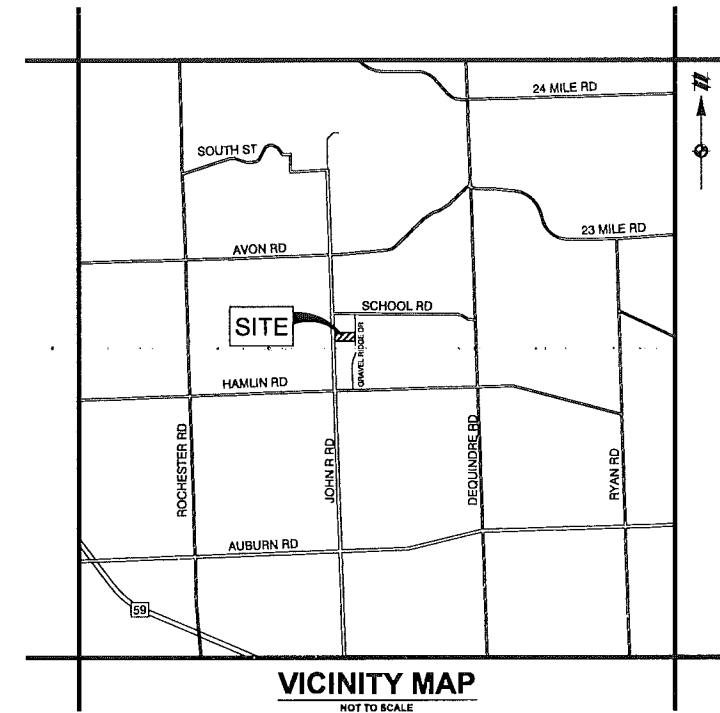


CRESTWYK ESTATES

4.44 ACRE DEVELOPMENT
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

ENGINEERING CONSTRUCTION PLANS

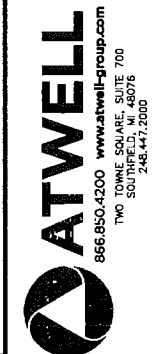


811
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DEVELOPMENT TEAM

DEVELOPER
M2J1, LLC
14955 TECHNOLOGY DRIVE
SHELBY TOWNSHIP, MI 48315
PHONE: (586) 421-5729
CONTACT: JIM POLYZOIS

LANDSCAPE ARCHITECT
NÚÑEZ DESIGN, INC.
249 PARK STREET
TROY, MI 48063
PHONE: (248) 224-5933
CONTACT: RALPH NÚÑEZ

CIVIL ENGINEER/SURVEYOR/ WETLAND CONSULTANT

ATWELL, LLC
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
PHONE: (248) 447-2000
CONTACT: ERIC LORD, P.E.

GOVERNING AGENCIES & UTILITY CONTACTS

MUNICIPALITY/PLANNER

CITY OF ROCHESTER HILLS
1000 ROCHESTER HILLS DRIVE
ROCHESTER HILLS, MI 48309
PHONE: (248) 656-4660
CONTACT: KRISTEN KAPELANSKI

CITY ENGINEER

CITY OF ROCHESTER HILLS
1000 ROCHESTER HILLS DRIVE
ROCHESTER HILLS, MI 48309
PHONE: (248) 841-2490
CONTACT: JASON BOUGHTON

SOIL EROSION

OAKLAND COUNTY WATER RESOURCES COMMISSION
ONE PUBLIC WORKS DRIVE
WATERFORD, MI 48328-1907
PHONE: (248) 858-5389

LEGAL DESCRIPTION

LOT 7 OF FERRYVIEW HOMELANDS SUBDIVISION AS RECORDED IN LIBER 27, PAGE 22, OAKLAND COUNTY RECORDS, A SUBDIVISION IN THE SOUTHWEST 1/4 OF SECTION 24, T3N, R11E, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

SITE DATA

THE CURRENT ZONING CLASSIFICATION IS R-4 (ONE FAMILY RESIDENTIAL DISTRICT) GROSS AREA: 4.64 AC. NET AREA: 4.44 AC.

LOT DENSITY
AREA=4.44 AC
UNITS=16 SINGLE FAMILY DETACHED CONDOMINIUMS
COVERAGE=16/4.44= 3.60 UNITS PER ACRE

SETBACKS
FRONT: 24' FROM BACK OF SIDEWALK
SIDE: 20' MINIMUM BETWEEN BUILDINGS
REAR: 30'

5' SIDEWALK PROVIDED ON BOTH SIDES OF ROAD
8' WIDE PEDESTRIAN PATHWAY ALONG JOHN R ROAD RIGHT OF WAY
ROADS ARE TO BE PRIVATE.

BENCHMARKS

BENCHMARK A:
ARROW ON HYDRANT, WEST SIDE OF JOHN R. ROAD, 23'± SOUTH OF SOUTH PROPERTY LINE
748.32'

BENCHMARK B:
PK NAIL IN SOUTH FACE OF UTILITY POLE, EAST SIDE OF JOHN R. ROAD 300'± NORTH OF NORTH PROPERTY LINE
749.12'

BENCHMARK C:
PK NAIL IN 18" DECIDUOUS TREE 100'± NORTH OF SOIL BORING #3
745.43'

BENCHMARK D:
PK NAIL IN SW FACE OF DECIDUOUS TREE 100'± EAST OF GRAVEL RIDGE DRIVE 75'± SOUTH OF NORTH PROPERTY LINE
745.11'

QUANTITIES:

Public Pathways		
Asphalt Pathway (2" surface, 2" binder, 4" aggregate)	210	SY
PCC Sidewalk with Subbase, 6"	8470	SF

Sanitary Sewer		
8" PVC Sewer Pipe	714	LF
4'-0" Diameter Manhole	3	EACH
Connect to Existing Sanitary Sewer Manhole	1	EACH

Watermain		
6" Ductile Iron Water Main Pipe	4	LF
8" Ductile Iron Water Main Pipe	888	LF
Te	2	EACH
Bend	4	EACH
Thrust Block	8	EACH
Fire Hydrant with Auxiliary Valve, Complete	2	EACH
8" Valve and Vault	1	EACH
8" x 8" Tapping Sleeve, Valve, and Gatewell	1	EACH
8" x 12" Tapping Sleeve, Valve, and Gatewell	1	EACH
Auger and Jack, with Casing - 20"	74	LF

Storm Sewer and Detention Basin		
6" PVC Perforated Underdrain	1466	LF
20" x 28" CMP ARCH Storm Pipe	91	LF
15" PVC Storm Sewer Pipe	14	LF
12" RCP Storm Sewer Pipe	971	LF
18" RCP Storm Sewer Pipe	202	LF
24" RCP Storm Sewer Pipe	332	LF
2'-0" Diameter Inlet	497	LF
4'-0" Diameter Manhole	6	EACH
5'-0" Diameter Manhole	9	EACH
AquaSwri AS-8 Unit	3	EACH
36" CMP Riser	1	EACH
6'-0" Bypass Structure	1	EACH
12" Flared End Section, with Grate	1	EACH
15" Flared End Section, with Grate	1	EACH
24" Flared End Section, with Grate	1	EACH

Paving		
John R Road and Gravel Ridge Road Asphalt Pavement	433	SY
Gravel Shoulder (21AA), 6"	115	SY
Base Granular Material (21AA), 4"	1800	SY
PCC Pavement, 8"	1800	SY
Concrete Curb and Gutter Type B-2	273	LF
Concrete Curb and Gutter (4" mountable)	1426	LF

NOTE: CONTRACTOR SHALL VERIFY ALL QUANTITIES

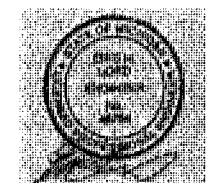
SHEET INDEX

C-01	COVER SHEET
C-02	CONSTRUCTION NOTES
C-03	EXISTING CONDITIONS PLAN
C-04	TREE INVENTORY
C-05	DEMOLITION PLAN
C-06	SITE LAYOUT PLAN
C-07	GRADING PLAN
C-08	DETAILED GRADING PLAN
C-09	EROSION CONTROL PLAN
C-10	EROSION CONTROL NOTES AND DETAILS
C-11	SOIL EROSION AND SEDIMENTATION CONTROL DETAILS
C-12	OVERALL UTILITY PLAN
C-13	ROAD, SANITARY SEWER, AND WATERMAIN PLAN
C-14	STORM SEWER PLAN AND PROFILE
C-15	STORM SEWER PLAN AND PROFILE
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C-17	DRAINAGE AREA MAP
C-18	CALCULATIONS AND TABLES
C-19	CONSTRUCTION DETAILS
C-20	CONSTRUCTION DETAILS
C-21	STORM SYSTEM STANDARD DETAILS
C-22	SANITARY SEWER STANDARD DETAILS
C-23	SANITARY SEWER STANDARD DETAILS
C-24	WATER MAIN STANDARD DETAILS
C-25	WATER MAIN STANDARD DETAILS

LANDSCAPE PLANS PREPARED BY NÚÑEZ DESIGN, INC.

LA - 1.0	LANDSCAPE CONCEPT PLAN
LA - 1.1	LANDSCAPE PLANTING PLAN
LA - 1.2	TYPICAL SINGLE FAMILY UNIT PLANTING PLAN
LA - 1.3	TYPICAL TWO FAMILY ATTACHED UNITS PLANTING PLAN
LA - 1.4	ELEVATION & CROSS SECTIONS
LA - 2.0	LANDSCAPE PLANTING DETAILS & NOTES

T-1.0	EXISTING TREE SURVEY
T-1.1	TREE ANALYSIS



SECTION 24
TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

M2J1, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
COVER SHEET

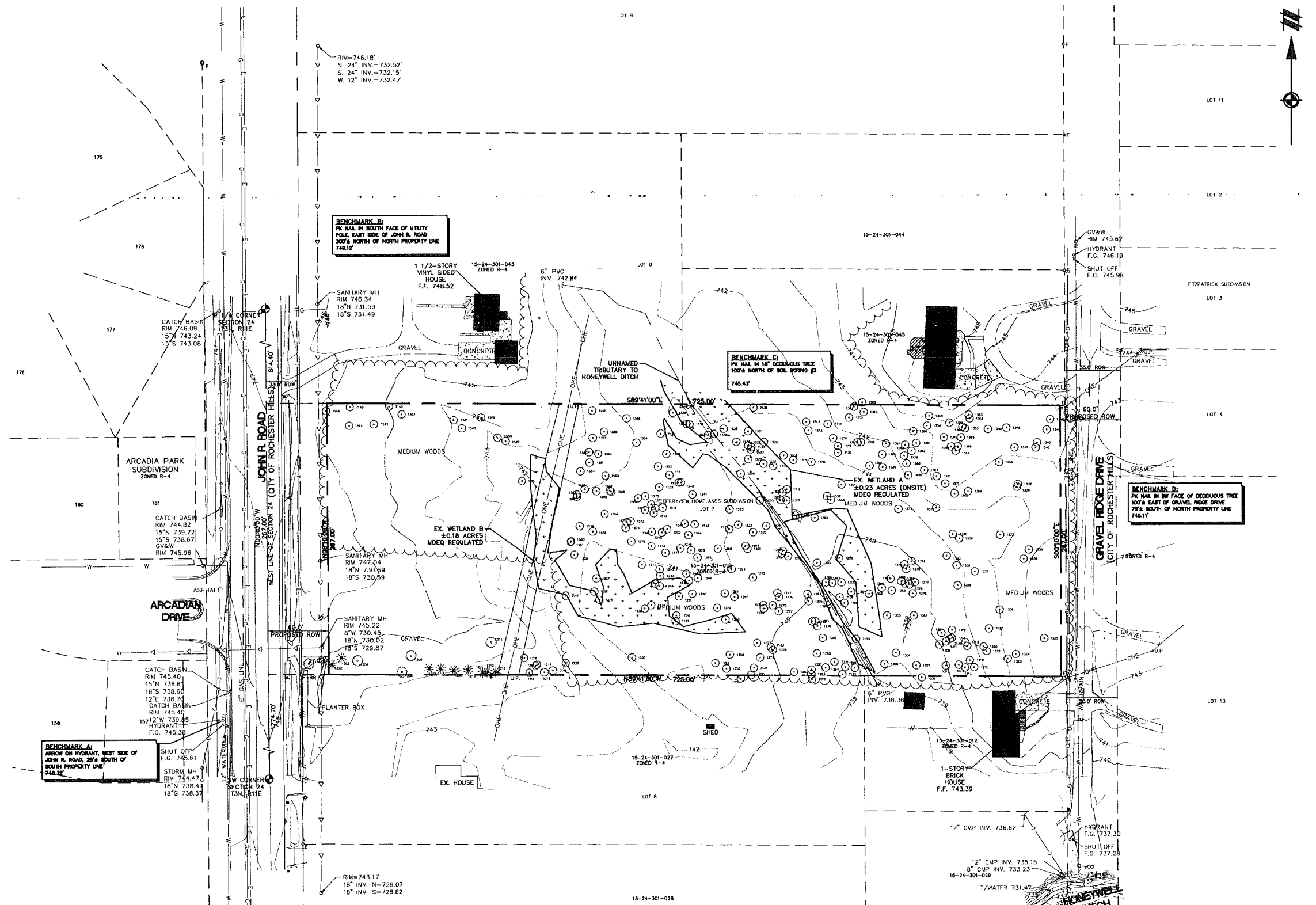
DATE: NOVEMBER 22, 2017
01-12-2018 CITY SUBMITTAL
02-28-2018 REVISION PER CITY

REVISIONS

DRAWN BY: REK
CHECKED BY: JPC
P.M.: E. LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO: C-01

LEGEND

- BOUNDARY LINE
- - - EXISTING ROW
- · - · BOUNDARY ADJACENT LINE
- - - EXISTING EASEMENT LINE
- - - EXISTING SETBACK LINE
- · - · EXISTING CONTOUR
- · - · EXISTING CURB AND GUTTER
- · - · EXISTING SANITARY SEWER
- · - · EXISTING STORM SEWER
- · - · EXISTING WATER LINE
- · - · EXISTING UNDERGROUND GAS
- · - · EXISTING UNDERGROUND TELEPHONE
- · - · EXISTING OVERHEAD TELEPHONE
- · - · EXISTING UNDERGROUND ELECTRIC
- · - · EXISTING OVERHEAD ELECTRIC
- · - · EXISTING CENTERLINE OF DITCH
- · - · EXISTING FENCE
- · - · EXISTING GUARD RAIL
- · - · EXISTING VEGETATION LINE
- · - · EXISTING WETLAND
- SECTION CORNER
- FOUND IRON ROD
- SET IRON ROD
- FOUND PK NAIL
- FOUND MONUMENT
- EXISTING SIGN
- EXISTING BOLLARD
- EXISTING TREE WITH TREE TAG NUMBER
- EXISTING CLEANOUT
- EXISTING SANITARY MANHOLE
- EXISTING FLARED END SECTION
- EXISTING STORM CATCH BASIN/MANHOLE
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER MARKER
- EXISTING GAS METER
- EXISTING GAS RISER
- EXISTING GAS MARKER
- EXISTING TELEPHONE RISER
- EXISTING TELEPHONE MANHOLE
- EXISTING TELEPHONE MARKER
- EXISTING TRAFFIC SIGNAL
- EXISTING ELECTRIC TRANSFORMER
- EXISTING ELECTRIC BOX
- EXISTING ELECTRIC METER
- EXISTING ELECTRIC MARKER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING CABLE RISER
- EXISTING MAILBOX
- EXISTING FLAG POLE
- EXISTING SPOT ELEVATION
- EXISTING WETLAND
- EXISTING CONCRETE



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SECTION 24
TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

M2/J, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
EXISTING CONDITIONS PLAN

DATE: NOVEMBER 22, 2017
01-12-2018 CITY SUBMITTAL
02-18-2018 REVISION PER CITY

REVISIONS

SCALE 0 25 50
1" = 50 FEET
DRAWN BY: REK
CHECKED BY: JPC
P.L.M.: E. LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO. C-03

LEGAL DESCRIPTION OF PARCEL NUMBER 15-24-301-010
LOT 7 OF FERRYVIEW HOMELANDS SUBDIVISION AS RECORDED IN LIBER 27, PAGE 22, OAKLAND COUNTY RECORDS, A SUBDIVISION IN THE SOUTHWEST 1/4 OF SECTION 24, T3N, R11E, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

BASIS OF BEARING
BEARINGS WERE BASED ON "FERRYVIEW HOMELAND" LIBER 27, PAGE 22, O.C.R. (WEST SECTION LINE)

WETLANDS
THE EXISTING WETLANDS SHOWN ARE FROM A WETLAND DELINEATION PERFORMED BY ATWELL, LLC ON JANUARY 30, 2017.

K:\17000274\DWG\PLAN_SITES\SITE_FINAL\17000274_C-03.dwg 2/21/2018 3:12 PM ROKNIN.MXD

Tree Survey Results for the City of Rochester Hills, Oakland County Michigan- Atwell Project #17000274 John R. Road. Table with columns: Tree Tag ID, Species, Botanical Name, Common Name, DBH (IN), Landmark Tree, Condition, Notes/Comments. Rows 1202-1370.

Tree Survey Results for the City of Rochester Hills, Oakland County Michigan- Atwell Project #17000274 John R. Road. Table with columns: Tree Tag ID, Species, Botanical Name, Common Name, DBH (IN), Landmark Tree, Condition, Notes/Comments. Rows 1371-1530.

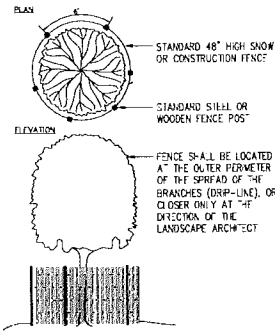
Tree Survey Results for the City of Rochester Hills, Oakland County Michigan- Atwell Project #17000274 John R. Road. Table with columns: Tree Tag ID, Species, Botanical Name, Common Name, DBH (IN), Landmark Tree, Condition, Notes/Comments. Rows 1531-7148.

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LEGEND

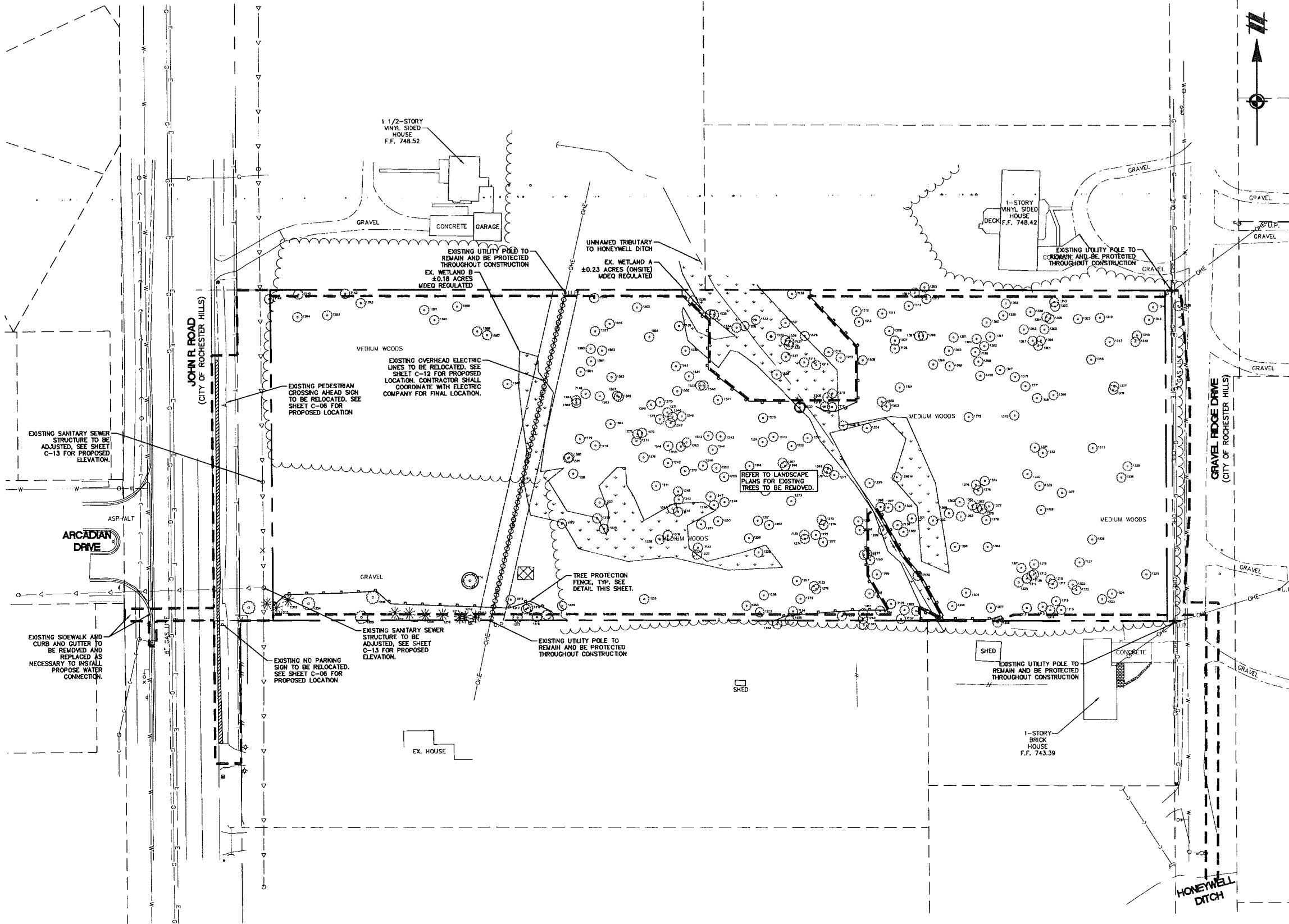
	BOUNDARY LINE
	EXISTING ROW
	TREE PROTECTION FENCE, SEE DETAIL THIS SHEET
	LIMITS OF DISTURBANCE
	REMOVE CONCRETE CURB AND GUTTER
	FULL DEPTH SAWCUT LIMITS
	EXISTING FENCE/UTILITY TO BE REMOVED
	REMOVE EXISTING ASPHALT/CONCRETE PAVEMENT
	REMOVE EXISTING BUILDING
	REMOVE EXISTING GRAVEL

- NOTES**
- FOR ADDITIONAL INFORMATION REFERENCE THE CONSTRUCTION NOTES SHEET, CONSTRUCTION DETAIL SHEET(S), AND ANY MUNICIPALITY AND/OR JURISDICTIONAL DETAILS ATTACHED TO THIS PLAN SET.
 - ANY ITEM NOT INDICATED AS BEING REMOVED SHALL REMAIN.
 - CONTRACTOR SHALL COORDINATE ALL UTILITY REMOVAL AND ABANDONMENT ACTIVITIES WITH LOCAL GOVERNING AGENCY OR UTILITY COMPANY PRIOR TO STARTING DEMOLITION TO ENSURE COMPLIANCE WITH GOVERNING AGENCY AND UTILITY COMPANY REMOVAL AND ABANDONMENT STANDARDS.
 - TREES TO BE REMOVED ARE DESIGNATED ON THIS PLAN FOR REFERENCE. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF ALL TREES AND VEGETATION NECESSARY TO ACCOMMODATE CONSTRUCTION.
 - CONTRACTOR MUST PROVIDE A BARRIER FROM PUBLIC ACCESS TO THE SITE PRIOR TO THE START OF DEMOLITION ACTIVITY AND UNTIL SITE CONSTRUCTION HAS BEEN COMPLETED.



TREE PROTECTION FENCE
NOT TO SCALE

NOTES:
1. ALL TREES TO BE REMOVED WILL BE DESIGNATED BY RED FLAGGING.
2. TREE PROTECTION FENCING IS TO BE INSTALLED PRIOR TO ANY DEMOLITION OR CONSTRUCTION AND IS TO REMAIN IN PLACE UNTIL COMPLETION OF PROJECT.
3. ALL TREES, FULL CROWN OR PARTIAL, TO BE KEPT CLEAR OF AND/OR WITH PROTECTIVE FENCE TO GUARANTEE EXISTENCE OF TREES, OR BRANCHES OR SPREAD OF ANY TREES, WITHIN THE 50' LINE OF 10' TREES TO BE KEPT.



