TREES.  
B. REPLACEMENT OF REMOVED TREES SHALL BE ON A TOTAL CALIPER BASIS.  
C. ALL REPLACEMENT OR RELOCATED TREES ARE TO MEASURE TWO AND ONE HALF (2 1/2) INCH DIAMETER (FOR DECIDUOUS TREES) 6" Ht. (MIN.) FOR EVERGREEN TREE.  
D. REPLACEMENT TREES WILL HAVE SHADE POTENTIAL AND OTHER CHARACTERISTICS COMPARABLE TO REMOVED TREES.  
E. ALL REPLACEMENT TREES SHALL BE SOA NURSERY GRADE 1 OR BETTER AND MUST BE APPROVED BY THE TOWNSHIP PRIOR TO PLANTING. RELOCATED TREES MUST BE TREE SPADED AND APPROVED BY THE TWP. PRIOR TO RELOCATION.  
F. REPLACEMENT TREES WILL BE STAKED, FERTILIZED AND MULCHED AND SHALL BE GUARANTEED FOR ONE (1) YEAR.  
G. 6" Ht. EVERGREEN SHALL COUNT AS A 2 1/2" CAL. DECIDUOUS TREE FOR REPLACEMENT.

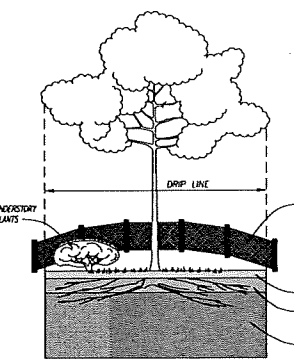
**TOPOGRAPHY LEGEND**

- WATER MAIN
- STORM SEWER
- SANITARY SEWER
- EASEMENT
- EX. U.S. ELEC. EX. O.A. WIRES
- EX. U.S. TELE. EX. U.S. GAS
- ROUND CATCH BASIN
- SQUARE CATCH BASIN
- UTILITY MANHOLE
- END OF PIPE
- SANITARY MANHOLE
- CLEAN-OUT MANHOLE
- HYDRANT
- GATE VALVE WELL
- WATER VALVE
- WATER BOX
- VALVE
- LIGHT POLE
- AIR CONDITIONER
- MAIL BOX
- FENCE POST
- DOWN SPOUT
- SOIL BORING
- ELEC TRANS PAD
- UTILITY POLE
- CITY AND/OR OUT POLE
- SIGN POST
- GAS METER
- TELEPHONE RISER
- ELECTRICAL RISER
- CABLE TV RISER
- FT FINISHED FLOOR OF GARAGE FLOOR OF BASEMENT FLOOR
- CONC. CONCRETE
- 3" SWI SET MAG. HALL
- 3" SWI SET FROM BAR
- #12 FOUND FROM BAR
- #12 FOUND C. MORTAR

**LEGEND**

- 100' --- EXISTING CONTOURS
- 100' --- EXISTING GRADE
- EXISTING GRAVEL
- EXISTING PAVEMENT
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED

**NOTE**  
THE TREE SURVEY WAS UPDATED BY OWEN TREE SERVICES



**TREE PROTECTION DETAIL**  
(NO SCALE)

NEW TAG #	DBH (INCHES)	SPECIES	SCIENTIFIC NAME	CONDITION	NOTES	REMOVE?
924	15	crabapple	Malus sp.	poor		
925	10	Norway spruce	Picea abies	fair		
927	20	Norway maple	Acer platanoides	dying	50% gone	yes
928	8-10-6	crabapple	Malus sp.	poor	twin	yes
929	9-9	crabapple	Malus sp.	poor	twin	yes
931	22	Austrian pine	Pinus nigra	poor	diseased	yes
932	14	Norway spruce	Picea abies	fair		
933	12	Colorado spruce	Picea pungens	poor	50% gone	yes
934	34	silver maple	Acer saccharinum	unsound		yes
935	19	Colorado spruce	Picea pungens	fair		
936	20	Norway spruce	Picea abies	poor	50% gone	yes
937	26	Eastern white pine	Pinus strobus	fair		
4912	7-3-1	American elm	Ulmus americana	poor	triple	yes
938	25	Eastern white pine	Pinus strobus	unsound		yes
939	14	white spruce	Picea glauca	poor		yes
940	16	Eastern white pine	Pinus strobus	good		
4918	7.4-6-1	silver maple	Acer saccharinum	unsound	multiple	yes
4919	6-6-5-4-1	silver maple	Acer saccharinum	unsound	multiple	yes
941	20	Norway maple	Acer platanoides	unsound		yes
4920	10-5-6	boxelder	Acer negundo	unsound	triple	yes
942	27	silver maple	Acer saccharinum	good		
943	18	Norway maple	Acer platanoides	fair		
944	34	silver maple	Acer saccharinum	unsound		yes
945	14-14	white birch	Betula papyrifera	good	twin	yes
946	12	Northern catalpa	Catalpa speciosa	fair	pollarded	yes
947	4921	honey locust	Gleditsia triacanthos	fair		yes
948	10	honey locust	Gleditsia triacanthos	unsound		yes

NEW TAG #	DBH (INCHES)	SPECIES	SCIENTIFIC NAME	CONDITION	NOTES	REMOVE?	
949	4926	12	Northern catalpa	Catalpa speciosa	poor	pollarded	yes
951	29	red oak	Quercus rubra	good			
952	9-9-9-1	honey locust	Gleditsia triacanthos	fair	multiple	yes	
953	4910	12	silver maple	Acer saccharinum	good		yes
954	11	silver maple	Acer saccharinum	unsound			
955	4911	16	silver maple	Acer saccharinum	fair		
957	4913	18	mulberry	Morus alba	unsound		
958	4914	13	honey locust	Gleditsia triacanthos	good		yes
959	4915	10-11	boxelder	Acer negundo	unsound	twin	yes
960	4916	14-9	boxelder	Acer negundo	unsound	twin	yes
962	12-12-12	silver maple	Acer saccharinum	unsound	multiple	yes	
963	4909	15-13-10	river birch	Betula nigra	good	triple	
964	13-15-12	river birch	Betula nigra	good	triple		
965	14-14	river birch	Betula nigra	good	twin		
966	12	river birch	Betula nigra	fair			
967	11	river birch	Betula nigra	good			
968	16	river birch	Betula nigra	good			
969	13	river birch	Betula nigra	good			
970	13-7	river birch	Betula nigra	good	twin		
971	14	river birch	Betula nigra	good			
4908	6-8	river birch	Betula nigra	good	twin		
4907	6-4	river birch	Betula nigra	good	twin		
972	3-8	river birch	Betula nigra	good	twin		
4906	7-6	river birch	Betula nigra	good	twin		
973	10	river birch	Betula nigra	unsound		yes	
975	6-10	river birch	Betula nigra	unsound	twin	yes	
4905	7-7	river birch	Betula nigra	unsound	twin	yes	

NEW TAG #	DBH (INCHES)	SPECIES	SCIENTIFIC NAME	CONDITION	NOTES	REMOVE?	
976	13	river birch	Betula nigra	good			
977	12-13	river birch	Betula nigra	good	twin		
978	9	river birch	Betula nigra	good			
979	9	river birch	Betula nigra	good			
980	13	river birch	Betula nigra	unsound			
981	11	river birch	Betula nigra	good	twin		
982	8-10	river birch	Betula nigra	good	twin		
983	12-8	river birch	Betula nigra	unsound	twin		
985	17	river birch	Betula nigra	good	twin		
986	12-12	river birch	Betula nigra	good			
988	4903	12	river birch	Betula nigra	good	twin	
989	14	river birch	Betula nigra	good			
990	12	river birch	Betula nigra	poor			
994	4902	28-8-9	boxelder	Acer negundo	unsound	triple	yes
4917	11	black walnut	Juglans nigra	good		yes	
4922	16	Norway maple	Acer platanoides	good		yes	
4923	17	Norway maple	Acer platanoides	good		yes	
4924	9	honey locust	Gleditsia triacanthos	fair		yes	
4925	8	honey locust	Gleditsia triacanthos	fair		yes	
4927	7	Norway maple	Acer platanoides	good		yes	
4928	7	Norway maple	Acer platanoides	good		yes	
4929	7	honey locust	Gleditsia triacanthos	fair		yes	
4930	8	honey locust	Gleditsia triacanthos	good		yes	
4931	9	honey locust	Gleditsia triacanthos	good		yes	
4932	6	Norway maple	Acer platanoides	good		yes	
4933	8	crabapple	Malus sp.	good			

**TREE SURVEY**  
PART OF THE S.W. 1/4 OF SECTION 25  
T.11N., R.15E., CITY OF ROCHESTER HILLS,  
OAKLAND COUNTY, MICHIGAN

DATE: 170254-215  
Job No. 9-11-2018  
Scale: 1"=30'  
Drawn BY: FRANK BARTOLOTTA  
Check BY: SHELBY TOWNSHIP, MI 48316  
Sheet # of 12  
Fig. Bk.

**PROPOSED BERKSHIRE SITE CONDOMINIUM**

FOR: FRANK BARTOLOTTA  
2553 23<sup>RD</sup> MILE ROAD  
SHELBY TOWNSHIP, MI 48316  
(586) 731-1630

PHONE: 586 731-8030  
FAX: 586 731-2005



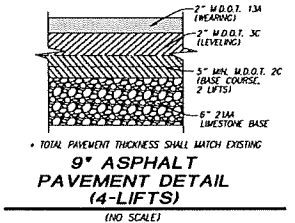
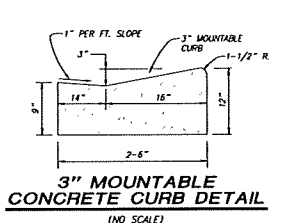
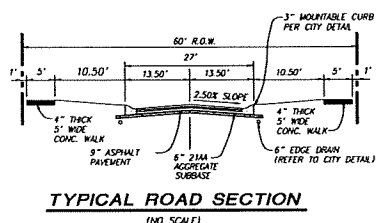
CITY FILE NO. 17-040, SECTION 25  
TREE SURVEY - SHEET 4 of 12





3 WORKING DAYS BEFORE YOU DIG  
CALL MISS DIG  
1-800-482-7171  
(TOLL FREE) for the location of underground utilities

Contractor Note:  
The locations of existing underground utilities are shown in an approximate way only. The contractor shall determine the exact location of all existing utilities before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve any and all underground utilities.



**BENCHMARKS**

- CUTI MARK IN W. FACE U-POLE, EAST SIDE OF JOHN R. AT HOUSE #2731. ELEVATION=716.65 DATUM=NAVD88
- SAN. MH. IN GRAVEL RIDGE DR. AT HOUSE 2731. ELEVATION=716.60 DATUM=NAVD88
- 1/4\"/>
- 1/4\"/>
- 1/4\"/>

NORTH



SCALE: 1"=30'



**LEGEND**

- UTILITY CROSSINGS - STORM SEWER / SANITARY SEWER**
- A STORM PASSES OVER SANITARY LEAD >14.06' SEPARATION
  - B STORM PASSES OVER SANITARY LEAD >11.61' SEPARATION
  - C STORM PASSES OVER SANITARY LEAD >12.11' SEPARATION
  - D STORM PASSES OVER SANITARY LEAD >11.79' SEPARATION
  - E STORM PASSES OVER SANITARY LEAD >11.74' SEPARATION
  - F STORM PASSES OVER SANITARY LEAD >15.81' SEPARATION
  - G STORM PASSES OVER SANITARY LEAD >15.81' SEPARATION
- STORM SEWER / WATER MAIN**
- H DP WATER MAIN UNDER STORM
  - I DP WATER MAIN UNDER STORM
  - J DP WATER MAIN UNDER STORM
  - K DP WATER MAIN UNDER STORM
  - L STORM PASSES OVER WATER MAIN
  - M RUN WATER MAIN OVER SANITARY LEAD
  - N RUN WATER MAIN OVER SANITARY LEAD
  - O RUN WATER MAIN OVER SANITARY LEAD
  - P DP WATER MAIN UNDER SANITARY LEAD
  - Q DP WATER MAIN UNDER SANITARY LEAD
  - R DP WATER MAIN UNDER SANITARY LEAD
  - S DP WATER MAIN UNDER SANITARY LEAD
  - T RUN WATER MAIN OVER SANITARY LEAD
- WATER MAIN / SANITARY SEWER**
- U RUN WATER MAIN OVER SANITARY LEAD
  - V RUN WATER MAIN OVER SANITARY LEAD
  - W RUN WATER MAIN OVER SANITARY LEAD
  - X RUN WATER MAIN OVER SANITARY LEAD
  - Y RUN WATER MAIN OVER SANITARY LEAD
- TOPOGRAPHY LEGEND**
- WATER MAIN
  - STORM SEWER
  - EASEMENT
  - EX. U.C. ELEC.
  - EX. O.U. WIRES
  - EX. U.C. TELE.
  - EX. U.C. GAS
  - ROUND CATCH BASIN
  - SQUARE CATCH BASIN
  - UTILITY MANHOLE
  - STORM MANHOLE
  - END OF PIPE
  - SANITARY MANHOLE
  - CLEAN-OUT
  - MANHOLE
  - HYDRANT
  - GATE VALVE WELL
  - WATER VALVE
  - WATER BOX
  - VALVE
  - LIGHT POLE
  - AIR CONDITIONER
  - MAN BOX
  - DOWN POST
  - DOWN SPOUT
  - SOIL BORING
  - ELEC TRANS PAD
  - UTILITY POLE
  - UTILITY ANCHOR
  - OUT POLE
  - SIGN POST
  - SPRINKLER HEAD
  - GAS METER
  - TELEPHONE RISER
  - ELECTRICAL RISER
  - CABLE W/ RISER
  - FINISHED FLOOR
  - BASEMENT FLOOR
  - CONC. CONCRETE
  - SMN SET W/AC. WALL
  - SEI SET ROOM
  - FE FOUND FOR BAR
  - W/SH FOUND C. MONUMENT

**UTILITY CROSSINGS - STORM SEWER / SANITARY SEWER**

**STORM SEWER / WATER MAIN**

**WATER MAIN / SANITARY SEWER**

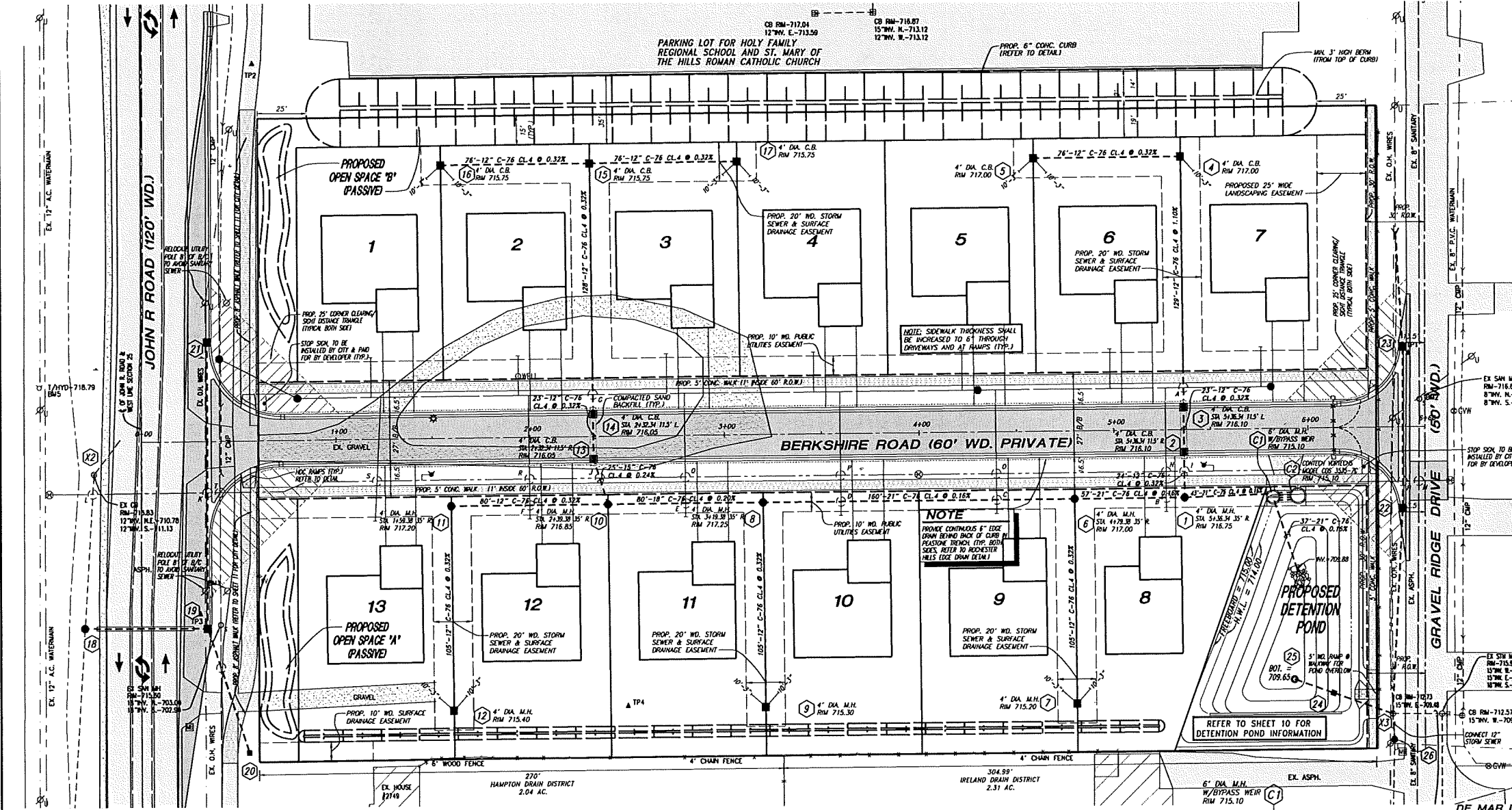
**NOTE**  
ALL MOUNTABLE CURB CATCH BASIN EASEMENTS SHOULD BE CL. 7005 WITH 7045 TYPE M1 GATE AND "DUMP NO WASTE" LETTERING AND FISH BAGE

**STORM SEWER NOTES**

- Covers for Manholes, Catch Basins and Inlets
- Manhole frame and cover shall be E.I.H. 1040, Type A cover, or equivalent.
- Manhole and catch basin covers shall include "Dump no waste" Drains to Waterways or approved similar message.
- Catch basin and inlet frame and cover shall be as follows:
  - A. E.I.H. 7045, or equal, for use with barrier curb and gutter, and with concrete pavement with integral curb.
  - B. E.I.H. 7065, or equal, for use with mountable curb and gutter, and with concrete pavement with mountable integral curb.
  - C. E.I.H. 7085, or equal, for use with B-2 or rolled curb.
  - D. E.I.H. Type D Beehive Grole, or equal, for use on open ditch structures and catch basins located in swales in easements outside the public street right-of-way.

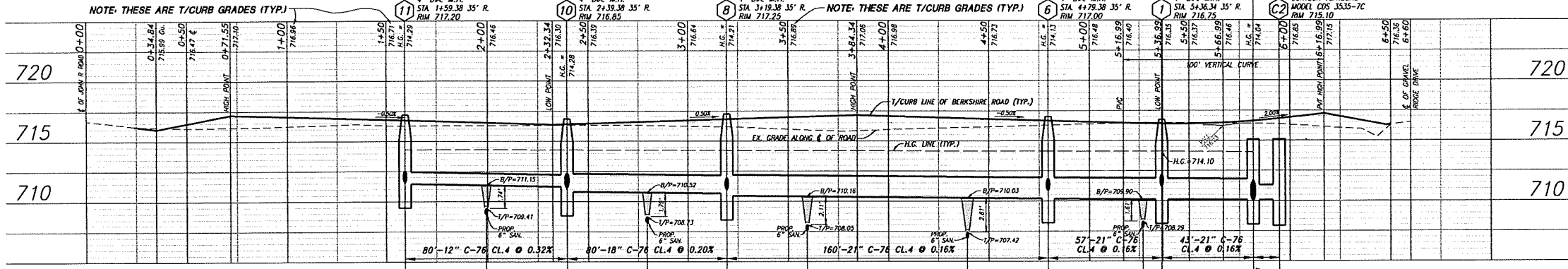
**PAVING NOTES**

- Contractor shall notify the City of Rochester Hills seventy two (72) hours in advance of construction.
- Contractor shall post a Maintenance Bond with the City in the amount of 10% of actual construction cost for a period of two (2) years prior to acceptance for maintenance by the City of Rochester Hills.
- All materials and construction shall adhere to the current Michigan Department of State Highway Standards and Specifications.
- All gravel shoulders and road ditches shall be per plan and stable prior to acceptance by the City of Rochester Hills.
- All topsoil shall be removed from the road R.O.W. prior to cutting or filling.
- Road ditches and drainage swales having grades of 1.50% or greater shall be sodded and pegged in place.
- Additional sub-base and/or underdrains may be required if poor sub-soil or wet conditions are encountered during pavement construction.
- Roadside area from the back of curb to R.O.W. line shall be fine graded and receive roadside seeding, fertilizer and mulch immediately after completion of road paving or gas or electrical underground, whichever is constructed last.



**NOTE**  
PROVIDE CONTINUOUS 6\"/>

REFER TO SHEET 10 FOR DETENTION POND INFORMATION



**BERKSHIRE ROAD**  
SCALE: HORIZONTAL: 1" = 30'  
VERTICAL: 1" = 5'

CITY FILE NO. 17-040, SECTION 25  
STORM SEWER and PAVING PLAN - SHEET 6 OF 12

1700254-215  
DATE 9-11-2018  
Job No. 1700254-215  
Scale 1"=30'  
Drawn J.M.  
Check R.H.L.  
REVISED PER CITY REVIEW 01-07-19  
REVISED PER CITY REVIEW 01-11-19

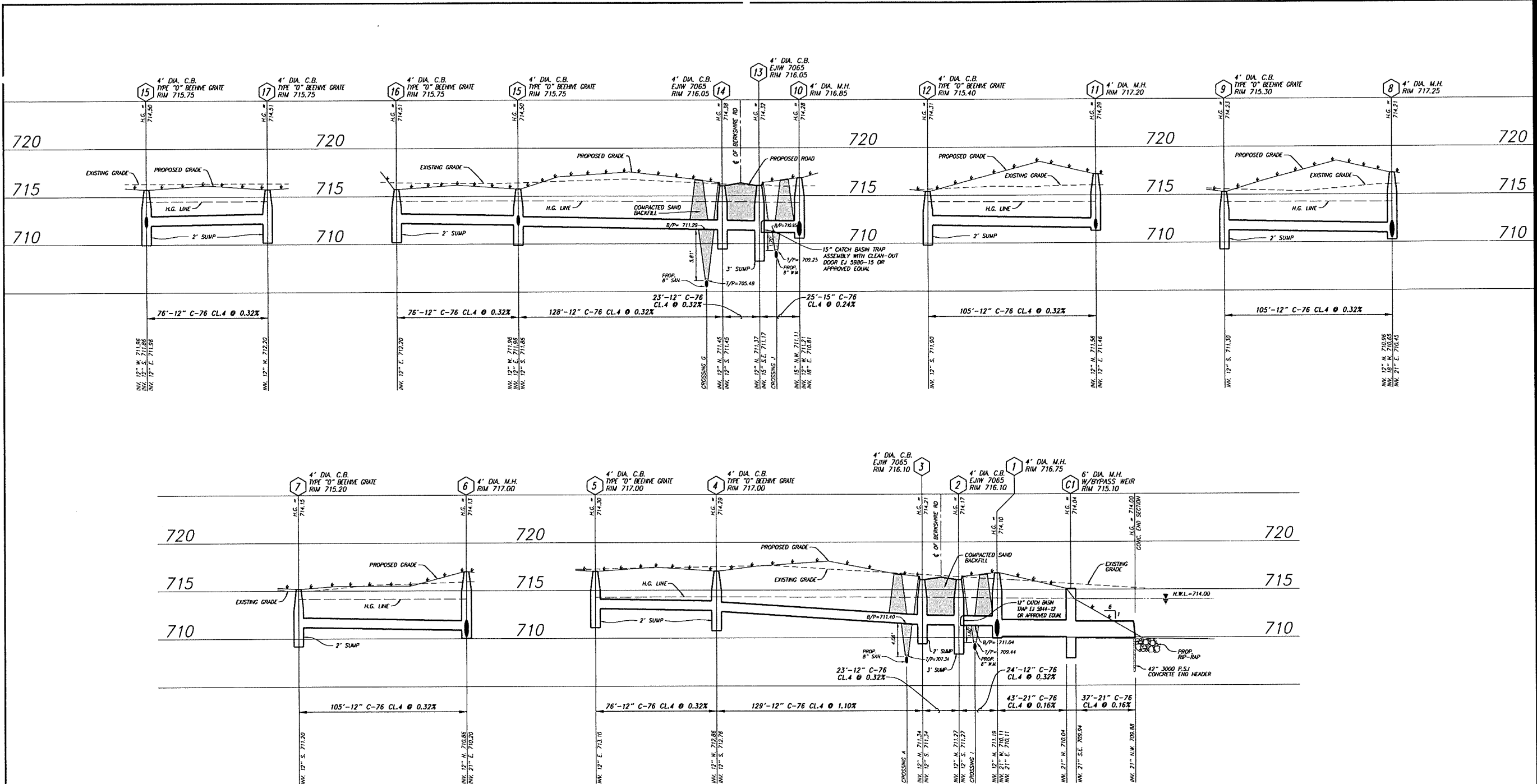
**PROPOSED BERKSHIRE SITE CONDOMINIUM**

FOR: FRANK BARTOLOTTA  
CRESCENT HOMES  
2553 23 MILE ROAD  
SHELBY TOWNSHIP, MI 48315  
(586) 731-1650

PHONE 586 731-8030  
FAX 586 731-2605

**URBAN LAND CONSULTANTS**  
PLANNERS LAND SURVEYORS  
8800 23 MILE ROAD SHELBY TWP., MI 48316-4516

**STORM SEWER and PAVING PLAN**  
PART OF THE S.W. 1/4 OF SECTION 25  
T.11N., R.15E., CITY OF ROCHESTER HILLS,  
OAKLAND COUNTY, MICHIGAN



**STORM SEWER PROFILES**  
 SCALE: HORIZONTAL: 1" = 30'  
 VERTICAL: 1" = 5'



**Contractor Note:**  
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**STORM SEWER PROFILES**  
 PART OF THE S.W. 1/4 OF SECTION 25  
 T.11N., R.15E., CITY OF ROCHESTER HILLS,  
 OAKLAND COUNTY, MICHIGAN

---

BY: J.M. JENKINS, CIVIL ENGINEER

ADDITIONS AND/OR REVISIONS: REV. 055 DATE PER CONSOLE REVIEW  
 REV. 03-12-18 REVISED PER CITY REVIEW  
 REV. 11-16-18 REVISED PER CITY REVIEW

DATE: 03-12-18

170254-215  
 Job No. Date 9-11-2018  
 Scale 1"=30'  
 Drawn C.V.  
 Check R.W.L.  
 Sheet 7 of 12  
 Fig. Bk.