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SECTION 24
TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

M2JI, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
DEMOLITION PLAN

DATE: NOVEMBER 22, 2017
01-12-2018 CITY SUBMITTAL
03-28-2018 REVISED PER CITY

REVISIONS

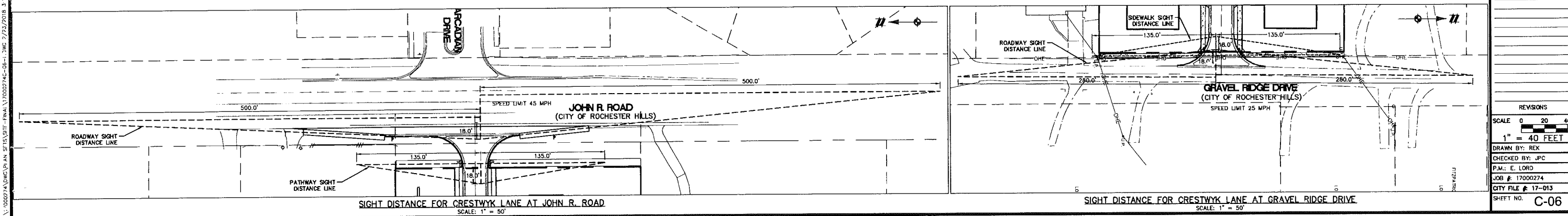
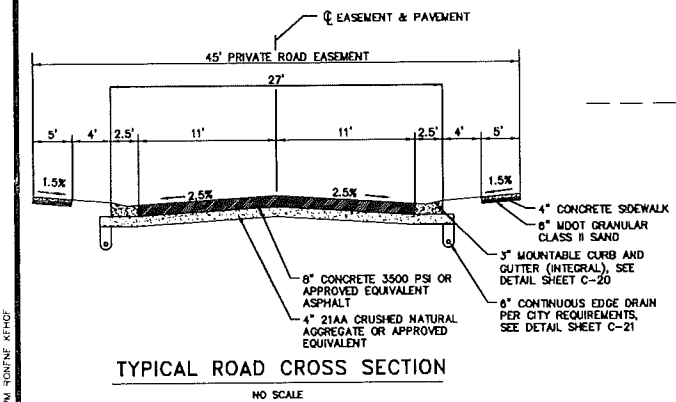
SCALE 0 20 40
1" = 40 FEET

DRAWN BY: REX
CHECKED BY: JPC
P.M.: E. LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO. C-05

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LEGEND	
	BOUNDARY LINE
	EXISTING ROW
	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING EASEMENT LINE
	PROPOSED EASEMENT LINE
	BUILDING SETBACK LINE
	PROPOSED BREAKAWAY GATE
	ADA RAMP
	PROPOSED SIGN
	PROP. STOP SIGN
	DIMENSION TO BACK OF CURB
	DIMENSION TO PROPERTY LINE
	DIMENSION TO EDGE OF PAVEMENT
	DIMENSION TO BUILDING
	EXISTING LIGHT POLE
	PROPOSED CONCRETE SIDEWALK SEE TYPICAL CROSS SECTION THIS SHEET
	PROPOSED CONCRETE PAVEMENT SEE TYPICAL CROSS SECTION THIS SHEET
	PROPOSED HEAVY DUTY ASPHALT PAVEMENT SEE DETAIL SHEET C-20
	PROPOSED GRAVEL SHOULDER (6" 21AA CRUSHED NATURAL AGGREGATE OR APPROVED EQUIVALENT)
	PROPOSED ASPHALT PEDESTRIAN PATHWAY SEE DETAIL SHEET C-20

NOTES:
 1. SEE SHEET C-02 FOR CONSTRUCTION NOTES.
 2. ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.



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SECTION 24
 TOWN 3 NORTH, RANGE 11 EAST
 CITY OF ROCHESTER HILLS
 OAKLAND COUNTY, MICHIGAN

M201, LLC
 CRESTWYK ESTATES
 ENGINEERING CONSTRUCTION PLANS
 SITE LAYOUT PLAN

DATE: NOVEMBER 22, 2017
 01-12-2018 CITY SUBMITTAL
 02-28-2018 REVISION PER CITY

REVISIONS	

SCALE: 0 20 40
 1" = 40 FEET
 DRAWN BY: REK
 CHECKED BY: JPC
 P.M.: E. LORD
 JOB #: 17000274
 CITY FILE #: 17-013
 SHEET NO. C-06

LEGEND	
	BOUNDARY LINE
	EXISTING ROW
	EXISTING CONTOUR
	PROPOSED CONTOUR
	PROPOSED NATURAL FEATURE SETBACK
	PROPOSED RIDGE LINE
	EXISTING STORM SEWER
	PROPOSED STORM SEWER
	EXISTING STORM CATCH BASIN/MANHOLE
	PROPOSED STORM CATCH BASIN/MANHOLE
	PROPOSED SPOT ELEVATION
	PROPOSED RIM ELEVATION
	MATCH EXISTING ELEVATION
	PROPOSED TOP OF CURB ELEVATION
	PROPOSED EDGE OF PAVEMENT ELEVATION
	PROPOSED FINISHED GRADE AT TOP OF WALL
	PROPOSED FINISHED GRADE AT BOTTOM OF WALL
	PROPOSED DROP BRICK LEDGE ELEVATION
	PROPOSED FINISHED GRADE ELEVATION
	EMERGENCY OVERFLOW ROUTE
	PROPOSED DRAINAGE ARROW
	WETLAND AREA NOT TO BE DISTURBED
	WETLAND AREA TO BE FILLED
	EXISTING TREE TO REMAIN

WETLAND IMPACTS

WETLAND A	
AREA TO BE FILLED	3,925 SF (0.090 AC)
AREA TO BE UNDISTURBED	5,159 SF (0.141 AC)
TOTAL WETLAND A	10,085 SF (0.231 AC)
WETLAND B	
AREA TO BE FILLED	7,956 SF (0.183 AC)
AREA TO BE UNDISTURBED	0
TOTAL WETLAND B	7,956 SF (0.183 AC)
TOTAL WETLAND IMPACTS	11,881 SF (0.273 AC)

NATURAL FEATURES SETBACK IMPACT

WETLAND A	
SETBACK IMPACTED	591 LF
SETBACK UNDISTURBED	138 LF
TOTAL NATURAL FEATURE SETBACK	729 LF
WETLAND B	
SETBACK IMPACTED	961 LF
SETBACK UNDISTURBED	0 LF
TOTAL NATURAL FEATURE SETBACK	961 LF
TOTAL NATURAL FEATURE SETBACK IMPACT:	1,552 LF

PROPOSED CRESTWYK LANE WETLAND CROSSING

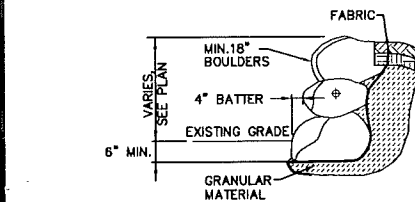
THE EXISTING WETLAND DITCH IS PROPOSED TO BE ENCLOSED WITHIN A 20" X 28" ARCH CUP CULVERT WHICH WILL BE BURIED 8" BELOW THE EXISTING GRADE OF THE DITCH. BY BURYING THE PIPE, THE EXISTING DITCH WILL MAINTAIN A NATURAL BOTTOM WHILE CROSSING THE PROPOSED ROADWAY AND WILL MINIMIZE WETLAND AND WATERCOURSE IMPACTS.

NOTES

- SEE SHEET C-02 FOR GRADING NOTES.
- REFER TO SHEET C-18 FOR MASS GRADING DETAILS.
- ALL DRIVEWAYS SHALL BE MINIMUM 16' WIDE.
- HONEYWELL DRAIN IS UNDER THE JURISDICTION OF THE OAKLAND COUNTY DRAIN COMMISSIONER'S OFFICE.
- PROPOSED GRADES TO MATCH EXISTING ELEVATIONS AT THE SILT FENCE.
- ROAD TO BE CROWNED AT 2.5% TO MEET CITY OF ROCHESTER HILL STANDARDS.
- ALL ROAD IMPROVEMENTS TO JOHN R ROAD WILL MEET CITY OF ROCHESTER HILLS STANDARDS. AN ACCESS PERMIT WILL BE OBTAINED FROM THE CITY OF ROCHESTER HILLS PRIOR TO CONSTRUCTION.
- FIRE HYDRANTS SHALL HAVE MAXIMUM 500' SEPARATION ALONG ROAD.
- ALL LOTS, AND PARKS MUST HAVE ACCESS TO A UTILITY EASEMENT.

GRADING NOTES

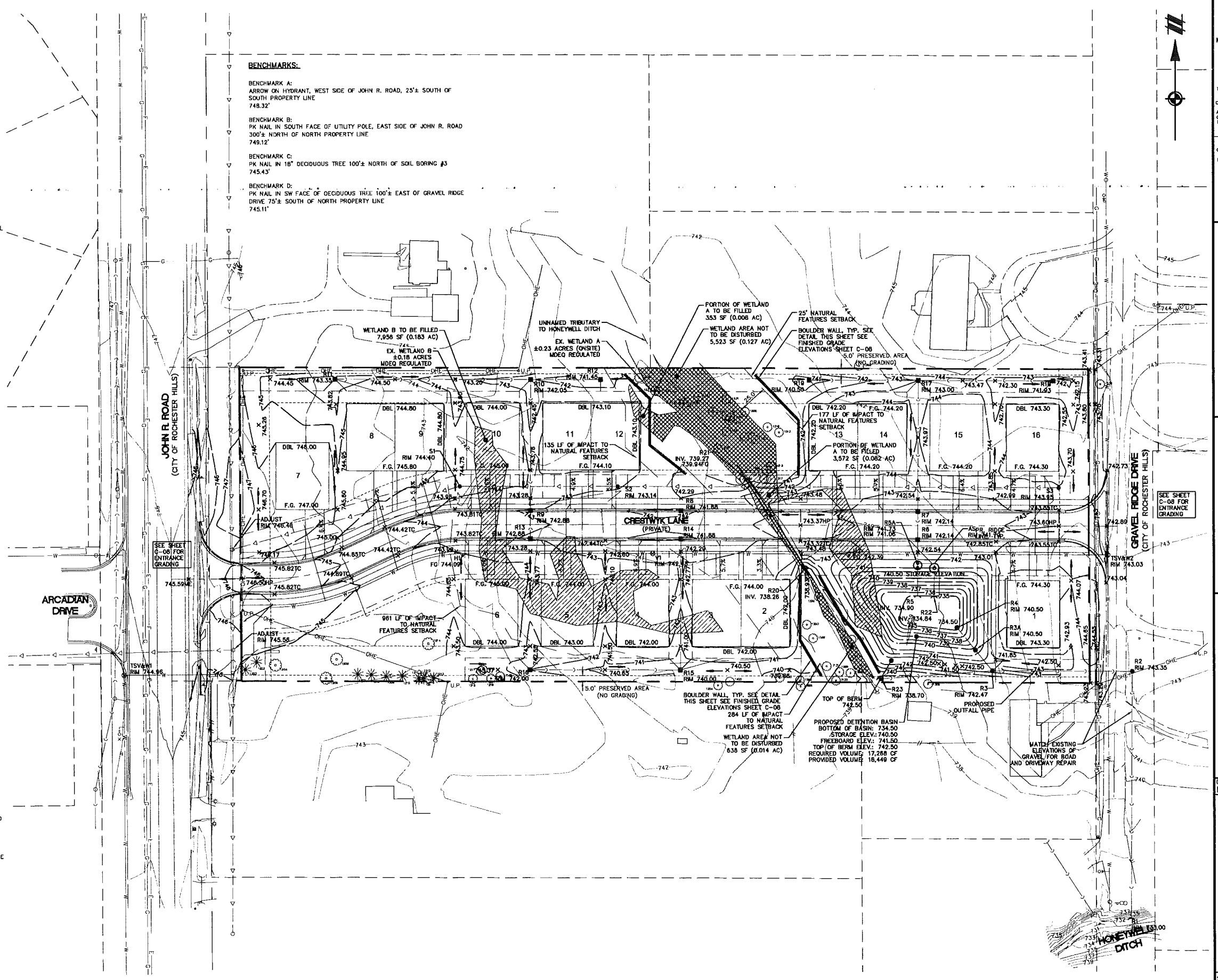
- THE BOXES SHOWN ON THE LOTS DO NOT REPRESENT THE BUILDABLE AREA BUT ARE FOR GRAPHICAL PURPOSES ONLY.
- NO WORK SHALL BE PERMITTED IN THE WETLANDS UNLESS A PERMIT HAS BEEN ISSUED TO DO SO.
- ALL GRADES IN PAVEMENT ARE GUTTER OF 4" MOUNTABLE CURB UNLESS OTHERWISE INDICATED.
- ALL SIDE YARD AND REAR YARD SWALES TO HAVE A 1.0% MINIMUM SLOPE AND ARE TO BE COMPLETED BY THE DEVELOPER WHEN SITE IS ROUGH GRADED.
- SLOPES FROM 2-4.5% SLOPES WILL BE SMOOTHED, AND SLOPES EXCEEDING 4.5% WILL HAVE STAKED 500'.
- ESTABLISH PERMANENT BENCHMARK ONSITE PRIOR TO CLEARING/DEMOLITION.



BOULDER WALL
NO SCALE

BENCHMARKS:

- BENCHMARK A:**
ARROW ON HYDRANT, WEST SIDE OF JOHN R. ROAD, 25'± SOUTH OF SOUTH PROPERTY LINE
748.32'
- BENCHMARK B:**
PK NAIL IN SOUTH FACE OF UTILITY POLE, EAST SIDE OF JOHN R. ROAD
300'± NORTH OF NORTH PROPERTY LINE
749.12'
- BENCHMARK C:**
PK NAIL IN 18" DECIDUOUS TREE 100'± NORTH OF SOIL BORING #3
745.43'
- BENCHMARK D:**
PK NAIL IN SW FACE OF DECIDUOUS TREE 100'± EAST OF GRAVEL RIDGE DRIVE
75'± SOUTH OF NORTH PROPERTY LINE
745.11'



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

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NOTICE:
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SECTION 24
TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

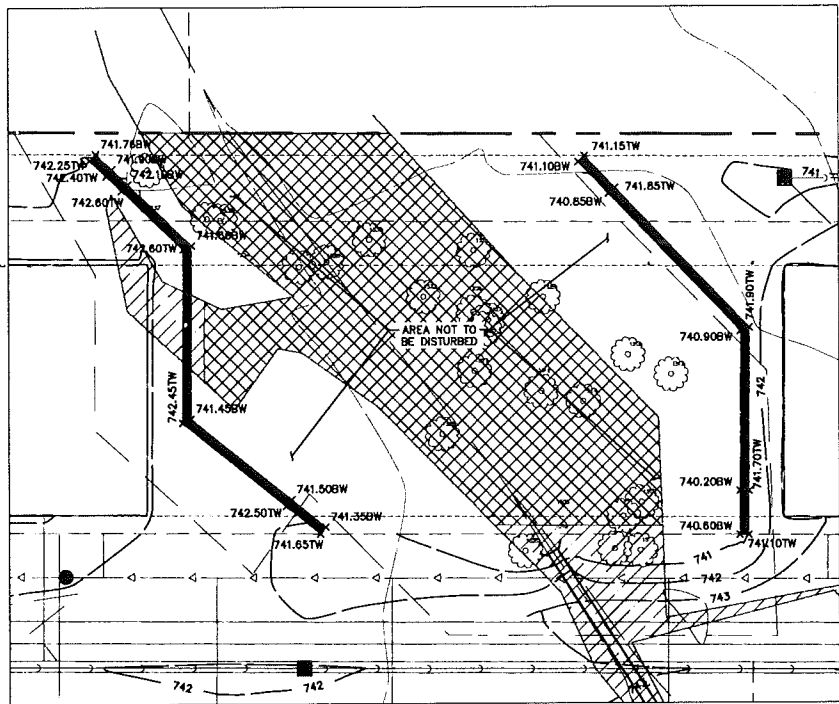
M2J1, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
GRADING PLAN

DATE: NOVEMBER 22, 2017
01-12-2018 CITY SUBMITTAL
02-28-2018 REVISION PER CITY

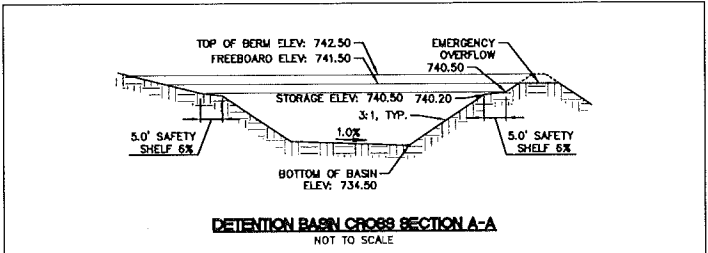
REVISIONS	

SCALE 0 20 40
1" = 40 FEET

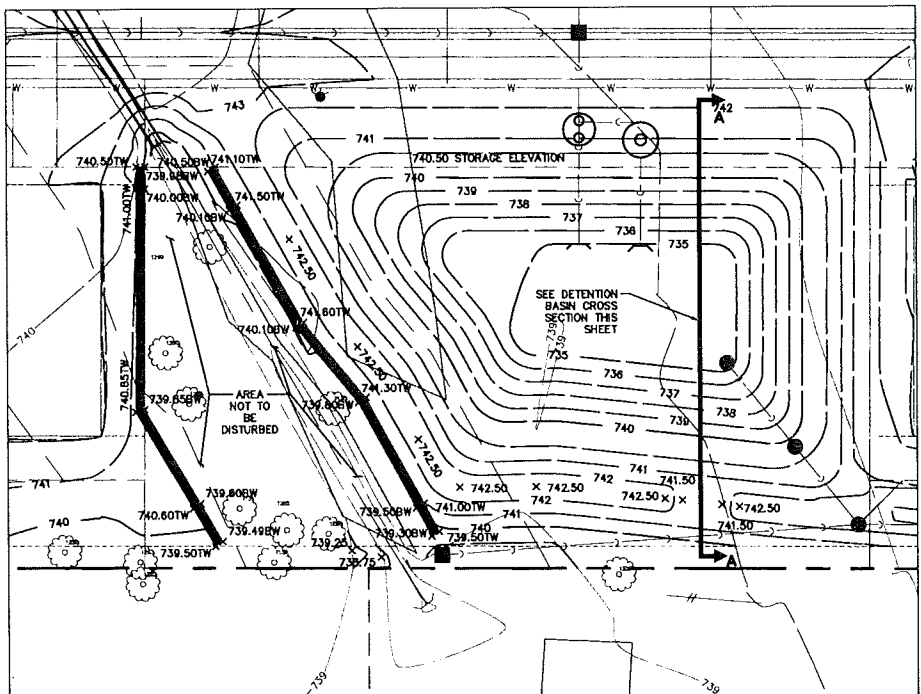
DRAWN BY: REK
CHECKED BY: JPC
P.M.: E. LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO. **C-07**



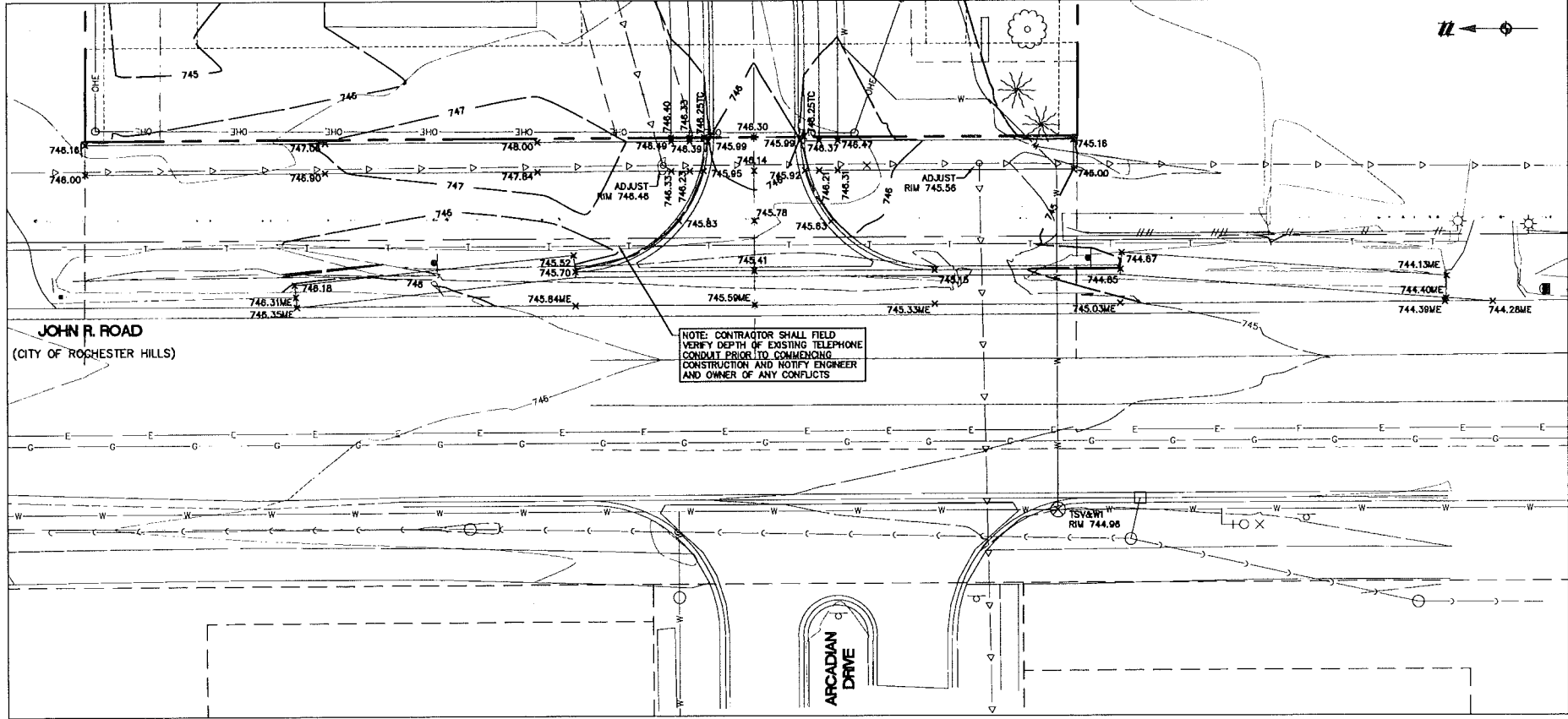
NORTH BOULDER WALL ELEVATIONS
SCALE: 1" = 20'



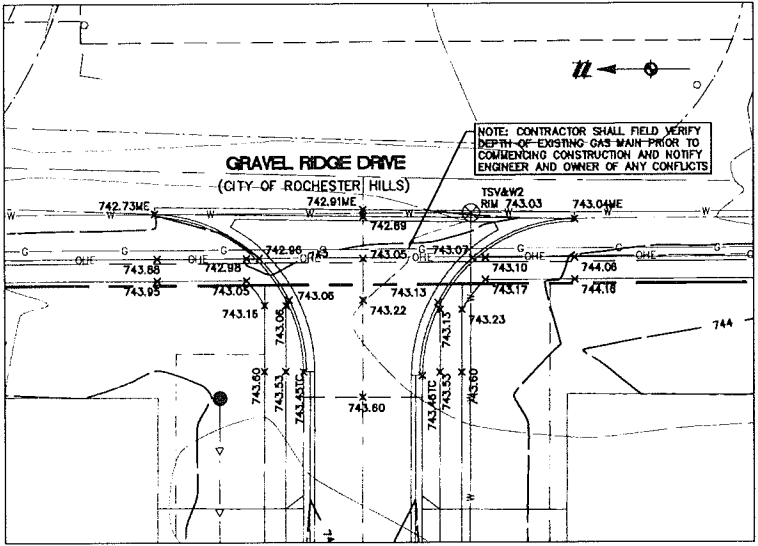
DETENTION BASIN CROSS SECTION A-A
NOT TO SCALE



SOUTH BOULDER WALL ELEVATIONS
SCALE: 1" = 20'



JOHN R. ROAD INTERSECTION GRADING DETAIL
SCALE: 1" = 20'



GRAVEL RIDGE DRIVE INTERSECTION GRADING DETAIL
SCALE: 1" = 20'

811

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THE LIABILITY OF CONFIDENTIALITY OF INFORMATION IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE DEPTH AND LOCATION OF ALL UTILITIES PRIOR TO COMMENCING CONSTRUCTION AND NOTIFY ENGINEER AND OWNER OF ANY CONFLICTS.

NOTICE: CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE DEPTH AND LOCATION OF ALL UTILITIES PRIOR TO COMMENCING CONSTRUCTION AND NOTIFY ENGINEER AND OWNER OF ANY CONFLICTS.

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SECTION 24
TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

M2/J, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
DETAILED GRADING PLAN

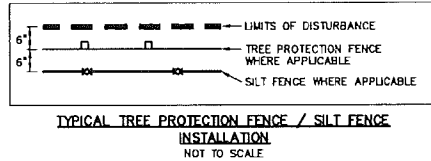
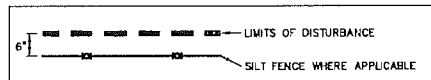
DATE: NOVEMBER 22, 2017
01-12-2018 CITY SUBMITAL
02-28-2018 REVISED PER CITY

NO.	REVISIONS

SCALE: AS NOTED
DRAWN BY: REX
CHECKED BY: JPC
P.M.: E. LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO. C-08

- LEGEND**
- BOUNDARY LINE
 - EXISTING ROW
 - LIMITS OF DISTURBANCE
 - EXISTING CONTOUR
 - PROPOSED CONTOUR
 - TEMPORARY SILT FENCE, SEE DETAIL SHEET C-11
 - TREE PROTECTION FENCE, SEE DETAIL SHEET C-05
 - PROPOSED RIDGE LINE
 - TEMPORARY CONSTRUCTION ENTRANCE, SEE DETAIL SHEET C-11
 - RIP RAP, SEE DETAIL SHEET C-11
 - EROSION CONTROL BLANKET
 - WETLAND AREA NOT TO BE DISTURBED
 - TEMPORARY INLET FILTER, SEE DETAIL SHEET C-11

SITE DATA TABLE	
TOTAL PROJECT AREA (ACRES)	4.64
TOTAL DISTURBED AREA (ACRES)	4.6



CITY OF ROCHESTER HILLS EROSION NOTES

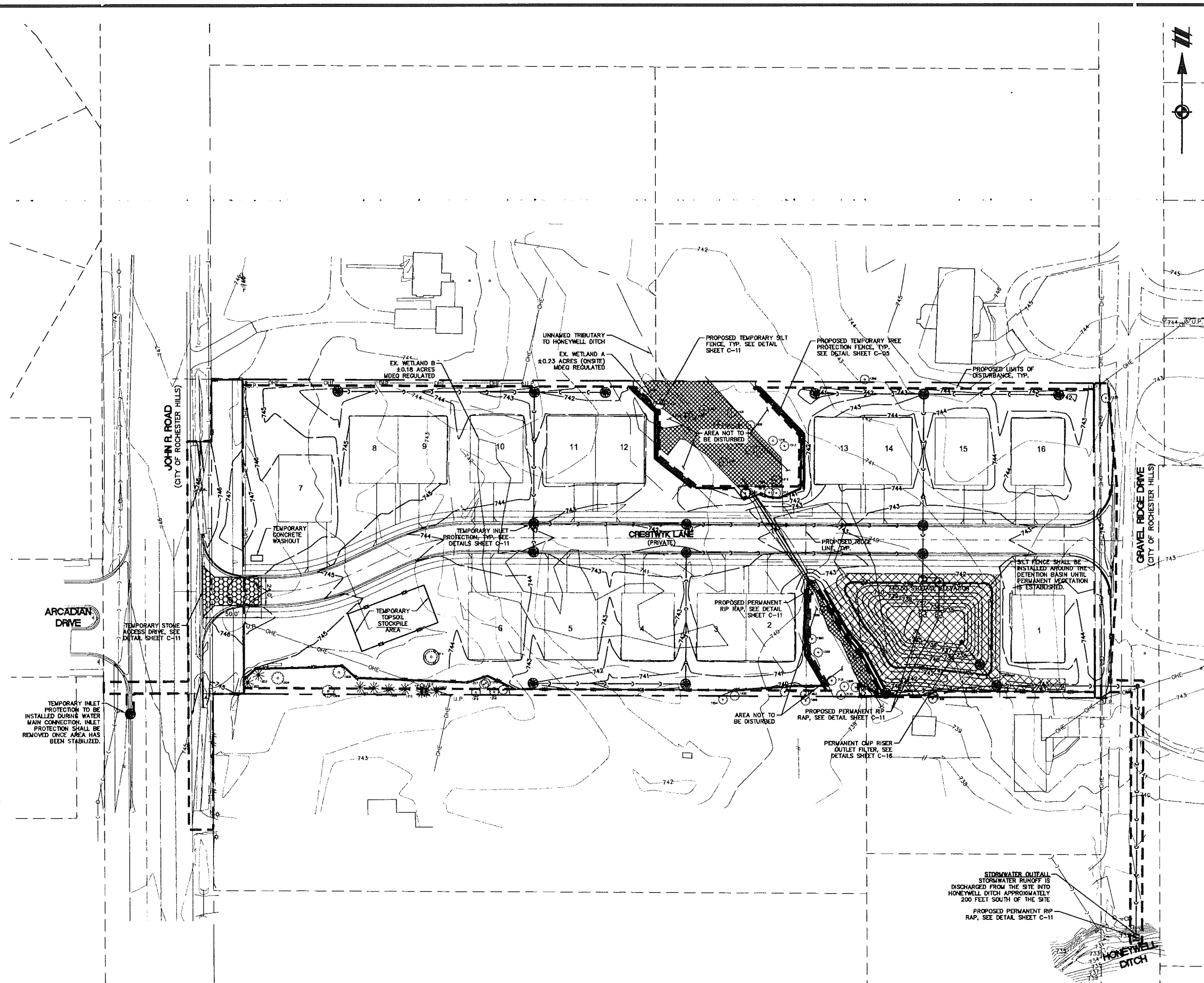
- ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO STANDARDS AND SPECIFICATIONS OF THE OAKLAND COUNTY DRAIN COMMISSIONER.
- ALL TEMPORARY AND PERMANENT (POST CONSTRUCTION) SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL CONFORM TO THE CITY OF ROCHESTER HILLS CURRENT MSA PERMIT. ANY CONFLICT BETWEEN THESE STANDARDS AND THE MSA 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 SO2 FILTERS.
- STAGING 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.

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LEGAL DESCRIPTION

LOT 7 OF FERRYMEW HOMELANDS SUBDIVISION AS RECORDED IN LIBER 27, PAGE 22, OAKLAND COUNTY RECORDS, A SUBDIVISION IN THE SOUTHWEST 1/4 OF SECTION 24, T3N, R11E, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN



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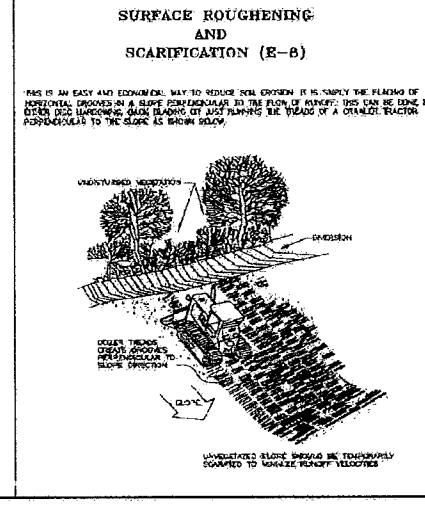
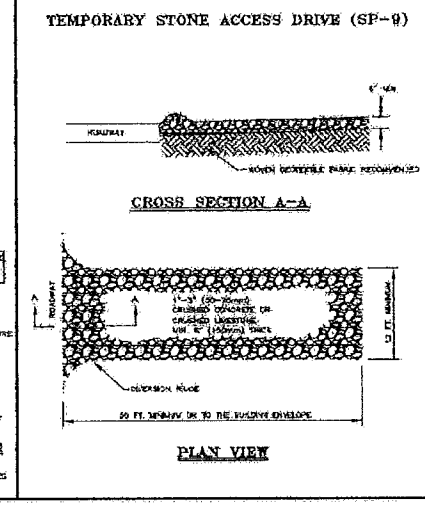
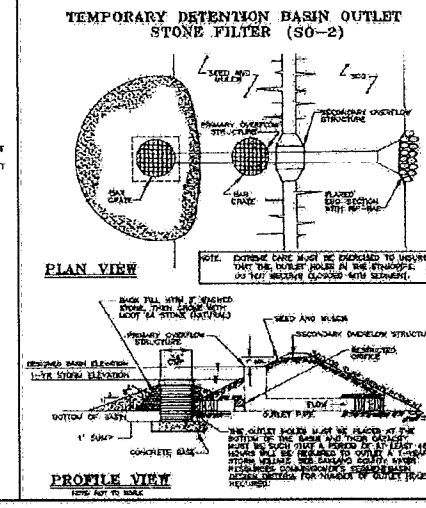
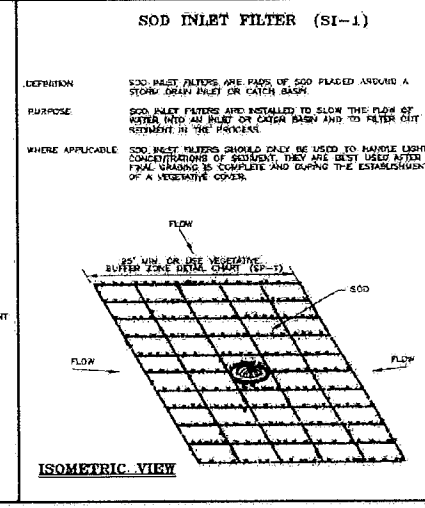
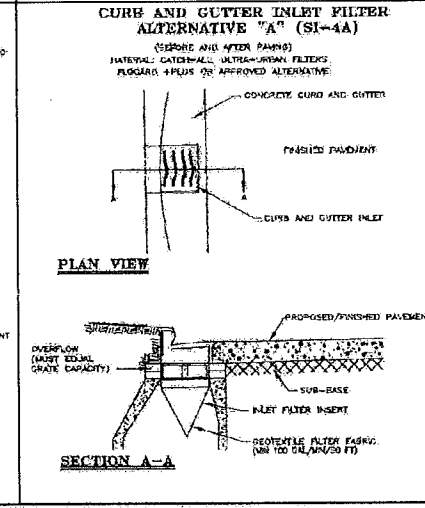
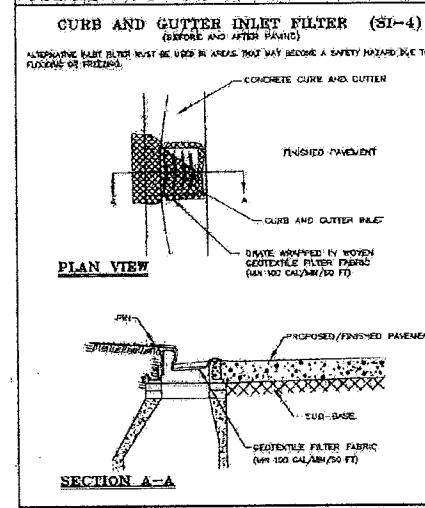
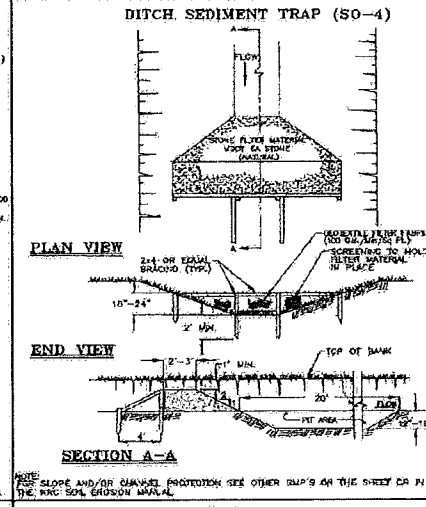
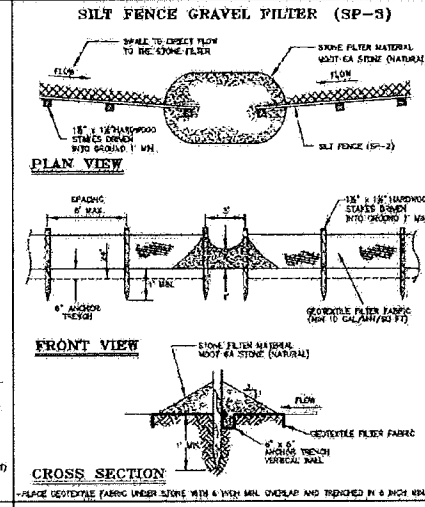
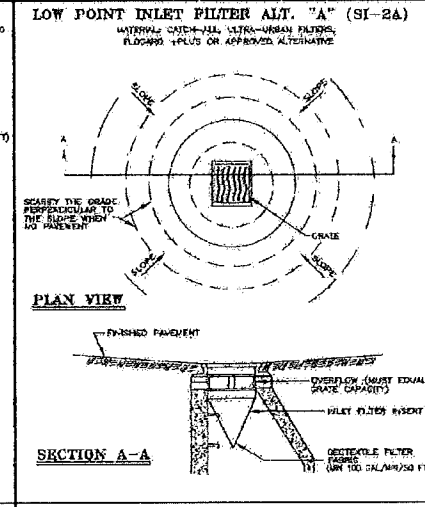
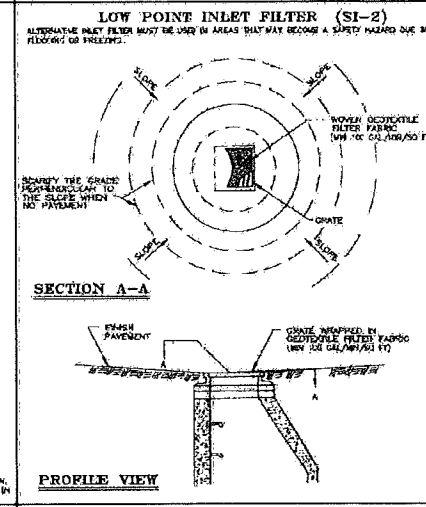
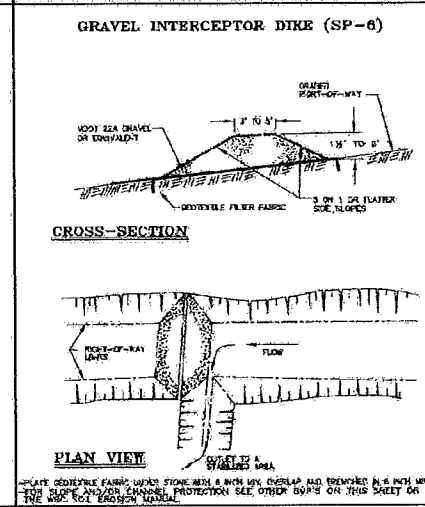
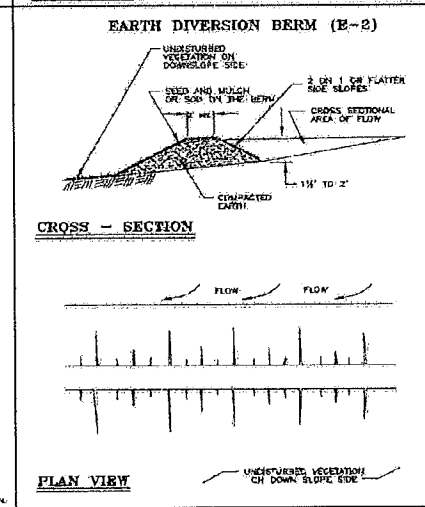
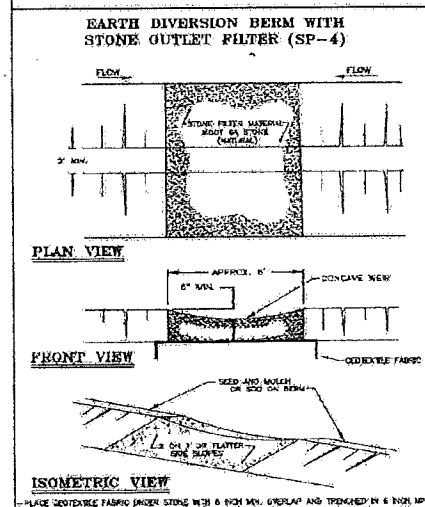
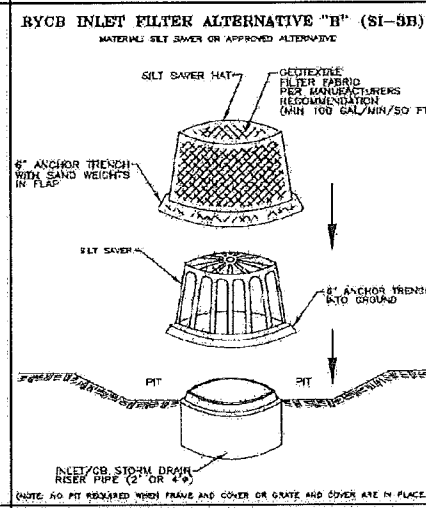
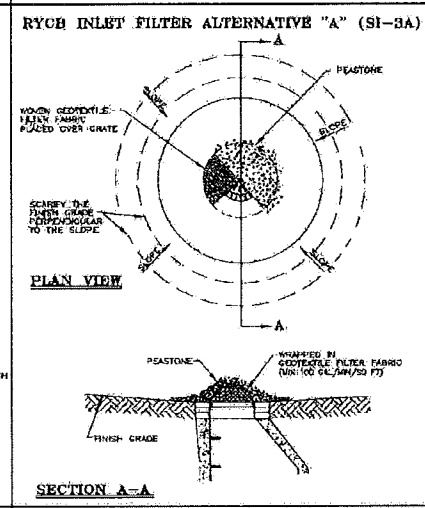
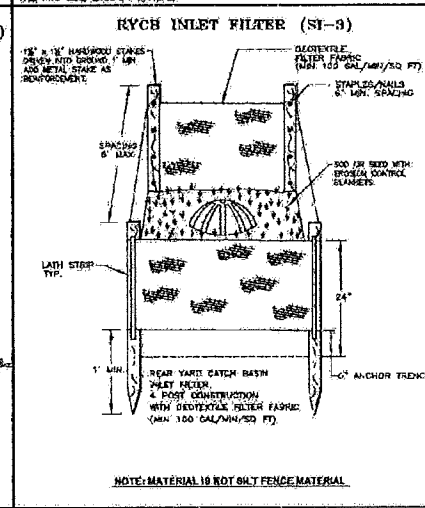
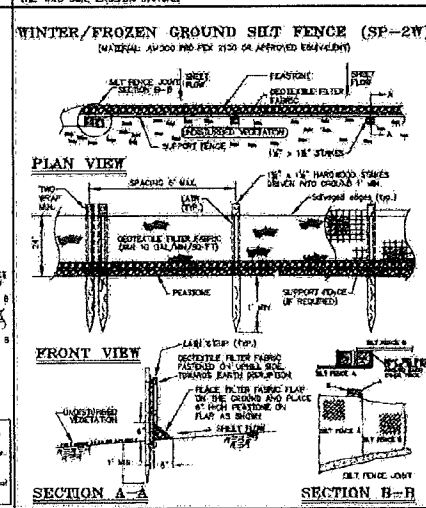
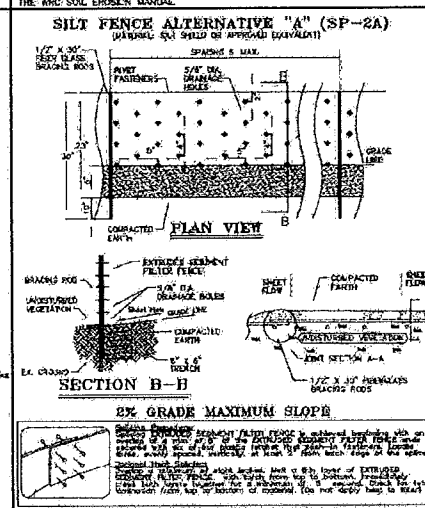
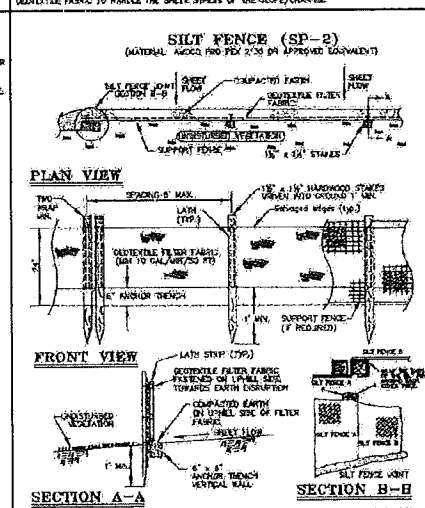
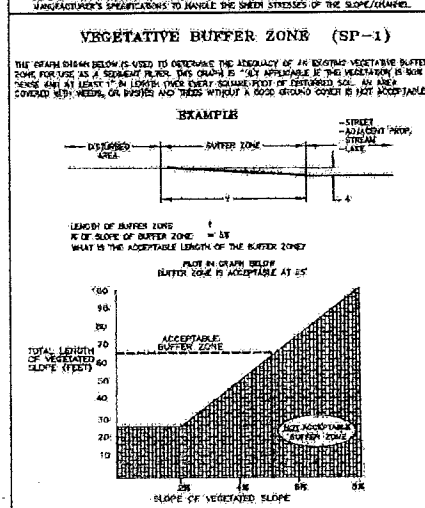
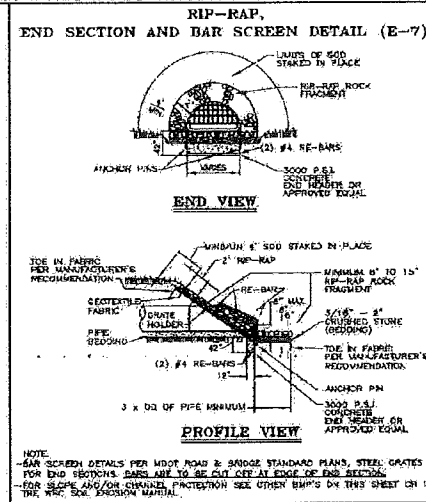
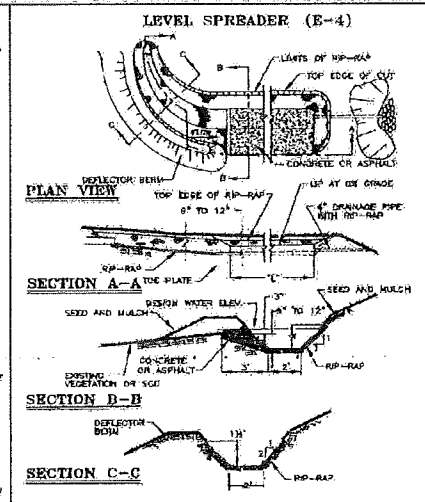
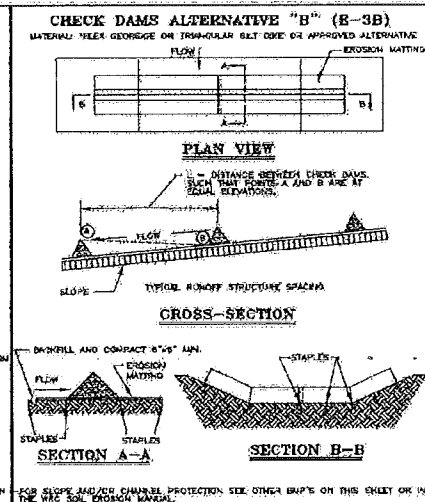
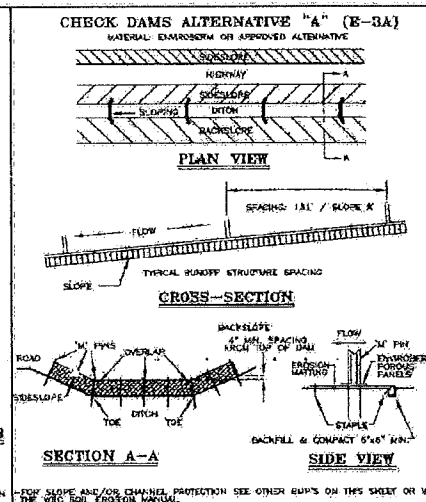
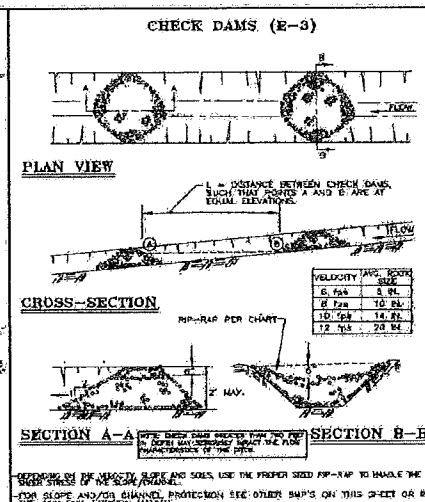
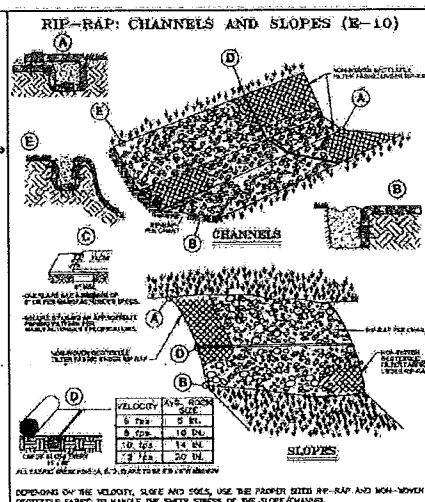
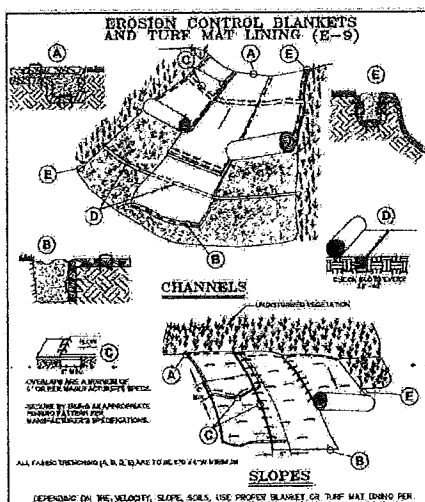
SECTION 24
TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

M2/J, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
EROSION CONTROL PLAN

DATE
NOVEMBER 22, 2017
01-13-2018 CITY SUBMITTAL
02-28-2018 REVISED PER CITY

NO.	REVISIONS

SCALE 0 20 40
1" = 40 FEET
DRAWN BY: REX
CHECKED BY: JPC
P.M.: E LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO. C-09