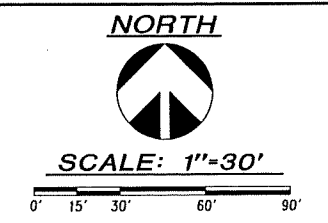
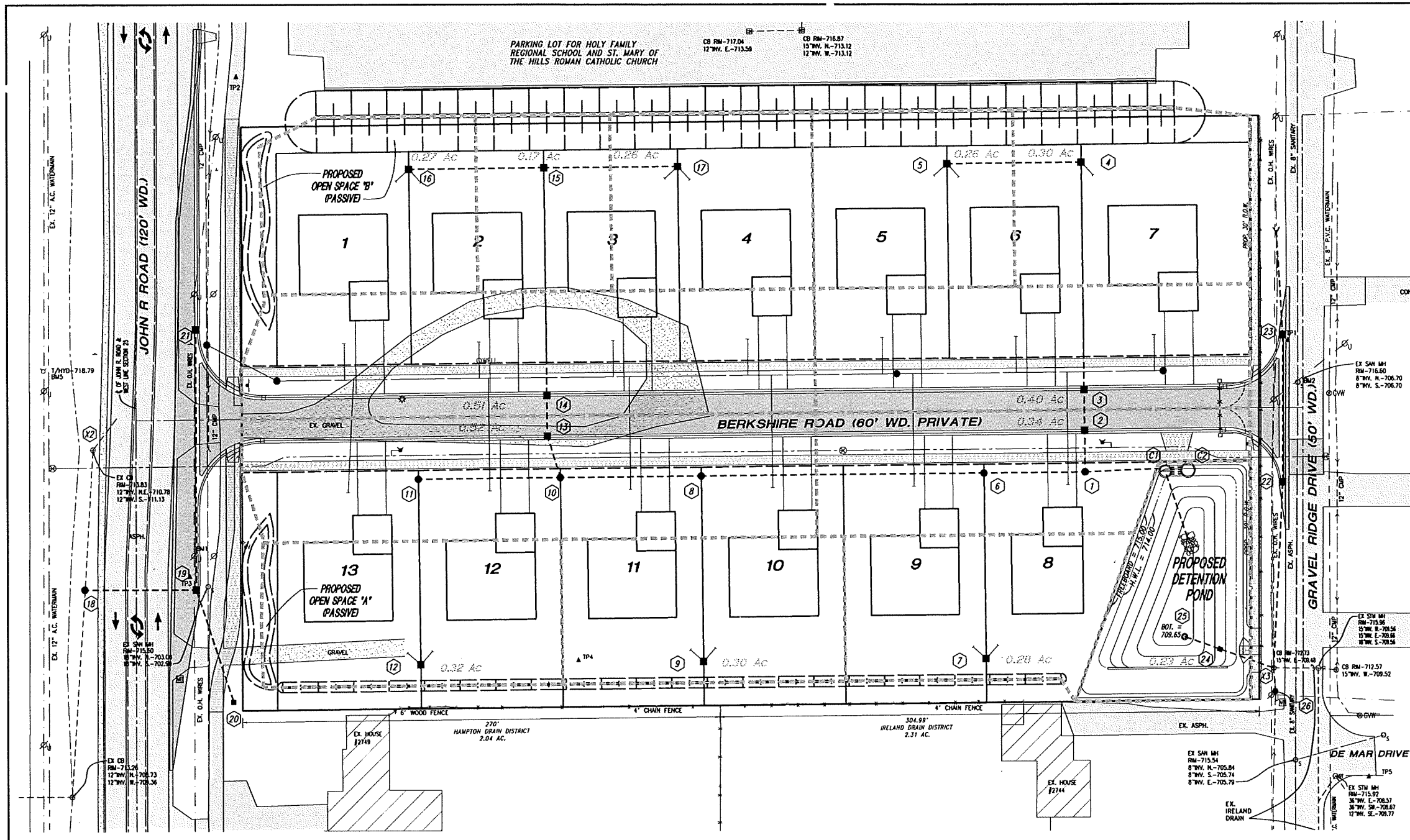
**PROPOSED BERKSHIRE SITE CONDOMINIUM**

FOR: FRANK BARTOLOTTA  
 CRESTLINE HOMES  
 2553 23 MILE ROAD  
 SHELBY TOWNSHIP, MI 48316  
 (586) 731-1630

PHONE 586 731-8830  
 FAX 586 731-2808

**URBAN LAND CONSULTANTS** ©  
 CIVIL ENGINEERS PLANNERS LAND SURVEYORS  
 8800 23 MILE ROAD SHELBY TWP., MI 48316-4515

CITY FILE NO. 17-040, SECTION 25  
 STORM SEWER PROFILES - SHEET 7 of 12



- BENCHMARKS**
- CUT NAIL IN W. FACE U-POLE, EAST SIDE OF JOHN R. AT HOUSE #2731  
ELEVATION=716.65  
DATUM=NAVD88
  - SAIL NAIL IN GRAVEL RIDGE DR. AT HOUSE 2731  
ELEVATION=716.60  
DATUM=NAVD88
  - 1/4" HD AT NORTH END OF GRAVEL RIDGE DR.  
ELEVATION=722.78  
DATUM=NAVD88
  - 1/4" HD AT S.E. CORNER OF INTERSECTION OF GRAVEL RIDGE DR. AND BELLEVUE RD.  
ELEVATION=717.28  
DATUM=NAVD88
  - 1/4" HD ON W. SIDE OF JOHN R. 150' S. OF N. PL.  
ELEVATION=718.79  
DATUM=NAVD88

**DRAINAGE AREA and STORM CALCULATIONS**  
PART OF THE S.W. 1/4 OF SECTION 25  
T.11N., R.15E., CITY OF ROCHESTER HILLS,  
OAKLAND COUNTY, MICHIGAN

DATE: 170254-215  
Job No. 170254-215  
Scale 1"=30'  
Drawn J.M.  
Check R.M.L.  
Sheet 8 of 12  
Rev'd. Bk.

**PROPOSED BERKSHIRE SITE CONDOMINIUM**  
FOR: FRANK BARTOLOTTA  
CRESTLINE HOMES  
2553 23 MILE ROAD  
SHELBY TOWNSHIP, MI 48316  
(586) 731-1630

BERKSHIRE SITE CONDOMINIUM  
STORM SEWER CALCULATIONS

DATE: 7/24/2016 JOB NO. 170254-215

Type of Pipe = RCP  
n = 0.013

Intensity =  $i = 175 / T + 25$   
I = 20 minutes minimum

COMPOSITE "C" = 0.40

From	Pipe To	Acres	C	C x A	Total C x A	Time(t) min.	i in./hr.	Q=cIA cfs	Pipe Capacity	Pipe Dia(in)	Slope %		Line Length(ft)	Velocity f/s	Flow Time min.	Upstream			Downstream		
											Min. H.G.	Actual				Rim	H.G.	Invert	Rim	H.G.	Invert
17	15 sublt	0.26	0.40	0.10	0.10	20.00	3.89	0.40	2.02	12	0.01	0.32	76	2.57	0.49	715.75	714.51	712.20	715.75	714.50	711.95
16	15 sublt	0.27	0.40	0.11	0.11	20.00	3.89	0.42	2.02	12	0.01	0.32	76	2.57	0.49	715.75	714.51	712.20	715.75	714.50	711.96
15 total	14	0.17	0.40	0.07	0.28	20.49	3.85	1.08	2.02	12	0.09	0.32	128	2.57	0.83	715.75	714.50	711.68	716.05	714.38	711.45
14	13	0.51	0.40	0.20	0.48	21.33	3.78	1.83	2.02	12	0.26	0.32	23	2.57	0.16	716.05	714.38	711.45	716.05	714.32	711.37
13	10 sublt	0.52	0.40	0.21	0.69	21.47	3.77	2.61	3.17	15	0.16	0.24	25	2.58	0.16	716.05	714.32	711.17	716.85	714.28	711.11
12	11	0.32	0.40	0.13	0.13	20.00	3.89	0.50	2.02	12	0.02	0.32	105	2.57	0.68	715.40	714.32	711.90	717.20	714.30	711.56
11	10 sublt	0.13	0.40	0.10	0.13	20.68	3.83	0.49	2.02	12	0.02	0.32	80	2.57	0.52	717.20	714.30	711.46	716.85	714.28	711.21
10 total	8 sublt	0.62	0.40	0.25	0.62	21.64	3.75	3.08	4.71	18	0.09	0.20	80	2.66	0.50	716.85	714.28	710.81	717.25	714.21	710.65
9	8 sublt	0.30	0.40	0.12	0.12	20.00	3.89	0.47	2.02	12	0.02	0.32	105	2.57	0.68	715.30	714.23	711.30	717.25	714.21	710.96
8 total	6 sublt	0.94	0.40	0.38	0.94	22.14	3.71	3.49	6.36	21	0.05	0.16	160	2.63	1.01	717.25	714.21	710.45	717.00	714.14	710.20
7	6 sublt	0.28	0.40	0.11	0.11	20.00	3.89	0.44	2.02	12	0.01	0.32	105	2.57	0.68	715.20	714.15	711.20	717.00	714.14	710.86
6 total	1 sublt	1.05	0.40	0.42	1.05	23.15	3.63	3.82	6.36	21	0.06	0.16	57	2.63	0.36	717.00	714.14	710.20	716.75	714.10	710.11
5	4	0.26	0.40	0.10	0.10	20.00	3.89	0.40	2.02	12	0.01	0.32	76	2.57	0.49	717.00	714.30	713.10	717.00	714.29	712.86
4	3	0.30	0.40	0.12	0.20	20.49	3.85	0.86	3.75	12	0.06	1.10	129	4.76	0.45	717.00	714.29	712.76	716.10	714.21	711.34
3	2	0.40	0.40	0.16	0.38	20.95	3.81	1.46	2.01	12	0.17	0.32	23	2.55	0.15	716.10	714.21	711.34	716.10	714.18	711.27
2	1 sublt	0.34	0.40	0.14	0.52	21.10	3.80	1.97	2.02	12	0.31	0.32	24	2.57	0.16	716.10	714.18	711.27	716.75	714.10	711.19
1 total	CDS	1.57	0.40	0.63	1.57	23.51	3.61	5.67	6.36	21	0.13	0.16	43	2.63	0.27	716.75	714.10	710.11	715.10	714.05	710.04
CDS	pond	1.57	0.40	0.63	1.57	23.78	3.59	5.64	6.36	21	0.13	0.16	37	2.63	0.23	715.10	714.05	709.94	714.00	714.00	709.88
25	24	0.23	0.40	0.09	1.66	24.02	3.57	5.94	2.02	12	2.78	0.32	21	2.57	0.14	714.00	711.36	709.65	714.00	710.77	709.58
24	X3	1.66	0.40	0.66	1.66	24.15	3.56	5.92	3.20	15	0.84	0.24	32	2.60	0.21	714.00	710.77	709.58	714.00	710.50	709.50

**3 WORKING DAYS BEFORE YOU DIG**  
CALL MISS DIG  
1-800-487-1171  
TOLL FREE for the location of underground utilities

Contractor Note:  
The locations of existing underground utilities are shown in an approximate way only. The contractor shall determine the exact location of all existing utilities before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve any and all underground utilities.

PHONE: 586.731-8030  
FAX: 586.731-2805

**URBAN LAND CONSULTANTS**  
CIVIL ENGINEERS PLANNERS LAND SURVEYORS  
8800 23 MILE ROAD  
SHELBY TWP., MI 48316-4516

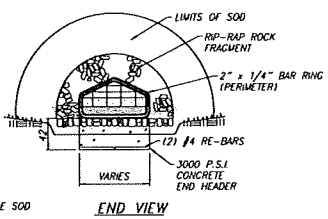






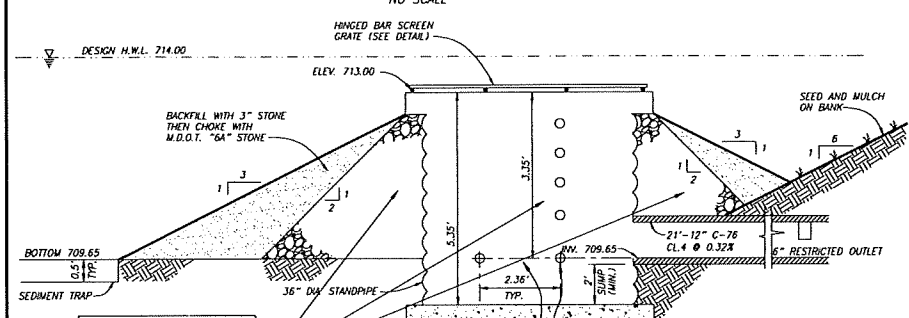
**3 WORKING DAYS BEFORE YOU DIG**  
CALL MISS DIG  
1-800-482-7171  
TOLL FREE for the location of underground utilities

**Contractor Note:**  
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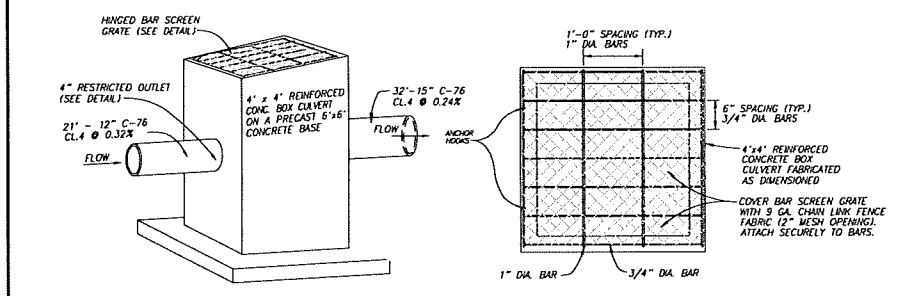


END VIEW

END SECTION AND BAR SCREEN DETAIL

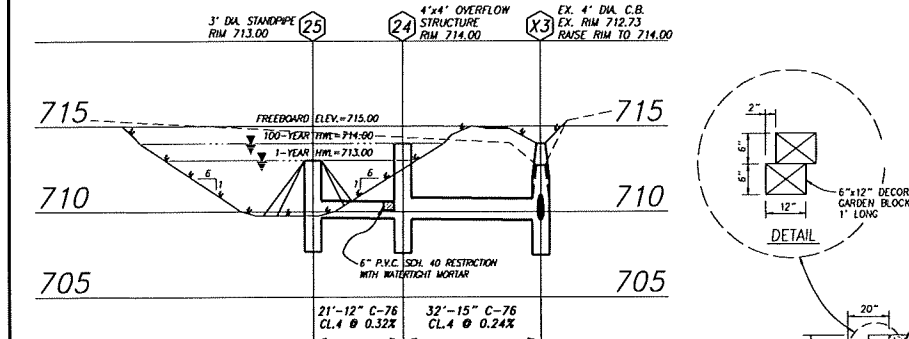


DETENTION BASIN OUTLET CONTROL STRUCTURE #25



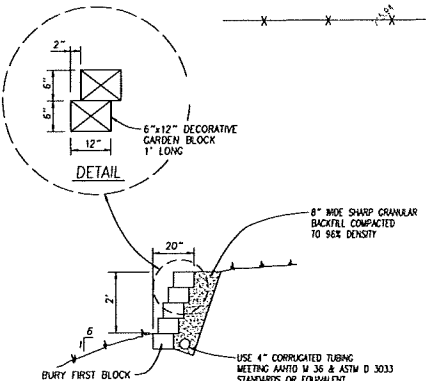
ISOMETRIC MANHOLE DETAIL STRUCTURE #24

BAR SCREEN GRATE DETAIL

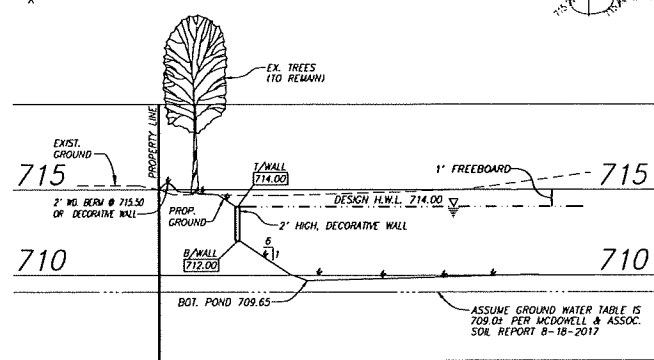


STORM SEWER PROFILES

SCALE: HORIZONTAL: 1" = 20'  
VERTICAL: 1" = 5'

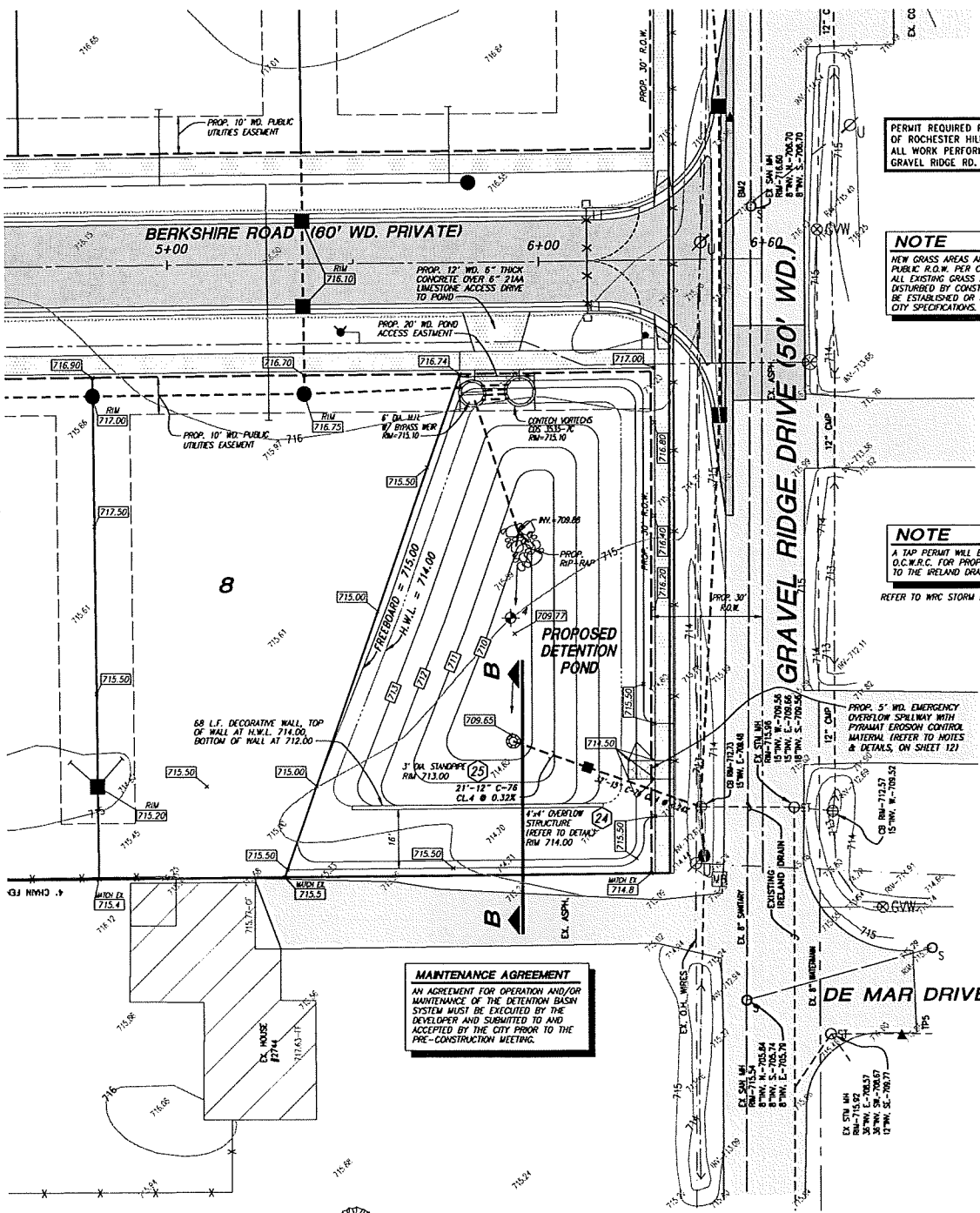


DECORATIVE WALL DETAIL



SECTION B-B

SCALE: HORIZONTAL: 1" = 20'  
VERTICAL: 1" = 5'



PERMIT REQUIRED FROM CITY OF ROCHESTER HILLS FOR ALL WORK PERFORMED WITHIN GRAVEL RIDGE RD. R.O.W.

**NOTE**  
NEW GRASS AREAS ARE REQUIRED IN PUBLIC R.O.W. PER CITY STANDARDS. ALL EXISTING GRASS AREAS THAT ARE DISTURBED BY CONSTRUCTION SHALL BE ESTABLISHED OR RESTORED PER CITY SPECIFICATIONS.

**NOTE**  
A TAP PERMIT WILL BE REQUIRED FROM O.C.W.R.C. FOR PROPOSED CONNECTION TO THE IRELAND DRAIN.

**MAINTENANCE AGREEMENT**  
AN AGREEMENT FOR OPERATION AND/OR MAINTENANCE OF THE DETENTION BASIN SYSTEM MUST BE EXECUTED BY THE DEVELOPER AND SUBMITTED TO AND ACCEPTED BY THE CITY PRIOR TO THE PRE-CONSTRUCTION MEETING.

**BENCHMARKS**

1. CUT MARK BY W. FACE U-POLE, EAST SIDE OF JOHN R. AT HOUSE #2731 ELEVATION=716.65 DATUM=NAVD88	4. 1/4\"/>
2. S.M. IN. IN GRAVEL RIDGE DR. AT HOUSE 2731 ELEVATION=716.60 DATUM=NAVD88	5. 1/4\"/>
3. 1/4\"/>	

**NORTH**

**SCALE: 1"=20'**

**DETECTION POND PLAN**

PARCEL ACREAGE: A = 4.32 ACRES (net)  
PER O.C.W.R.C. DESIGN FOR THE IRELAND DRAIN, THE STORM SEWER DRAINING THIS PARCEL WAS DESIGNED FOR A "C" = 0.288  
SETTING THE ALLOWABLE OUTFLOW PER THE RATIONAL METHOD  
10-CR. WITH C=0.288, I=17.5/1.25; I=25; A=2.31  
Q<sub>1</sub> = (0.288) + (17.5/1.25) + (2.31) = 2.68 CFS  
\*SET POND OUTFLOW AT 0.62 CFS/Acre = 4.32 x 0.62 = 2.68 CFS\*\*

**COMPOSITE COEFFICIENT "C" FOR THE SITE**

- TOTAL AREA OF SITE = 4.32 ACRES
- PAVED (STREETS, ROADS, SIDEWALKS, DRIVEWAYS) --- C=0.95  
ROADWAY PAVEMENT = 0.292 Ac.  
SIDEWALK = 0.131 Ac.  
ROADWAY AREA/UNIT = 0.0295 AC./UNIT = 0.254 Ac.
- BUILDING AREA (HOUSES, PATIOS, DECK, ETC.) --- C=0.95  
13 x (14x43) / 43,560 Ac.
- GREEN AREA (GRASS) --- C=0.15  
SOIL GROUP A (C=0.15) = 4.32 - 0.677 - 0.604 = 3.04 Ac.
- RUNOFF COEFFICIENT  
(0.677+0.604) x 0.95 + 3.17 x 0.15 = 0.392 ∴ C = 0.40

**POND SIZING CALCULATION (OKLAHOMA COUNTY WATER RESOURCE COMMISSION METHOD)**

A) TRIBUTARY AREA: 4.32 ACRES AT PROPOSED C = 0.40  
B) POND OUTFLOW: 2.68 CFS  
C) PROPOSED 100 YEAR FREQUENCY STORM DETENTION  
Q<sub>1</sub> = (ALLOWABLE OUTFLOW) = 2.68  
Q<sub>2</sub> = (AC. x PROPOSED "C") = 4.32 x 0.40 = 1.55  
T<sub>0</sub> =  $\sqrt{\frac{10,312.5}{Q_2}} - 25 = 56.57$  MINUTES  
V<sub>0</sub> = 16,500T - 400T  
V<sub>0</sub> = 11,442.99 - 3,507.34 = 7,935.65 CU. FT. / ACRE-IMPERVIOUS  
V<sub>0</sub> (ACRES) = (4.32 AC. x 17,935.65 CU. FT. / AC.) = 13,712.8 CU. FT.

**VOLUME PROVIDED:**

POND CONTOUR AREA	DEPTH	VOLUME
A <sub>1</sub> 714.00 = 6,368 S.F.	h = 1.0', V = 5,594.9 C.F.	
A <sub>2</sub> 713.00 = 4,856 S.F.	h = 1.0', V = 4,148.9 C.F.	
A <sub>3</sub> 712.00 = 3,480 S.F.	h = 1.0', V = 2,703.8 C.F.	
A <sub>4</sub> 711.00 = 1,996 S.F.	h = 1.0', V = 1,352.0 C.F.	
A <sub>5</sub> 710.00 = 798 S.F.	h = 0.35', V = 93.1 C.F.	
A <sub>6</sub> 709.65 = 0 S.F.	V = 13,892.7 C.F.	

TOTAL VOLUME PROVIDED = 13,892.7 C.F. > 13,712.8 C.F. ∴ O.K.

**SUMMARY:**  
FREEBOARD ELEVATION= 715.00  
HIGH WATER LEVEL = 714.00  
BOTTOM OF POND = 709.65  
OVERFLOW TO GRAVEL RIDGE DRIVE EXISTING C.B.  
OUTLET: RESTRICTED TO IRELAND DRAIN

**NOTE**

- ALL STORMS UP TO ONE HALF (1/2) MUST BE CAPTURED AND INFILTRATED ON-SITE.
- THE MAXIMUM DEPTH OF AN INFILTRATION SYSTEM SHALL BE ONE AND A HALF FEET (1-1/2) UNLESS THE INFILTRATION RATE IS GREATER THAN ONE HALF INCHES (1/2) PER HOUR. IN SUCH CASE, THE SYSTEM MAY BE DEEPER AND MUST BE CAPABLE OF INFILTRATING THE RECHARGE VOLUME WITHIN A 48-HOUR PERIOD.
- RECHARGE SHOULD NOT BE CONCENTRATED TO ONE AREA. IT SHOULD BE DISTRIBUTED TO MULTIPLE AREAS THROUGHOUT THE SITE.
- SITE DESIGN SHOULD IMPLEMENT RUNOFF REDUCTION TECHNIQUES SUCH AS THOSE DESCRIBED IN APPENDIX A OF THE CITY OF ROCHESTER HILLS ENGINEERING DESIGN STANDARDS.

**VOLUME OF WATER TO BE INFILTRATED**  
R<sub>0</sub> = 1,815 x 4.32 Ac. x 0.40 = 3,136 C.F.

**OUTLET RESTRICTION SIZE**  
Q<sub>1</sub> = 0.62 x 0 x 2 x g x h = 2.68 cfs  
h = 714.00 - 709.65 = 4.35'  
0 = 2.68 cfs  
0 = 0.62/2 x 32.2 x 4.35'  
Dia. pipe = 0.573 ft. = 6.88 in.  
USE 6" P.V.C. SCHD. 40

**WEIR CALCULATION FOR EMERGENCY OVERFLOW SPILLWAY**  
WEIR EQUATION: Q = 3.0 x L x H<sup>3/2</sup>  
USING Q = 2.68 CFS  
ASSUME WEIR WIDTH "L" = 5' & HEIGHT, "H" = 0.50'  
Q = 3.0 x 5' x 0.50'<sup>3/2</sup>  
= 5.3 CFS > 2.68 CFS ∴ O.K.  
(USE WIDTH=5' & HEIGHT=0.50')

**SEDIMENT FOREBAY CALCULATIONS (OKLAHOMA COUNTY WATER RESOURCE COMMISSION METHOD)**

REQUIRED VOLUME  
A) TRIBUTARY AREA: 4.32 ACRES AT PROPOSED C = 0.40  
B) POND OUTFLOW = 2.68 CFS  
C) PROPOSED 1 YEAR FREQUENCY STORM DETENTION  
V<sub>0</sub> = 4,320 x C x A = 4,320 x 0.40 x 4.32 = 7,485 CU. FT.  
H<sub>0</sub> = 713.00 - 709.65 = 3.35 FT.  
A<sub>0</sub> =  $\frac{V_0}{H_0} = \frac{7,485}{3.35} = 2,237$  SQ. FT.  
A<sub>0</sub> = 0.3988 A<sub>0</sub> x  $\sqrt{H_0}$   
= 172,800  
0 =  $\frac{0.3988 x 2,228 x \sqrt{3.35}}{172,800} = 0.00941$  SO. FT.  
AREA OF 1" DIA. HOLES = 0.00515 SQ. FT. ∴ 2 HOLES ARE REQUIRED

**LEGEND**

- 100 EXISTING CONTOURS
- 10.00 EXISTING GRADE
- EXISTING GRAVEL
- EXISTING PAVEMENT
- PROPOSED ASPHALT
- PROPOSED STORM
- PROPOSED WATERWAY
- PROPOSED SANITARY

**TOPOGRAPHY LEGEND**

- WATER MAIN
- STORM SEWER
- SANITARY SEWER
- EASEMENT
- EX. U.S. ELEC.
- EX. U.S. T.E.L.
- EX. U.S. GAS
- ROUND CATCH BASIN
- SQUARE CATCH BASIN
- UTILITY MANHOLE
- STORM MANHOLE
- END OF PIPE
- CLEAN-OUT
- MANHOLE
- HYDRANT
- GATE VALVE WELL
- WATER VALVE
- WATER BOX
- VALVE
- LIGHT POLE
- AIR CONDITIONER
- MAIL BOX
- FENCE POST
- DOWN SPOUT
- SOIL BORING
- ELEC TRANS PAD
- UTILITY POLE
- CUT ANCHOR
- COIL POLE
- SOIL POST
- SPRINKLER HEAD
- GAS METER
- TELEPHONE RISER
- ELECTRICAL RISER
- CABLE TV RISER
- FINISHED FLOOR
- CANOE FLOOR
- BF. BASEMENT FLOOR
- CONC. CONCRETE
- SH. SET MAG. NAL
- SB SET IRON BAR
- 4" ETE FOUND FROM BAR
- WT-WON FOUND C. MONUMENT

**SOIL BORING LOG**

Soil Boring #4  
Elevation=715.00

**OUTLET RESTRICTION SIZE**  
Q<sub>1</sub> = 0.62 x 0 x 2 x g x h = 2.68 cfs  
h = 714.00 - 709.65 = 4.35'  
0 = 2.68 cfs  
0 = 0.62/2 x 32.2 x 4.35'  
Dia. pipe = 0.573 ft. = 6.88 in.  
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WEIR EQUATION: Q = 3.0 x L x H<sup>3/2</sup>  
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ASSUME WEIR WIDTH "L" = 5' & HEIGHT, "H" = 0.50'  
Q = 3.0 x 5' x 0.50'<sup>3/2</sup>  
= 5.3 CFS > 2.68 CFS ∴ O.K.  
(USE WIDTH=5' & HEIGHT=0.50')

**SEDIMENT FOREBAY CALCULATIONS (OKLAHOMA COUNTY WATER RESOURCE COMMISSION METHOD)**

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A<sub>0</sub> = 0.3988 A<sub>0</sub> x  $\sqrt{H_0}$   
= 172,800  
0 =  $\frac{0.3988 x 2,228 x \sqrt{3.35}}{172,800} = 0.00941$  SO. FT.  
AREA OF 1" DIA. HOLES = 0.00515 SQ. FT. ∴ 2 HOLES ARE REQUIRED