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

DATE: 01/2011

SCALE: NONE

DESIGNED BY: WIC

DRAWN BY: MJP

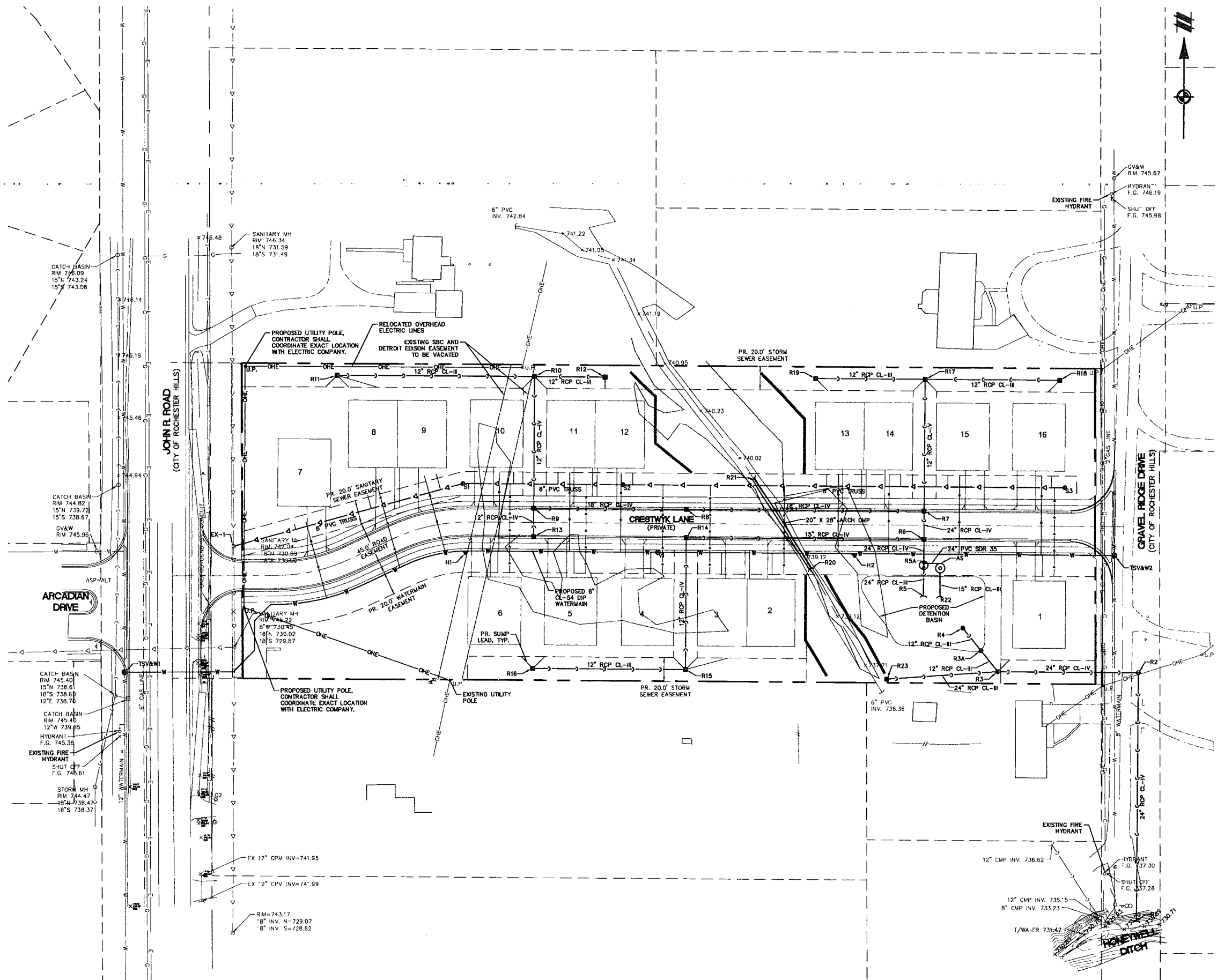
SHEET NO: C-11

LEGEND	
---	BOUNDARY LINE
---	EXISTING ROW
---	EXISTING EASEMENT LINE
---	PROPOSED EASEMENT LINE
---	EXISTING SANITARY SEWER
---	PROPOSED SANITARY SEWER
---	EXISTING STORM SEWER
---	PROPOSED STORM SEWER
---	EXISTING WATER LINE
---	PROPOSED WATER LINE
---	EXISTING UNDERGROUND GAS
---	PROPOSED UNDERGROUND GAS
---	EXISTING UNDERGROUND TELEPHONE
---	PROPOSED UNDERGROUND TELEPHONE
---	EXISTING OVERHEAD ELECTRIC
---	PROPOSED OVERHEAD ELECTRIC
---	EXISTING LIGHT POLE
○	EXISTING MANHOLE/CATCH BASIN
●	PROPOSED MANHOLE/CATCH BASIN/INLET
---	EXISTING END SECTION
---	PROPOSED END SECTION
---	EXISTING WATER VALVE
---	PROPOSED WATER VALVE
---	EXISTING FIRE HYDRANT
---	PROPOSED FIRE HYDRANT
○	EXISTING UTILITY POLE
○	PROPOSED UTILITY POLE

NOTES

- SEE SHEET C-02 FOR UTILITY NOTES AND SHEETS C-21 THRU C-25 FOR CITY OF ROCHESTER HILLS NOTES AND DETAILS.
- A CONTINUOUS EDGE DRAIN SHALL BE PROVIDED ALONG THE FULL LENGTH OF THE PROPOSED ROADWAY. THE EDGE DRAIN SHALL TIE INTO THE PROPOSED STORM SEWER SYSTEM.

CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH APPROPRIATE UTILITY COMPANIES TO ENSURE THAT THE REQUIRED VERTICAL AND HORIZONTAL CLEARANCES AT ALL LOCATIONS WHERE ANY UTILITY LINE CROSSES AN EXISTING OR PROPOSED GAS, TELEPHONE OR ELECTRIC LINE ARE MET.



BENCHMARKS:

BENCHMARK A:
ARROW ON HYDRANT, WEST SIDE OF JOHN R. ROAD, 25'± SOUTH OF SOUTH PROPERTY LINE
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CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

M2J1, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
OVERALL UTILITY PLAN

DATE
NOVEMBER 22, 2017
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NO.	DATE	DESCRIPTION

REVISIONS

SCALE 0 20 40
1" = 40 FEET

DRAWN BY: REK
CHECKED BY: JPC
P.M.: E. LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO. C-12

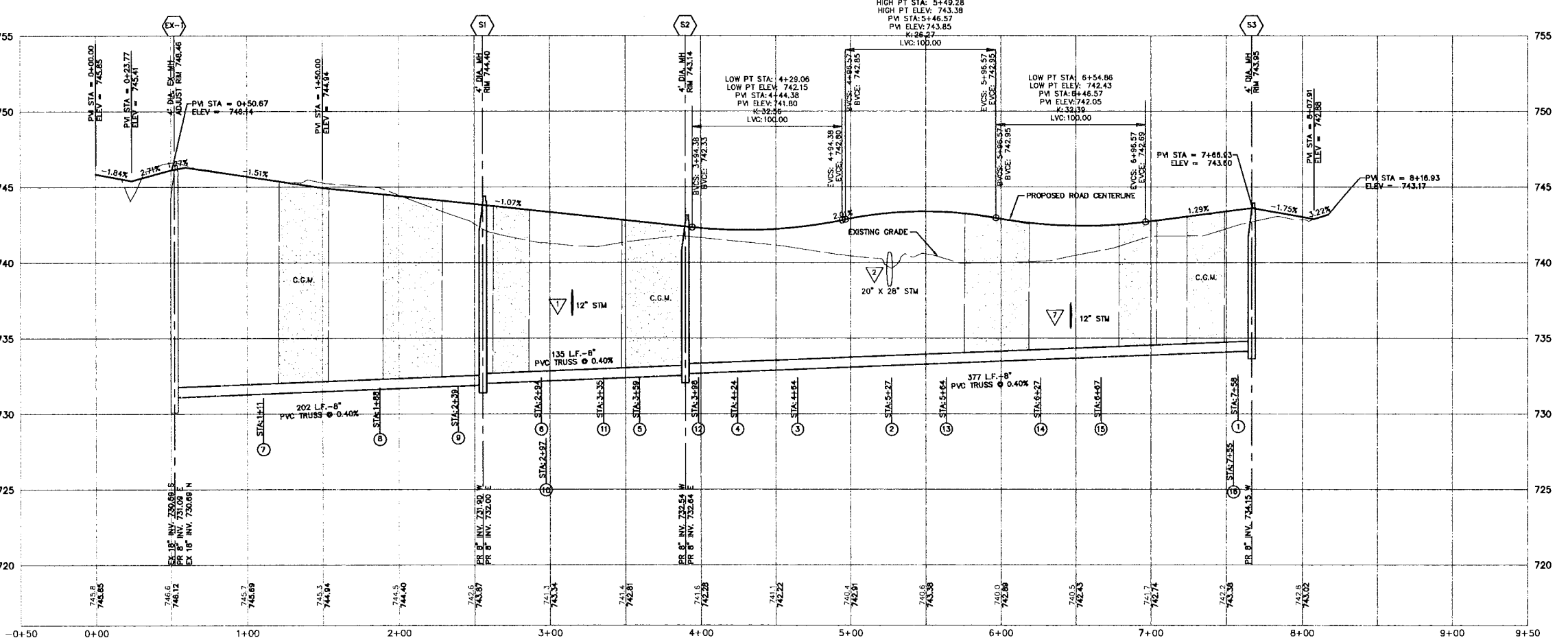
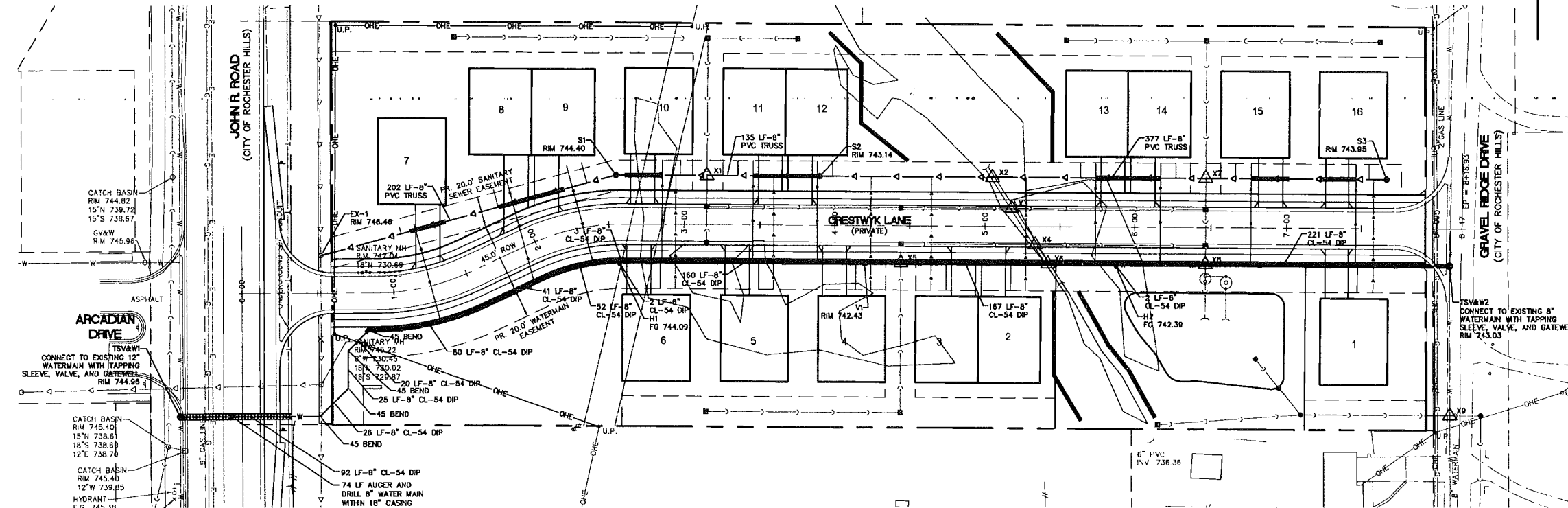
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LEGEND

- BOUNDARY LINE
- EXISTING ROW
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SEWER LEAD
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING WATER LINE
- PROPOSED WATER LINE
- PROPOSED WATER LEAD
- EXISTING UNDERGROUND GAS
- PROPOSED UNDERGROUND GAS
- EXISTING UNDERGROUND TELEPHONE
- PROPOSED UNDERGROUND TELEPHONE
- EXISTING OVERHEAD TELEPHONE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- PROPOSED UNDERGROUND ELECTRIC
- PROPOSED OVERHEAD ELECTRIC
- PROPOSED COMPACTED GRANULAR MATERIAL (C.G.M.)
- EXISTING LIGHT POLE
- PROPOSED LIGHT POLE
- EXISTING MANHOLE/CATCH BASIN
- PROPOSED MANHOLE/CATCH BASIN/INLET
- EXISTING END SECTION
- PROPOSED END SECTION
- EXISTING WATER VALVE
- PROPOSED WATER VALVE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- EXISTING UTILITY POLE
- PROPOSED UTILITY POLE
- PROPOSED UTILITY CROSSING, SEE UTILITY CROSSING CHART SHEET C-18

- NOTES:**
- SEE SHEET C-02 FOR UTILITY NOTES AND SHEETS C-22 THRU C-25 FOR CITY OF ROCHESTER HILLS SANITARY SEWER AND WATER MAIN NOTES AND DETAILS.
 - ALL UTILITY TRENCH BACKFILL WITHIN THE INFLUENCE OF PAVEMENT SHALL BE MDOT CLASS II GRANULAR MATERIAL.
 - REFER TO SHEET C-18 FOR PIPE CROSSING TABLE AND SANITARY SEWER LEAD TABLE.
 - ALL SANITARY HOUSE LEADS SHALL BE PVC SDR 23.5 PIPE.
 - A SUCCESSFUL AIR TEST AND VIDEO RECORDING OF THE SANITARY SEWER SHALL BE REQUIRED FOR PROJECT ACCEPTANCE.
 - A SAFE BACTERIOLOGICAL AND PRESSURE TESTS SHALL BE REQUIRED FOR PROJECT ACCEPTANCE.

CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH APPROPRIATE UTILITY COMPANIES TO ENSURE THAT THE REQUIRED VERTICAL AND HORIZONTAL CLEARANCES AT ALL LOCATIONS WHERE ANY UTILITY LINE CROSSES AN EXISTING OR PROPOSED GAS, TELEPHONE OR ELECTRIC LINE ARE MET.



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

THE LOCATION OF THE EXISTING UTILITIES SHOWN ON THESE PLANS WAS DETERMINED BY SURFACE AND/OR UNDERGROUND METHODS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION. ANY DAMAGE TO UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND CONSTRUCTION NOTICES FROM ALL UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL UTILITIES. ANY DAMAGE TO UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND CONSTRUCTION NOTICES FROM ALL UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL UTILITIES. ANY DAMAGE TO UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF ANY TEMPORARY STRUCTURES OR OTHER NECESSARY STRUCTURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL PERSONNEL AND THE PUBLIC. ANY ACCIDENTS OR DAMAGES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

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OAKLAND COUNTY, MICHIGAN 48869

SECTION 24
TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

M2/J1, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
ROAD, SANITARY SEWER, AND WATERMAIN PLAN

DATE: NOVEMBER 22, 2017
01-12-2018 CITY SUBMITTAL
03-16-2019 REVISED PER CITY

REVISIONS

SCALE 0 20 40
1" = 40 FEET
DRAWN BY: REK
CHECKED BY: JPC
P.M.: E. LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO. C-13

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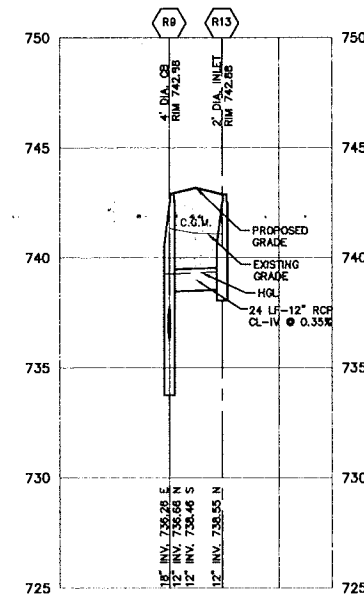
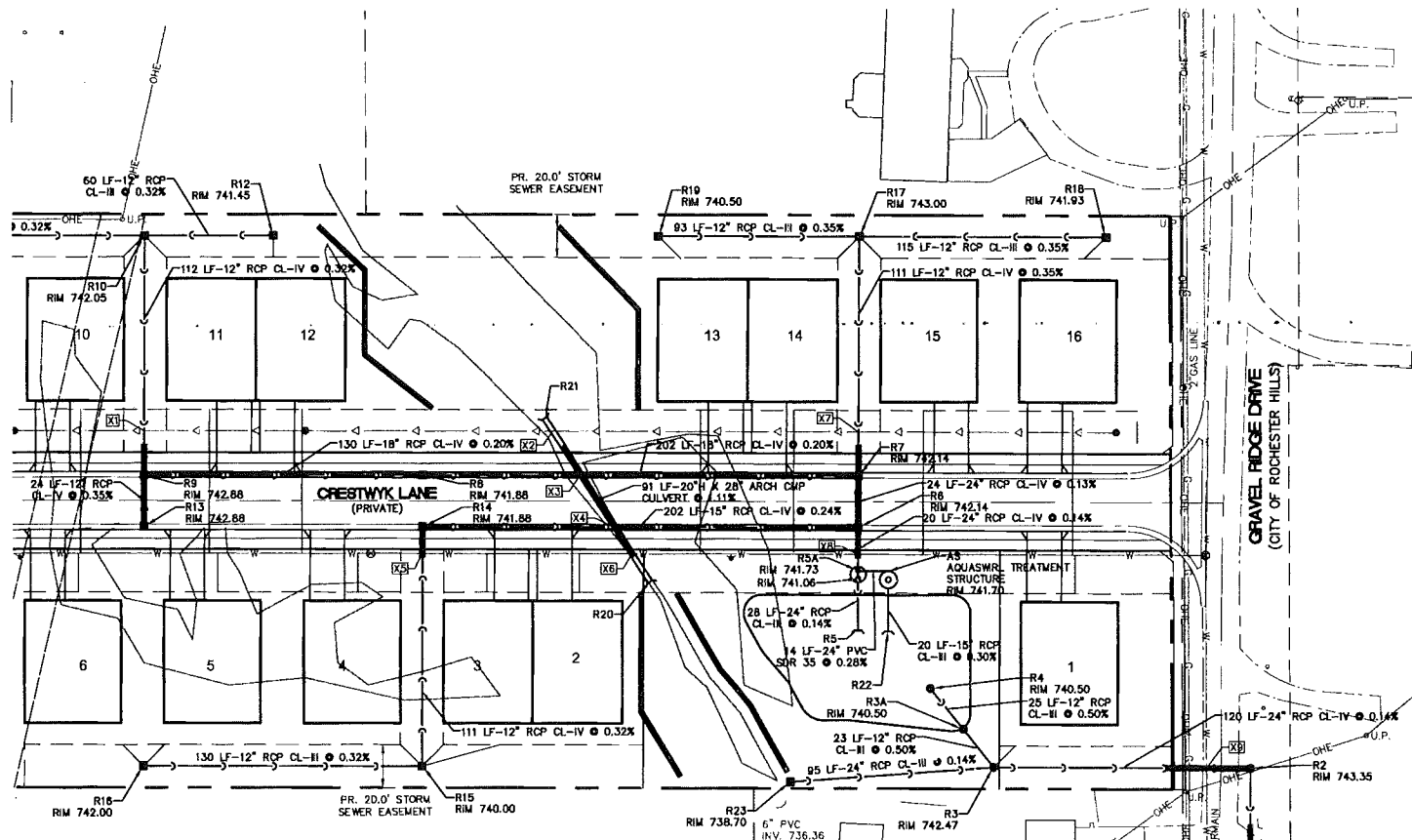
LEGEND

---	BOUNDARY LINE
---	EXISTING ROW
---	EXISTING EASEMENT LINE
---	PROPOSED EASEMENT LINE
---	EXISTING SANITARY SEWER
---	PROPOSED SANITARY SEWER
---	EXISTING STORM SEWER
---	PROPOSED STORM SEWER
---	EXISTING WATER LINE
---	PROPOSED WATER LINE
---	EXISTING UNDERGROUND GAS
---	PROPOSED UNDERGROUND GAS
---	EXISTING UNDERGROUND TELEPHONE
---	PROPOSED UNDERGROUND TELEPHONE
---	EXISTING UNDERGROUND ELECTRIC
---	PROPOSED UNDERGROUND ELECTRIC
---	EXISTING OVERHEAD ELECTRIC
---	PROPOSED OVERHEAD ELECTRIC
---	PROPOSED COMPACTED GRANULAR MATERIAL (C.G.M.)
---	EXISTING LIGHT POLE
---	PROPOSED LIGHT POLE
---	EXISTING MANHOLE/CATCH BASIN
---	PROPOSED MANHOLE/CATCH BASIN/INLET
---	EXISTING CLEANOUT
---	PROPOSED CLEANOUT
---	PROPOSED DOWNSPOUT
---	EXISTING END SECTION
---	PROPOSED END SECTION
---	EXISTING WATER VALVE
---	PROPOSED WATER VALVE
---	EXISTING FIRE HYDRANT
---	PROPOSED FIRE HYDRANT
---	EXISTING UTILITY POLE
---	PROPOSED UTILITY POLE
---	PROPOSED UTILITY CROSSING, SEE UTILITY CROSSING CHART SHEET C-18

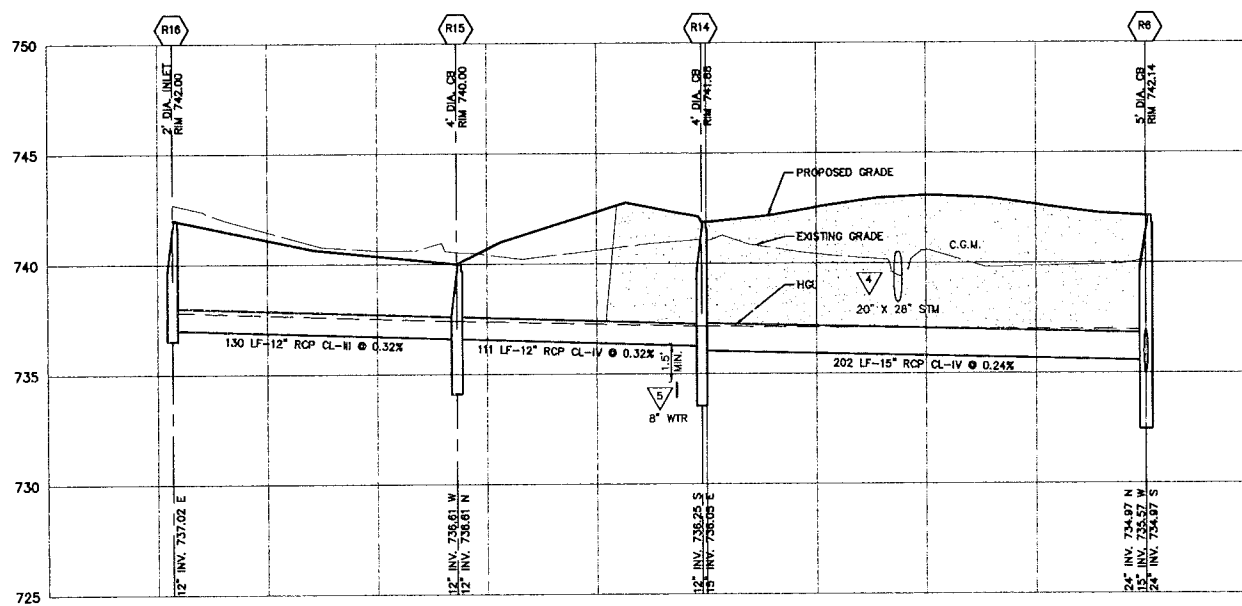
CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH APPROPRIATE UTILITY COMPANIES TO ENSURE THAT THE REQUIRED VERTICAL AND HORIZONTAL CLEARANCES AT ALL LOCATIONS WHERE ANY UTILITY LINE CROSSES AN EXISTING OR PROPOSED GAS, TELEPHONE OR ELECTRIC LINE ARE MET.

NOTES

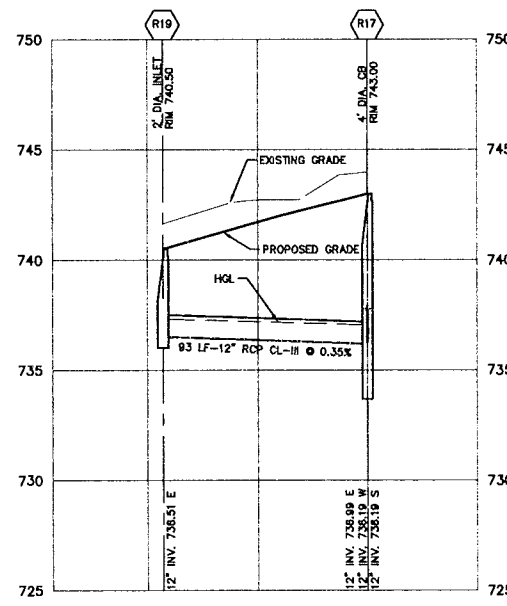
- SEE SHEET C-02 FOR UTILITY NOTES AND SHEET C-21 FOR CITY OF ROCHESTER HILLS STORM SEWER NOTES AND DETAILS.
- A CONTINUOUS EDGE DRAIN SHALL BE PROVIDED ALONG THE FULL LENGTH OF THE PROPOSED ROADWAY. THE EDGE DRAIN SHALL TIE INTO THE PROPOSED STORM SEWER SYSTEM.
- ALL ALL UTILITY TRENCH BACKFILL WITHIN THE INFLUENCE OF PAVEMENT SHALL BE WOOD CLASS II GRANULAR MATERIAL.
- REFER TO SHEET C-19 FOR PIPE CROSSING TABLE AND SANITARY SEWER LEAD TABLE.
- ALL BASEMENTS TO BE SERVED WITH SUMP PUMP LEADS.



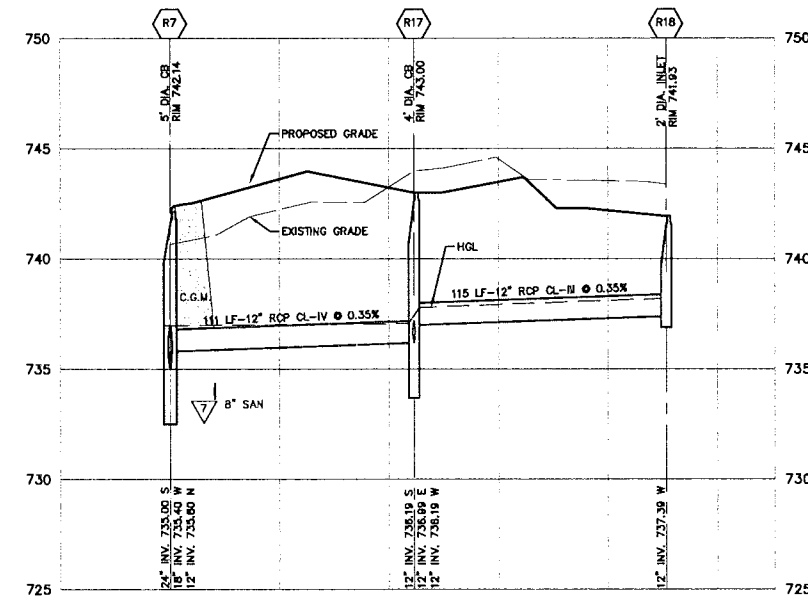
STORM R9-R13
VERT: 1"=4'
HORZ: 1"=40'



STORM R6-R16
VERT: 1"=4'
HORZ: 1"=40'



STORM R17-R19
VERT: 1"=4'
HORZ: 1"=40'



STORM R7-R18
VERT: 1"=4'
HORZ: 1"=40'

811

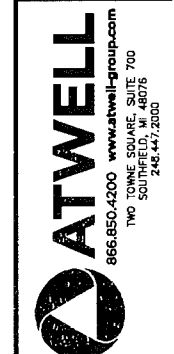
Know what's below.

Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE CONTRACTOR. THE CONTRACTOR SHALL OBTAIN THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCURRED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESENT ANY AND ALL UNDERGROUND UTILITIES.

NOTICE: CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE ENGINEER NOR THE ENGINEER SHALL BE RESPONSIBLE FOR SAFETY OF THE WORK, OR PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES OR OF ANY OTHER PERSONS.

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SECTION 24

TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

M2J1, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
STORM SEWER PLAN AND PROFILE

DATE: NOVEMBER 22, 2017
01-12-2018 CITY SUBMITTAL
02-28-2018 REVISION PER CITY

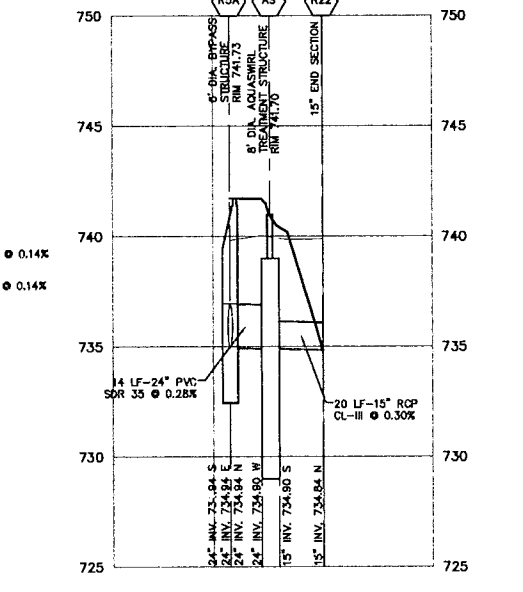
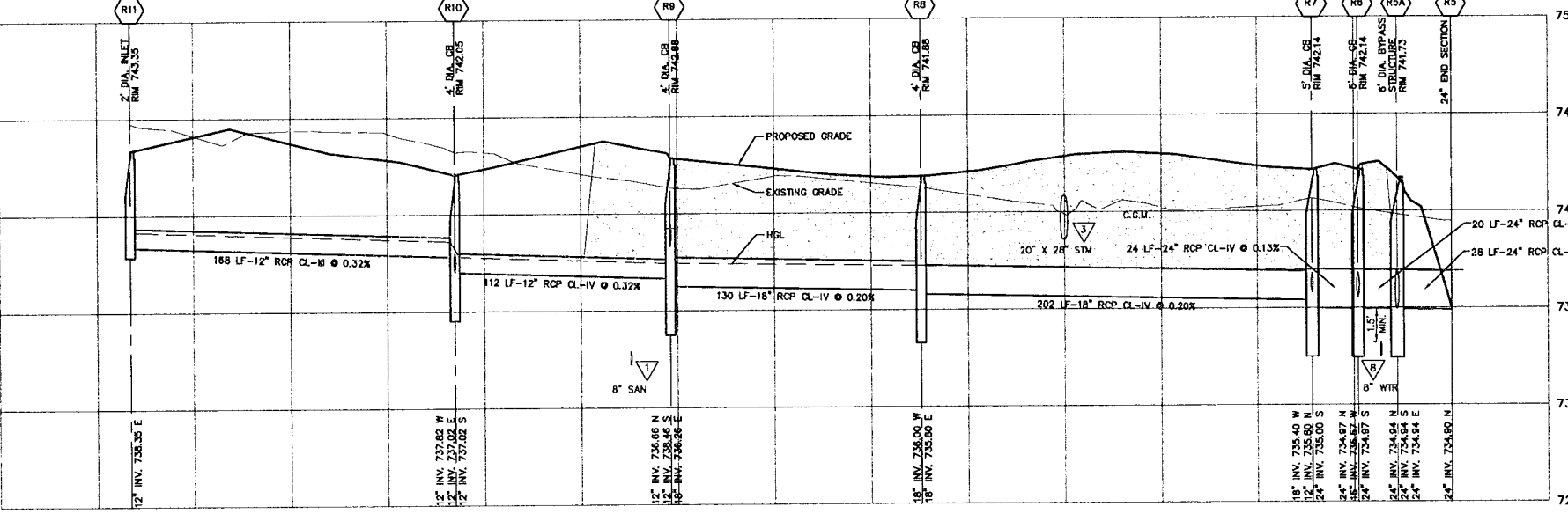
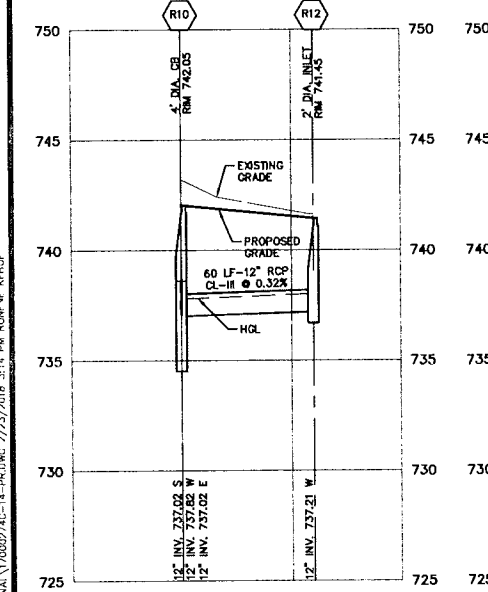
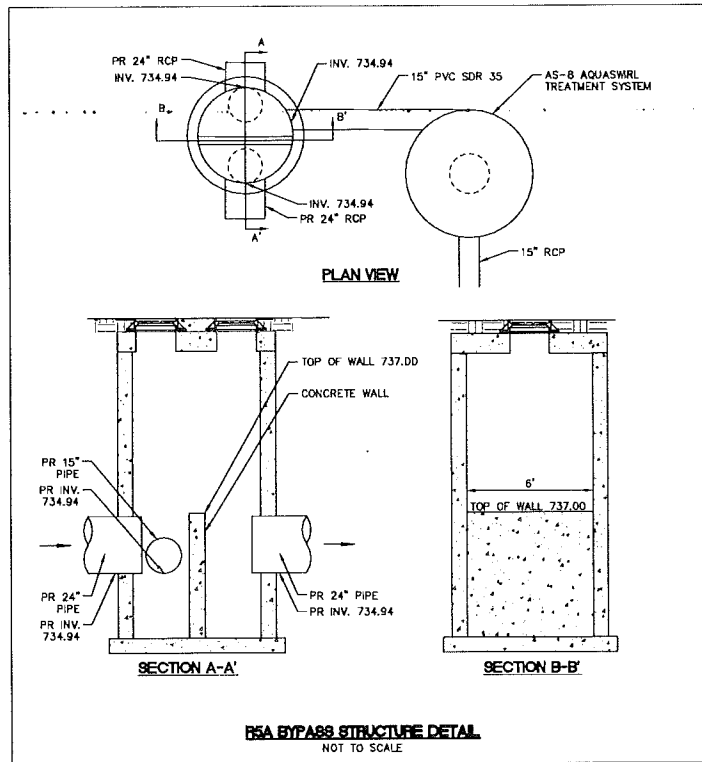
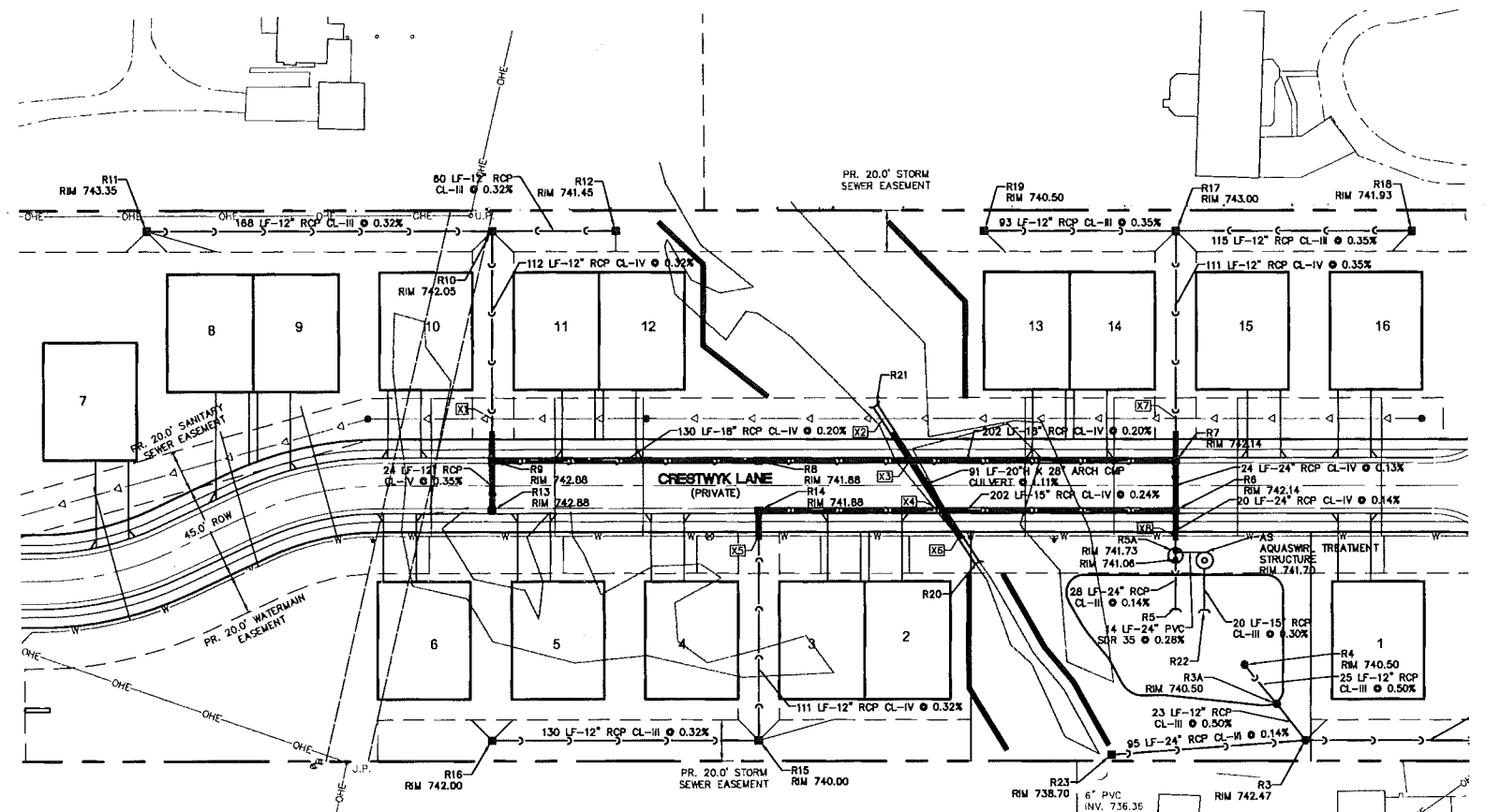
REVISIONS
SCALE 0 20 40
1" = 40 FEET
DRAWN BY: REK
CHECKED BY: JPC
P.M.: E LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO. C-14

---	BOUNDARY LINE
---	EXISTING ROW
---	EXISTING EASEMENT LINE
---	PROPOSED EASEMENT LINE
->->	EXISTING SANITARY SEWER
->->	PROPOSED SANITARY SEWER
->->	EXISTING STORM SEWER
->->	PROPOSED STORM SEWER
---	EXISTING WATER LINE
---	PROPOSED WATER LINE
---	EXISTING UNDERGROUND GAS
---	PROPOSED UNDERGROUND GAS
---	EXISTING UNDERGROUND TELEPHONE
---	PROPOSED UNDERGROUND TELEPHONE
---	EXISTING OVERHEAD ELECTRIC
---	PROPOSED UNDERGROUND ELECTRIC
---	PROPOSED OVERHEAD ELECTRIC
---	PROPOSED COMPACTED GRANULAR MATERIAL (C.G.M.)
---	PROPOSED COMPACTED GRANULAR MATERIAL (C.G.M.)
○	EXISTING LIGHT POLE
○	PROPOSED LIGHT POLE
□	EXISTING MANHOLE/CATCH BASIN
□	PROPOSED MANHOLE/CATCH BASIN/INLET
○	EXISTING CLEANOUT
○	PROPOSED CLEANOUT
○	EXISTING DOWNSPOUT
○	PROPOSED DOWNSPOUT
⌋	EXISTING END SECTION
⌋	PROPOSED END SECTION
⊕	EXISTING WATER VALVE
⊕	PROPOSED WATER VALVE
⊕	EXISTING FIRE HYDRANT
⊕	PROPOSED FIRE HYDRANT
⊕	EXISTING UTILITY POLE
⊕	PROPOSED UTILITY POLE
⊕	PROPOSED UTILITY CROSSING, SEE UTILITY CROSSING CHART SHEET C-18

CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH APPROPRIATE UTILITY COMPANIES TO ENSURE THAT THE REQUIRED VERTICAL AND HORIZONTAL CLEARANCES AT ALL LOCATIONS WHERE ANY UTILITY LINE CROSSES AN EXISTING OR PROPOSED GAS, TELEPHONE OR ELECTRIC LINE ARE MET.

NOTES

- SEE SHEET C-02 FOR UTILITY NOTES AND SHEET C-21 FOR CITY OF ROCHESTER HILLS STORM SEWER NOTES AND DETAILS.
- A CONTINUOUS EDGE DRAIN SHALL BE PROVIDED ALONG THE FULL LENGTH OF THE PROPOSED ROADWAY. THE EDGE DRAIN SHALL TIE INTO THE PROPOSED STORM SEWER SYSTEM.
- ALL ALL UTILITY TRENCH BACKFILL WITHIN THE INFLUENCE OF PAVEMENT SHALL BE MDOT CLASS II GRANULAR MATERIAL.
- REFER TO SHEET C-19 FOR PIPE CROSSING TABLE AND SANITARY SEWER LEAD TABLE.
- ALL BASEMENTS TO BE SERVED WITH SUMP PUMP LEADS.



12" INV. 737.02 S
12" INV. 737.02 W
12" INV. 737.02 E
12" INV. 737.21 W

12" INV. 738.35 E
12" INV. 737.02 W
12" INV. 737.02 E
12" INV. 737.02 S
12" INV. 738.66 N
12" INV. 738.46 S
12" INV. 738.36 E
15" INV. 735.00 W
15" INV. 735.80 E
18" INV. 735.40 W
24" INV. 735.00 S
24" INV. 734.87 N
24" INV. 734.84 W
24" INV. 734.84 N
24" INV. 734.87 S
24" INV. 734.94 N
24" INV. 734.94 E
24" INV. 734.94 W
24" INV. 734.94 S

24" INV. 734.94 E
24" INV. 734.94 W
24" INV. 734.84 N
24" INV. 734.84 S
15" INV. 734.90 S
15" INV. 734.84 N

811
Know what's below.
Call before you dig.
THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE MANNER ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICES
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. HOWEVER, THE OWNER AND THE ENGINEER SHALL BE RESPONSIBLE TO ASSURE AN APPROPRIATE RESPONSIBILITY FOR SAFETY OF THE WORK OF PERSONS ENGAGED IN THE WORK OF ANY NEARBY STRUCTURES OR OF ANY OTHER PERSONS.

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SECTION 24
TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

MPJ, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
STORM SEWER PLAN AND PROFILE

DATE: NOVEMBER 22, 2017
01-12-2018 CITY SUBMITTAL
02-26-2018 REVISED PER CITY

NO.	DESCRIPTION

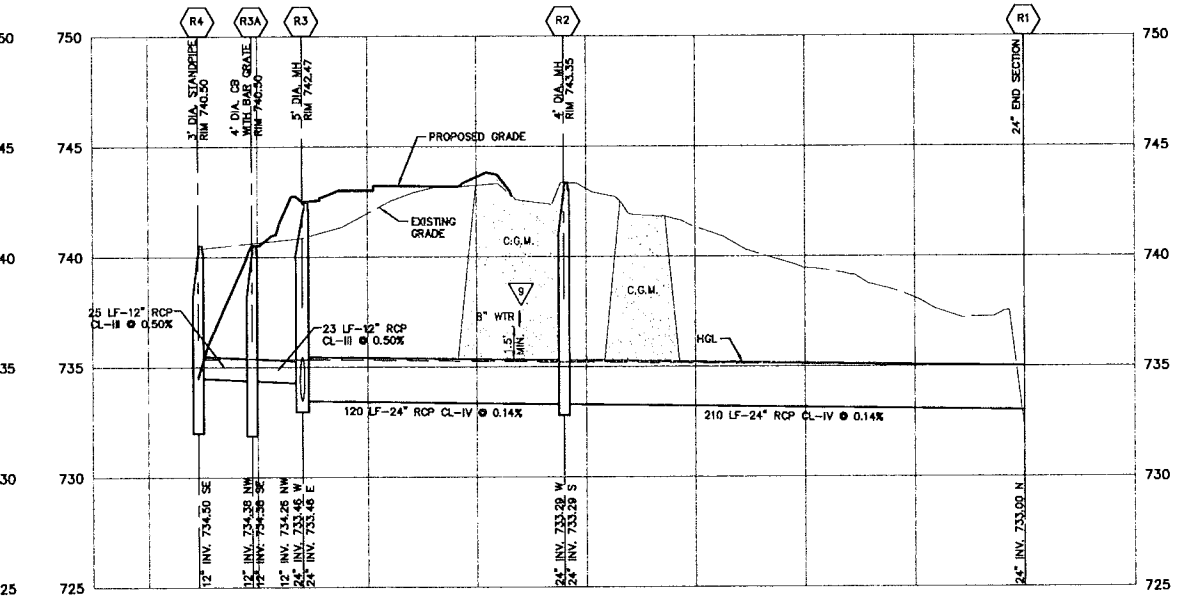
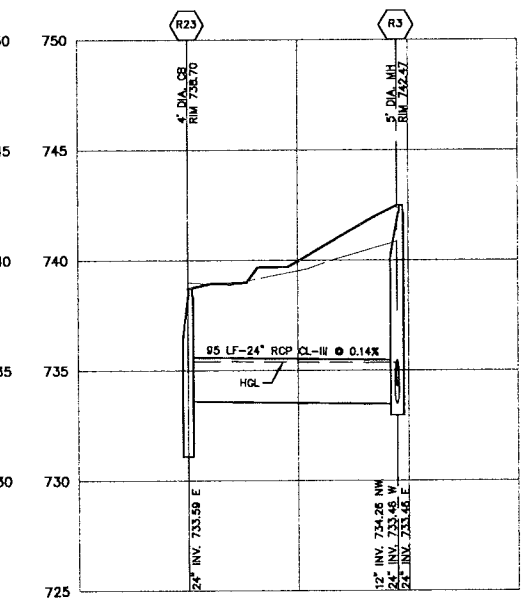
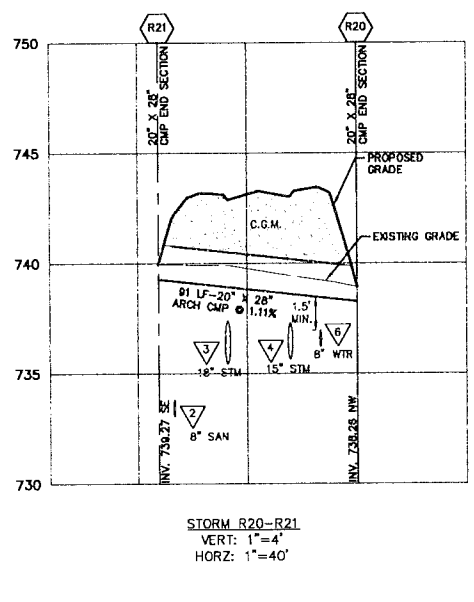
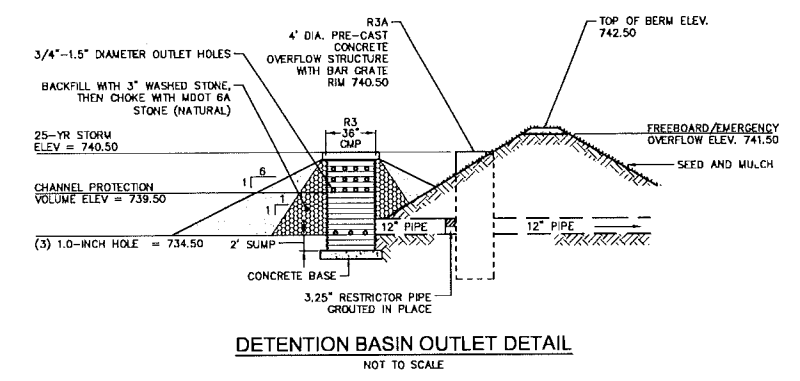
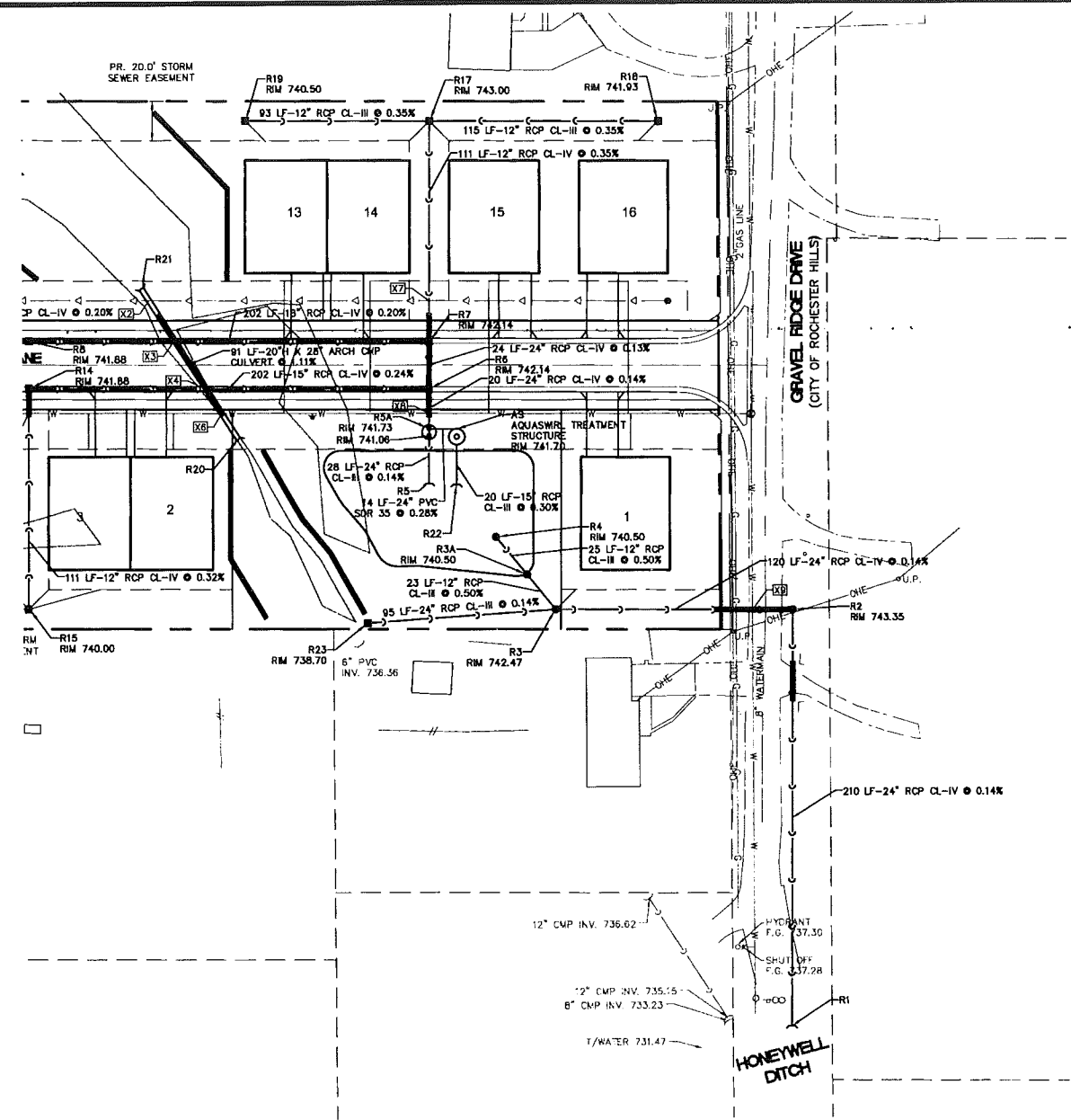
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1" = 40 FEET
DRAWN BY: REK
CHECKED BY: JPC
P.M.: E. LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO. C-15