**PROPOSED BERKSHIRES SITE CONDOMINIUM**

FOR: FRANK BARTOLTA  
2553 23 MILE ROAD  
SHELBY TOWNSHIP, MI 48316  
(586) 731-1630

URBAN LAND CONSULTANTS  
PLANNERS LAND SURVEYORS  
8800 23 MILE ROAD  
SHELBY TWP., MI 48316-4516  
PHONE 586 931-8830  
FAX 586 731-8605

DATE: 170254-215  
Job No.: 170254-215  
Scale: 1"=20'  
Drawn: J.M.  
Check: R.W.L.  
Sheet 10 of 12  
REV. DATE PER  
03-12-19 REV. PER O.C.W.R.C. REVIEW  
07-26-19 REV. PER CITY PARKS REVIEW  
11-16-19 REV. PER CITY REVIEW

ADDITIONS AND/OR REVISIONS

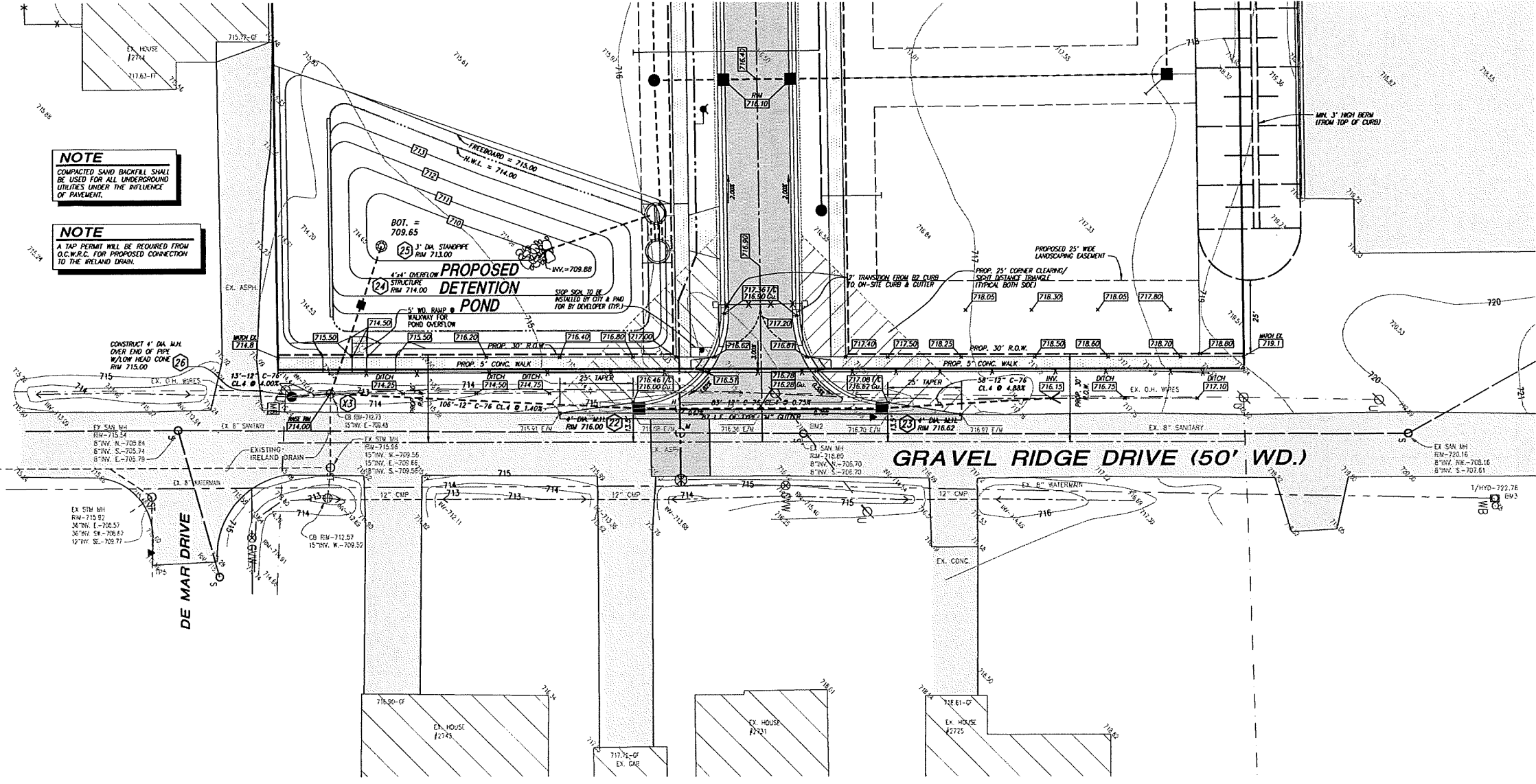
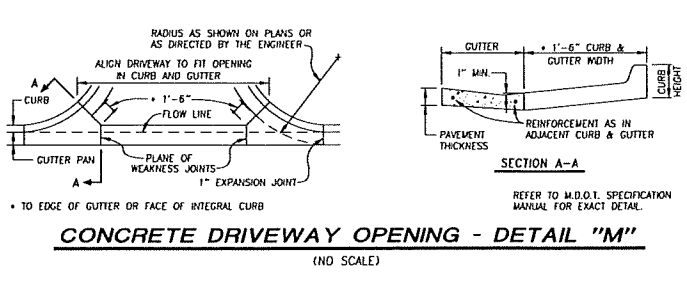
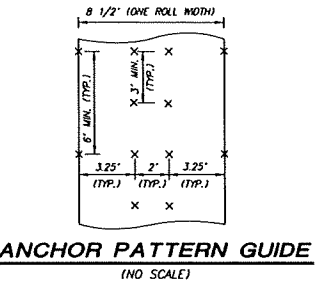


**3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171**  
 (CALL FIRST for the location of underground utilities)

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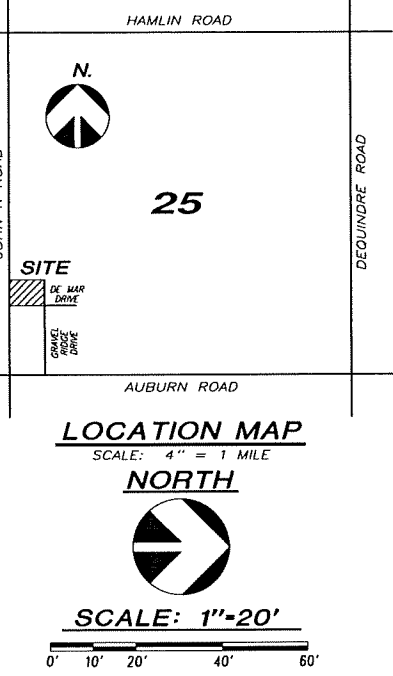
**PYRAMAT INSTALLATION NOTES**

1. GRADE AND COMPACT AREA OF INSTALLATION.
2. INSTALL 2" MIN. TOPSOIL.
3. REMOVE ANY ROCKS, CLOUDS, VEGETATION, OR OTHER OBSTRUCTIONS SO THAT THE INSTALLED PYRAMAT WILL HAVE DIRECT CONTACT WITH THE SOIL SURFACE.
4. UNROLL PYRAMAT DOWN SLOPE.
5. LAY PYRAMAT LOOSE TO MAINTAIN DIRECT CONTACT WITH SOIL. (DO NOT PULL MAT TIGHT, AS THIS MAY RESULT IN BRIDGING OF SOIL SURFACE.)
6. SECURE PYRAMAT TO GROUND SURFACE USING 6" x 11 GAUGE U-SHAPED WIRE STAPLES. ANCHORS SHOULD BE DRIVEN FLUSH TO THE SOIL SURFACE. ANCHORS, COMPACT, AND BACKFILL UPSTREAM END OF MAT IN A 12" x 6" TRENCH. MAT SHALL BE ANCHORED ALONG BOTH SIDES OF SHALE BOTTOM EVERY 3' MIN. AND ALONG TOP OF SHALE BANKS EVERY 6' MIN. (SEE SECTION B-B AND ANCHOR PATTERN GUIDE, THIS SHEET)
7. SEED PYRAMAT AND ENTIRE DISTURBED AREA AFTER INSTALLATION, PRIOR TO FILLING MAT WITH ANY SOIL.
8. SPREAD AND LIGHTLY RAKE 1" OF FINE TOPSOIL INTO THE PYRAMAT USING BACK OF RAKE OR OTHER FLAT TOOL TO ENSURE A SMOOTH, SOIL-FILLED SURFACE THAT JUST EXPOSES THE TOP OF THE MATRIX. DO NOT PLACE EXCESSIVE SOIL ABOVE THE MAT.
9. HYDROMULCH OR STRAW MULCH PROPERLY INSTALLED PYRAMAT TO PROVIDE TEMPORARY EROSION PROTECTION.
10. DO NOT RUN CONSTRUCTION EQUIPMENT OVER PYRAMAT.



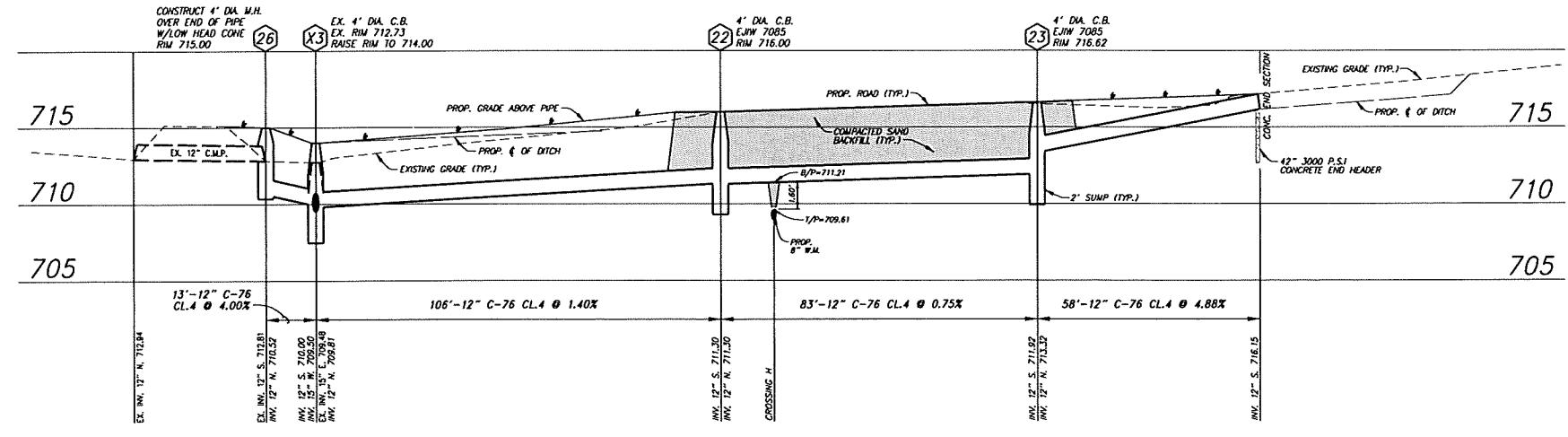
**NOTE**  
 COMPACTED SAND BACKFILL SHALL BE USED FOR ALL UNDERGROUND UTILITIES UNDER THE INFLUENCE OF PAVEMENT.

**NOTE**  
 A TAP PERMIT WILL BE REQUIRED FROM O.C.W.P.C. FOR PROPOSED CONNECTION TO THE IRELAND DRAIN.



- BENCHMARKS**
1. CUT NAIL IN W. FACE U-POLE, EAST SIDE OF JOHN R. DR. AND DELMAR RD. ELEVATION=716.65 DATUM=NAVD88
  2. SAIL NH. IN GRAVEL RIDGE DR. AT HOUSE #2731 ELEVATION=716.60 DATUM=NAVD88
  3. 1/4" DIA. AT NORTH END OF GRAVEL RIDGE DR. ELEVATION=722.78 DATUM=NAVD88
  4. 1/4" DIA. AT S.E. CORNER OF INTERSECTION OF GRAVEL RIDGE DR. AND DELMAR RD. ELEVATION=717.28 DATUM=NAVD88
  5. 1/4" DIA. ON W. SIDE OF JOHN R. 150' S. OF N. PL. ELEVATION=718.79 DATUM=NAVD88

- LEGEND**
- EXISTING CONTOURS
  - EXISTING GRADE
  - EXISTING GRAVEL
  - EXISTING PAVEMENT
  - PROPOSED ASPHALT
  - PROPOSED STORM
  - PROPOSED WATERMAIN
  - PROPOSED SANITARY
- TOPOGRAPHY LEGEND**
- WATER MAIN
  - STORM SEWER
  - SANITARY SEWER
  - EASMENT
  - EX. U.G. ELEC.
  - EX. U.G. WRES
  - EX. U.G. TELE.
  - EX. U.G. GAS
  - ROUND CATCH BASIN
  - SQUARE CATCH BASIN
  - UTILITY MANHOLE
  - STORM MANHOLE
  - END OF PIPE
  - SANITARY MANHOLE CLEAN-OUT
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  - OUT ANCHOR
  - SOIL POST
  - SPRINKLER HEAD
  - GAS METER
  - TELEPHONE RISER
  - ELECTRICAL RISER
  - CABLE TV RISER
  - FRESHED FLOOR
  - GARAGE FLOOR
  - BASEMENT FLOOR
  - CONC. CONCRETE
  - OSM. SET WAG. NAIL
  - OSB SET IRON BAR
  - REBAR FOUND C. WORKMENT



MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. MINIMUM DIMENSIONS 5'-0" SEE NOTES ON MDDT DETAIL R-28-J.

MAXIMUM RAMP CROSS SLOPE IS 2.0% RUNNING SLOPE 5/8" x 7/8" (8.3% MAXIMUM). SEE NOTES ON MDDT DETAIL R-28-J.

NOTE: ACCEPTABLE DETECTABLE WARNING PLATE MATERIALS INCLUDE ARBOR TILE AND SOLUTIONS, E.I. OR APPROVED EQUAL MATERIALS MUST BE RIGID CAST IN PLACE AND BINDER RED IN COLOR.

NOTE: ALTERNATE REVERSE CUTTER SECTION TO BE USED ONLY WHEN DRAWING AWAY FROM CURB. SEE GRADING PLAN.

**GRAVEL RIDGE ROAD IMPROVEMENTS**  
 PART OF THE S.W. 1/4 OF SECTION 25  
 T.11N., R.15E., CITY OF ROCHESTER HILLS,  
 OAKLAND COUNTY, MICHIGAN

**PROPOSED BERKSHIRE SITE CONDOMINIUM**

FOR: FRANK BARTOLOTTA  
 2653 23 MILE ROAD  
 SHELBY TOWNSHIP, MI 48316  
 (586) 731-1630

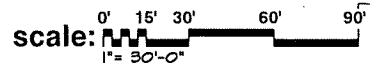
URBAN LAND CONSULTANTS  
 CIVIL ENGINEERS LAND SURVEYORS  
 8800 23 MILE ROAD SHELBY TWP., MI 48316-4516  
 PHONE 586 731-8030 FAX 586 731-8695

DATE: 9-11-2018  
 SCALE: 1"=20'  
 DRAWN: J.M.  
 CHECK: R.W.M.  
 SHEET 12 OF 12  
 REVISED PER CITY REVIEW  
 01-02-19  
 11-16-19

landscape plan for:  
**Berkshire**  
 City of Rochester Hills, Michigan

**note:**

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



**landscape requirements and calculations**

right-of-way landscape	REQUIRED	PROVIDED
TOTAL LIN. FT. OF R.O.W. FRONTAGE JOHN R ROAD	270'±	10
ONE (1) DECIDUOUS OR EVERGREEN TREE PER 95 LIN. FT.	3	5
ONE (1) ORNAMENTAL TREE PER 60 LIN. FT.	5	5
TOTAL LIN. FT. OF R.O.W. FRONTAGE GRAVEL RIDGE ROAD	195'±	4
ONE (1) DECIDUOUS OR EVERGREEN TREE PER 95 LIN. FT.	2	4
ONE (1) ORNAMENTAL TREE PER 60 LIN. FT.	3	3
street tree requirement	REQUIRED	PROVIDED
ONE (1) DECIDUOUS TREE PER LOT	15	CITY
detention pond	REQUIRED	PROVIDED
TOTAL LIN. FT. OF DETENTION POND FREE BOARD	525'±	
ONE (1) ONE HALF (1/2) DECIDUOUS TREE PER 100 LIN. FT.	5.25	5
ONE (1) EVERGREEN TREE PER 100 LIN. FT.	3.25	3
FOUR (4) DECIDUOUS OR EVERGREEN SHRUBS PER 100 LIN. FT.	12.42	17
tree replacement	REQUIRED	PROVIDED
TOTAL NO. OF TREES SURVEY ON SITE	81	
TOTAL NO. OF TREES SAVED ON SITE	41 (52%)	
TOTAL NO. OF TREES REMOVED ON SITE	40	
NO. OF UNSOUND OR POOR CONDITION TREES REMOVED	20	
NO. OF REGULATED TREES REMOVED	20	REQUIRED
TOTAL TREE REPLACEMENT CREDIT	40	PROVIDED
20'-8" HIGH EVERGREEN TREES AT 1-CREDIT	20	
20'-10" HIGH EVERGREEN TREES AT 2-CREDITS	40	

**landscape maintenance notes:**

- SECTION 18-0369 MAINTENANCE
- THE OWNER OF THE PROPERTY SHALL BE RESPONSIBLE FOR ALL MAINTENANCE OF SITE LANDSCAPING, AS FOLLOWS:
- LANDSCAPING SHALL BE KEPT IN A NEAT, ORDERLY AND HEALTHY GROWING CONDITION, FREE FROM DEBRIS AND REFUSE.
  - PRUNING SHALL BE MINIMAL AT THE TIME OF INSTALLATION, ONLY TO REMOVE DEAD OR DISEASED BRANCHES. SUBSEQUENT PRUNING SHALL ASSURE PROPER MATURATION OF PLANTS TO ACHIEVE THEIR APPROVED PURPOSE.
  - ALL DEAD, DAMAGED, OR DISEASED PLANT MATERIAL SHALL BE REMOVED IMMEDIATELY AND REPLACED WITHIN SIX (6) MONTHS AFTER IT DIES OR IN THE NEXT PLANTING SEASON, WHICHEVER OCCURS FIRST. FOR PURPOSES OF THIS SECTION THE PLANTING SEASON FOR DECIDUOUS PLANTS SHALL BE BETWEEN MARCH 1 AND JUNE 1 AND FROM OCTOBER 1 UNTIL THE PREPARED SOIL BECOMES FROZEN. THE PLANTING SEASON FOR EVERGREEN PLANTS SHALL BE BETWEEN MARCH 1 AND JUNE 1. PLANT MATERIAL INSTALLED TO REPLACE DEAD OR DISEASED MATERIAL SHALL BE AS CLOSE AS PRACTICAL TO THE SIZE OF THE MATERIAL IT IS INTENDED TO REPLACE. THE CITY MAY NOTIFY PROPERTY OWNERS OF THE NEED TO REPLACE DEAD, DAMAGED, OR DISEASED MATERIAL.
  - THE APPROVED LANDSCAPE PLAN SHALL BE CONSIDERED A PERMANENT RECORD AND INTEGRAL PART OF THE SITE PLAN APPROVAL. UNLESS OTHERWISE APPROVED IN ACCORDANCE WITH THE AFORESAID PROCEDURES, ANY REVISIONS TO OR REMOVAL OF PLANT MATERIALS, OR NON-COMPLIANCE WITH THE MAINTENANCE REQUIREMENTS OF THIS SECTION 18-0369 WILL PLACE THE PARCEL IN NON-CONFORMITY WITH THE APPROVED LANDSCAPE PLAN AND BE A VIOLATION OF THIS ORDINANCE.
  - IF PROTECTED TREES ARE DAMAGED, A FINE SHALL BE ISSUED ON AN INCH-BY-INCH BASIS AT A MONETARY RATE AS DEFINED BY THE FORESTRY DEPARTMENT.

**general landscape notes:**

- LANDSCAPE CONTRACTOR SHALL VISIT THE SITE, INSPECT EXISTING CONDITIONS, REVIEW PROPOSED PLANTINGS AND RELATED WORK. CONTACT THE OWNER AND/OR LANDSCAPE ARCHITECT WITH ANY CONCERNS OR DISCREPANCY BETWEEN THE PLAN, PLANT MATERIAL LIST, AND/OR SITE CONDITIONS.
- PRIOR TO BEGINNING OF CONSTRUCTION ON ANY WORK, CONTRACTORS SHALL VERIFY LOCATIONS OF ALL ON SITE UTILITIES, GAS, ELECTRIC, TELEPHONE, CABLE TO BE LOCATED BY CONTACTING MISS DIG 1-800-482-7171. ANY DAMAGE OR INTERRUPTION OF SERVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COORDINATE ALL RELATED WORK ACTIVITIES WITH OTHER TRADES AND REPORT ANY UNACCEPTABLE JOB CONDITIONS TO OWNER PRIOR TO COMMENCING.
- NUMERICAL VALUE ON THE LANDSCAPE QUANTITIES SPECIFIED ON THE PLAN TAKE PRECEDENCE OVER GRAPHIC REPRESENTATION. VERIFY ANY CONCERN/DISCREPANCY WITH LANDSCAPE ARCHITECT.
- ALL CONSTRUCTION AND PLANT MATERIAL LOCATION TO BE ADJUSTED ON SITE IF NECESSARY.
- ALL SUBSTITUTIONS OR DEVIATIONS FROM THE LANDSCAPE PLAN MUST BE APPROVED BY ROCHESTER HILLS AND LANDSCAPE ARCHITECT.
- ALL LARGE TREES AND EVERGREENS TO BE STAKED, GUYED AND WRAPPED AS DETAIL SHOWN ON PLAN.
- PLANT BEDS TO BE DRESSED WITH MIN. 4" OF FINELY DOUBLE SHREDDED HARD-BARK MULCH.
- DIK SHRUB PITS 1' LARGER THAN SHRUB ROOT BALLS AND TREE PITS 2' LARGER THAN ROOT BALL. BACK FILL WITH ONE PART TOP SOIL AND ONE PART SOIL FROM EXCAVATED PLANTING HOLE.
- NATURAL COLOR FINELY SHREDDED HARDWOOD BARK MULCH REQUIRED FOR ALL PLANTINGS.
- REMOVE ALL TUNE WIRE AND BURLAP FROM TREE AND SHRUB EARTH BALLS, AND FROM TREE TRUNKS. 4" THICK BARK MULCH FOR TREES IN 4" DIA. CIRCLE WITH 3" FULLED AWAY FROM TRUNK. 4" THICK BARK MULCH FOR SHRUBS AND 4" THICK BARK MULCH FOR PERENNIALS.
- PLANT MATERIAL QUALITY & INSTALLATION SHALL BE IN ACCORDANCE WITH THE CURRENT AMERICAN ASSOCIATION OF NURSERMEN LANDSCAPE STANDARDS.
- PROVIDE FEAT 60D FOR ALL NEW AND DISTURBED LAWN AREAS UNLESS NOTED OTHERWISE.
- ALL PLANTING AREAS TO BE PREPARED WITH APPROPRIATE SOIL MIXTURES AND FERTILIZER BEFORE PLANT INSTALLATION.
- PLANT TREES AND SHRUBS GENERALLY NO CLOSER THEN THE FOLLOWING DISTANCES FROM SIDEWALKS, CURBS AND PARKING STALLS:
  - SHADE TREES 5 FT.
  - ORNAMENTAL AND EVERGREEN TREES (CRAB, PINE, SPRUCE, ETC.) 10 FT.
  - SHRUBS THAT ARE LESS THAN 1 FOOT TALL AND WIDE AT MATURITY 2 FT.
- NO TREES OR EVERGREENS TO BE INSTALLED OVER ANY PROPOSED OR EXISTING UTILITY LINES AS SHOWN ON THE OVERALL LANDSCAPE PLAN. SEE ENGINEERING PLANS FOR LOCATION AND DETAIL.
- ALL LAWN AREAS AND LANDSCAPE BEDS IN JOHN R ROAD GREENBELT AND BUFFER AREA BETWEEN CHURCH PARKING AND PROPOSED LOTS TO BE FULLY IRRIGATED WITH AN AUTOMATIC UNDERGROUND SYSTEM. IRRIGATION SYSTEM TO HAVE SEPARATE ZONES FOR LAWN AREAS, PARKING ISLANDS, AND SHRUB BEDS WITH DIFFERENT CONTROL. MOISTURE LEVEL ADJUSTMENT PER ZONE AS REQUIRED.
- UNLESS NOTED OTHERWISE, LANDSCAPE BEDS ADJACENT TO LAWN TO RECEIVE EDGING. EDGING SHALL BE 4" X 1/2" METAL (FINISH BLACK OR GREEN) OR APPROVED EQUAL AND TO BE INSTALLED WITH HORIZONTAL METAL STAKES AT 32" O.C. OR PER MANUFACTURER'S SPECIFICATION.
- ALL NEW PARKING ISLANDS AND LANDSCAPE BEDS ADJACENT AND NEXT TO BUILDINGS SHALL BE EXCAVATED OF ALL BUILDING MATERIALS AND POOR SOILS A MIN. OF 16" DEPTH. BACK FILL WITH GOOD, MEDIUM TEXTURED PLANTING SOILS. ADD A MIN. 4" OF TOPSOIL OVERFILL TO FINISH GRADE. PROVIDE POSITIVE DRAINAGE.
- WATERING OF ALL PLANTS AND TREES TO BE PROVIDED IMMEDIATELY AND MULCHING WITHIN 24 HOURS AFTER INSTALLATION.
- ALL TREE PITS TO BE TESTED FOR PROPER DRAINAGE PRIOR TO TREE PLANTING. PROVIDE APPROPRIATE DRAINAGE SYSTEM AS REQUIRED IF THE TREE PIT DOES NOT DRAIN SUFFICIENTLY.
- THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPE PLANT MATERIALS AND IRRIGATION INSTALLATION FOR A PERIOD OF TWO YEAR BEGINNING AFTER THE COMPLETION OF LANDSCAPE INSTALLATION DATE APPROVED BY THE CITY OR LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL REPLACE DURING AND AT THE END OF THE GUARANTEE PERIOD, ANY DEAD OR UNACCEPTABLE PLANTS, AS DETERMINED BY THE TOWNSHIP OR LANDSCAPE ARCHITECT, WITHOUT COST TO THE OWNER.
- ALL LANDSCAPE AREAS TO BE IRRIGATED. THE WATERING OF LANDSCAPE AREAS WILL OCCUR BETWEEN THE HOURS OF 12:00 AM AND 5:00 AM.
- IRRIGATION OVERSPRAY SHALL NOT BROADCAST ONTO THE CITY PATHWAY OR SIDEWALK LOCATED WITHIN THE PUBLIC ROW.

**NOTE:**  
 THE CITY OF ROCHESTER HILLS WILL PLANT STREET TREES IN THE R.O.W. AFTER CONSTRUCTION OF THE PROJECT IS COMPLETE. THE APPLICANT SHALL PAY \$200.00 PER LOT FOR STREET TREES.

PROPOSED SMALL AND LARGE EVERGREEN TREES ON ADJACENT PROPERTY. PERMITS AND PERMISSION FROM CHURCH TO BE OBTAINED PRIOR TO INSTALLATION.

HATCHING DENOTES EXISTING TREES TO REMAIN

POLE AND OVER-HEAD UTILITY

LAWN AREAS TO RECEIVE IRRIGATION & 60D ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE.

2' TO 3' HIGH UNDULATING FREE FORM EARTHBERM, MAXIMUM 1 ON 3 SLOPE. LAWN AREAS TO RECEIVE IRRIGATION & 60D ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE.

EXISTING UTILITY POLE TO BE RELOCATED PER DETROIT EDISON. ANY PROPOSED CANOPY OR EVERGREEN TREES TO BE INSTALLED A MIN. 15' AWAY FROM NEAR POLE AND OVERHEAD WIRE LOCATION.

25' VEHICULAR CLEARVIEW LINE

5' PEDESTRIAN WALK

2' TO 3' HIGH UNDULATING FREE FORM EARTHBERM, MAXIMUM 1 ON 3 SLOPE. LAWN AREAS TO RECEIVE IRRIGATION & 60D ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE.

CORNER SIGHT DISTANCE (BIKE). OBSERVATION POINT/SIGHT DISTANCE IS 140' BOTH DIRECTIONS @ 15' FROM EDGE OF SIDEWALK/PATHWAYS

CORNER SIGHT DISTANCE (AUTOMOBILE). OBSERVATION POINT/SIGHT DISTANCE IS 500' BOTH DIRECTIONS @ 10' FROM EDGE OF ROAD. (JOHN R. ROAD-3 LANES; @ 45 MPH)

2' TO 3' HIGH UNDULATING FREE FORM EARTHBERM, MAXIMUM 1 ON 3 SLOPE. LAWN AREAS TO RECEIVE IRRIGATION & 60D ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE.