LEGEND

---	BOUNDARY LINE
---	EXISTING ROW
---	EXISTING EASEMENT LINE
---	PROPOSED EASEMENT LINE
---	EXISTING SANITARY SEWER
---	PROPOSED SANITARY SEWER
---	EXISTING STORM SEWER
---	PROPOSED STORM SEWER
---	EXISTING WATER LINE
---	PROPOSED WATER LINE
---	EXISTING UNDERGROUND GAS
---	PROPOSED UNDERGROUND GAS
---	EXISTING UNDERGROUND TELEPHONE
---	PROPOSED UNDERGROUND TELEPHONE
---	EXISTING UNDERGROUND ELECTRIC
---	PROPOSED UNDERGROUND ELECTRIC
---	EXISTING OVERHEAD ELECTRIC
---	PROPOSED OVERHEAD ELECTRIC
---	PROPOSED COMPACTED GRANULAR MATERIAL (C.G.M.)
---	EXISTING LIGHT POLE
---	PROPOSED LIGHT POLE
---	EXISTING MANHOLE/CATCH BASIN
---	PROPOSED MANHOLE/CATCH BASIN/INLET
---	EXISTING CLEANOUT
---	PROPOSED CLEANOUT
---	EXISTING DOWNSPOUT
---	PROPOSED DOWNSPOUT
---	EXISTING END SECTION
---	PROPOSED END SECTION
---	EXISTING WATER VALVE
---	PROPOSED WATER VALVE
---	EXISTING FIRE HYDRANT
---	PROPOSED FIRE HYDRANT
---	EXISTING UTILITY POLE
---	PROPOSED UTILITY POLE
---	PROPOSED UTILITY CROSSING, SEE UTILITY CROSSING CHART SHEET C-18

CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH APPROPRIATE UTILITY COMPANIES TO ENSURE THAT THE REQUIRED VERTICAL AND HORIZONTAL CLEARANCES AT ALL LOCATIONS WHERE ANY UTILITY LINE CROSSES AN EXISTING OR PROPOSED GAS, TELEPHONE OR ELECTRIC LINE ARE MET.

- NOTES**
- SEE SHEET C-02 FOR UTILITY NOTES AND SHEET C-21 FOR CITY OF ROCHESTER HILLS STORM SEWER NOTES AND DETAILS.
 - A CONTINUOUS EDGE DRAIN SHALL BE PROVIDED ALONG THE FULL LENGTH OF THE PROPOSED ROADWAY. THE EDGE DRAIN SHALL TIE INTO THE PROPOSED STORM SEWER SYSTEM.
 - ALL UTILITY TRENCH BACKFILL WITHIN THE INFLUENCE OF PAVEMENT SHALL BE MDT CLASS II GRANULAR MATERIAL.
 - REFER TO SHEET C-19 FOR PIPE CROSSING TABLE AND SANITARY SEWER LEAD TABLE.
 - ALL BASEMENTS TO BE SERVED WITH SUMP PUMP LEADS.



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

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

NOTICE: CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR THE SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OR OF ANY OTHER PERSONS.

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SECTION 24
TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

M2JI, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
STORM SEWER PLAN AND PROFILE

DATE: NOVEMBER 22, 2017
01-12-2018 CITY SUBMITTAL
03-28-2018 REVISION PER CITY

REVISIONS

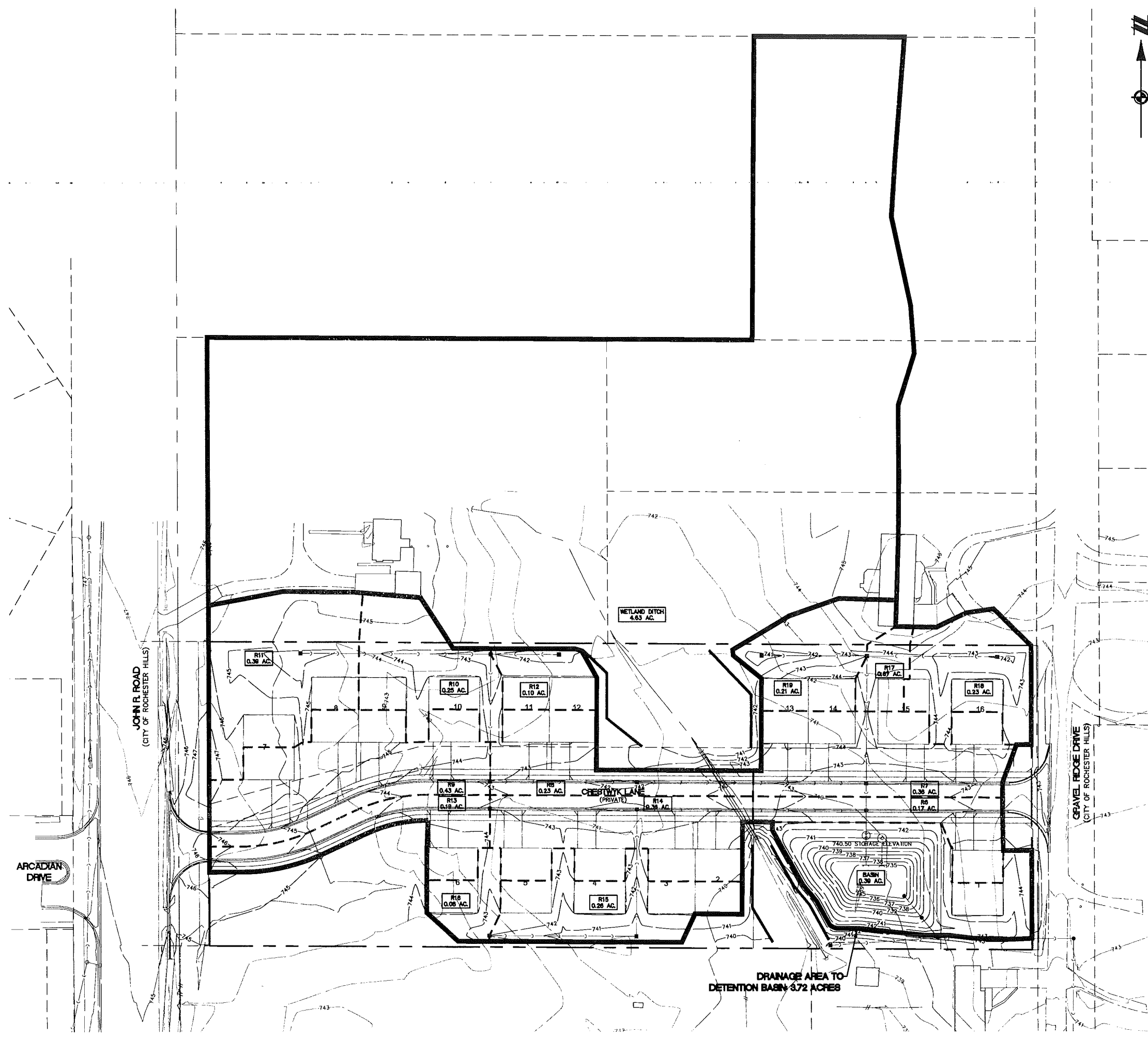
SCALE 0 20 40
1" = 40 FEET

DRAWN BY: REK
CHECKED BY: JPC
P.M.: E. LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO. C-16

LEGEND

	BOUNDARY LINE
	EXISTING ROW
	EXISTING CONTOUR
	PROPOSED CONTOUR
	PROPOSED DRAINAGE BOUNDARY
	PROPOSED INLET DRAINAGE AREA
	EXISTING STORM SEWER
	PROPOSED STORM SEWER
	EXISTING STORM CATCH BASIN/MANHOLE
	PROPOSED STORM CATCH BASIN/MANHOLE

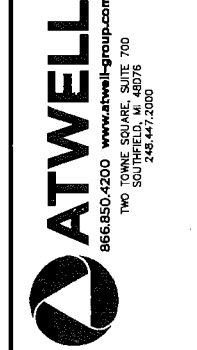
SEE SHEET C-18 FOR STORMWATER CALCULATIONS



Know what's below.
Call before you dig.
 THE LOCATION OF EXISTING UTILITIES IS SHOWN ON THIS DRAWING. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO ANY EXCAVATION WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO ANY EXCAVATION WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO ANY EXCAVATION WORK.

NOTICE:
 CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK OF PERSONS ENGAGED IN THE WORK, OR ANY NEARBY STRUCTURES OR OF ANY OTHER PERSONS.

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SECTION 24
 TOWN 3 NORTH, RANGE 11 EAST
 CITY OF ROCHESTER HILLS
 OAKLAND COUNTY, MICHIGAN

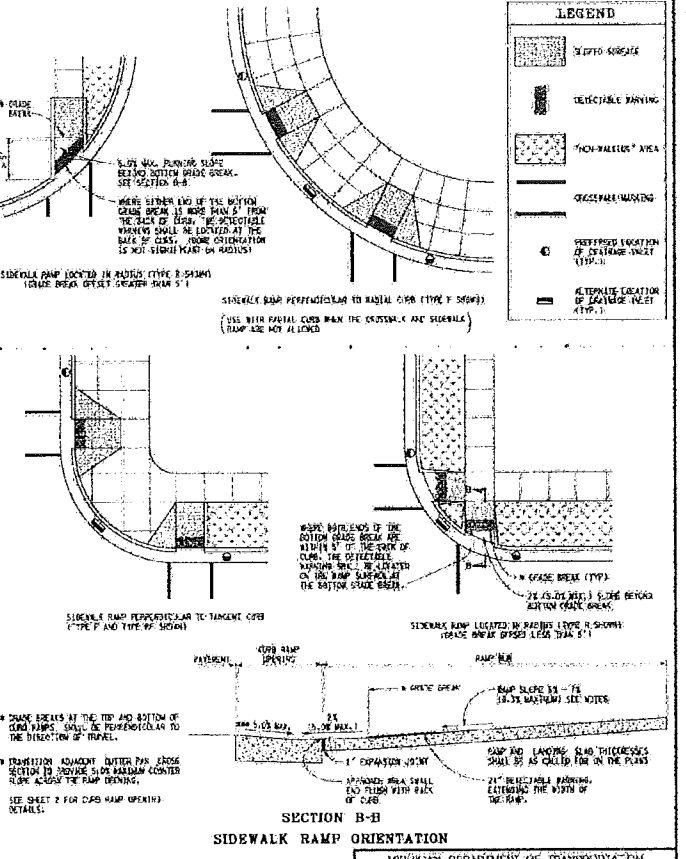
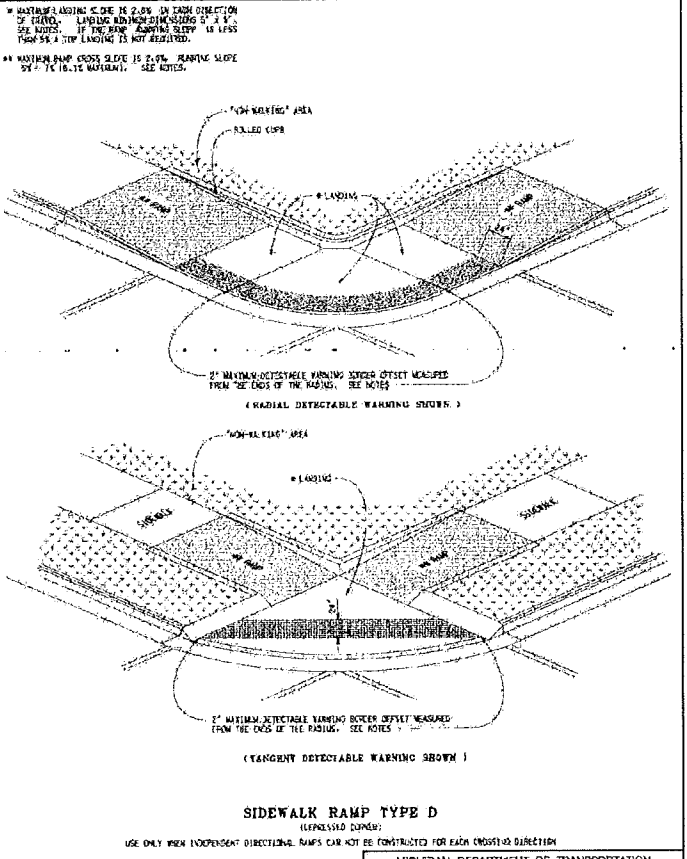
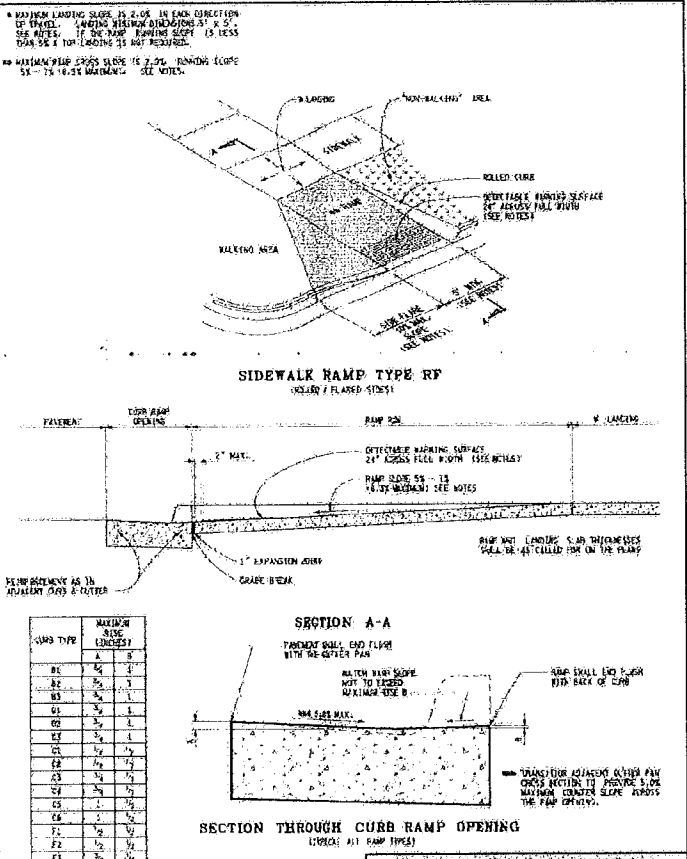
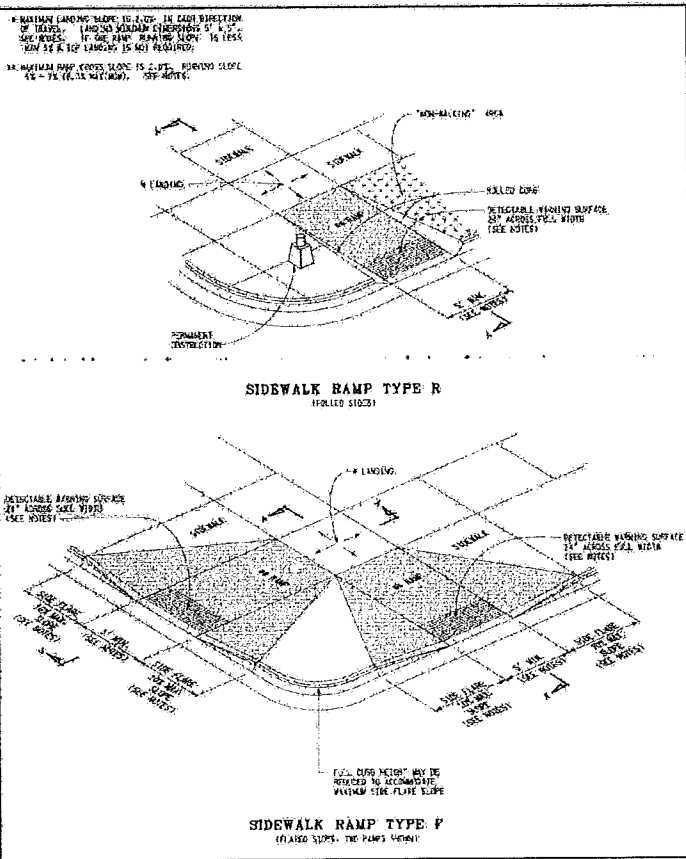
M2/J1, LLC
 CRESTWYK ESTATES
 ENGINEERING CONSTRUCTION PLANS
 DRAINAGE AREA MAP

DATE: NOVEMBER 22, 2017
 01-12-2018 CITY SUBMITTAL
 02-28-2018 REVISION PER CITY

NO.	REVISIONS

SCALE 0 20 40
 1" = 40 FEET
 DRAWN BY: REK
 CHECKED BY: JPC
 P.M.: E. LORD
 JOB #: 17000274
 CITY FILE #: 17-013
 SHEET NO. C-17

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MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARDS PLAN FOR

SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

DATE: 10-20-2017
PLAN NO: R-28-J
SHEET: 1 OF 7

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARDS PLAN FOR

SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

DATE: 10-20-2017
PLAN NO: R-28-J
SHEET: 2 OF 7

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARDS PLAN FOR

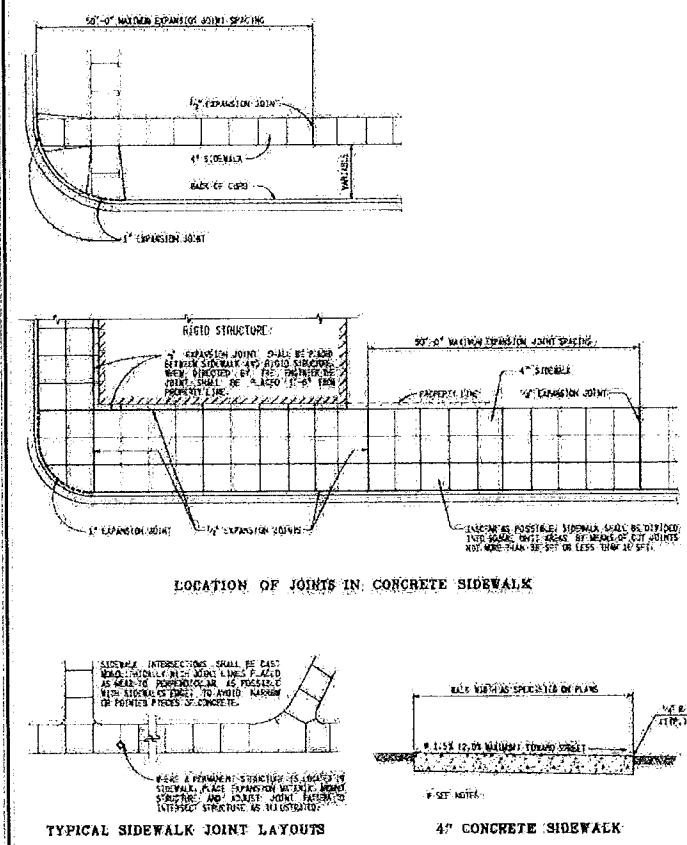
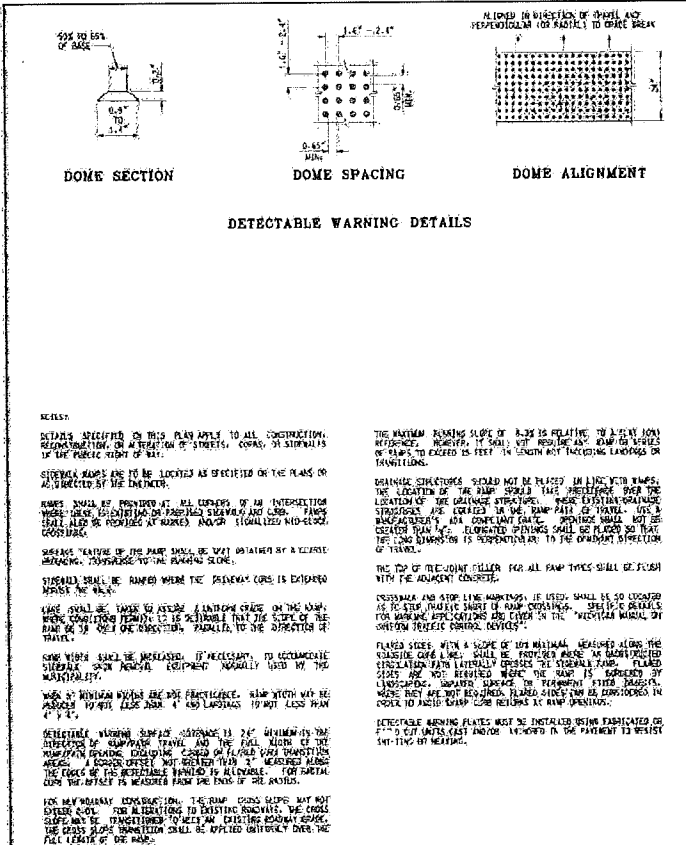
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

DATE: 10-20-2017
PLAN NO: R-28-J
SHEET: 3 OF 7

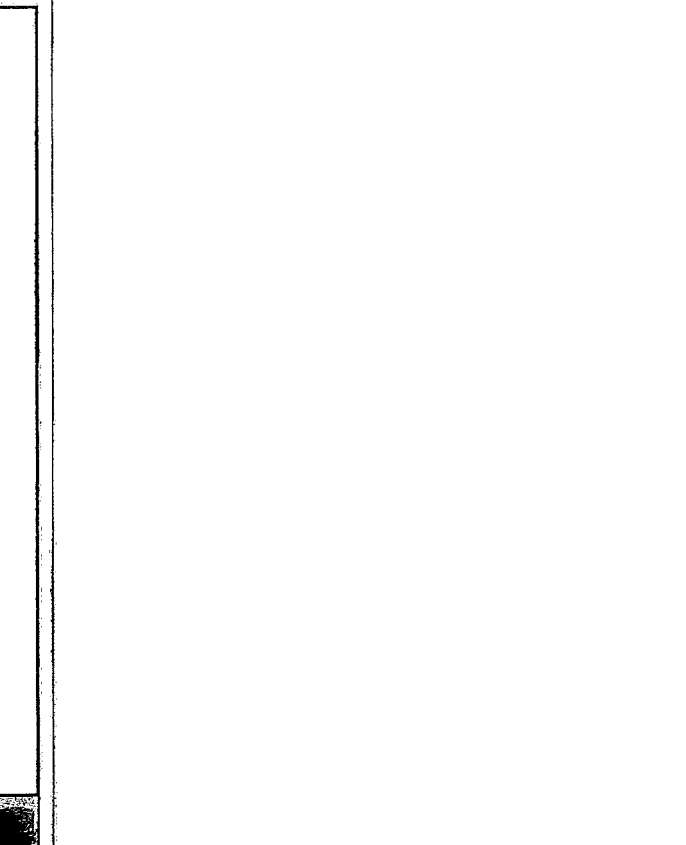
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARDS PLAN FOR

SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

DATE: 10-20-2017
PLAN NO: R-28-J
SHEET: 4 OF 7



GARAGE SIZE	Local Roads			Major Roads	
	Width of Approach of Street (in Feet)	Width of Flare (in Feet)	Width of Approach of Street (in Feet)	Width of Flare (in Feet)	Width of Approach of Street (in Feet)
1 CAR GARAGE	12	18	3	32	10
	13	19	3	33	10
	14	20	3	34	10
	15	21	3	35	10
	16	22	3	36	10
2 CAR GARAGE	17	23	3	36	9.5
	18	24	3	36	9
	19	25	3	36	8.5
	20	25	2.5	36	8
	21	25	2	36	7.5
Max. Width	22	25	1.5	36	7
	23	25	1	36	6.5
	24	25	0.5	36	6
25	25	0	36	5.5	



MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARDS PLAN FOR

SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

DATE: 10-20-2017
PLAN NO: R-28-J
SHEET: 1 OF 7

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARDS PLAN FOR

DRIVEWAY OPENINGS & APPROACHES AND CONCRETE SIDEWALK

DATE: 10-20-2017
PLAN NO: R-29-I
SHEET: 1 OF 4

CITY OF ROCHESTER HILLS
STANDARD DETAIL FOR:

Residential Driveway Approach

DATE: 10-20-2017
PLAN NO: R-29-I
SHEET: 1 OF 4

CITY OF ROCHESTER HILLS
STANDARD DETAIL FOR:

Residential Driveway Approach

DATE: 10-20-2017
PLAN NO: R-29-I
SHEET: 1 OF 4

811

Know what's below.
Call before you dig.

NOTICE: CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE HELD RESPONSIBLE FOR SAFETY OF THE WORK OF PERSONS EMPLOYED IN THE WORK OF ANY NEARBY STRUCTURES OR OF ANY OTHER PERSONS.

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OKLAHOMA CITY, OKLAHOMA 73102



SECTION 24
TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OKLAHOMA COUNTY, MICHIGAN

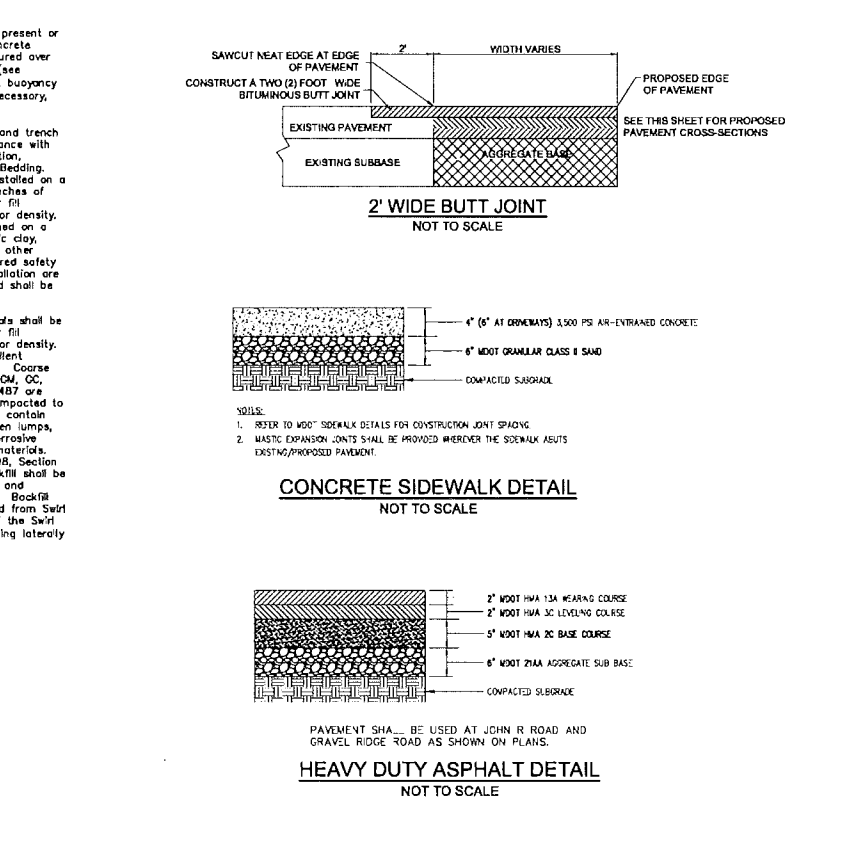
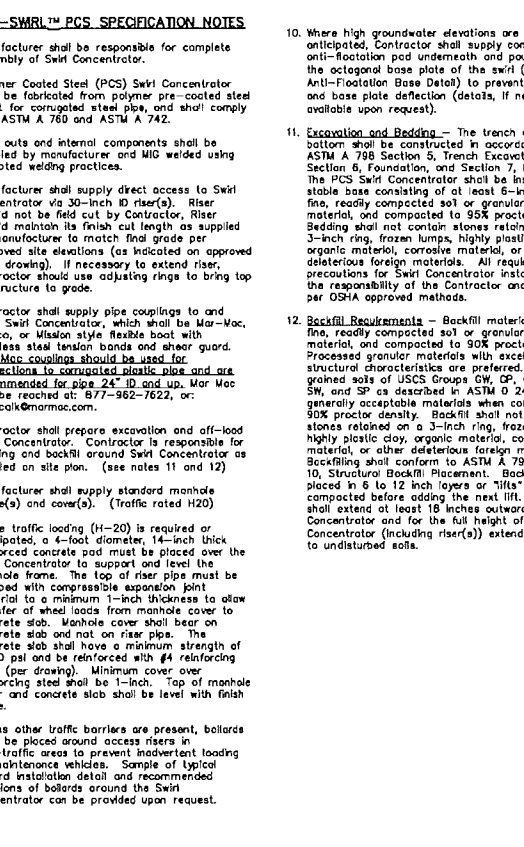
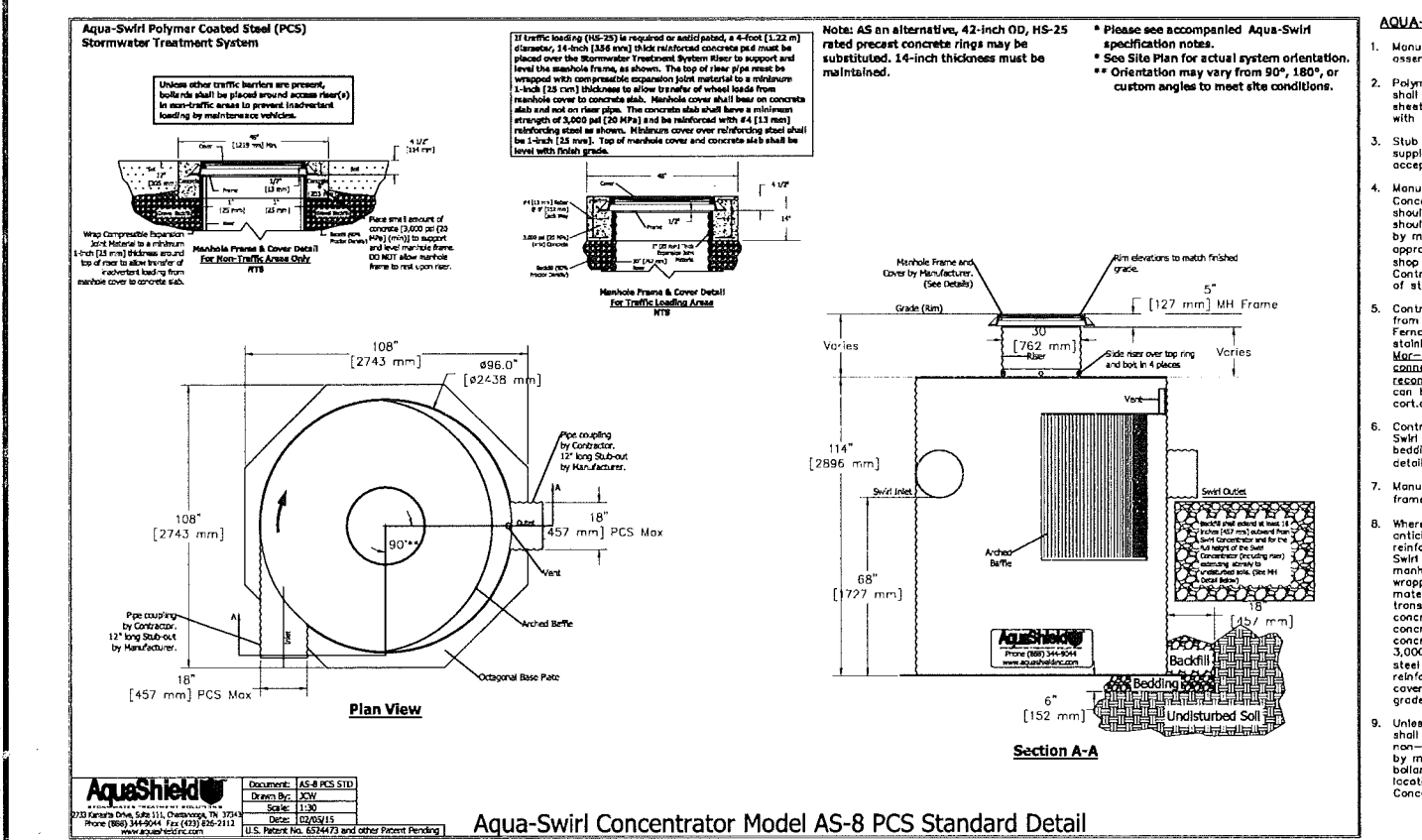
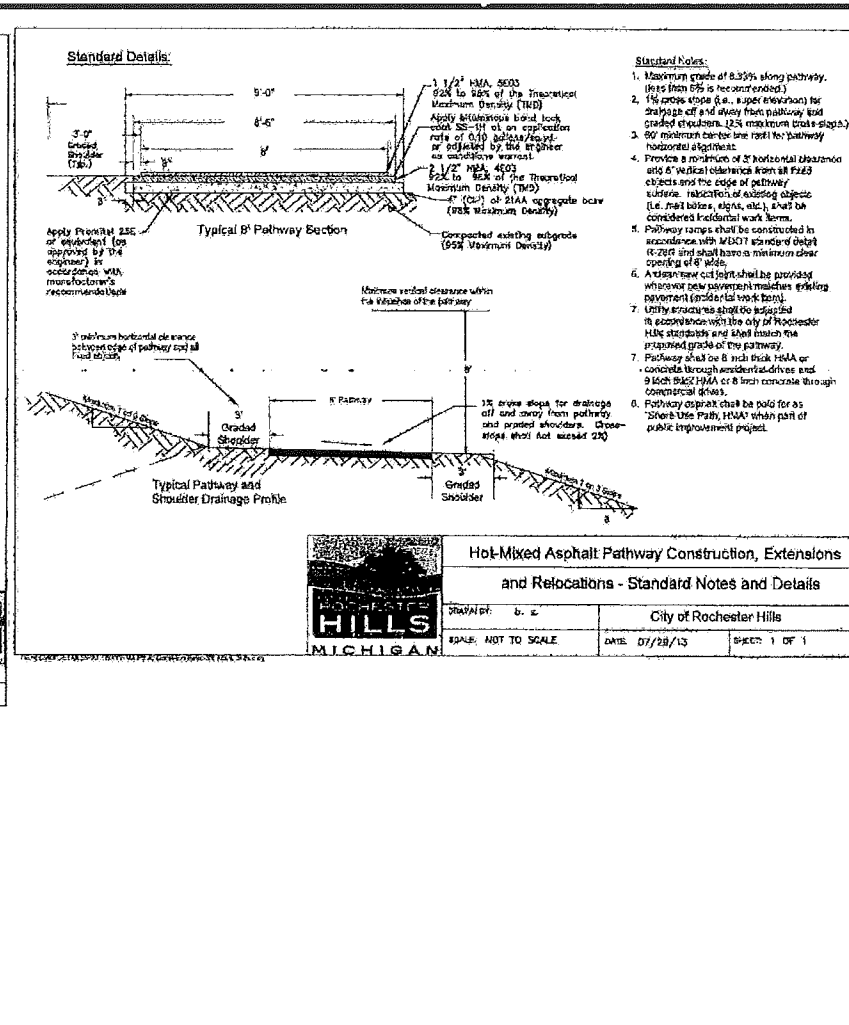
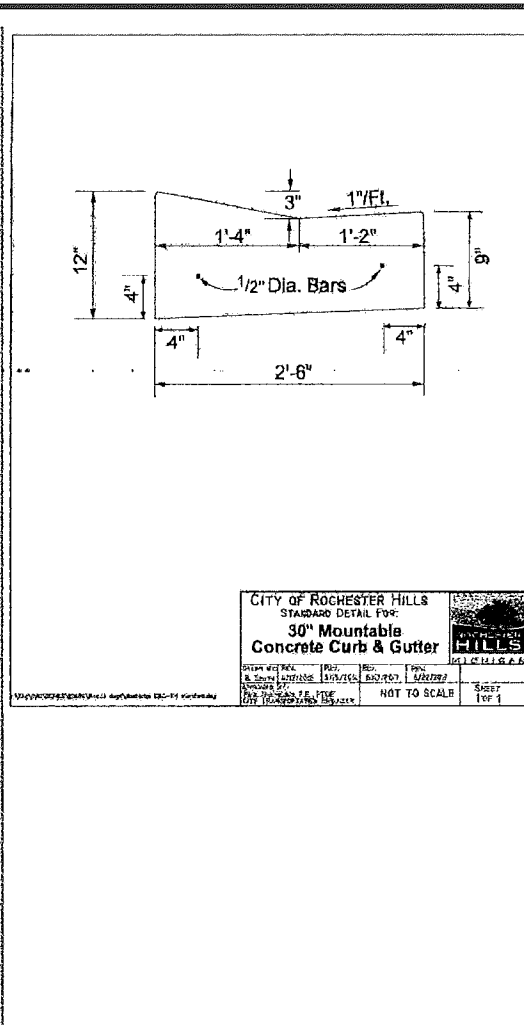
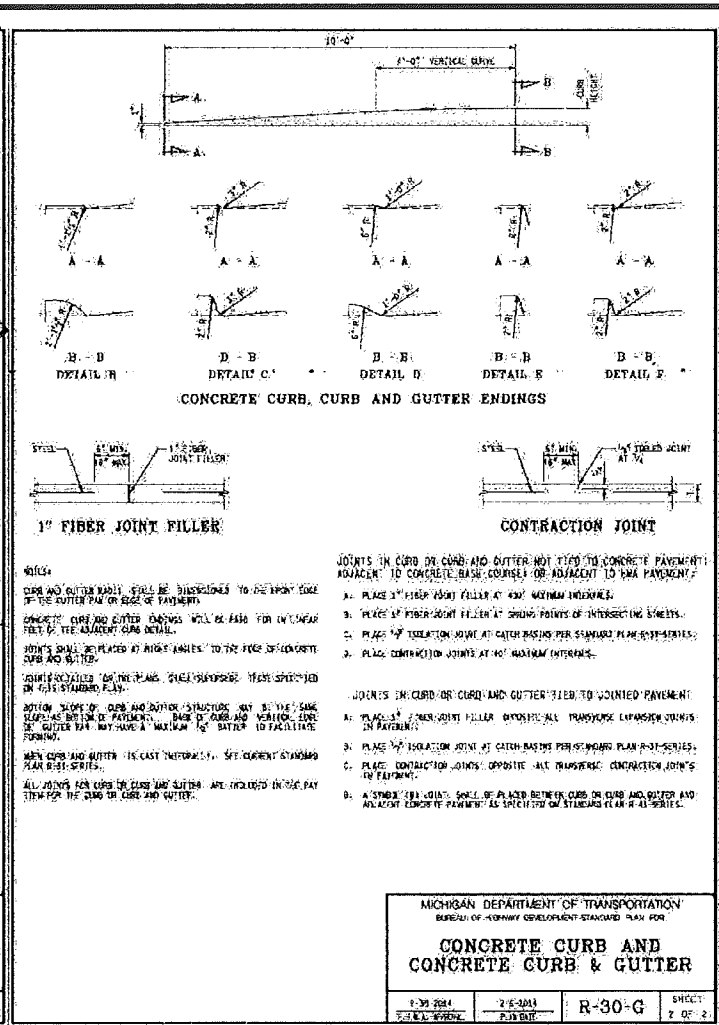
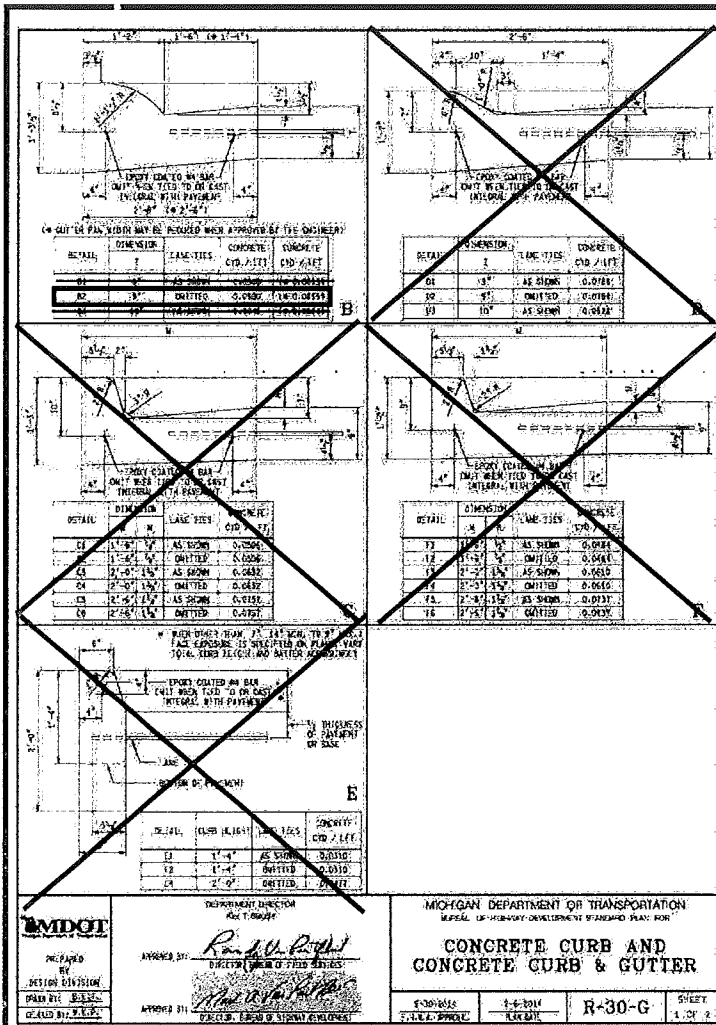
M2/J, LLC
CRESTWJK ESTATES
ENGINEERING CONSTRUCTION PLANS
CONSTRUCTION DETAILS

DATE: NOVEMBER 22, 2017
01-12-2018 CITY SUBMITTAL
02-20-2018 REVISED PER CITY

REVISIONS

NO.	DESCRIPTION

DRAWN BY: REK
CHECKED BY: JPC
P.L.M.: E. LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO. C-19



811
Know what's below.
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ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNS SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

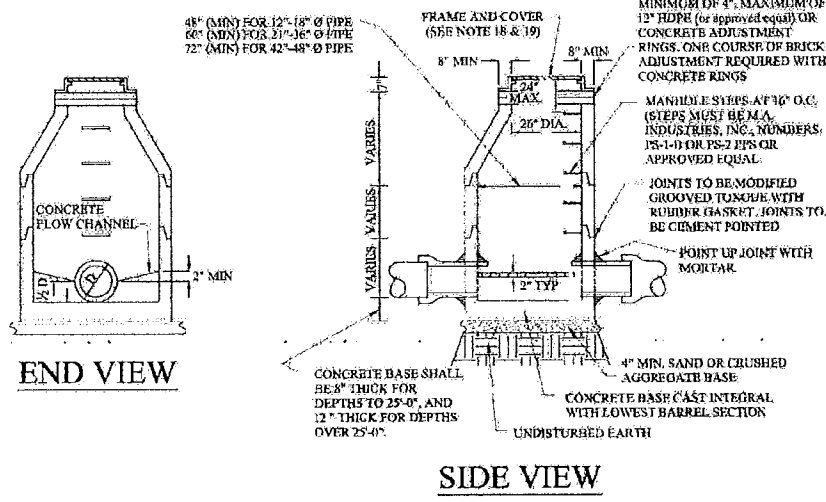
SECTION 24
TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

M2UJ, LLC
CRESTWYK ESTATES
ENGINEERING CONSTRUCTION PLANS
CONSTRUCTION DETAILS

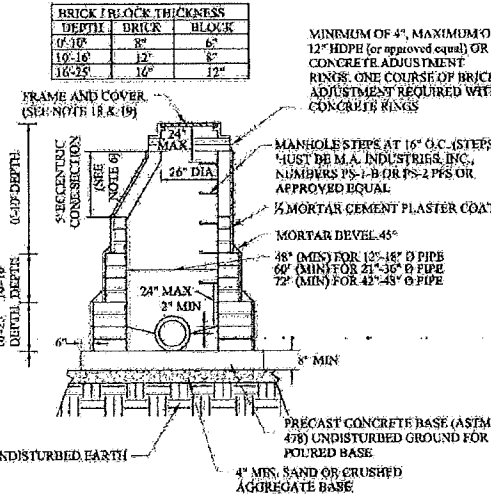
DATE NOVEMBER 22, 2017
01-12-2018 CITY SUBMITTAL
02-28-2018 REVISED PER CITY

REVISIONS

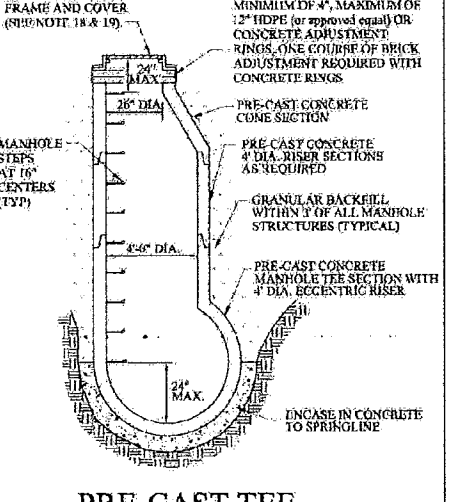
DRAWN BY: REK
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P.L.M.: E. LORD
JOB #: 17000274
CITY FILE #: 17-013
SHEET NO.: C-20



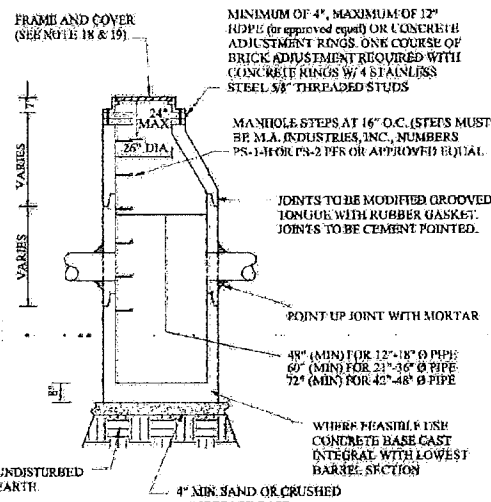
PRE-CAST STORM MANHOLE



BRICK OR BLOCK MANHOLE

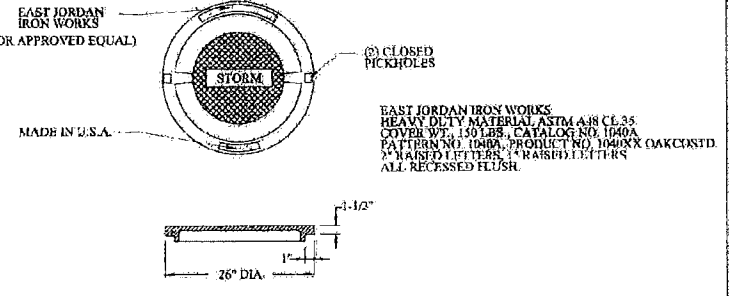


PRE-CAST TEE MANHOLE DETAIL

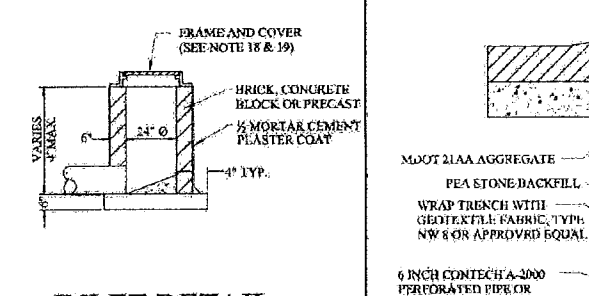


PRECAST STORM CATCH BASIN

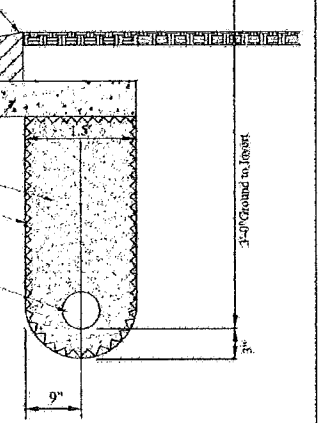
- GENERAL NOTES:**
- ALL EXISTING AND NEW STORM SYSTEMS SHALL BE CLEANED AND FLUSHED ONCE PER YEAR. ALL EXISTING AND NEW STORM SYSTEMS SHALL BE CLEANED AND FLUSHED ONCE PER YEAR. ALL EXISTING AND NEW STORM SYSTEMS SHALL BE CLEANED AND FLUSHED ONCE PER YEAR.
 - STORM SEWER PIPE SHALL BE OF SIZE AND TYPE 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. 348 SPECIFICATION) 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 2MS 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 BASIN.
 - 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.