HATCHING DENOTES EXISTING TREE TO REMAIN

CORNER SIGHT DISTANCE (BIKE). OBSERVATION POINT/SIGHT DISTANCE IS 140' BOTH DIRECTION @ 15' FROM EDGE OF SIDEWALK/PATHWAY.

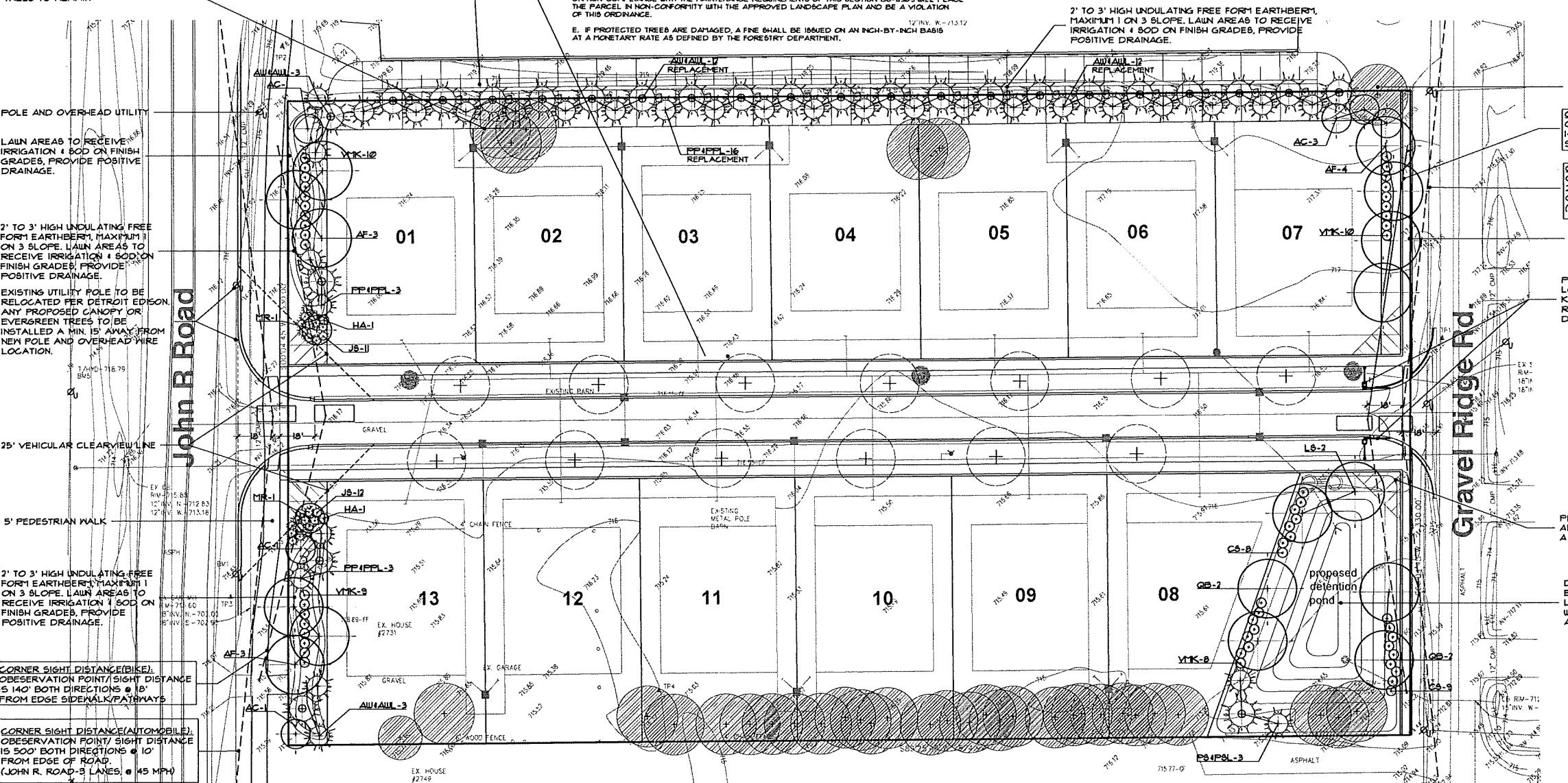
CORNER SIGHT DISTANCE (AUTOMOBILE). OBSERVATION POINT/SIGHT DISTANCE IS 280' BOTH DIRECTION @ 10' FROM EDGE OF GRAVEL ROAD. (GRAVEL RIDGE ROAD-2 LANE, @ 25 MPH)

5' PEDESTRIAN WALK

PROPOSED VEHICULAR GATE LOCATION WITH STONE PIER AND KNOX BOX PER FIRE DEPARTMENT REQUIREMENTS. SEE 811 L8-2 FOR DETAILS.

PROPOSED JUNIPER TO BE ALLOWED TO 'KNIT' TOGETHER AS A MASSING

DETENTION BASIN - SEE ENGINEERING PLANS FOR LOCATION, SIZE, SIDE SLOPES, WATER ELEVATION, TOP OF BANK AND DETAILS.



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 Shelby Township, MI 48316  
 ph. (586) 822-3944

project:  
**BERKSHIRE**

project location:  
 City of Rochester Hills,  
 Michigan  
 John R Road and Gravel  
 Ridge Road

sheet title:  
**GENERAL PLANTING  
 PLAN**

job no./issue/revision date:

LS17.083.07	SPA	7-05-2017
LS17.083.08	SPA	8-01-2017
LS17.083.09	SPA	9-21-2017
LS17.083.11	SPA	11-29-2017
LS18.079.05	SPA	05-29-2018
LS18.079.06	SPA	06-11-2018
LS19.038.02	SPA	02-26-2019

drawn by:  
**JP, CS**  
 checked by:  
**FP, OG**  
 date:  
**2-26-2019**

notice:  
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project no:  
**LS18.079.05**  
 sheet no:  
**LS-1 of 2**

## plant material list

key	quant. (s-1)	botanical name	common name	unit cost	size	total cost	comments
<b>LARGE AND SMALL DECIDUOUS TREES</b>							
AF	10	ACER X FREEMANII 'JEFFERSON'	AUTUMN PLATE RED MAPLE	135.00	3" DB	1350.00	
QB	4	QUERCUS BICOLOR	WHITE BSWAMP OAK	135.00	3" DB	540.00	
LB	3	LIRIODENDRON STRACIFLUA	AMERICAN BLUEBELL	135.00	3" DB	405.00	
AC	6	AMELANCHIER XA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE BERRYBERRY	175.00	10" DB	1050.00	MULTI-BRCH
FR	2	FRAXINUS 'ROYALTY'	ROYALTY CRABAPPLE	125.00	2" DB	250.00	
<b>SHRUBS</b>							
VK	31	VIBURNUM XIB 'MOHAWK'	MOHAWK VIBURNUM	15.00	3 1/2" DB	465.00	
CB	11	CORNUS BICOLOR	RED TIGR DOGWOOD	15.00	3 1/2" DB	165.00	
HA	2	HYDRANGEA ANNABELLE	ANNABELLE HYDRANGEA	15.00	5" CONT.	30.00	
<b>LARGE AND SMALL EVERGREENS</b>							
JB	23	JUNIPERUS SABINA 'BUFFALO'	BUFFALO JUNIPER	15.00	74" DB	345.00	47" OC. SPACING
AW	16	ABIES CONCOLOR	CONCOLOR WHITE FIR	13.75	8" DB	220.00	
AWL	14	ABIES CONCOLOR	CONCOLOR WHITE FIR	14.00	10" DB O	196.00	
PS	2	PINUS STROBUS	EASTERN WHITE PINE	13.75	8" DB	27.50	
PNL	1	PINUS STROBUS	EASTERN WHITE PINE	14.00	10" DB O	14.00	
NP	12	PICEA ABIES	NORWAY SPRUCE	14.00	10" DB	168.00	
PNL	10	PICEA ABIES	NORWAY SPRUCE	14.50	12" DB O	145.00	
			SOIL (110 B.Y.)	16.57		165.70	
			HYDRO-BEED (1750 B.Y.)	13.57		135.70	
			IRRIGATION	16.000		16.000	
			<b>TOTAL</b>			<b>8170</b>	

### City of Rochester Hills notes:

PRIOR APPROVAL IS REQUIRED TO PLANT ANY TREE OR SHRUB ON THE PUBLIC R/W. ALL TREES AND SHRUBS MUST BE PLANTED AT LEAST 10' FROM THE EDGE OF THE PUBLIC ROAD. TREES MUST BE PLANTED AT LEAST 15' AWAY FROM CURB OR ROAD EDGE WHERE THE SPEED LIMIT IS MORE THAN 35 MPH. 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' 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/W LINES 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 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 AT LEAST 15' AWAY FROM THE NEAREST OVERHEAD WIRE. TREES MUST BE PLANTED AT A MINIMUM OF 5' FROM AN UNDERGROUND UTILITY, UNLESS THE CITY'S LANDSCAPE ARCHITECT REQUIRES A GREATER DISTANCE.

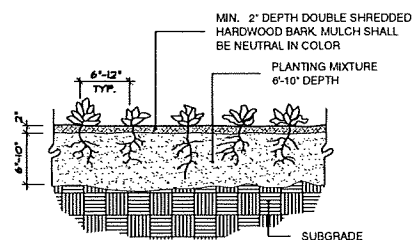
PRIOR TO THE RELEASE OF THE PERFORMANCE BOND:

A. THE CITY OF ROCHESTER HILLS WILL INSPECT ALL LANDSCAPE PLANTINGS INCLUDED ON THE PLANS.

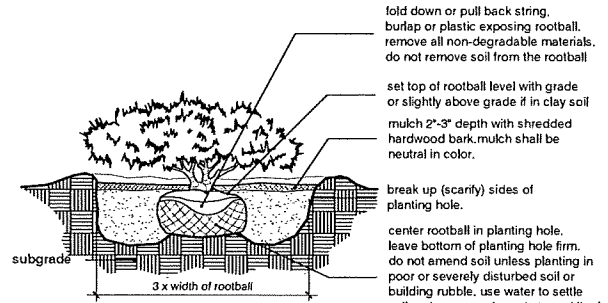
B. THE CITY OF ROCHESTER HILLS FORESTRY DIVISION WILL INSPECT ALL TREES, EXISTING OR PLANTED, TO IDENTIFY ANY THAT POSE A HAZARD TO THE SAFE USE OF THE PUBLIC R.O.M. FORESTRY MAY REQUIRE THE DEVELOPER TO REMOVE, AND POSSIBLY REPLACE, ANY SUCH TREES.

C. THESE REQUIREMENTS ARE INCORPORATED INTO THE PLAN

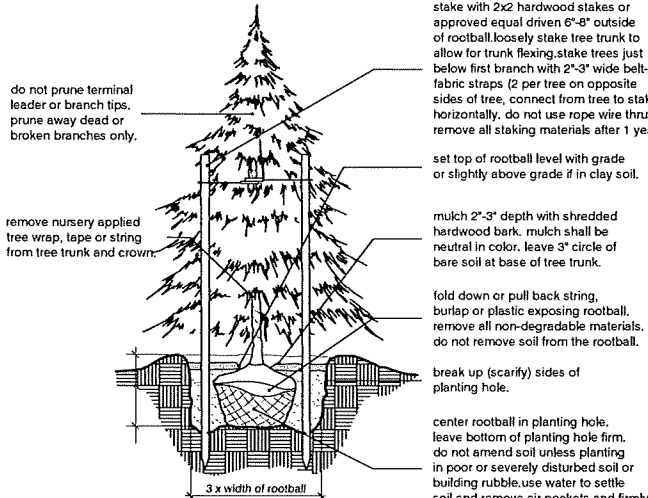
C. THESE REQUIREMENTS ARE INCORPORATED INTO THE PLAN



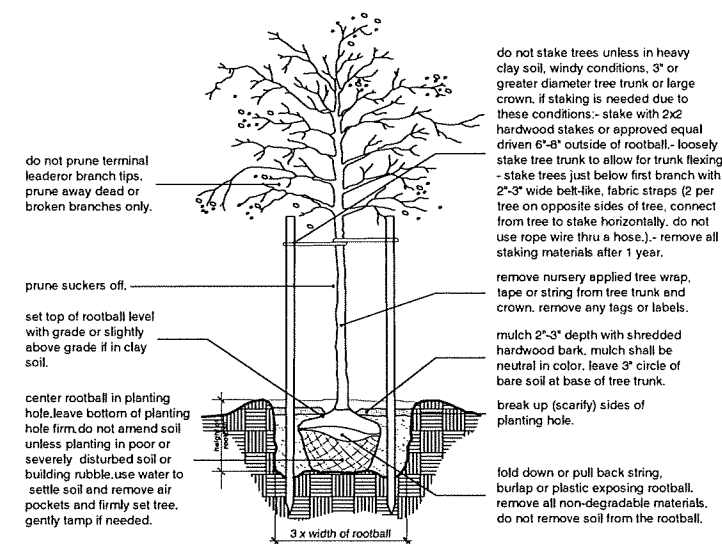
perennial planting detail  
no scale



shrub planting detail  
no scale



evergreen planting detail  
no scale



tree planting detail  
no scale

### detention basin seed mix:

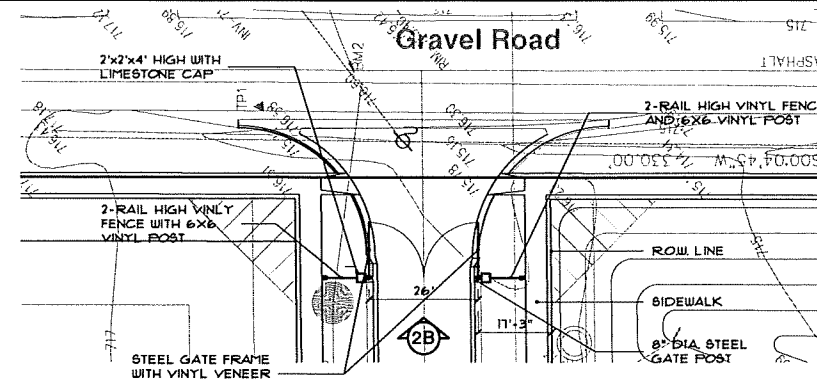
Sedge Meadow Mix: (Edge Zone)		
7 lbs of sedges, grasses and wildflowers recommended for soils that are saturated during most of the growing season. Use just above the normal waterline in the capillary zone in our Lake Edge Enhancement System.		
<b>Sedge Meadow Mix oz/acre</b>		
1 Carex comosa (Bristly Sedge)	1 Aster periviscus (Swamp Aster)	
1 Carex cristata (Great Sedge)	1 Aster umbellatus (Flat-topped Aster)	
6 Carex hirsuta (Frank's Sedge)	1 Cassia hebecarpa (Wild Senna)	
2 Carex hystericina (Porcupine Sedge)	2 Eupatorium maculatum (Spotted Joe-Pye Weed)	
4 Carex lasiocarpa (Lance Sedge)	2 Eupatorium perfoliatum (Boneseal)	
2 Carex stipata (Aid-Fruited Sedge)	2 Helianthus scaberrimus (Kudzu Greenweed)	
6 Carex vulpinoidea (Fox Sedge)	2 Liatris spicata (Dense Blazing Star)	
64 Elymus virginicus (Virginia Wild Rye)	1 Lobelia cardinalis (Cardinal Flower)	
6 Glycine striata (Fowl Manna Grass)	1 Lobelia siphilitica (Great Blue Lobelia)	
6 Leersia orizoides (Rice Cut Grass)	1 Penstemon digitalis (Foxglove Beardtongue)	
8 Panicum virgatum (Switchgrass)	1 Pycnanthemum virginianum (Mountain Mint)	
2 Scirpus atrovirens (Dark Green Bulrush)	3 Rudbeckia fulgida speciosa (Showy Black-Eyed Susan)	
	4 Rudbeckia hirta (Black-Eyed Susan)	
	3 Rudbeckia subtomentosa (Sweet Black-Eyed Susan)	
	2 Siphium perfoliatum (Coppertan)	
	2 Siphium laciniatum (Pharis Dock)	
	1 Solidago jasida (Swamp Goldenrod)	
	2 Solidago odora (Fiddleheads Goldenrod)	
	2 Verbena hastata (Blue Vervain)	
	2 Vernonia fasciculata (Smooth Ironweed)	
	1 Veronicastrum virginicum (Culver's Root)	
	1 Zizia aurea (Sokken Alexander)	

**Components per acre**  
Sedge Meadow: 8 lbs grasses and sedges, 3 lbs forbes

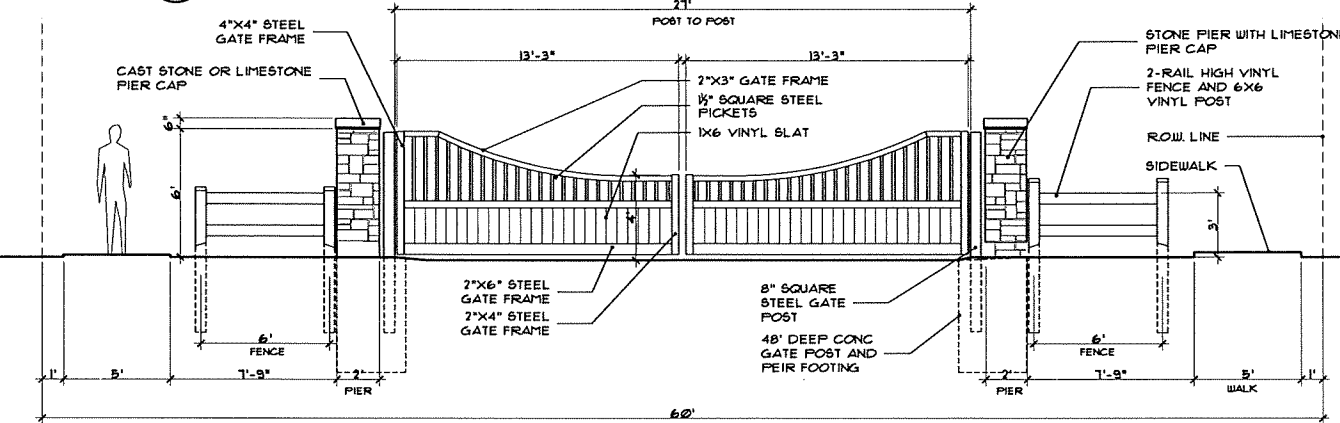
**annual cover: (Edge, Upland & Dry Upland Zones)**

50% Temporary Grasses: will contain two of the following species:  
Seed oats: Avena sativa  
Annual Rye: Lolium multiflorum  
Winter Wheat: Triticum aestivum  
American Slough Grass: Beckmannia eryzophora

**SOURCE:**  
NATIVEscape LLC  
P.O. BOX 122  
MANCHESTER, MICHIGAN 48158  
ph: 517.456.9646  
www.nativeescape.net



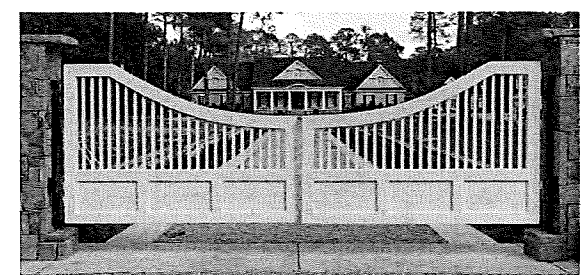
2A gate site plan  
scale: 20' = 1' - 0"



2B gate elevation  
scale: 1/4" = 1' - 0"

### pier/fence / notes:

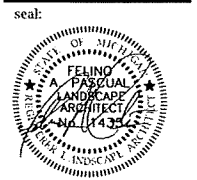
- LOCATE AND STAKE ALL EXISTING AND PROPOSED UTILITIES PRIOR TO CONSTRUCTION. COORDINATE ANY ADJUSTMENTS WITH ARCHITECT.
- SEE LANDSCAPE PLAN FOR PROPOSED PLANTINGS ADJACENT TO PROPOSED ENTRY SIGN MONUMENTS, PIERS & FENCES.
- VERIFY SOIL BEARING CAPACITY PRIOR TO ENTRY SIGN MONUMENT & PIER CONSTRUCTION. IF SOIL BEARING CAPACITY FALLS BELOW STANDARD REQUIREMENTS, CONSULT STRUCTURAL ENGINEER FOR RECOMMENDATION OF FINAL ENTRY MONUMENT & PIER FOOTING DESIGN.
- SIGNAGE TEXT AND LOGO TO BE METAL PRISMATIC DIMENSIONAL LETTERS. PRIOR TO SIGN INSTALLATION, PERMITS TO BE OBTAINED PER ROCHESTER HILLS REQUIREMENTS AND APPROVALS.
- FOOTINGS SHALL BEAR ON FIRM, UNDISTURBED SOIL WITH AN ASSURED SAFE BEARING CAPACITY OF 2000 P.S.I. IF SOIL OF THIS CAPACITY IS NOT FOUND AT THE ELEVATIONS INDICATED, FOOTINGS SHALL BE ENLARGED OR LOWERED AT THE DIRECTION OF THE SOIL ENGINEER. VERIFY FOUNDATION SOIL BEARING PRESSURE IN FIELD BY SOILS ENGINEER.
- ALL INFORMATION CONTAINED HEREIN IS SUBJECT TO APPROVAL, AND PERMITS PERMITS TO BE OBTAINED PRIOR TO CONSTRUCTION.
- ALL CONCRETE WORK AND PLACEMENT SHALL CONFORM TO THE LATEST RECOMMENDATIONS OF A.C.I.
- PROVIDE DOUELS INTO FOUNDATION TO MATCH SIZE AND SPACING OF VERTICAL REINFORCEMENT AT ALL WALLS, UNLESS OTHERWISE NOTED.
- MINIMUM CONCRETE STRENGTH TO BE 3000 P.S.I. @ 28 DAYS. UO.N. SLABS SHALL BE 3500 P.S.I. MIN. UO.N. EXPOSED CONCRETE SHALL BE 4000 P.S.I. WITH 6% 1 IN ENTRAINED AIR UO.N.
- PROVIDE MINIMUM 3" CONCRETE COVER FOR REINFORCEMENT BARS BELOW GRADE AND MINIMUM 2" CONCRETE COVER FOR REINFORCEMENT BARS ABOVE GRADE.



gate view illustration  
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project:  
**BERKSHIRE**

project location:  
City of Rochester Hills, Michigan  
John R Road and Gravel Ridge Road

sheet title:  
**PLANT MATERIAL AND PLANTING DETAILS**

job no./issue/revision date:
LS17.083.07 SPA 7-05-2017
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LS17.083.09 SPA 9-21-2017
LS17.083.11 SPA 11-29-2017
LS18.079.05 SPA 05-29-2018
LS18.079.06 SPA 06-11-2018
LS19.038.02 SPA 02-26-2019

drawn by:  
**JP, CS**  
checked by:  
**FP, OG**  
date:  
**2-26-2019**

notice:  
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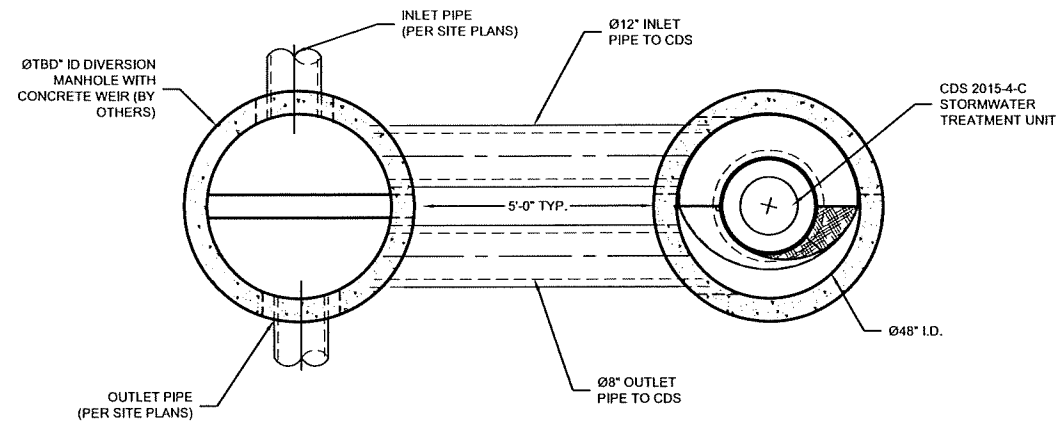
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**3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171**  
For the location of public utility lines  
The location and elevations of existing underground utilities as shown on this drawing are only approximate. no guarantee is either expressed or implied as to the completeness of accuracy. contractor shall be exclusively responsible for determining the exact location and elevation prior to the start of construction.

project no:  
**LS18.079.05**

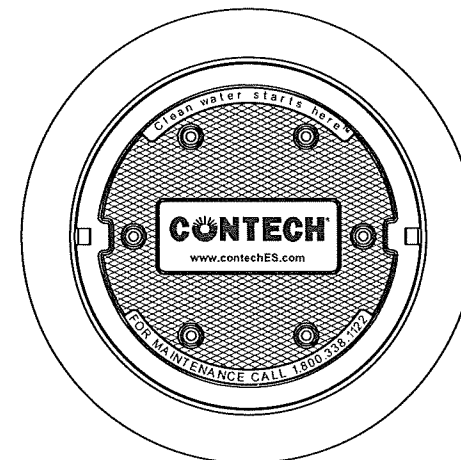
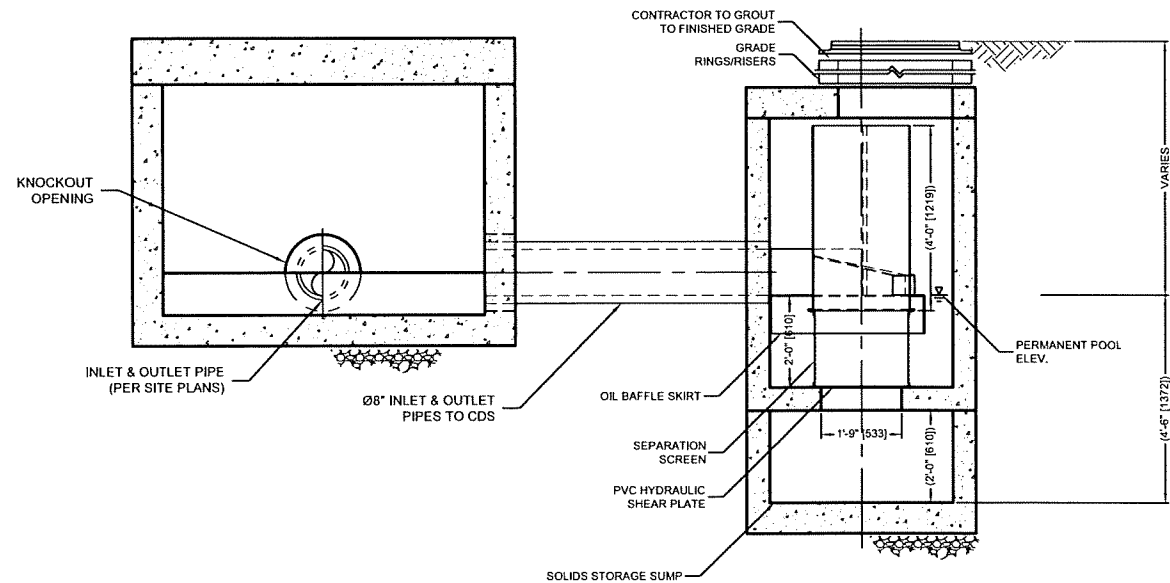
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**LS-2 of 2**

# Plant Material List, Planting Details, and Notes

C:\USERS\VALENTINE\DESKTOP\MICHIGAN\OAKLAND COUNTY CDS\OCWRC OFFLINE CDS STD DTL.DWG 12/13/2018 3:41 PM



CDS SITE DESIGNATION	WATER QUALITY FLOW	MIN. WEIR CREST LENGTH	TOP OF WEIR ELEVATION
2A	0.98 CFS	4'	711.04'



**FRAME AND COVER**  
(DIAMETER VARIES)  
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS			
STRUCTURE ID	48"		
WATER QUALITY FLOW RATE (CFS OR L/s)	0.93 CFS		
PEAK FLOW RATE (CFS OR L/s)	N/A		
RETURN PERIOD OF PEAK FLOW (YRS)	OFFLINE		
SCREEN APERTURE	2400		
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE			18"
OUTLET PIPE			18"
RIM ELEVATION			

**GENERAL NOTES**

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. [www.contechES.com](http://www.contechES.com)
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.

**INSTALLATION NOTES**

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

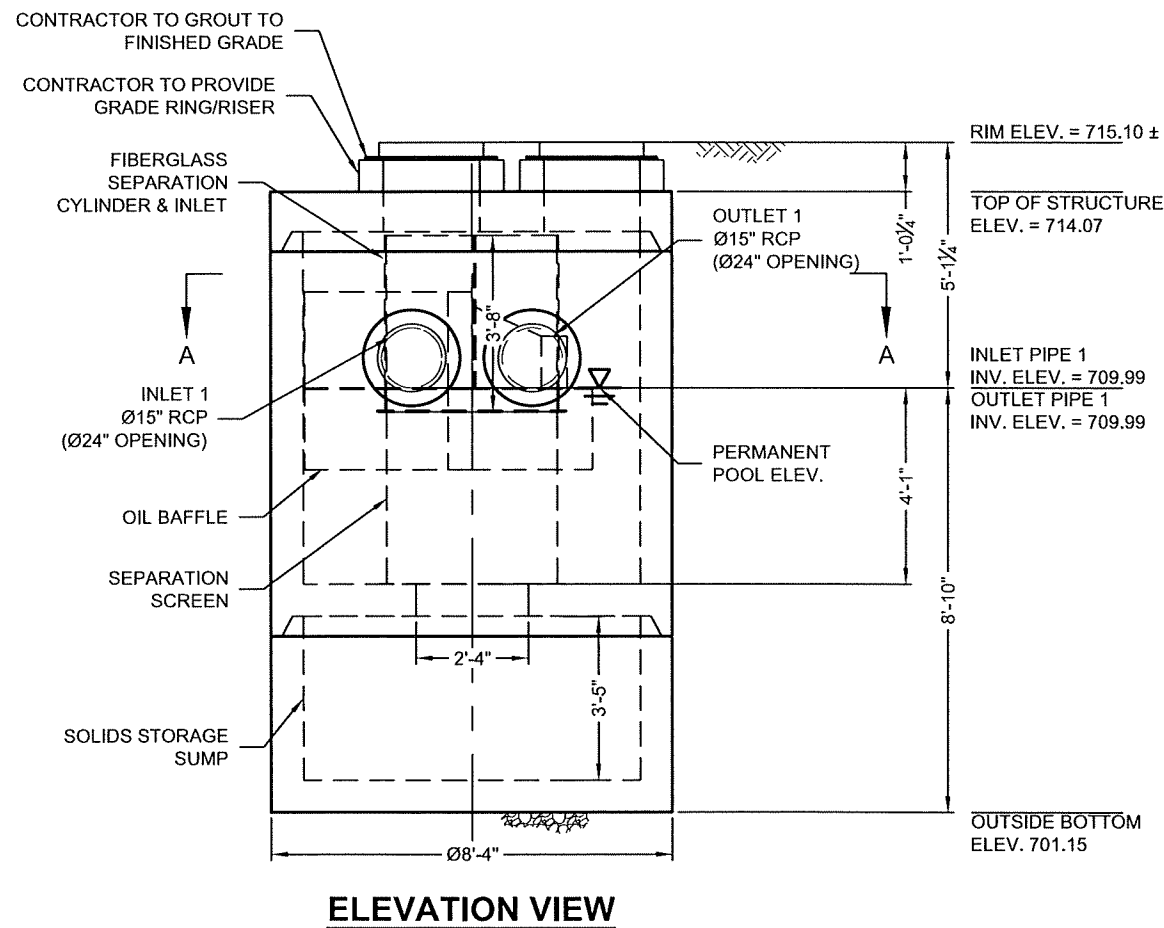
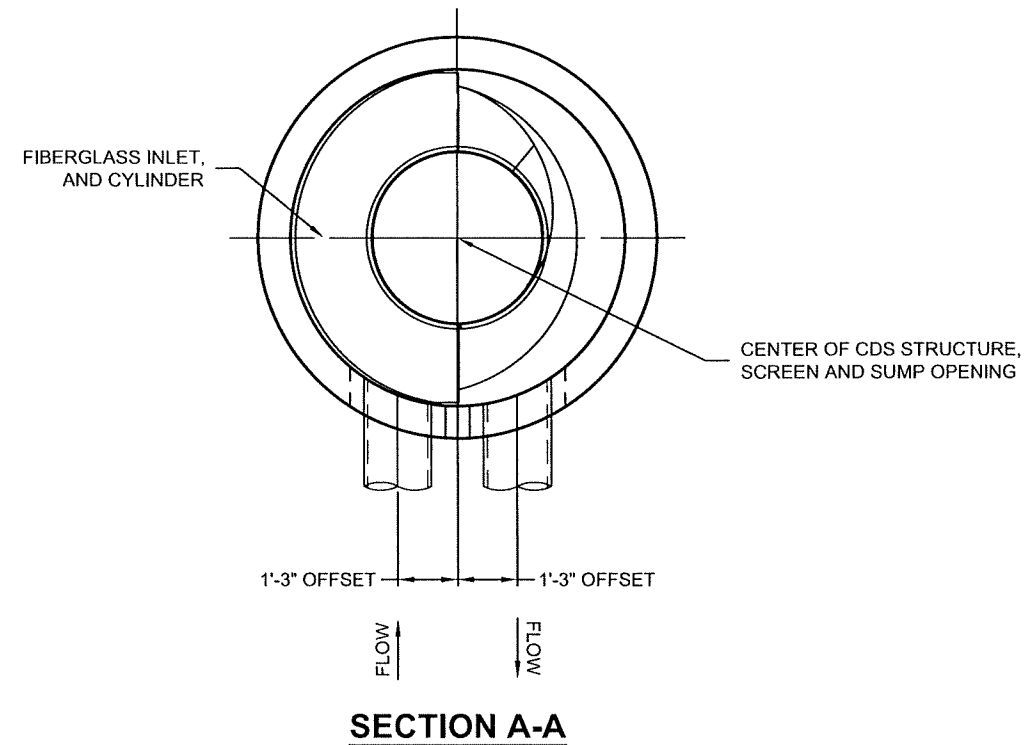
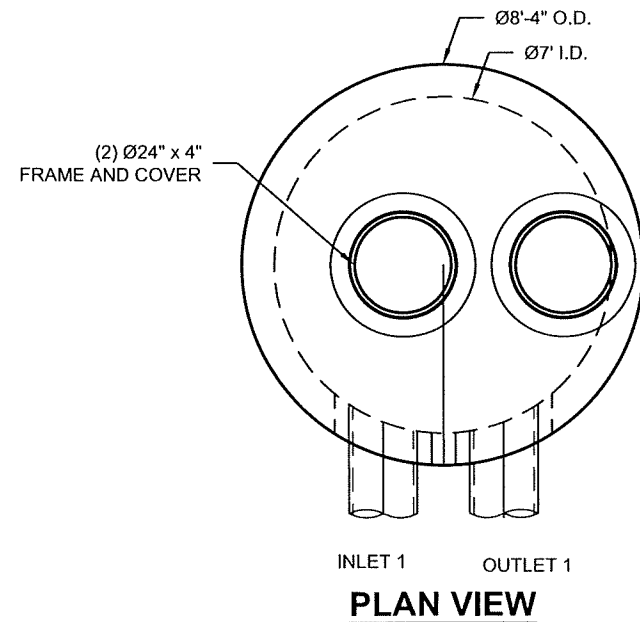


THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,708,848; 6,647,720; 6,511,506; 6,584,193; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING



www.contechES.com  
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069  
800-338-1122 513-645-7000 513-645-7993 FAX

OCWRC MANUFACTURED SYSTEMS  
CDS TREATMENT UNIT  
OFFLINE CDS-4  
STANDARD DETAIL



**MATERIAL LIST (PROVIDED BY CONTECH)**

COUNT	DESCRIPTION	INSTALLED BY
1	FIBERGLASS INLET AND CYLINDER	CONTECH
1	2400 micron, 3.5' O.D. x 3.58' SEP. SCREEN	CONTECH
1	SEALANT FOR JOINTS (BY PRECASTER)	CONTRACTOR
2	Ø24" x 4" FRAME & COVER, EJ#41600389, OR EQUIV.	CONTRACTOR

BYPASS WEIR INFORMATION		
WQ FLOW	WEIR LENGTH	WEIR HEIGHT
2.8 CFS	4' MIN.	711.74'

**GENERAL NOTES**

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. [www.ContechES.com](http://www.ContechES.com)
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
- STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
- IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
- CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

**INSTALLATION NOTES**

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

**STRUCTURE WEIGHT**

APPROXIMATE HEAVIEST PICK = 24000 LBS.  
STRUCTURE IS DELIVERED IN 3 PIECES

MAX FOOTPRINT = Ø8'-4"

**CONTECH  
CONTRACT  
DRAWING**

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MARK	DATE	REVISION DESCRIPTION	BY

**CDS3535-7-C - 607987-10**  
**BERKSHIRE SITE CONDOMINIUM**  
**ROCHESTER, MI**  
**for SYSTEM: C2**

**CONTECH**  
 ENGINEERED SOLUTIONS LLC  
[www.ContechES.com](http://www.ContechES.com)  
 805 Global Way Suite 113, Linthicum, MD 21090  
 888-740-3318 410-796-5505 888-376-8511 FAX

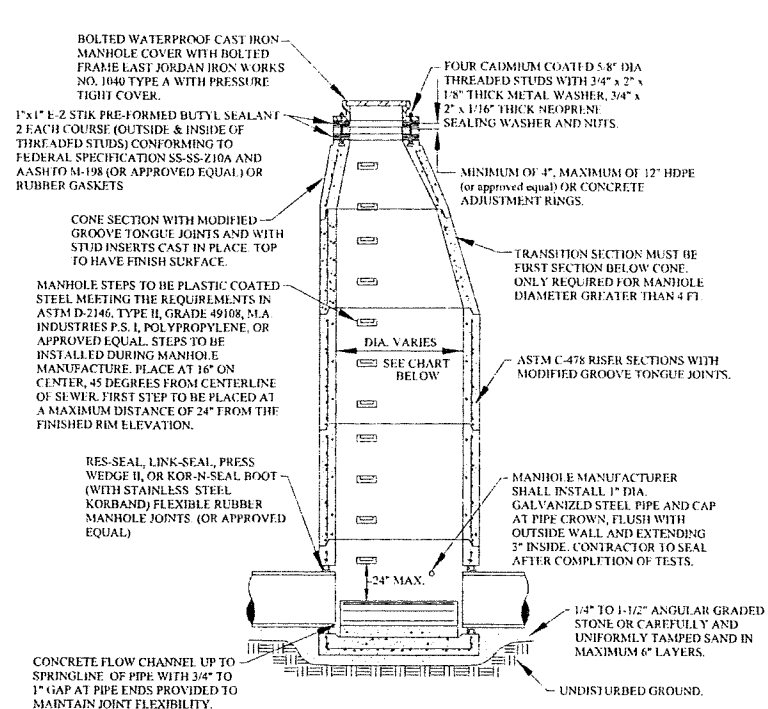
DATE:	03/06/19	SCALE:	1/4" = 1'-0"
DESIGNED:	PWV	DRAWN:	PWV
CHECKED:	###	APPROVED:	###
PROJECT No.:	607987	SEQUENCE No.:	10
SHEET:	1	OF	1

NCI  
 LAYOUT 1A  
 3535-7-FGIS  
 5824 / NORW10



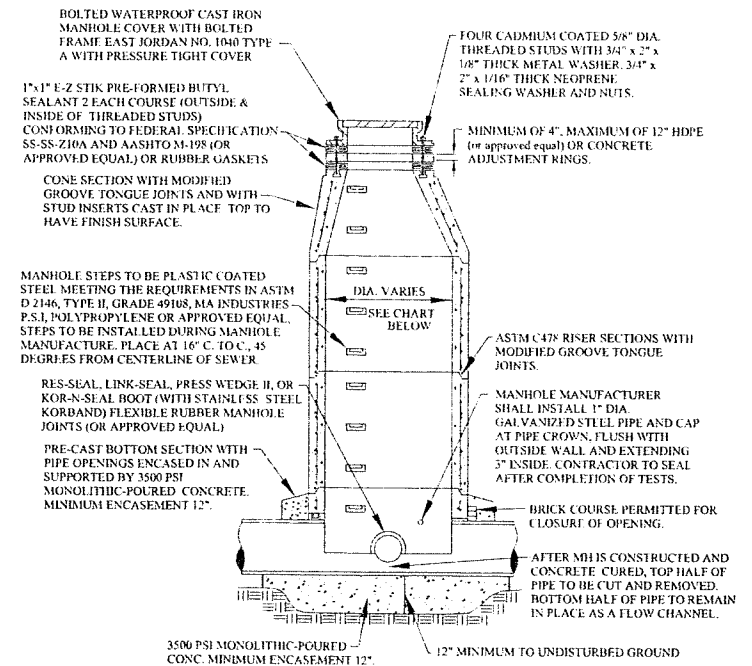
## SANITARY SEWER CONSTRUCTION NOTES

- ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ROCHESTER HILLS AND THE OAKLAND COUNTY DRAIN COMMISSIONER (O.C.D.C.). ALL SANITARY SEWER CONSTRUCTION SHALL HAVE FULL-TIME INSPECTION SUPERVISED BY THE CITY OF ROCHESTER HILLS INSPECTION SERVICES.
- NO SEWER INSTALLATION SHALL HAVE AN INFILTRATION EXCEEDING 100 GALLONS PER INCH DIAMETER PER MILE OF PIPE IN A 24 HOUR PERIOD, AND NO SINGLE RUN OF SEWER BETWEEN MANHOLES SHALL EXCEED 100 GALLONS PER INCH DIAMETER PER MILE. AIR TESTS IN LIEU OF INFILTRATION TESTS SHALL BE AS SPECIFIED IN THE OAKLAND COUNTY DRAIN COMMISSIONER STANDARDS. PRELIMINARY-AIR TESTS ARE WITNESSED BY THE CITY AND FINAL AIR TESTS ARE WITNESSED BY BOTH THE CITY AND THE O.C.D.C. ONLY PIPE AND PIPE JOINTS APPROVED BY THE CITY MAY BE USED FOR SANITARY SEWER CONSTRUCTION.
- LOCATED IN THE FIRST MANHOLE UPSTREAM FROM THE POINT OF ALL CONNECTIONS TO AN EXISTING SEWER. OR EXTENSION, A TEMPORARY 12-INCH 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 FILLET PROVIDED FOR THE FLOW CHANNEL. A WATERTIGHT BULKHEAD SHALL BE PROVIDED ON THE DOWNSTREAM SIDE OF THE SUMP MANHOLE.
- AT ALL TIMES WHEN LAYING OF NEW PIPE IS NOT ACTUALLY IN PROGRESS, THE UPSTREAM OPEN END OF THE PIPE SHALL BE CLOSED BY TEMPORARY WATERTIGHT PLUGS OR BY OTHER APPROVED MEANS. IF WATER IS IN THE TRENCH WHEN WORK IS RESUMED, THE PLUG SHALL NOT BE REMOVED UNTIL THE DANGER OF WATER ENTERING THE PIPE HAS PASSED. ALL MAIN LINE PIPE SHALL BE LAID WITH A PIPE LASER BEAM FOR LINE AND GRADE. A TARGET MUST BE INSTALLED AT THE END OF THE PIPE BEING LAYED.
- ALL BUILDING LEADS AND RISERS SHALL BE SIX INCH SDR 23.5 PVC PIPE WITH CHEMICALLY FUSED JOINTS OR GASKETED JOINTS APPROVED BY CITY ENGINEER. BUILDING LEADS TO BE FURNISHED WITH REMOVABLE AIRTIGHT AND WATERTIGHT STOPPERS.
- ALL SEWER PIPE SHALL BE INSTALLED IN CLASS "B" BEDDING OR BETTER.
- ALL NEW MANHOLES SHALL HAVE CITY APPROVED FLEXIBLE, WATERTIGHT SEALS WHERE PIPES PASS THROUGH WALLS. MANHOLES SHALL BE OF PRE-CAST SECTIONS WITH MODIFIED GROOVE TONGUE AND RUBBER GASKET TYPE JOINTS. PRE-CAST MANHOLE CONE SECTIONS SHALL BE CITY APPROVED MODIFIED ECCENTRIC CONE TYPE. ALL MANHOLES SHALL BE PROVIDED WITH BOLTED, WATERTIGHT COVERS.
- AT ALL CONNECTIONS TO MANHOLES IN ALL SEWERS, OR EXTENSIONS, DROP CONNECTIONS WILL BE REQUIRED WHEN THE DIFFERENCE IN INVERT ELEVATIONS EXCEEDS 18 INCHES.
- GROUND WATER, STORM WATER, CONSTRUCTION WATER, DOWN SPOUT DRAINAGE OR WEEP TILE DRAINAGE SHALL NOT BE ALLOWED TO ENTER ANY SANITARY SEWER INSTALLATION.
- PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL TELEPHONE MISS DIG THREE (3) DAYS IN ADVANCE (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.
- AN 18 INCH MINIMUM VERTICAL SEPARATION AND A 10 FOOT MINIMUM HORIZONTAL SEPARATION MUST BE MAINTAINED BETWEEN SANITARY SEWER AND ALL OTHER UTILITIES.
- AS A MEANS OF INSURING PROPER INSTALLATION OF THE SANITARY SEWER PIPE, THE CONTRACTOR SHALL VIDEO INSPECT, ACCORDING TO THE CITY OF ROCHESTER HILLS VIDEO INSPECTION STANDARDS, 100% OF THE SANITARY SEWER PIPE. THE CONTRACTOR SHALL PROVIDE 24 HOURS NOTICE TO THE OAKLAND COUNTY DRAIN COMMISSIONER OR THE CITY OF ROCHESTER HILLS PRIOR TO VIDEO INSPECTION, SO A REPRESENTATIVE MAY BE PRESENT. ROCHESTER HILLS WILL BE PROVIDED WITH A DIGITAL COPY OF THE VIDEO INSPECTION AND LOG IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS INSPECTION STANDARDS.



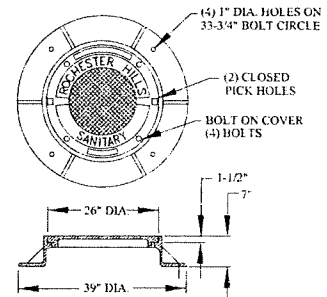
### MANHOLE SIZING CHART

MANHOLE DIAMETER	MAX. PIPE SIZE FOR STRAIGHT THRU INST.	MAX. PIPE SIZE FOR RIGHT ANGLE INST.
4"	24"	18"
5"	36"	24"
6"	42"	36"
7"	60"	42"



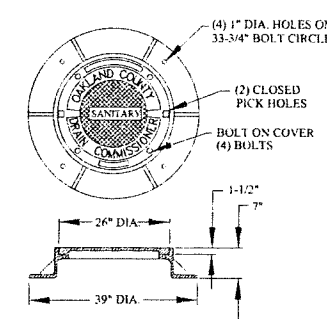
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4"	24"
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EAST JORDAN IRON WORKS HEAVY DUTY MATERIAL ASTM A48 CL 35 COVER WT. 150 LBS., CATALOG NO. 1040 TYPE A

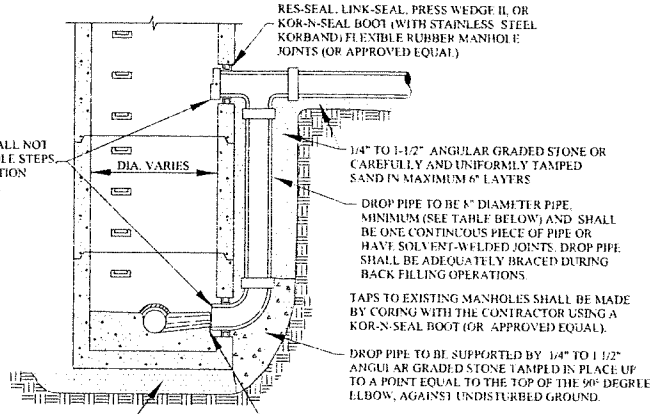
### ROCHESTER HILLS MANHOLE COVER



EAST JORDAN IRON WORKS HEAVY DUTY MATERIAL ASTM A48 CL 35 COVER WT. 150 LBS., CATALOG NO. 1040 TYPE A

### O.C.D.C. LETTERED MANHOLE COVER

DROP PIPE LOCATION SHALL NOT INTERFERE WITH MANHOLE STEPS OR STEPS AND CONE SECTION SHALL BE REPOSITIONED



SEWER SIZE	DROP SIZE	MH SIZE
UP TO 10"	8"	4"
UP TO 18"	10"	4"
UP TO 30"	18"	5"

### EXTERIOR DROP CONNECTION

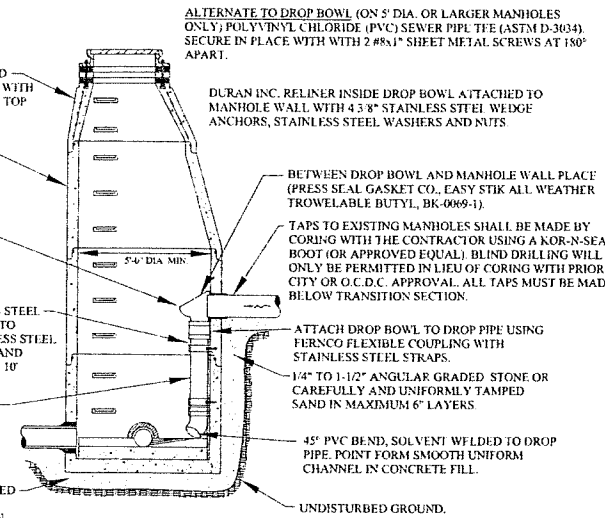
CONE SECTION WITH MODIFIED GROOVE TONGUE JOINTS AND WITH STUD INSERTS CAST IN PLACE TOP TO HAVE FINISH SURFACE

PVC PLASTIC DROP PIPE LOCATION SHALL NOT INTERFERE WITH MANHOLE STEPS, OR STEPS AND CONE SECTION SHALL BE REPOSITIONED.

MINIMUM TWO DURAN INC. RELINER STAINLESS STEEL ADJUSTABLE CLAMPING BRACKETS ATTACHED TO MANHOLE WALL WITH TWO EACH 1/2" 3/8" STAINLESS STEEL WEDGE ANCHORS, STAINLESS STEEL WASHERS AND NUTS. MAXIMUM SPACING BETWEEN BRACKETS 10"

PVC PLASTIC DROP PIPE SHALL BE ONE PIPE SIZE SMALLER (6" MIN.) THAN PIPE ENTERING MANHOLE. LOCATION SHALL BE FLUSH WITH MANHOLE WALL AND NOT INTERFERE WITH MANHOLE STEPS

1/4" TO 1-1/2" ANGULAR GRADED STONE OR CAREFULLY AND UNIFORMLY TAMPED SAND IN MAXIMUM 6" LAYERS.



### INTERIOR DROP CONNECTION

NOTE: INTERIOR DROP CONNECTION PERMITTED ONLY WHEN APPROVED BY CITY ENGINEER.



REVISIONS	DATE
APPROVED BY CITY COUNCIL, DATE: JULY 21, 2008	
PREFARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES	

NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION

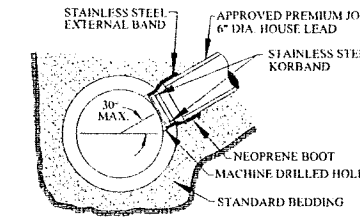
**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

## SANITARY SEWER STANDARD DETAILS

NOT TO SCALE DATE: 7/21/2008  
SHEET 1 OF 2

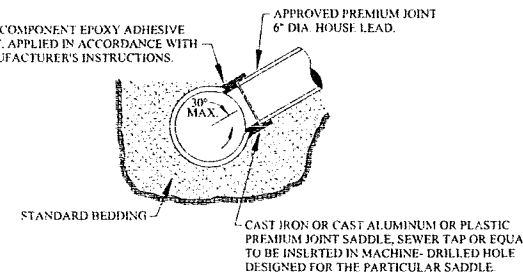
## CITY OF ROCHESTER HILLS GRAVITY BUILDING LEAD REQUIREMENTS AND DETAILS

1. ALL BUILDING LEAD WORK MUST BE PERFORMED UNDER THE CITY OF ROCHESTER HILLS INSPECTION.
2. FOR ALL CITY OF ROCHESTER HILLS SYSTEMS CALL 248-841-2510 48-HOURS PRIOR TO SCHEDULING INSPECTION.  
  
FOR ALL OCDC-OPERATED SYSTEMS, CALL 248-858-1110 48-HOURS IN ADVANCE PRIOR TO SCHEDULING INSPECTION.
3. SANITARY SEWER MAY NOT BE USED AS A DEWATERING OUTLET.
4. WHERE AN EXISTING BUILDING LEAD IS BEING EXTENDED, DISSIMILAR TYPES AND SIZES OF PIPE SHALL BE JOINED USING A CITY OF ROCHESTER HILLS APPROVED ADAPTER.
5. APPROVED BUILDING LEAD PIPE FOR GRAVITY SEWER LEADS:
  - A. PVC PLASTIC, ASTM D2751, SDR 23.5
  - B. DUCTILE IRON PIPE, AMERICAN WATER WORKS ASSOCIATION (AWWA) C-104/A21.4, CLASS 54. JOINTS SHALL BE SUPER BEL TITE, TYTON, TY-SEAL, MULTI-TITE, DUAL-TITE, OR VERI-TITE.
  - C. ANY DEVIATIONS FROM ABOVE SPECIFICATIONS REQUIRES APPROVAL BY CITY ENGINEER.
6. ALLOWABLE TYPES OF SEWER PIPE ADAPTERS: FERRO ADAPTER OR FERRO FLEXIBLE COUPLING.
7. FOR 6" LEADS A CLEANOUT MUST BE INSTALLED EVERY 100 FT. FOR 4" LEADS A CLEANOUT MUST BE INSTALLED EVERY 50 FT. 90° BENDS NOT ALLOWED EXCEPT FROM THE HORIZONTAL TO THE VERTICAL WITHIN 5 FEET OF THE BUILDING.



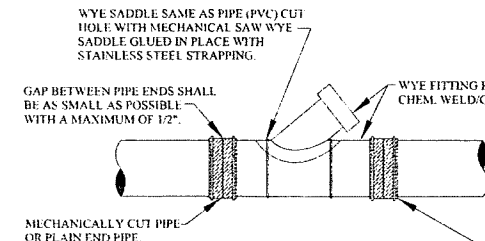
### KOR-N-TEE TAP FOR CONCRETE PIPE

TWO-COMPONENT EPOXY ADHESIVE JOINT, APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



NOTE: SURFACE OF MAIN SEWER SHALL BE CLEANED WITH AN ABRASIVE GRINDER PRIOR TO EPOXY APPLICATION. DUE TO VARIATION OF SET-UP TIME OF EPOXY ADHESIVE WITH TEMPERATURE, ANCHOR STRAPS SHALL BE USED TO SECURE SADDLE IN POSITION IN COLD WEATHER OR WHENEVER WORK IS TO PROCEED PRIOR TO COMPLETE CURE OF EPOXY.

### SEWER TAP-ALL SIZES OF MAIN SEWER PIPES VITRIFIED CLAY



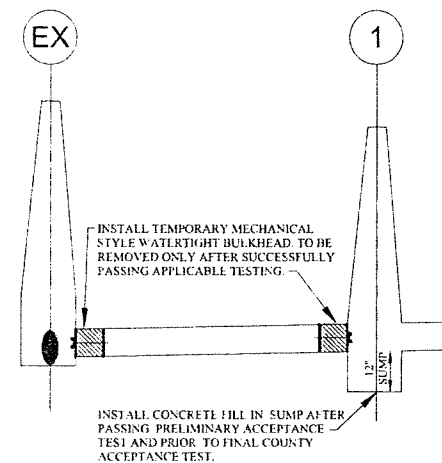
WYE SADDLE SAME AS PIPE (PVC) CUT HOLE WITH MECHANICAL SAW WYE SADDLE GLUED IN PLACE WITH STAINLESS STEEL STRAPPING.

MECHANICALLY CUT PIPE OR PLAIN END PIPE.

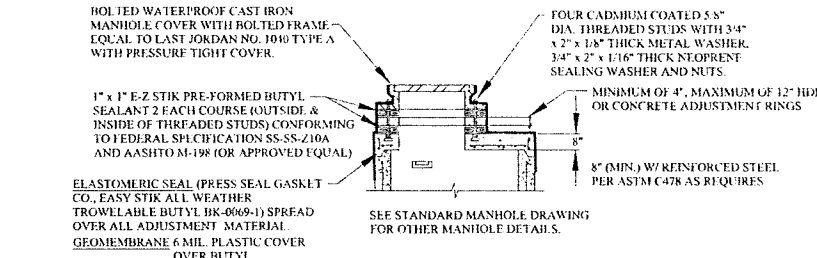
FERRO FLEXIBLE COUPLING OR APPROVED EQUAL USE MANUFACTURER'S BUSHINGS IF DISSIMILAR PIPE ARE CONNECTED. WATER MAIN REPAIR CLAMPS, SMITH-BLAIR, BAKER, FORD OR EQUAL (ALL STAINLESS STEEL) MAY ALSO BE USED.

NOTE: PIPE SHALL BE BEDDED IN STANDARD PLASTIC PIPE BEDDING.

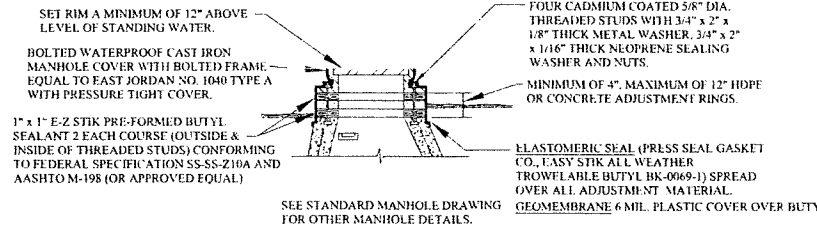
### WYE PIPE INSERTION WITH FLEXIBLE COUPLINGS (RIGID PIPE)



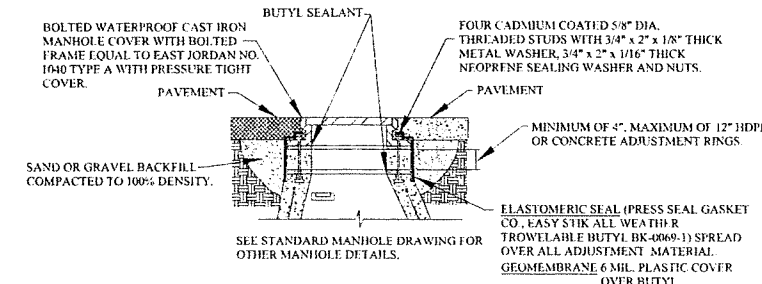
### PROFILE OF BULKHEADS AND ONE FOOT SUMP



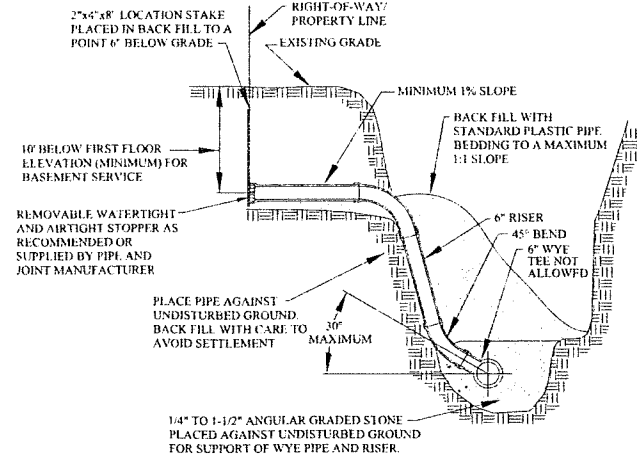
### FLAT TOP MANHOLE



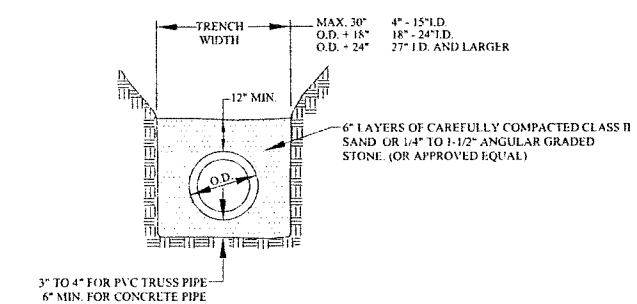
### ADJUSTMENT DETAIL FOR MANHOLE TOPS WITHIN FLOOD PRONE AREAS



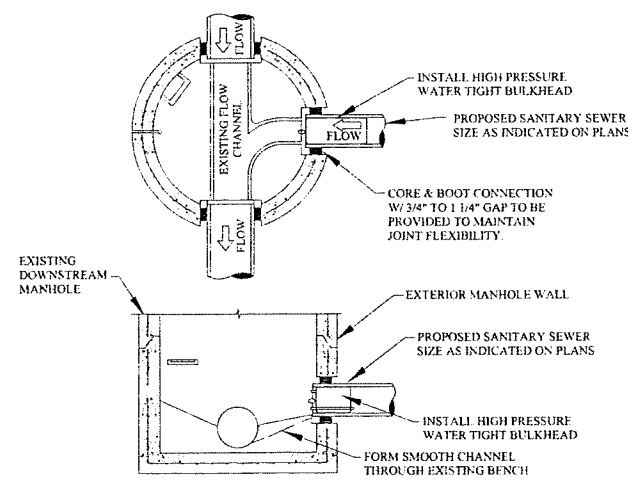
### ADJUSTMENT DETAIL MANHOLE TOPS WITHIN PAVEMENT AREAS



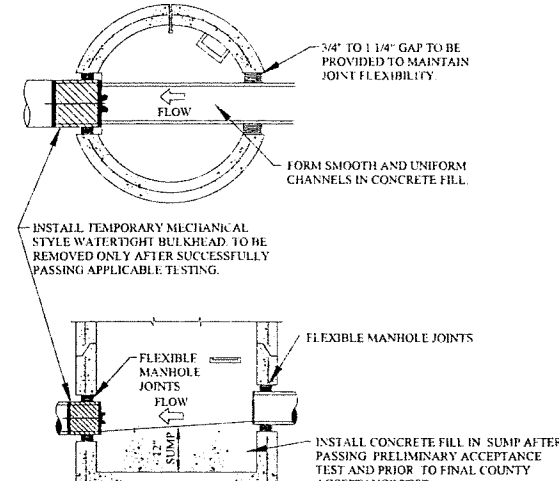
### HOUSE LEAD DETAIL



### STANDARD BEDDING (CLASS B)



### TESTING BULKHEAD IN EXISTING MANHOLE



### FIRST MANHOLE UPSTREAM FROM SANITARY TAP

I HEREBY CERTIFY THAT OUR FIRM HAS PREPARED THESE AS-BUILT DRAWINGS OF THE IMPROVEMENTS AS CONSTRUCTED, AND THAT TO THE BEST OF MY KNOWLEDGE THOSE IMPROVEMENTS NOTED AS "AS BUILT" WERE CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED CONSTRUCTION PLANS, AND ALSO THAT THE SANITARY SEWER AND STRUCTURES, AS CONSTRUCTED, ARE WITHIN THE EASEMENT DESCRIPTIONS REQUIRED BY THE CITY OF ROCHESTER HILLS.

(COMPANY NAME)

(ENGINEER'S SIGNATURE)

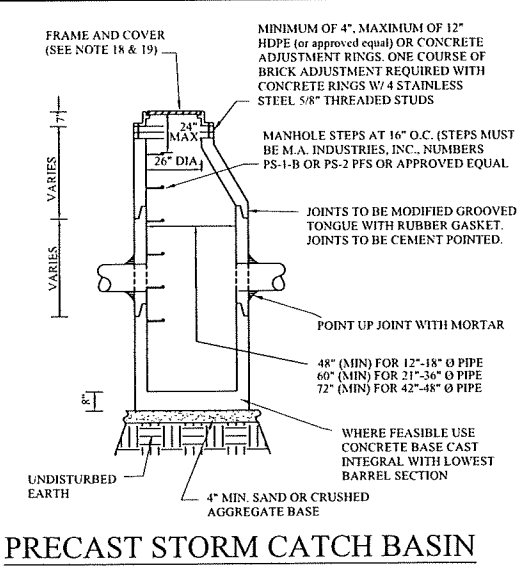
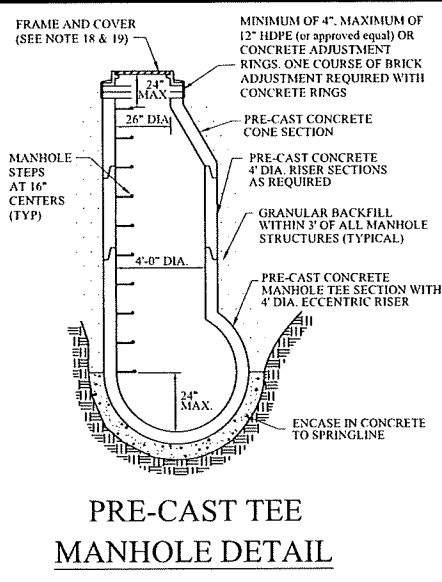
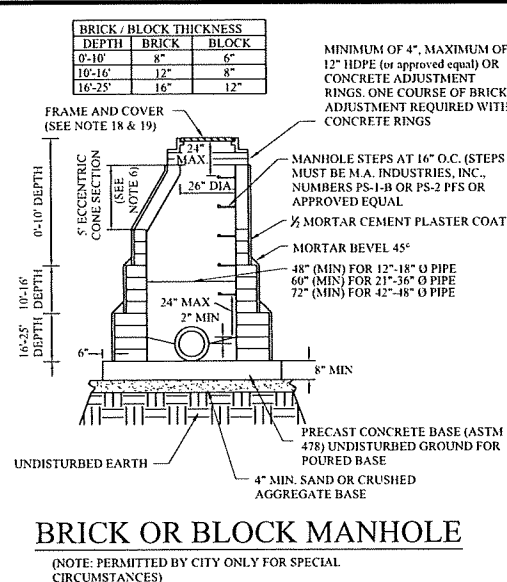
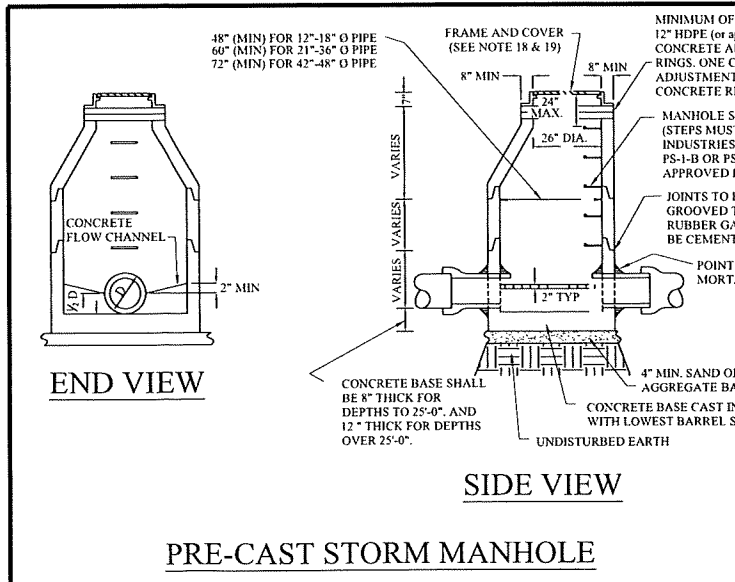
PROFESSIONAL ENGINEER NO. \_\_\_\_\_

ENGINEER SEAL

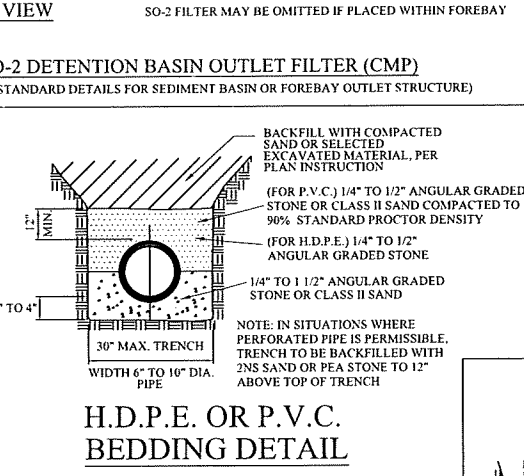
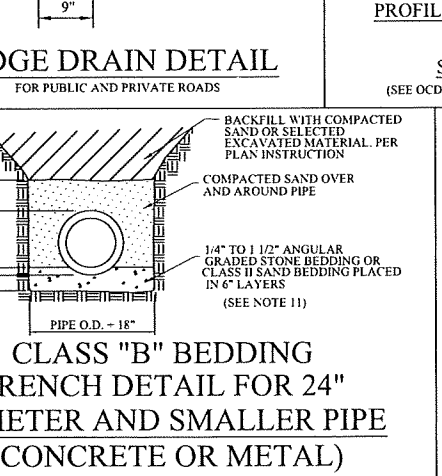
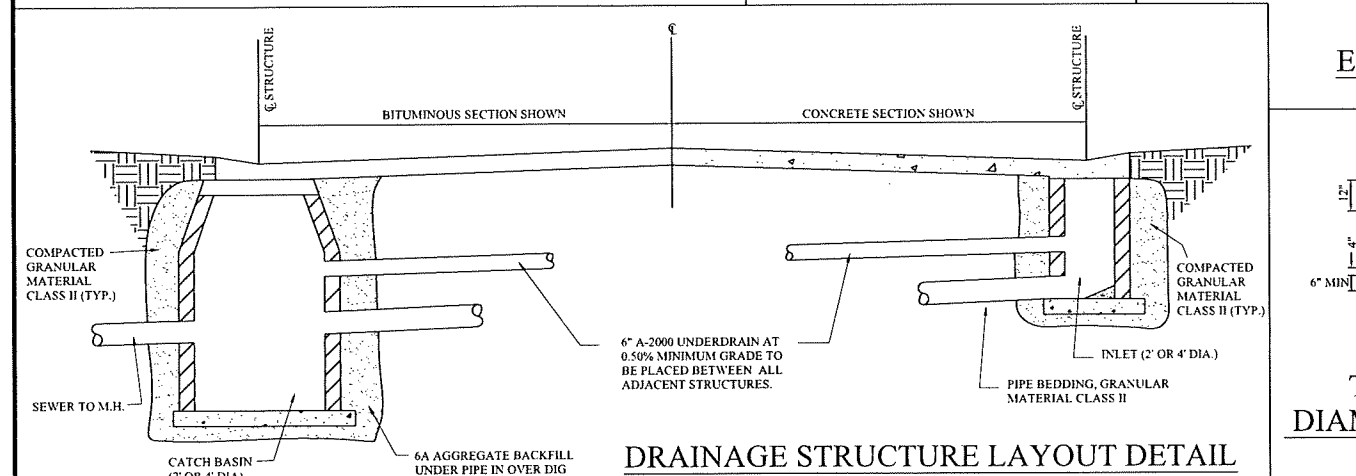
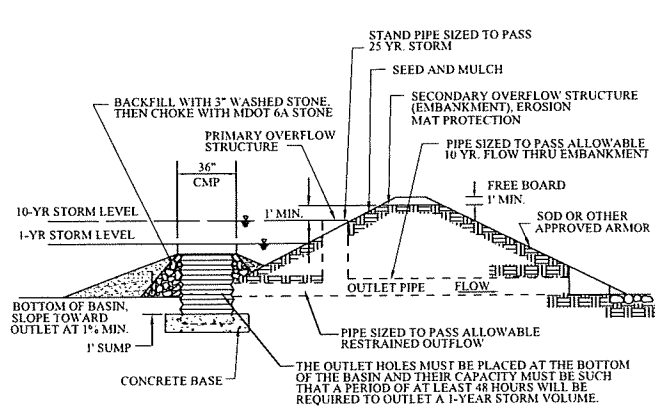
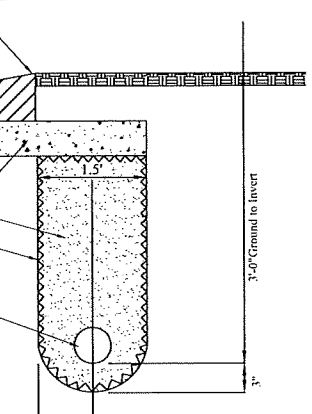
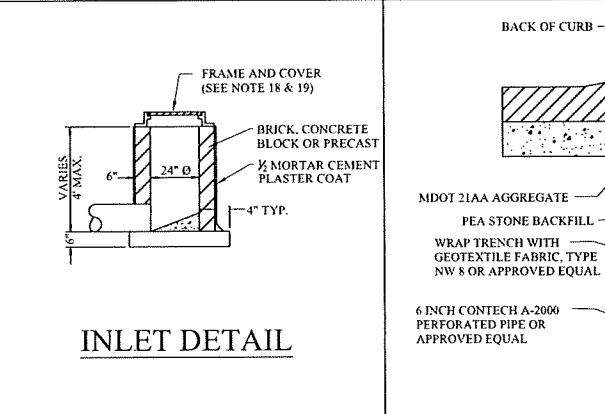
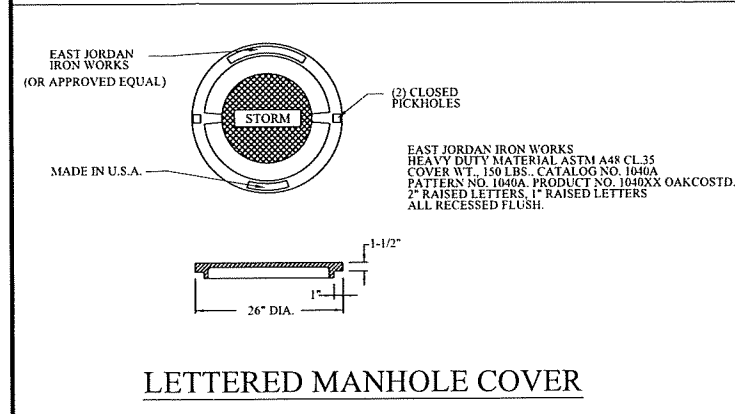
4. THE MAXIMUM SCALE SHALL BE ONE (1) INCH EQUALS FIFTY (50) FEET.
5. THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
6. THE SIZE, MANUFACTURER AND MODEL NUMBERS OF ALL VALVES AND PUMPS INSTALLED SHALL BE INDICATED.
7. A TOTAL AS-BUILT DRAWING QUANTITY LIST SHALL BE INCLUDED.
8. THE LOCATIONS SHALL BE SHOWN ON THE PLANS WITH AN ACCURACY OF ONE (1) FOOT.
9. THE OFFSET OF THE SANITARY MAIN FROM PROPERTY LINES SHALL BE INDICATED.
10. ALL MANHOLES, VALVE WELLS, PUMPS AND ALL SANITARY SYSTEM APPURTENANCES SHALL BE LOCATED FROM TWO FIXED OBJECTS (MANHOLES, BUILDING CORNERS ETC.).
11. ALL UNDERGROUND APPURTENANCES, SUCH AS TELLER WELLS, METER PITS, GRINDER PUMPS AND PUMP STATION PITS, ETC. SHALL BE LOCATED FROM THE NEAREST MANHOLE THAT IS CONNECTED TO THE SAME SANITARY MAIN AS THE APPURTENANCE.
12. THE ACCURATE LOCATION OF ALL UTILITY CROSSINGS WHERE THE VERTICAL SEPARATION IS LESS THAN 18" SHALL BE NOTED.
13. AS-BUILTS SHALL BE PREPARED IN ACCORDANCE WITH CITY OF ROCHESTER HILLS AS-BUILT GUIDELINES AS PROVIDED AT THE PRE-CONSTRUCTION MEETING.



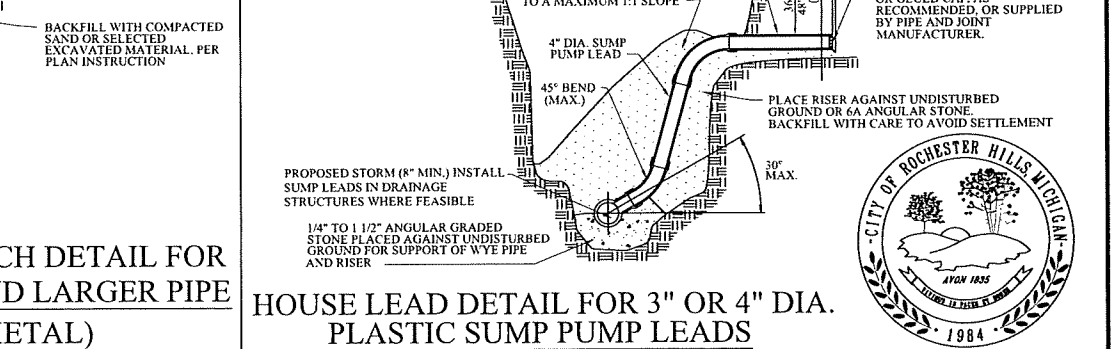
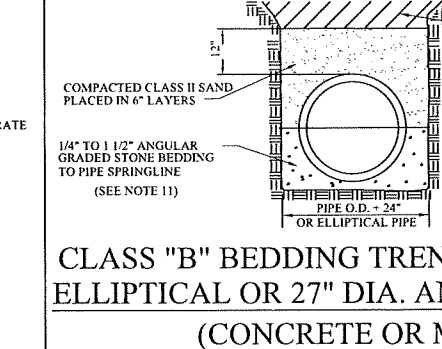
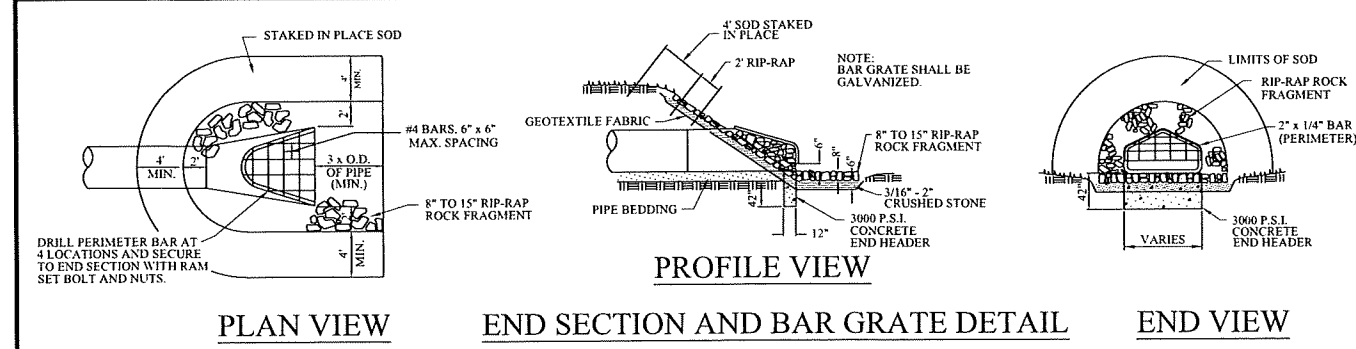
REVISIONS	DATE	APPROVED BY CITY COUNCIL, DATE: JULY 21, 2008	NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION	<h2 style="margin: 0;">City of Rochester Hills</h2> <p style="margin: 0;">1000 Rochester Hills Drive, Rochester Hills, Michigan 48309</p>	<h2 style="margin: 0;">SANITARY SEWER STANDARD DETAILS</h2>	NOT TO SCALE	DATE: 7/21/2008
				SHEET 2 OF 2			



- GENERAL NOTES:**
- ALL EXISTING AND NEW STORM SYSTEMS SHALL BE CLEANED AND FLUSHED ONCE SITE IS 90% BUILT OUT AND VEGETATED. SEDIMENT, ROCK, AND OTHER DEBRIS SHALL BE COLLECTED AND DISPOSED OF IN A PROPER MANNER. IN NO CASE SHALL DEBRIS BE FLUSHED DOWN A STORM OR SANITARY SEWER FOR DISPOSAL. ALL DAMAGED IRRIGATION AND HOUSE DRAINAGE PIPE, DRAIN TILES, SEWER LATERALS AND CULVERTS SHALL BE REPAIRED EXPEDITIOUSLY. DEBRIS COLLECTED SHALL BE DISPOSED IN A COMMERCIAL LANDFILL OR OTHER APPROVED LOCATION.
  - STORM SEWER PIPE SHALL BE OF SIZE AND TYPE NOTED ON THE APPROVED PLANS.
  - REINFORCED CONCRETE PIPE (RCP) SHALL BE MODIFIED GROOVED TONGUE JOINTS WITH O-RING TYPE RUBBER GASKET. PER ASTM C443.
  - ALL CATCH BASIN LEADS AND INLET LEADS SHALL BE ASTM C76-CLASS IV PIPE.
  - MINIMUM PIPE SIZE FOR SEWERS, CATCH BASIN LEADS, AND INLET LEADS SHALL BE 12" NOMINAL INTERNAL DIAMETER.
  - ECCENTRIC CONES SHALL BE PROVIDED ON ALL STRUCTURES, REGARDLESS OF THE MATERIAL USED. PRECAST REINFORCED CONCRETE MANHOLE, BLOCK, OR BRICK TO PROVIDE A TRUE VERTICAL FACE FOR PLACEMENT OF MANHOLE STEPS.
  - THE INSIDE JOINTS OF PIPES SIZES 42" AND LARGER DIAMETER SHALL BE POINTED UP WITH MORTAR UPON COMPLETION OF BACKFILLING OPERATIONS.
  - ALL PIPES SHALL HAVE CLASS, LOT NUMBER, AND DATE OF MANUFACTURE CONSPICUOUSLY MARKED ON EACH LENGTH BY MANUFACTURER.
  - ALL END SECTIONS 18" AND LARGER SHALL BE PROVIDED WITH A GALVANIZED BAR SCREEN.
  - PRECAST REINFORCED CONCRETE SECTIONS SHALL CONFORM TO ASTM 2478.
  - IN DRY, STABLE SOILS, PEASTONE (EQUIVALENT TO M.D.O.T. 34R SPECIFICATIONS) MAY BE SUBSTITUTED FOR THE STANDARD BEDDING, IF THE TRENCH IS WET OR UNSTABLE A GEOTEXTILE FABRIC MUST BE USED TO LINE THE TRENCH PRIOR TO THE PLACEMENT OF THE 2NS SAND, PEASTONE, OR 1/4"-1/2" ANGULAR GRADED STONE.
  - SCHEDULE INSPECTIONS 48 HOURS PRIOR TO START OF CONSTRUCTION BY CALLING THE CITY'S INSPECTION LINE AT 248-841-2510. FULL TIME INSPECTION SHALL BE REQUIRED FOR ALL UNDERGROUND STORM SEWER CONSTRUCTION.
  - THE CONTRACTOR SHALL CONTACT MISS DIG 72 HOURS BEFORE CONSTRUCTION AT (811) TO LOCATE EXISTING UNDERGROUND UTILITIES.
  - PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL HAVE IN HIS POSSESSION A CURRENT SOIL EROSION CONTROL PERMIT AS ISSUED BY THE O.C.D.C.
  - MINIMUM SUMP DEPTH IS 2' FOR CATCH BASINS.
  - A FLOATABLE TRAP IS REQUIRED PRIOR TO THE OUTLET, IN ACCORDANCE WITH CURRENT CITY OF ROCHESTER HILLS DESIGN STANDARDS.
  - AS A MEANS OF INSURING PROPER INSTALLATION OF THE STORM SEWER PIPE, AT THE DISCRETION OF THE CITY ENGINEER, THE CONTRACTOR SHALL VIDEO INSPECT, ACCORDING TO THE CITY OF ROCHESTER HILLS VIDEO INSPECTION STANDARDS, 100% OF THE STORM SEWER PIPE 12" AND LARGER IN DIAMETER. IF VIDEO INSPECTION IS REQUIRED BY THE CITY ENGINEER, THE CONTRACTOR SHALL PROVIDE 24 HOURS NOTICE TO THE CITY OF ROCHESTER HILLS PRIOR TO VIDEO INSPECTION, SO A REPRESENTATIVE MAY BE PRESENT. ROCHESTER HILLS WILL BE PROVIDED WITH A DIGITAL COPY OF THE VIDEO INSPECTION AND LOG IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS VIDEO INSPECTION STANDARDS.
- PROJECTS THAT THE CITY ENGINEER MAY IMPOSE THESE REQUIREMENTS ARE:
- ALL PUBLIC PROJECTS OR PROJECTS BEING CONSTRUCTED ON PUBLIC PROPERTY.
  - ANY PROJECT INVOLVING A DEVELOPMENT, SUBDIVISION, SITE CONDOMINIUM, CONDOMINIUM, OR ASSOCIATION.
  - ANY PROJECT THAT WILL RESULT IN MORE THAN ONE OWNER RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE COMPLETE STORM DRAINAGE SYSTEM



- COVERS FOR MANHOLES, CATCH BASINS, AND INLETS**
- MANHOLE FRAME AND COVER SHALL BE EJIW 1040, TYPE A COVER OR EQUIVALENT.
  - CATCH BASINS AND INLET FRAME AND COVER SHALL BE AS FOLLOWS:
    - EJIW 7045 WITH TYPE M1 GRATE AND 7050 T1 BACK, OR EQUAL, FOR USE WITH CONCRETE CURB AND GUTTER, (STRAIGHT CURB/M.D.O.T. F CURB) AND WITH CONCRETE PAVEMENT WITH INTEGRAL CURB.
    - EJIW 7085 WITH TYPE M1 GRATE OR EQUAL, FOR USE WITH CONCRETE B-2 MODIFIED MODIFIED CURB AND GUTTER, AND WITH CONCRETE WITH B-2 MODIFIED INTEGRAL CURB.
    - EJIW 7065 WITH TYPE M1 GRATE AND 7060 T1 BACK, OR EQUAL, FOR USE WITH MOUNTABLE CURB AND GUTTER, AND WITH CONCRETE PAVEMENT WITH MOUNTABLE INTEGRAL CURB.
    - EJIW FRAME 1040 WITH TYPE N OVAL GRATE OR TYPE O2 BEEHIVE GRATE, OR EQUAL, FOR USE ON OPEN DITCH STRUCTURES AND ON CATCH BASINS LOCATED IN SWALES, AND IN EASEMENTS OUTSIDE THE PUBLIC STREET RIGHT-OF-WAY.
    - EJIW FRAME 7030 WITH TYPE M6 VANE GRATE AND T1 BACK, OR EQUAL, FOR USE WITH RELIEF BASINS WHICH ARE ON LONGITUDINAL ROAD SLOPES OF 4% OR GREATER.
    - EJIW FRAME 5105 WITH TYPE M1 SINUSOIDAL GRATE OR EQUAL, FOR USE IN NON-CURB PAVEMENT AREAS.
- NOTE: COVERS MUST HAVE THE "DUMP NO WASTE! DRAINS TO WATERWAY" LETTERING (WHEN APPLICABLE).



REVISIONS	DATE	APPROVED BY
Edge Drain Detail	11-7-12	CITY COUNCIL, DATE: JULY 21, 2008
		PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES

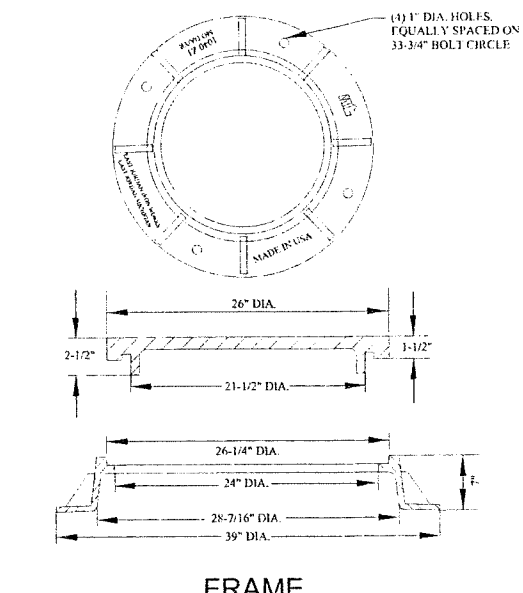
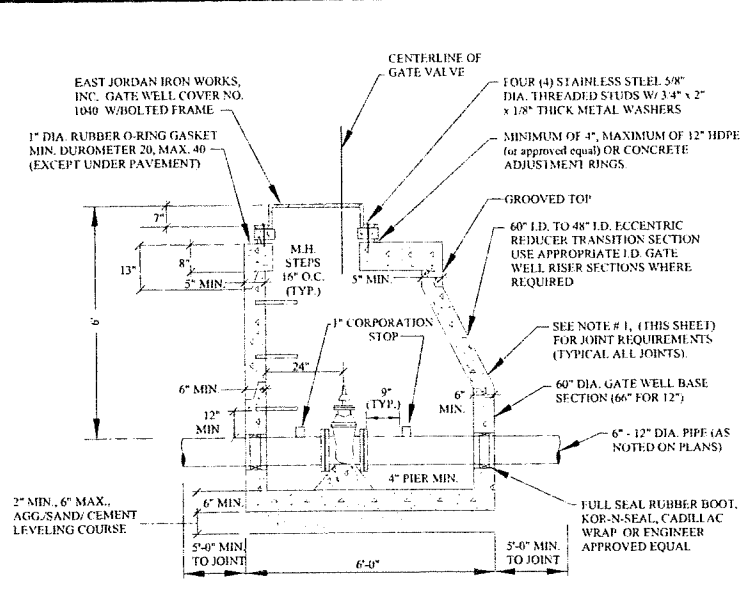
NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION

**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

**STORM SYSTEM STANDARD DETAILS**

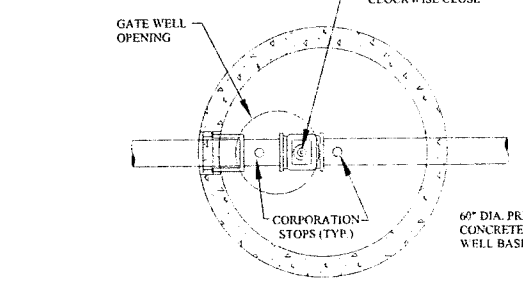
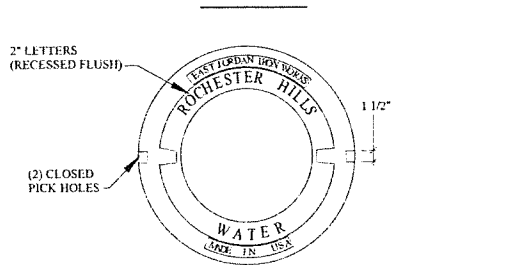
NOT TO SCALE	DATE: 7/21/2008
SHEET 1 OF 1	





MANHOLE STEPS TO BE PLASTIC COATED STEEL MEETING THE REQUIREMENTS IN ASTM D 2146, TYPE II, GRADE 49108, MA. INDUSTRIES P.S.S. POLYPROPYLENE OR APPROVED EQUAL. STEPS TO BE INSTALLED DURING MANHOLE MANUFACTURE, PLACED AT 16" C. TO C.

ALL VALVES SHALL BE CLOCKWISE CLOSE



**UTILITY CROSSING**

CLASS II SAND SHALL BE PLACED INTO TRENCH IN 6" LAYERS, LOOSE MEASURE, WITH EACH LAYER COMPACTED TO NOT LESS THAN 95% OF MAXIMUM UNIT WEIGHT AT ALL UTILITY CROSSINGS (FROM BOTTOM OF TRENCH TO TOP OF HIGHEST UTILITY).

6" MIN. COVER FOR WATER MAIN CROSSING UTILITY

18" MIN. SEPARATION

11-1/4" BENDS (TYP.)

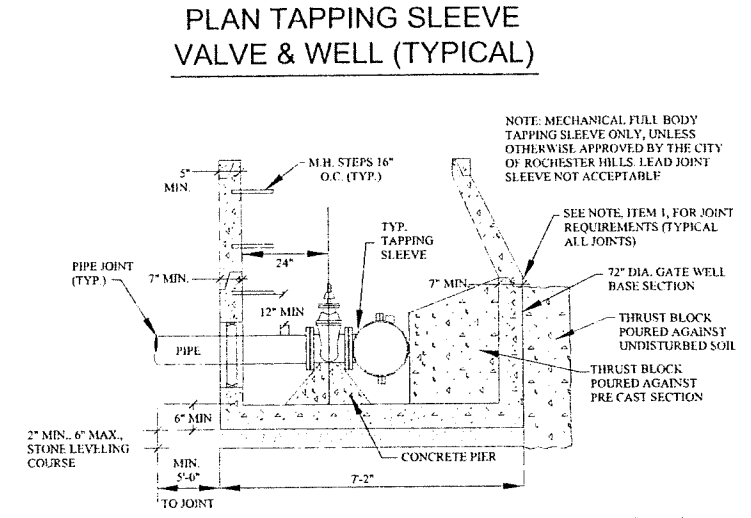
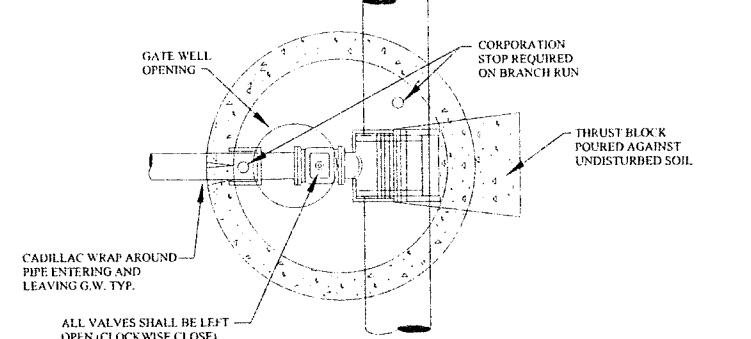
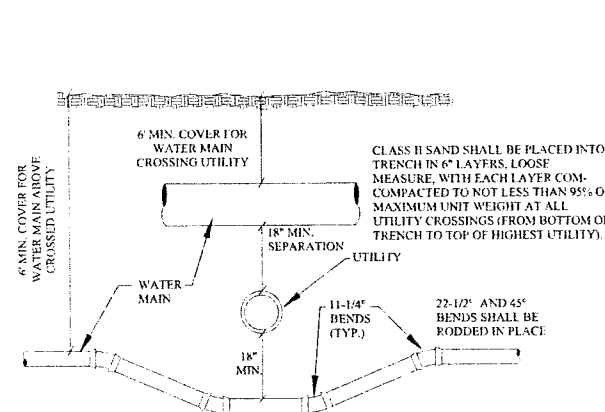
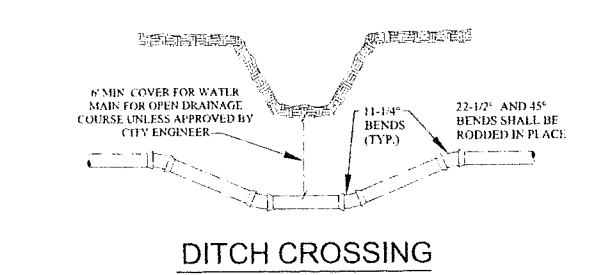
22-1/2" AND 45" BENDS SHALL BE RODDED IN PLACE

6" MIN. COVER FOR WATER MAIN ABOVE CROSSED UTILITY

WATER MAIN

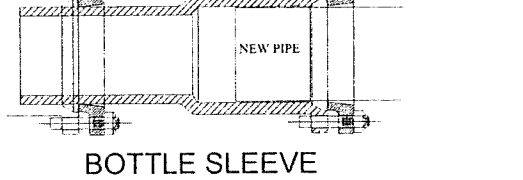
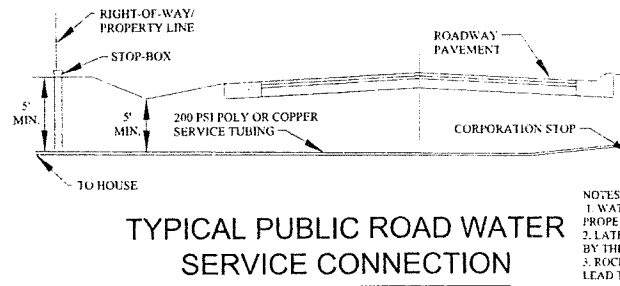
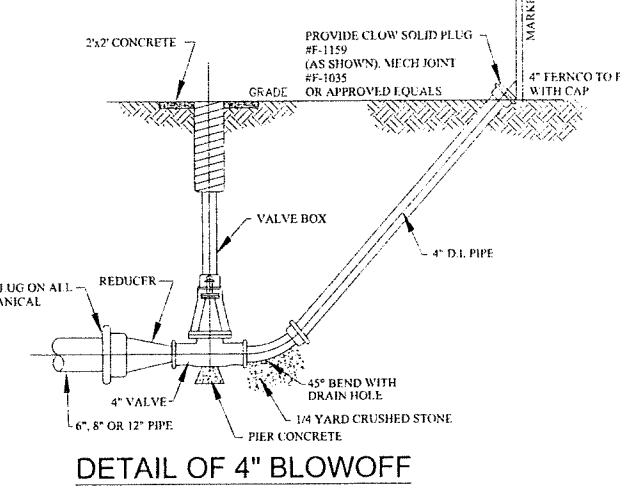
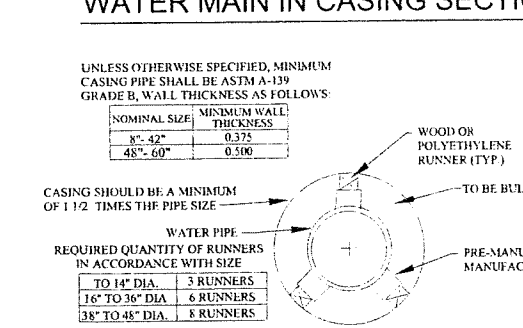
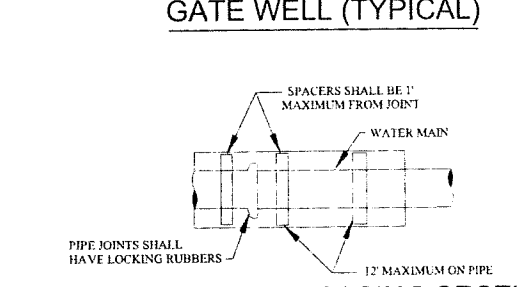
UTILITY

EAST JORDAN IRON WORKS MJ x PE DUAL-PURPOSE CUTTING-IN SLEEVE OR APPROVED EQUAL



**NOTES:**

- ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE MANUFACTURED TO CONFORM WITH A.S.T.M. C 475, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS, EXCEPT WALL THICKNESS SHALL BE AS SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATE WELL SECTIONS SHALL BE "MODIFIED GROOVE TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C 443, STANDARD SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
- CONTRACTOR SHALL INSTALL VALVES, TAPPING SLEEVES AND GATE WELL STRUCTURES IN STRICT COMPLIANCE WITH MEASUREMENTS PROVIDED ON SHEET 10 & 2'-0" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING NUT) TO ALLOW PROPER OPERATION OF VALVE THROUGH GATE WELL OPENING. FAILURE TO DO SO WILL REQUIRE CONTRACTOR TO CORRECT AT HIS EXPENSE.
- TAPPING SLEEVES SHALL BE MANUFACTURED BY ROMAC INDUSTRIES; MUELLER; EAST JORDAN; SMITH-BLAIR OR APPROVED EQUAL AND APPROVED BY THE CITY OF ROCHESTER HILLS. FULL BODY SLEEVES MUST BE USED EXCEPT FOR REINFORCED CONCRETE PRESSURE PIPE OR A.C. PIPE.
- FOR ALL PIPE USE A 1" CORPORATION STOP. NO CORPS SHALL BE USED IN CONCRETE PRESSURE PIPE.
- RUBBER O-RINGS SHALL NOT BE USED IN PAVEMENT.



**THRUST BLOCK DETAILS**

NOTE: 3000 PSI CONCRETE TO BE USED. THRUST BLOCK TO ABUT & REST AGAINST UNDISTURBED SOIL OR EARTH COMPACTED TO 95% MODIFIED PROCTOR

FOR 90° BENDS OR SMALLER					FOR PLUGS				FOR TEES				
D	A	B	C	E MIN.	D	A	B	C MIN.	D	A	B	C	E MIN.
20"	8"	6.5"	3.5"	2.5"	20"	7"	5"	2.5"	20"	6.5"	4.5"	3.5"	3"
16"	6"	4"	2.5"	2"	16"	4'-10"	4'-10"	2"	16"	4'-8"	4'-5"	2.5"	2.75"
12"	4"	3"	2"	1.75"	12"	4'-4"	3"	1'-9"	12"	4"	3"	2.5"	2.5"
10"	3"	3"	2"	1.75"	10"	3"	2"	1'-6"	10"	3"	2"	2"	2.25"
8"	2"	2"	2"	1.5"	8"	2'-10"	2'-6"	1'-6"	8"	2'-6"	2"	2"	2.25"
6"	2"	1.5"	2"	1.25"	6"	1'-6"	1'-6"	3"	6"	2"	2"	2"	2.25"



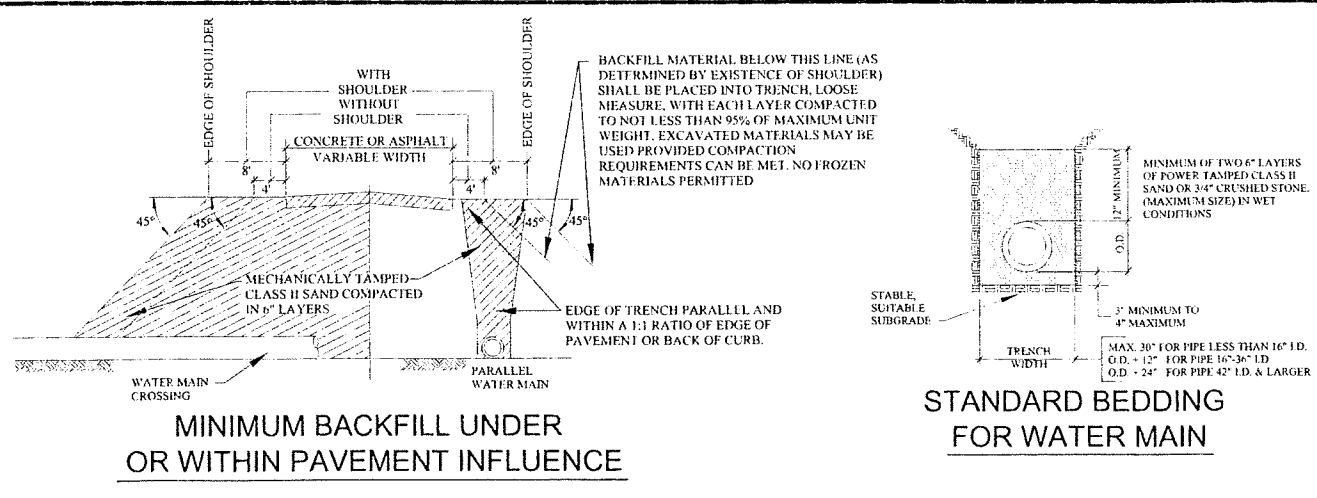
REVISIONS	DATE	APPROVED BY
		JULY 21, 2008
		CITY COUNCIL DATE:
		PREPARED BY: ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES

NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS PRIOR TO START OF CONSTRUCTION

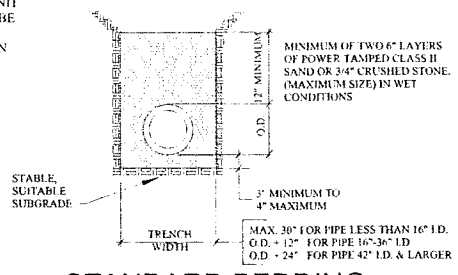
**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

**WATER MAIN STANDARD DETAILS**

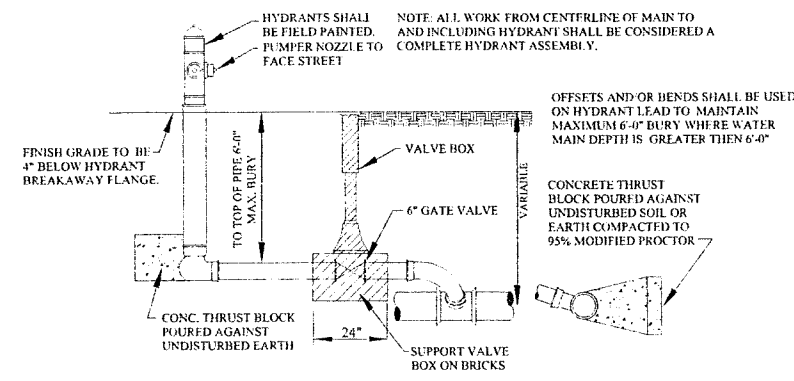
NOT TO SCALE	DATE: 7/21/2008
SHEET 1 OF 2	



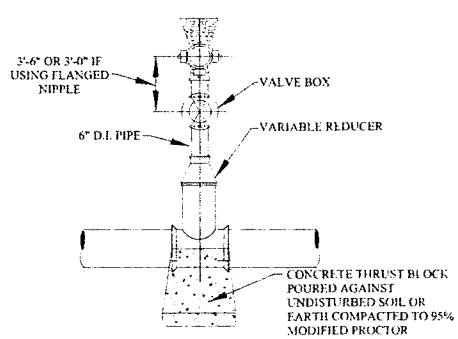
**MINIMUM BACKFILL UNDER OR WITHIN PAVEMENT INFLUENCE**



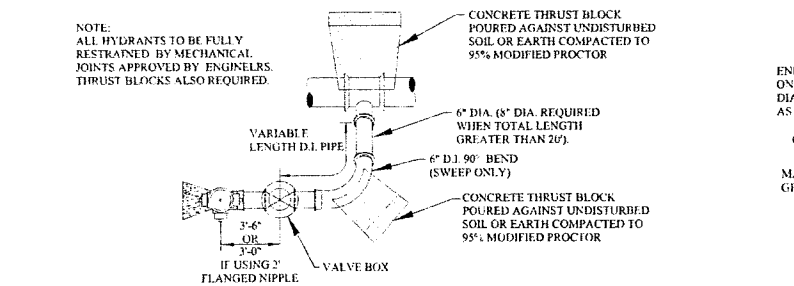
**STANDARD BEDDING FOR WATER MAIN**



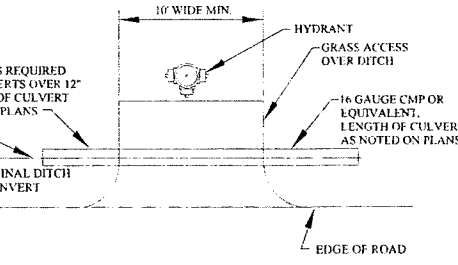
**HYDRANT SIDE OUTLET OPTION**



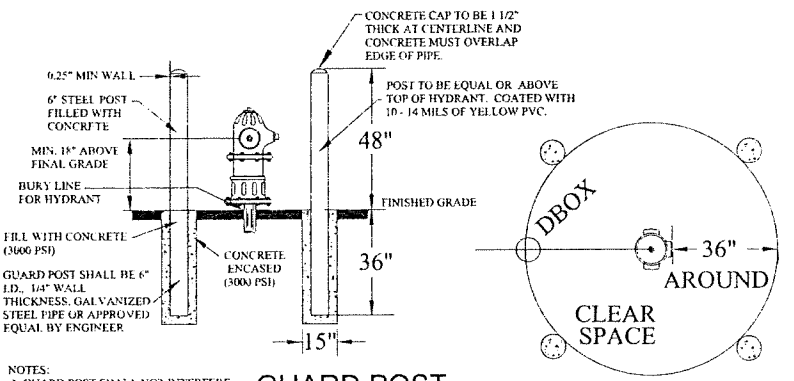
**HYDRANT CONNECTION (TYPICAL)**



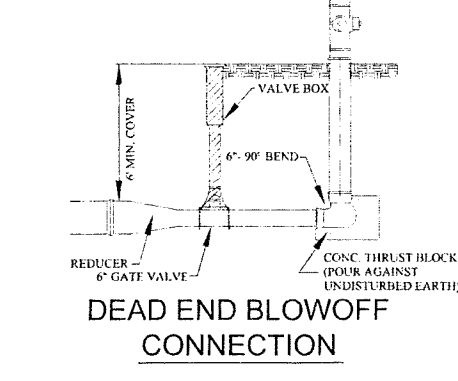
**HYDRANT SIDE OUTLET OPTION**



**DITCH ENCLOSURE AT HYDRANT/ GATE WELL**



**GUARD POST**



**DEAD END BLOWOFF CONNECTION**

**HYDRANT & BLOWOFF DETAILS**

**GENERAL NOTES**

- ALL CONSTRUCTION PROCEDURES AND MATERIALS SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ROCHESTER HILLS.
- A PRE-CONSTRUCTION MEETING SHALL BE SCHEDULED BY THE CITY OF ROCHESTER HILLS AND HELD PRIOR TO THE START OF CONSTRUCTION.
- CONTRACTOR MUST CONTACT MISS DUG (311) AT LEAST THREE WORKING DAYS PRIOR TO THE START OF CONSTRUCTION FOR UNDERGROUND UTILITY LOCATIONS. ALL UTILITIES SHALL BE STAKED BEFORE CONSTRUCTION BEGINS.
- ALL WATER MAIN EASEMENTS SHALL BE PROVIDED PRIOR TO CONSTRUCTION AND ACCEPTANCE OF THE WATER DISTRIBUTION SYSTEM.
- WATER MAINS SHALL BE CONSTRUCTED WITH A MINIMUM COVER OF 6 FEET BELOW FINISHED GRADES, INCLUDING OPEN DRAINAGE COURSES.
- ALL TRENCHES UNDER OR WITHIN A 1:1 RATIO OF EXISTING OR PROPOSED PAVEMENT OR DRIVEWAYS, SHALL BE BACKFILLED WITH COMPACTED CLASS II SAND TO GRADE (95% MAXIMUM UNIT DENSITY).
- WHERE TWO UTILITIES CROSS, PROVIDE CLASS II BACKFILL MATERIAL IN SIX (6) INCH COMPACTED LAYERS TO TOP OF HIGHEST UTILITY.
- WHERE WATER MAINS DIP UNDER OTHER UTILITIES, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE CONSTRUCTED WITH 1:1-1/4 VERTICAL BENDS, 22 1/2" OR 45" BENDS MUST BE RODDED AND PROPERLY ANCHORED.
- ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE IN ACCORDANCE WITH A.S.T.M. C478, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS. WALL THICKNESS SHALL BE AS SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATE WELL SECTIONS SHALL BE "MODIFIED GROOVE TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C 443, STANDARD SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SLEWEE AND CULVERT PIPE USING RUBBER GASKETS.
- CONTRACTOR SHALL INSTALL VALVES, TAPPING SLEEVES AND GATE WELL STRUCTURES IN STRICT COMPLIANCE WITH MEASUREMENTS PROVIDED ON SHEET 1 (2'-0" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING NUT) TO ALLOW PROPER OPERATION OF VALVE THROUGH GATE WELL OPENING.
- ALL CROSS-CONNECTION CONTROL DEVICES SHALL BE INSTALLED AS REQUIRED BY THE ROCHESTER HILLS PLUMBING INSPECTOR AND IN ACCORDANCE WITH THE STANDARDS OF THE OAKLAND COUNTY DRAIN COMMISSIONER OPERATION AND MAINTENANCE DIVISION AND THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF DRINKING WATER AND RADIOLOGICAL PROTECTION.
- ALL WATER SERVICE CONNECTIONS TWO (2) INCHES AND SMALLER SHALL BE MADE BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICES AFTER WATER MAIN ACCEPTANCE AND APPLICABLE PERMITS ARE OBTAINED.
- ALL FITTINGS AND BENDS SHOULD BE BLOCKED IN ACCORDANCE WITH THRUST BLOCK DETAILS, UNLESS ALTERNATE THRUST RESTRAINT SYSTEM, AS INDICATED PLANS AND SPECIFICATIONS, IS APPROVED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICE.

**WATER MAIN MATERIALS NOTES**

- TEMPORARY CONNECTIONS, WHICH MAY BE MADE FOR CHLORINATING AND FLUSHING PURPOSES, SHALL INCLUDE A TESTABLE DOUBLE CHECK VALVE BACKFLOW PREVENTER WITH CURRENT CERTIFICATION.
- CORPORATION STOPS USED FOR INSERTION INTO MAINS SHALL BE FORD TYPE B-44. ALL STOPS SHALL HAVE BRONZE CAST BODIES, KEYS, STEM WASHERS AND NUTS. INLET THREADS SHALL CONFORM TO THE LATEST VERSION OF AWWA C806.
- ALL DUCTILE IRON PIPE (D.I.P.) WATER MAIN SHALL BE DESIGNED FOR 150 PSI MINIMUM WORKING PRESSURE.
- THE DUCTILE IRON PIPE TO BE FURNISHED AND DELIVERED UNDER THIS SPECIFICATION SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C151 (ANSI A21.5), EXCEPT AS OTHERWISE SPECIFIED HEREIN. PIPE SHALL BE DOUBLE CEMENT-LINED AND SEAL COATED WITH AN APPROVED BITUMINOUS SEAL COAT IN ACCORDANCE WITH AWWA C104 (ANSI A21.4).
- DUCTILE IRON PIPE SHALL BE CLASS 54 FOR SIZES THREE (3) INCH THROUGH TWENTY (20) INCHES SIZE TWENTY-FOUR (24) INCH AND LARGER SHALL BE CLASS 55 DUCTILE IRON PIPE.
- PIPES TWENTY-FOUR (24) INCHES AND LARGER IN NOMINAL DIAMETER SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C100 FOR DUCTILE IRON WATER PIPE.
- MECHANICAL JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C111 (ANSI A21.11).
- FLANGE JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C110 (ANSI A21.10).
- FITTINGS FOR DUCTILE IRON PIPE SHALL BE DUCTILE IRON AND SHALL MEET REQUIREMENTS OF AWWA C110 (ANSI A21.10) OR AWWA C153 (ANSI A21.53). DUCTILE IRON FITTINGS SHALL BE RATED FOR 350 PSI, PIPE SIZES TWENTY-FOUR (24) INCH DIAMETER AND LESS, AND 250 PSI FOR PIPE SIZES OVER TWENTY-FOUR (24) INCH DIAMETER. DUCTILE IRON FLANGE FITTINGS SHALL BE RATED FOR 250 PSI FOR ALL PIPE DIAMETERS.
- ALL DUCTILE IRON PIPE, FITTINGS AND HYDRANTS SHALL BE ENCASED WITH POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH THE REQUIREMENTS OF A.N.S.I./A.W.W.A. STANDARD SPECIFICATION D1248 AND AWWA C105. POLYETHYLENE TUBE MATERIAL SHALL HAVE A THICKNESS OF .060" (6-MILS). ADHESIVE TAPE SHALL BE A GENERAL PURPOSE ADHESIVE TAPE 2" WIDE AND APPROXIMATELY 10-MILS THICK, SUCH AS SCOTCHRAP, NO.50, POLYKEN NO. 960, OR TAPECOAT CT.

**VALVE AND SLEEVE NOTES**

- GATE VALVES, SIZES THREE (3) INCH THROUGH SIXTEEN (16) INCH AND TAPPING VALVES SHALL MEET THE CITY OF ROCHESTER HILLS STANDARD AS DETAILED WITH NON-RISING STEM, (EAST JORDAN IRON WORKS, AMERICAN FLOW CONTROL, MUELLER)
- ALL IN LINE GATE VALVES FIGHT (8) INCH AND LARGER SHALL BE IN WELLS. SPECIFICATIONS SHALL INCLUDE THE DIRECTION OF OPERATION OF ALL VALVES (CLOCKWISE CLOSURE). VALVE BOX USE TO BE APPROVED BY ENGINEERING DIVISION.
- ALL GATE WELL COVERS SHALL BE CITY OF ROCHESTER HILLS STANDARD AS DETAILED.
- ALL GATE VALVES WITH OPERATING NUTS AT A DISTANCE GREATER THAN FIVE (5) FEET BELOW GROUND SURFACE SHALL BE PROVIDED WITH AN EXTENSION STEM. THE LENGTH OF THE EXTENSION STEM SHALL REACH WITHIN FIVE (5) FEET FROM THE GROUND SURFACE. WHEN AN EXTENSION STEM IS USED, IT SHALL BE HELD IN PLACE BY AN EXTENSION STEM GUIDE, SUITABLY FASTENED TO THE WALL OF THE GATE WELL. THE EXTENSION STEM SHALL BE MECHANICALLY ATTACHED TO THE OPERATING NUT. DETAILS OF THE EXTENSION SYSTEM AND THE METHOD OF INSTALLATION SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
- BUTTERFLY VALVES SHALL BE USED FOR VALVES GREATER THAN 16-INCH DIAMETER AND SHALL BE MODEL 2F11 AS MANUFACTURED BY HENRY PRATT COMPANY OR APPROVED EQUAL.
- TAPPING VALVES SHALL BE SERIES "A" AS MANUFACTURED BY EAST JORDAN IRON WORKS OR RESILIENT SEATED GATE VALVES AS APPROVED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES.
- TAPPING SLEEVES SHALL BE MANUFACTURED BY ROMAC INDUSTRIES; MUELLER; EAST JORDAN; SMITH-BLAIR OR APPROVED EQUAL AND APPROVED BY THE CITY OF ROCHESTER HILLS. FULL BODY SLEEVES MUST BE USED EXCEPT FOR REINFORCED CONCRETE, PRESSURE PIPE OR A.C. PIPE.

**HYDRANT REQUIREMENTS**

- ALL HYDRANTS SHALL BE CONSTRUCTED WITH A SIX (6) INCH COMPANION GATE VALVE IN A THREE (3) PIECE, ADJUSTABLE DUCTILE IRON VALVE BOX, WHICH SHALL INCLUDE A FIVE AND ONE-QUARTER (5-1/4) INCH SCREW SHAFT. VALVE BOXES SHALL BE SERIES 6840 AS MANUFACTURED BY TYLER PIPE OR APPROVED EQUAL.
- ALL HYDRANTS SHALL BE EAST JORDAN IRON WORKS NO. 5-BR-250 TRAFFIC MODEL OR AMERICAN FLOW CONTROL MODEL WB-67250. SELF-DRAINING HYDRANTS SHALL NOT BE USED. HYDRANTS SHALL HAVE BREAKAWAY FLANGE.
- ALL HYDRANTS SHALL BE PAINTED RED ABOVE GROUND AND BLACK BELOW GROUND WITH A FINISH COAT OF GLAMORTEX 501 ENAMEL, COLOR 314 VERMILION OR APPROVED EQUAL. HYDRANT CAPS SHALL BE PAINTED SAME COLOR AS THE HYDRANT.
- ALL FIRE HYDRANT JOINTS SHALL BE TOTALLY RESTRAINED BY THE USE OF RESTRAINED JOINT, THRUST BLOCKS ARE ALSO REQUIRED.

**ACCEPTANCE OF NEW WATER MAINS**

- PRIOR TO WATER MAIN ACCEPTANCE THE FOLLOWING CONDITIONS MUST BE MET: 1) PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS 2) ALL EASEMENT AND RIGHT-OF-WAY ACQUISITION MUST BE ACCEPTED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES 3) THE CITY OF ROCHESTER HILLS MUST BE PROVIDED WITH THE BILL OF SALE AND 4) ALL MYLAR "AS-BUILT" DRAWINGS MUST BE ACCEPTED AND APPROVED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES. THE CITY OF ROCHESTER HILLS INSPECTION DIVISION MUST WITNESS THE CONNECTION OF THE WATER MAIN TO THE EXISTING WATER MAIN, AFTER WHICH RESIDENTIAL AND COMMERCIAL TAPS WILL BE ALLOWED.
- THE CONTRACTOR SHALL NOTIFY THE CITY OF ROCHESTER HILLS INSPECTION DEPARTMENT (248.641.2510) FOR PRESSURE TESTING, BACTERIOLOGICAL SAMPLING, CONNECTIONS TO EXISTING WATER MAIN AND FINAL FIELD REPORT. A FORTY-EIGHT (48) HOUR ADVANCE NOTICE IS REQUIRED.
- THE CONTRACTOR SHALL DISINFECT AND PRESSURE TEST ALL NEW WATER MAIN IN ACCORDANCE WITH ROCHESTER HILLS STANDARDS. THE WATER MAIN SHALL PASS A 150 PSI PRESSURE TEST FOR A TWO (2) HOUR PERIOD. WATER LOSS SHALL NOT EXCEED A RATE OF 11.65 U.S. GALLONS PER INCH DIAMETER PER MILE OF WATER MAIN IN TWENTY-FOUR (24) HOURS.
- WHERE CONTRACTOR SUPPLIED GAUGES ARE REQUIRED, MINIMUM SIZE SHALL BE 3/2" DIAMETER OR LARGER GRADUATED IN ONE (1) OR TWO (2) POUND INCREMENTS FROM 1 TO 160 P.S.I. OR HIGHER AND HAVE CURRENT CERTIFICATION.
- PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED AND APPROVED PRIOR TO CONNECTING TO THE EXISTING WATER MAIN.

**CITY OF ROCHESTER HILLS WATER SYSTEMS AS-BUILT DRAWING SPECIFICATIONS**

IN AREAS WHERE WATER SYSTEMS ARE OPERATED AND MAINTAINED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICES, FINAL ACCEPTANCE OF THE WATER SYSTEM MUST BE RENDERED BY THE DEPARTMENT OF PUBLIC SERVICES, BEFORE THE SYSTEM CAN BE USED FOR THE SERVICE INTENDED.

ONE ITEM REQUIRED FOR FINAL ACCEPTANCE SHALL BE THE SUBMISSION OF AS-BUILT DRAWINGS TO THE CITY OF ROCHESTER HILLS, D.P.S., BY THE DESIGN ENGINEER. AS-BUILT DRAWINGS SHALL BE DEFINED AS AND CONTAIN THE FOLLOWING INFORMATION:

- FINAL AS-BUILT DRAWINGS SHALL BE PROVIDED ON THREE (3) MIL MYLAR, XEROX OR ANY HEAT PROCESS REPRODUCTIONS WILL NOT BE ACCEPTED.
- ALONG WITH THE MYLAR PLAN SET, PROVIDE THREE (3) SETS OF BLUEPRINTS, PRODUCED FROM THE MYLARS AND THE PLANS ON ELECTRONIC MEDIA IN AUTOCAD FORMAT (LATEST VERSION).
- EACH AND EVERY SHEET SHALL BE SEALED BY THE DESIGN ENGINEER, ALONG WITH THE FOLLOWING CERTIFICATION STATEMENT ON THE COVER SHEET.

I HEREBY CERTIFY THAT OUR FIRM HAS PREPARED THESE AS-BUILT DRAWINGS OF THE IMPROVEMENTS AS CONSTRUCTED, AND THAT TO THE BEST OF MY KNOWLEDGE THOSE IMPROVEMENTS NOTED AS "AS BUILT" WERE CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED CONSTRUCTION PLANS, AND ALSO THAT THE WATER MAIN AND STRUCTURES, AS CONSTRUCTED, LIE WITHIN THE EASEMENT DESCRIPTIONS REQUIRED BY THE CITY OF ROCHESTER HILLS.

\_\_\_\_\_  
(COMPANY NAME)

\_\_\_\_\_  
(ENGINEER'S SIGNATURE)

PROFESSIONAL ENGINEER NO. \_\_\_\_\_ ENGINEER SEAL

- THE MAXIMUM SCALE SHALL BE ONE (1) INCH EQUALS FIFTY (50) FEET.
- THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
- THE SIZE, BRAND AND MODEL NUMBERS OF ALL VALVES AND HYDRANTS INSTALLED SHALL BE INDICATED.
- A TOTAL AS-BUILT DRAWING QUANTITY LIST SHALL BE INCLUDED, AS WELL AS AN AS-BUILT DRAWING QUANTITY LIST ON EACH INDIVIDUAL SHEET.
- THE LOCATIONS SHALL BE SHOWN ON THE PLANS WITH AN ACCURACY OF ONE (1) FOOT.
- THE OFFSET OF THE WATER MAIN FROM PROPERTY LINES SHALL BE INDICATED.
- ALL GATE VALVE WELLS, HYDRANTS AND ALL WATER SYSTEM APPURTENANCES SHALL BE LOCATED FROM TWO FIXED OBJECTS (MANHOLES, BUILDING CORNERS ECT.).
- ALL UNDERGROUND APPURTENANCES, SUCH AS GATE VALVE WELLS, METER PITS, PRESSURE REDUCING VALVE PITS, ETC. SHALL BE LOCATED FROM THE NEAREST HYDRANT THAT IS CONNECTED TO THE SAME WATER MAIN AS THE APPURTENANCE.
- THE LOCATION AND SIZE OF EVERY RESTRAINED JOINT SHALL BE NOTED.
- THE ACCURATE LOCATION OF ALL UTILITY CROSSINGS WHERE THE VERTICAL SEPARATION, IS LESS THAN 18" SHALL BE NOTED.
- AS-BUILT SHALL BE PREPARED IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS AS-BUILT GUIDELINES AS PROVIDED AT THE PRE-CONSTRUCTION MEETING.



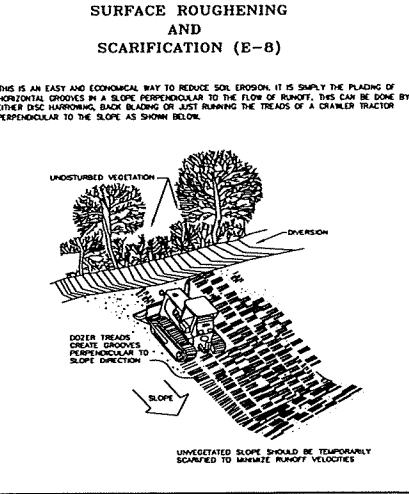
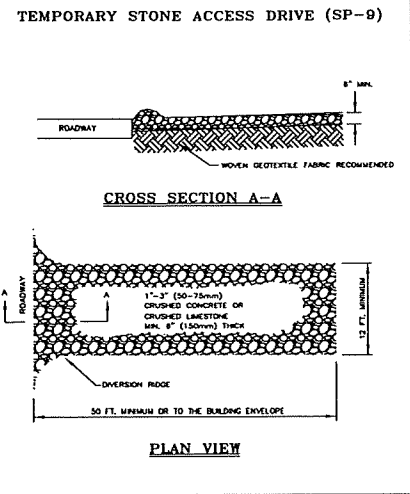
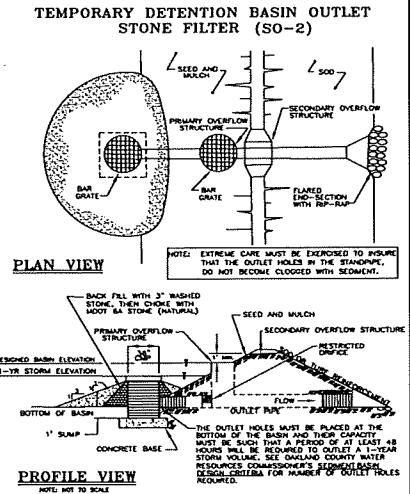
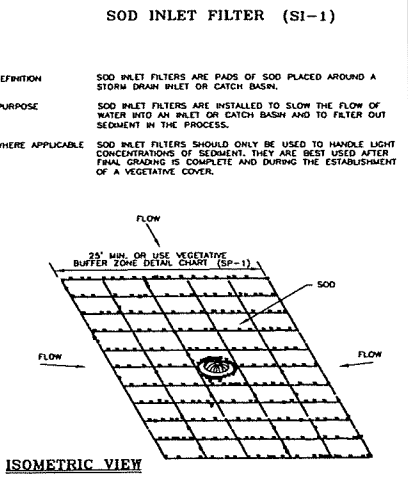
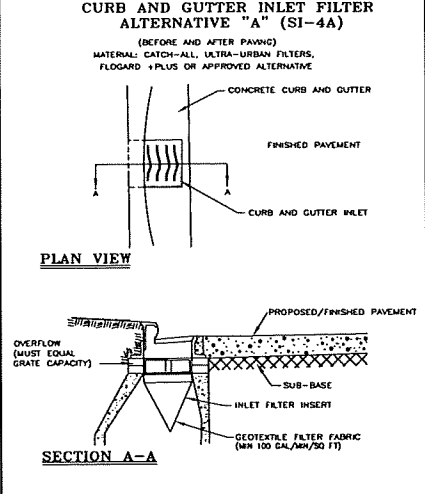
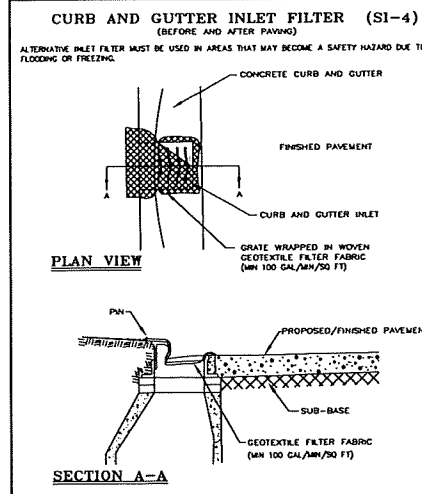
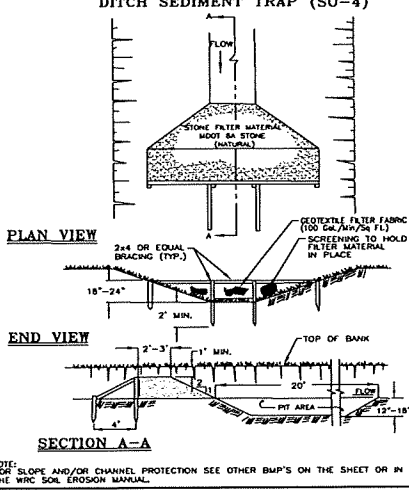
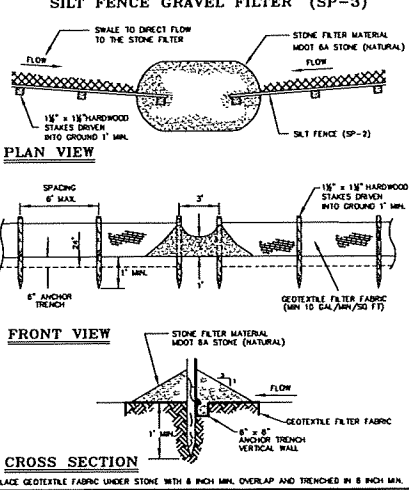
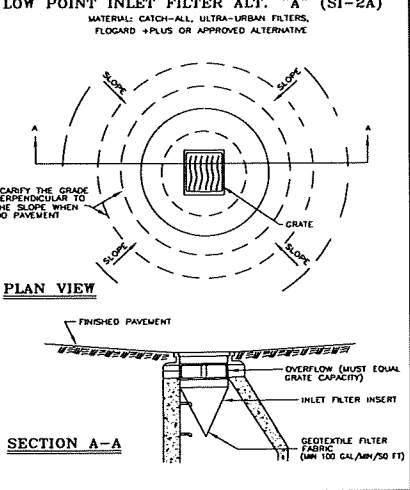
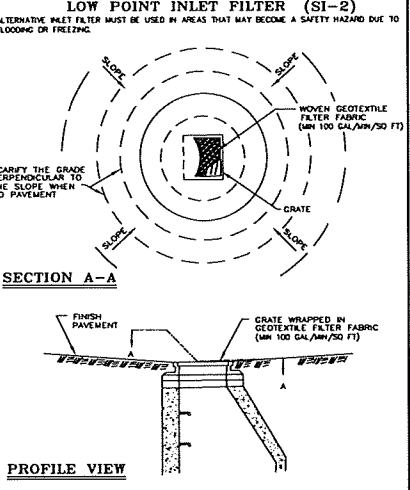
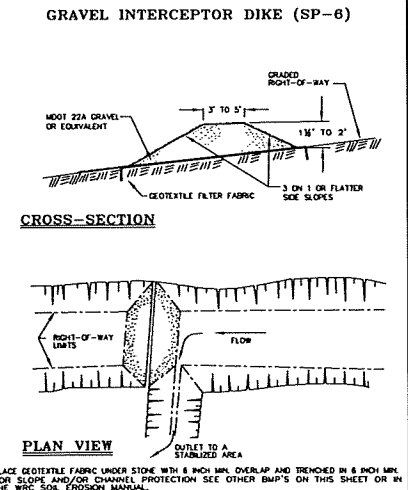
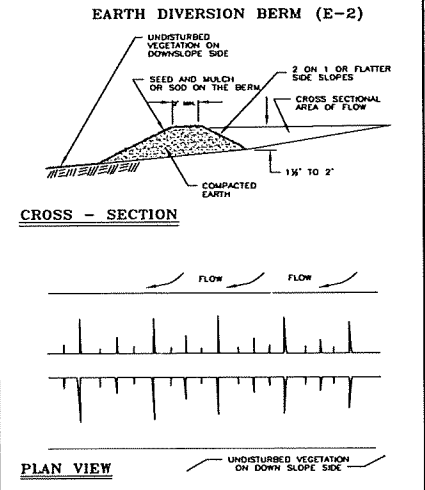
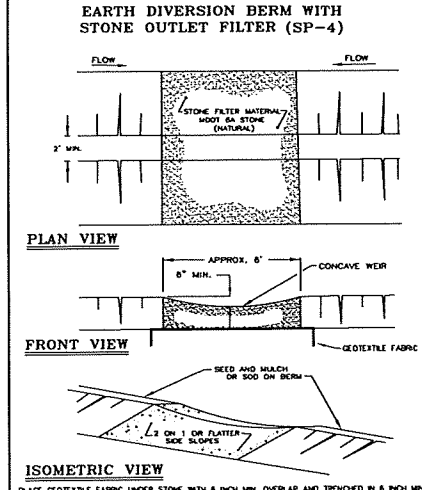
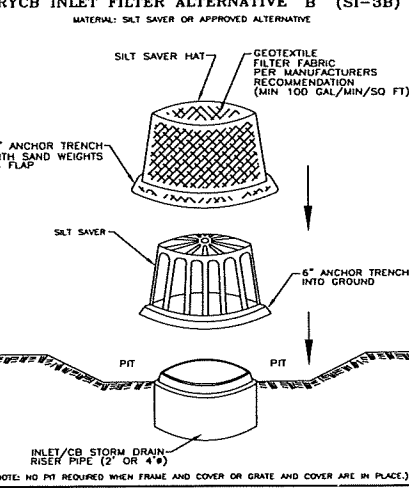
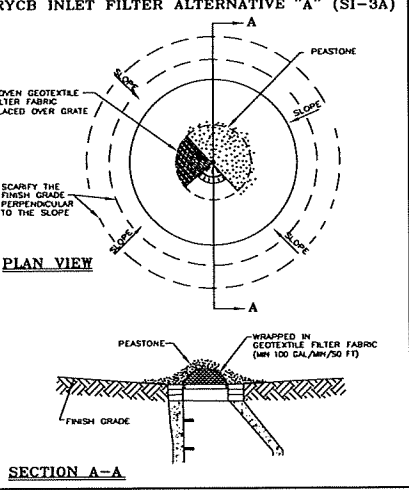
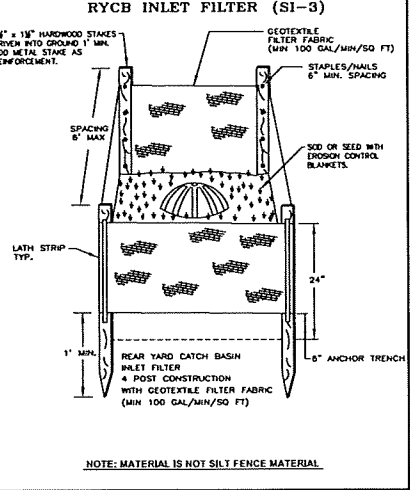
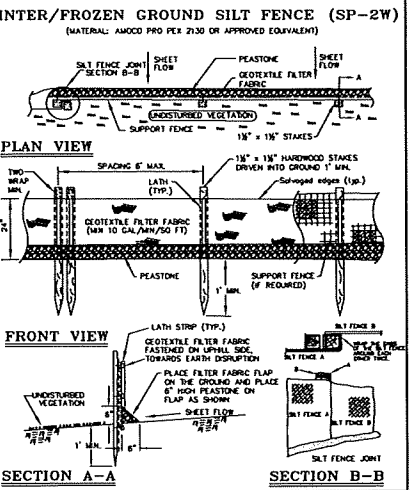
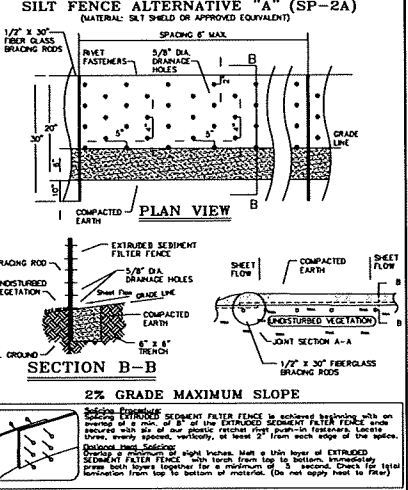
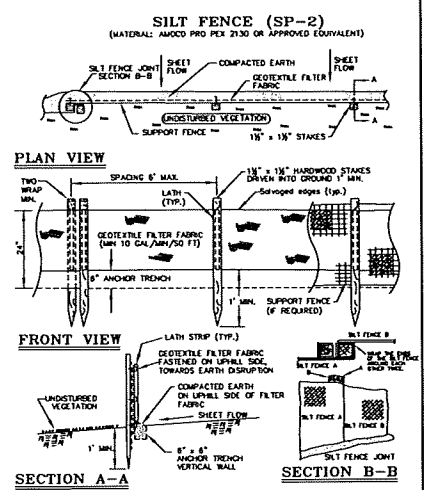
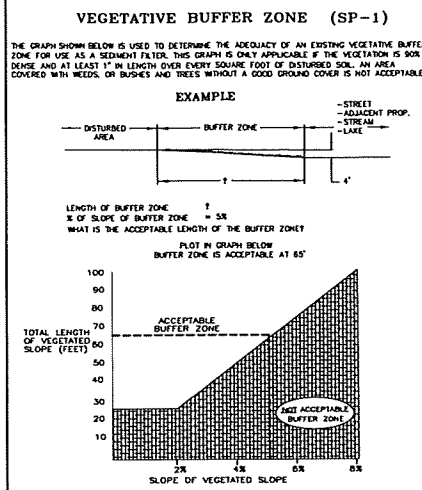
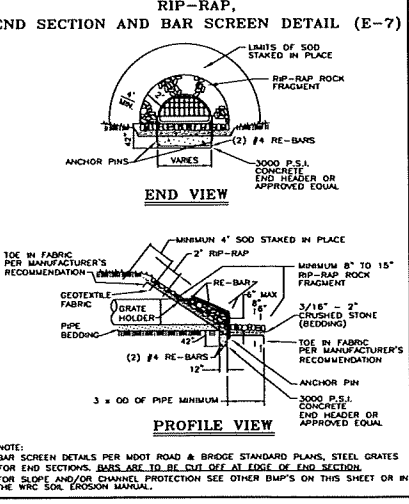
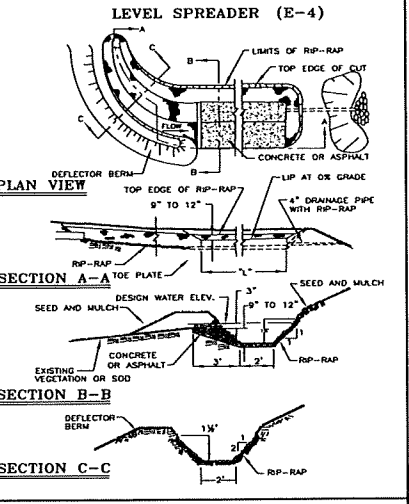
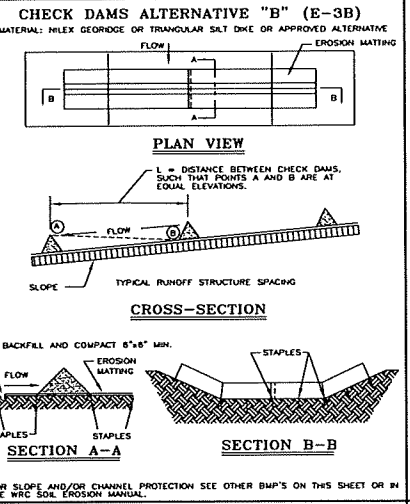
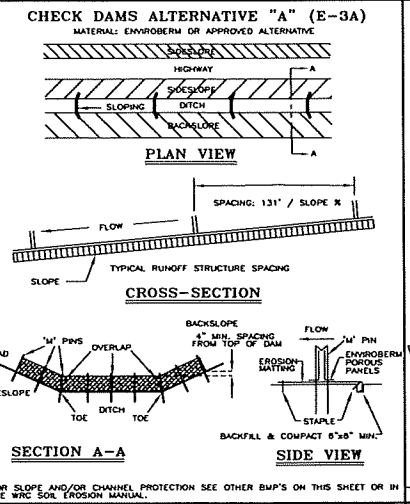
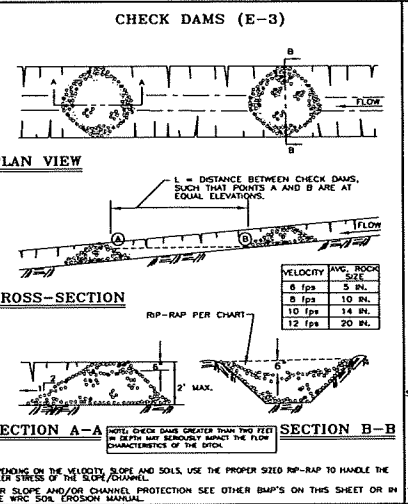
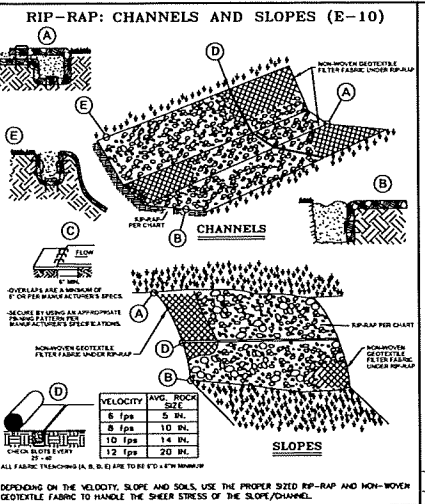
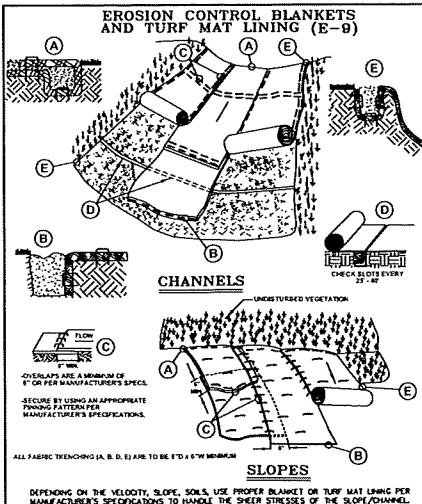
REVISIONS	DATE	APPROVED BY
		CITY COUNCIL, DATE: JULY 21, 2008
		PREPARED BY ENGINEERING DIVISION, DEPARTMENT OF PUBLIC SERVICES

NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-641-2510 48 HRS. PRIOR TO START OF CONSTRUCTION

**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

**WATER MAIN STANDARD DETAILS**

NOT TO SCALE	DATE: 7/21/2008
SHEET 2 OF 2	



**NOTE:**

WHILE PERFORMING WORK INVOLVING GROUNDS MAINTENANCE AND/OR THE CONSTRUCTION/MAINTENANCE OF ANY INFRASTRUCTURE, INCLUDING ROADS, WATER MAINS, SANITARY SEWERS, STORM DRAINS AND STORM WATER BEST MANAGEMENT PRACTICES (BMPs), CONTRACTORS SHALL MINIMIZE POLLUTION FROM STORM WATER RUNOFF THAT CAN AFFECT WATER QUALITY RELATED TO WORK ACTIVITIES. POLLUTANTS THAT COULD IMPAIR WATER QUALITY MAY INCLUDE FUEL, GREASE AND OIL, NUTRIENTS, BACTERIA AND PATHOGENS, LITTER AND DEBRIS, AND SOIL EROSION AND SEDIMENTATION. APPLICABLE BMPs SHALL BE IMPLEMENTED BY THE CONTRACTOR TO THE MAXIMUM EXTENT PRACTICABLE TO PROTECT WATER QUALITY AND WILDLIFE HABITAT.

### SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

DESIGNED BY:	WRC
DRAWN BY:	tlapjg
DATE:	01/01/01
SCALE:	NONE
PROJECT:	ONE PUBLIC WORKS DRIVE, BLDG 30 WEST WASHINGTON, WASHINGTON, DC 20001-1001
SHEET NO.:	1 of 1