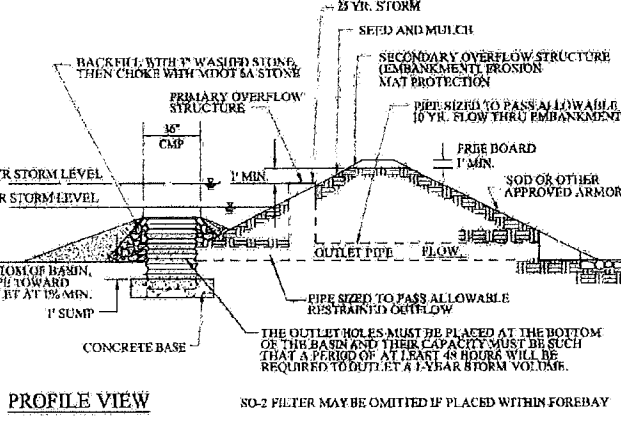
LETTERED MANHOLE COVER



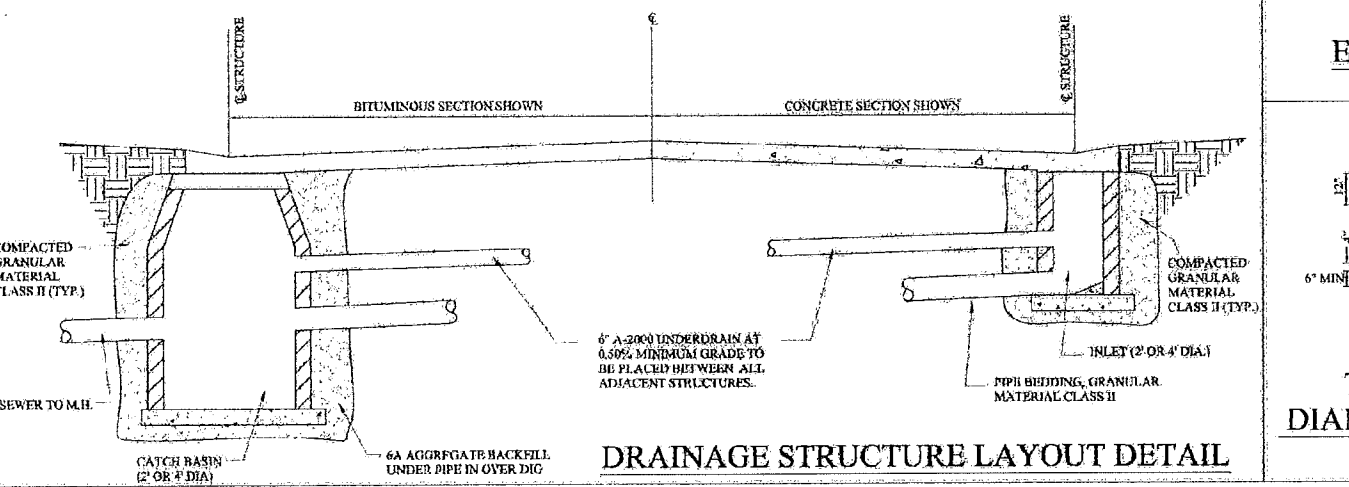
INLET DETAIL



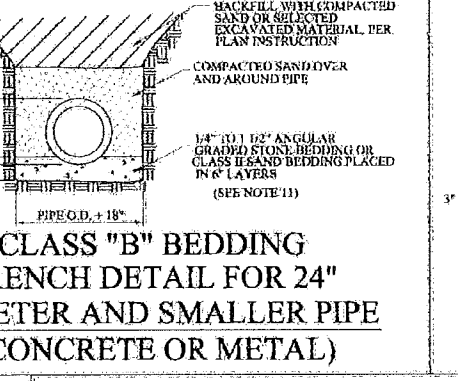
EDGE DRAIN DETAIL



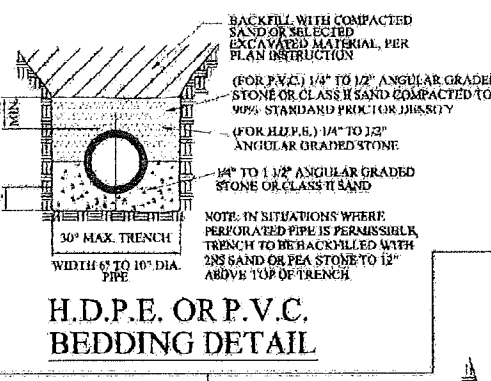
SO-2 DETENTION BASIN OUTLET FILTER (CMP)



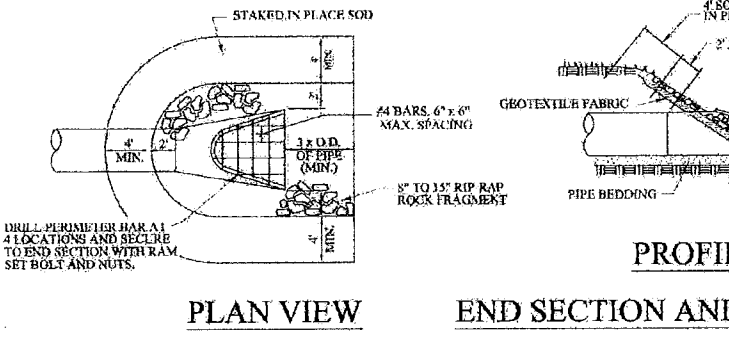
DRAINAGE STRUCTURE LAYOUT DETAIL



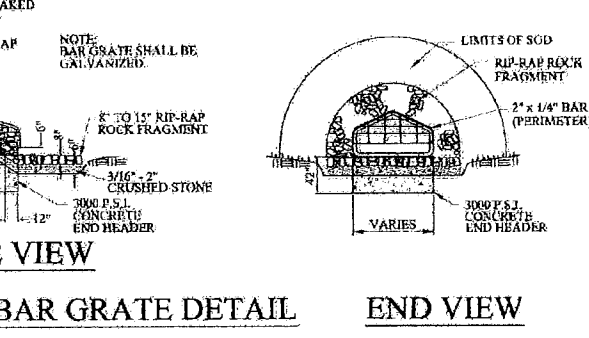
CLASS "B" BEDDING TRENCH DETAIL FOR 24" DIAMETER AND SMALLER PIPE



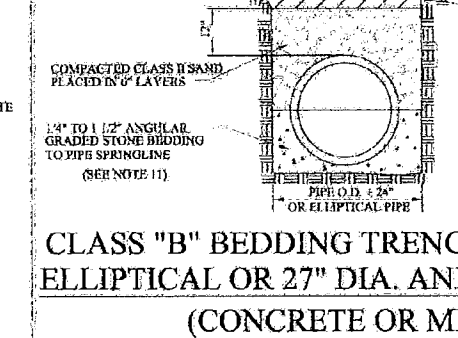
H.D.P.E. OR P.V.C. BEDDING DETAIL



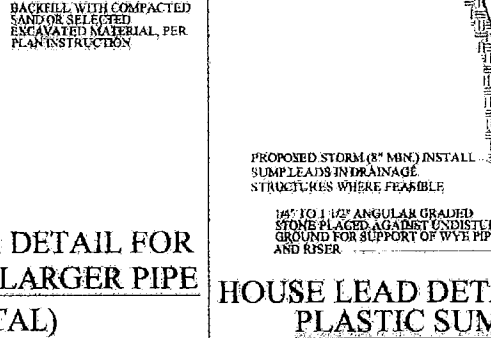
PLAN VIEW



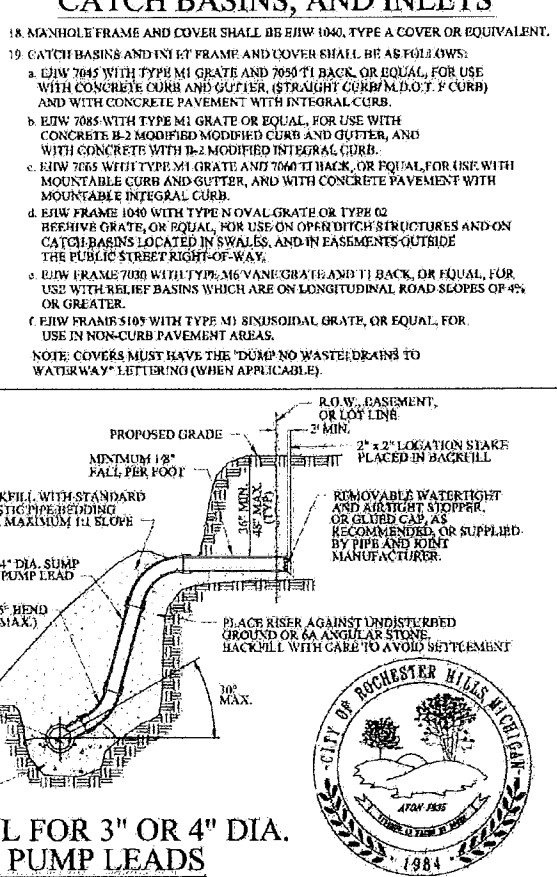
END SECTION AND BAR GRATE DETAIL



CLASS "B" BEDDING TRENCH DETAIL FOR ELLIPTICAL OR 27" DIA. AND LARGER PIPE



HOUSE LEAD DETAIL FOR 3" OR 4" DIA. PLASTIC SUMP PUMP LEADS



COVERS FOR MANHOLES, CATCH BASINS, AND INLETS

REVISIONS	DATE	APPROVED BY
Edge Drain Detail	11-7-12	CITY COUNCIL, DATE: JULY 24, 2008

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

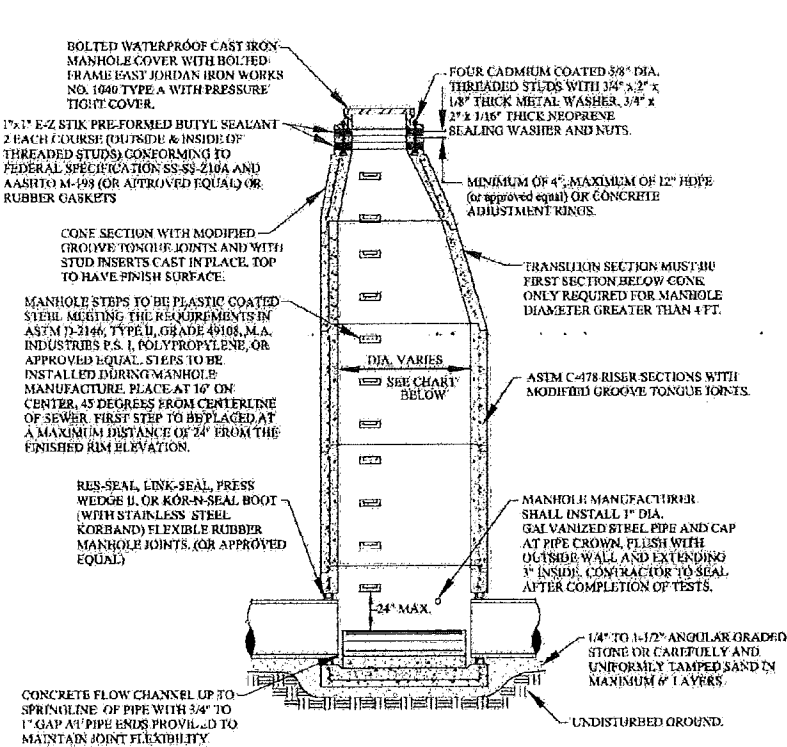
STORM SYSTEM STANDARD DETAILS

NOT TO SCALE DATE: 7/21/2008
SHEET C-21



SANITARY SEWER CONSTRUCTION NOTES

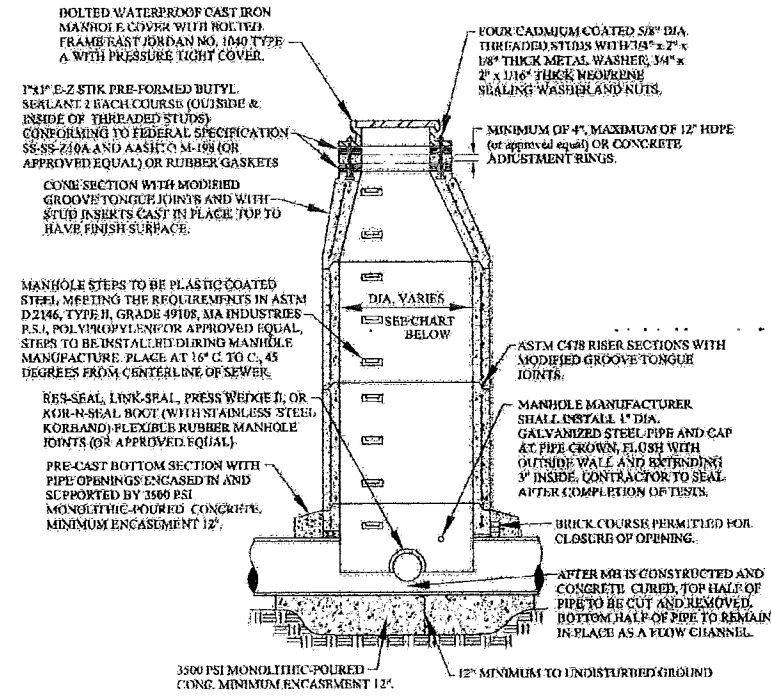
1. ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ROCHESTER HILLS AND THE OAKLAND COUNTY DRAIN COMMISSIONER (O.C.D.C.). ALL SANITARY SEWER CONSTRUCTION SHALL HAVE FULL-TIME INSPECTION SUPERVISED BY THE CITY OF ROCHESTER HILLS INSPECTION SERVICES.
2. NO SEWER 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.
3. LOCATED IN THE FIRST MANHOLE UPSTREAM FROM THE POINT OF ALL CONNECTIONS TO AN EXISTING SEWER, OR EXTENSION, A TEMPORARY 12-INCH DEEP SHIM 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 FILLER PROVIDED FOR THE FLOW CHANNEL. A WATER TIGHT HULKHEAD SHALL BE PROVIDED ON THE DOWNSTREAM SIDE OF THE SHIM MANHOLE.
4. 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 WATER TIGHT 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 LASKER BEAK FOR LINE AND GRADE. A TARGET MUST BE INSTALLED AT THE END OF THE PIPE BEING LAYED.
5. ALL BUILDING LEADS AND RISERS SHALL BE SIX INCH SDR 25.3 PVC PIPE WITH CHEMICALLY FUSED JOINTS OR GASKETED JOINTS APPROVED BY CITY ENGINEER. BUILDING LEADS TO BE FURNISHED WITH REMOVABLE AIR TIGHT AND WATER TIGHT STOPPERS.
6. ALL SEWER PIPE SHALL BE INSTALLED IN CLASS "D" BEDDING OR BETTER.
7. ALL NEW MANHOLES SHALL HAVE CITY APPROVED FLEXIBLE, WATER TIGHT 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, WATER TIGHT COVERS.
8. AT ALL CONNECTIONS TO MANHOLES IN ALL SEWERS, OR EXTENSIONS, DROP CONNECTIONS WILL BE REQUIRED WHEN THE DIFFERENCE IN INVERT ELEVATIONS EXCEEDS 18 INCHES.
9. GROUND WATER, STORM WATER, CONSTRUCTION WATER, DOWN SPOT DRAINAGE OR WEEP TIE DRAINAGE SHALL NOT BE ALLOWED TO ENTER ANY SANITARY SEWER INSTALLATION.
10. PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL TELEPHONE MISS/DIG THREE (3) DAYS IN ADVANCE (811) FOR THE LOCATION OF UNDERGROUND PIPELINE AND CABLE. EACH TAP AND SHALL ALSO NOTIFY REPRESENTATIVES OF OTHER UTILITIES LOCATED IN THE VICINITY OF THE WORK.
11. AN 18 INCH MINIMUM VERTICAL SEPARATION AND A 10 FOOT MINIMUM HORIZONTAL SEPARATION MUST BE MAINTAINED BETWEEN SANITARY SEWER AND ALL OTHER UTILITIES.
12. 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.



STANDARD MANHOLE

MANHOLE SIZING CHART

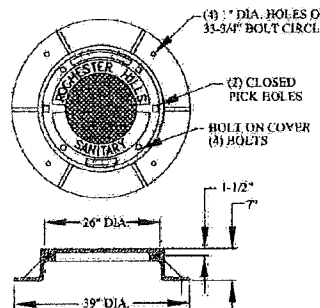
MANHOLE DIAMETER	MAX. PIPE SIZE FOR STRAIGHT THRU INST.	MAX. PIPE SIZE FOR RIGHT ANGLE INST.
4'	24"	18"
5'	36"	24"
6'	42"	36"
7'	60"	42"



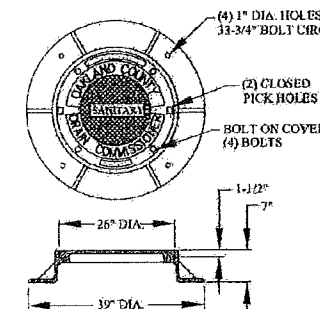
MANHOLE CONSTRUCTED OVER EXISTING SEWER

MANHOLE SIZING CHART

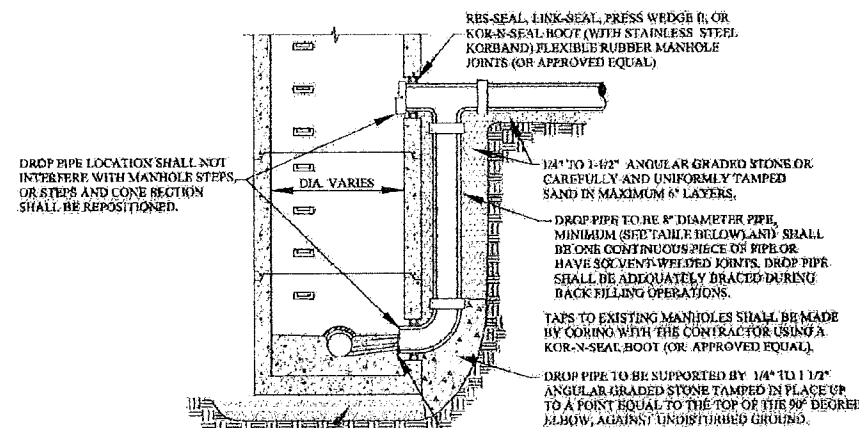
MANHOLE DIAMETER	MAX. PIPE SIZE FOR STRAIGHT THRU INST.
4'	24"
5'	36"
6'	42"
7'	60"



ROCHESTER HILLS MANHOLE COVER

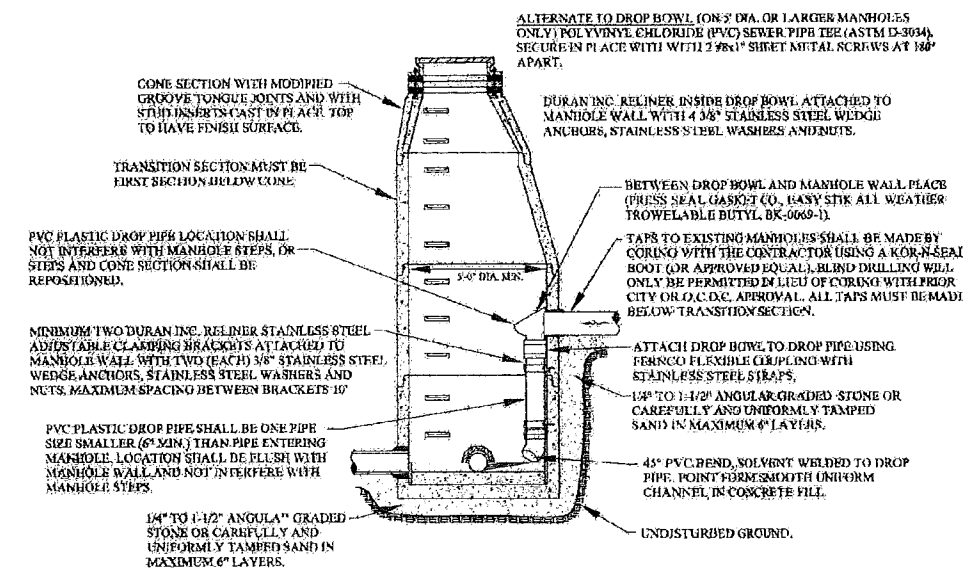


O.C.D.C. LETTERED MANHOLE COVER



EXTERIOR DROP CONNECTION

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



INTERIOR DROP CONNECTION

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

SANITARY SEWER MATERIALS

1. THE FOLLOWING MATERIALS MAY BE USED FOR PUBLIC SANITARY SEWER CONSTRUCTION, APPROVED PIPE MATERIALS MUST CONFORM TO STANDARDS ADOPTED BY THE OFFICE OF THE OAKLAND COUNTY DRAIN COMMISSIONER:
 - A. FOR SEWERS 8" TO 15" TO BE PVC TRUSS PIPE, ASTM D-2680, WITH GASKET JOINTS, OTHER TYPES OF PIPE AS APPROVED BY CITY ENGINEER.
 - B. FOR 6" SEWER LEADS SHALL BE SOLID WALLED PVC, SDR 25.3, D-2751, PIPE SHALL HAVE A MINIMUM PIPE STIFFNESS OF 150 P.S.I. AND A MINIMUM DEFLECTION OF 15% AT FAILURE. THE SEWER LEAD MATERIAL SHALL BE COMPATIBLE WITH SEWER MAIN MATERIAL.
 - C. FOR SEWERS GREATER THAN 15" TO BE REINFORCED CONCRETE PIPE (RCP) SHALL CONFORM TO THE CURRENT ASTM D C76 WALL B. JOINTS SHALL BE SYNTHETIC RUBBER AND MEET OR EXCEED THE REQUIREMENTS ESTABLISHED BY ASTM C361.

ALTERNATE TO DROP BOWL (ON 3" DIA. OR LARGER MANHOLES ONLY) POLYVINYL CHLORIDE (PVC) SEWER PIPE TEE (ASTM D-3054), SECURED IN PLACE WITH TWO (2) 3/8" SHEET METAL SCREWS AT 180° APART.



REVISIONS	DATE	APPROVED BY
		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

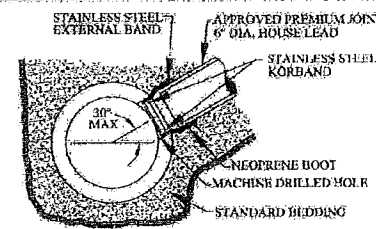
SANITARY SEWER STANDARD DETAILS

NOT TO SCALE	DATE: 7/21/2008
SHEET C-22	

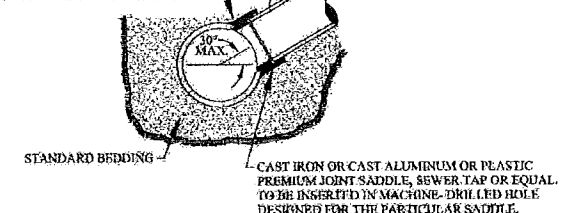
CITY OF ROCHESTER HILLS GRAVITY BUILDING LEAD REQUIREMENTS AND DETAILS

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 OFDC-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 D2711, SDR 25.5
B. DUCTILE IRON PIPE, AMERICAN WATER WORKS ASSOCIATION (AWWA) C-104/A21A, 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: FERNCO ADAPTER OR FERNCO 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



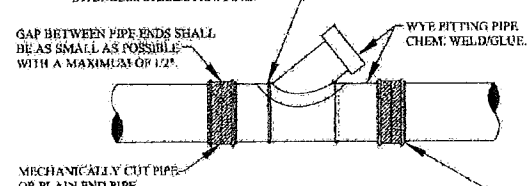
TWO-COMPONENT EPOXY ADHESIVE JOINT, APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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 WINDS TO PROCEED PRIOR TO COMPLETE CURE OF EPOXY.

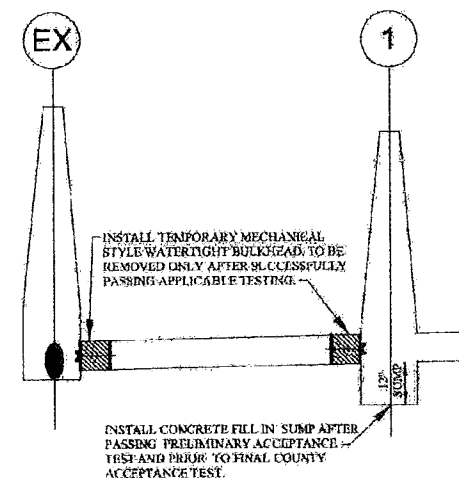
SEWER TAP-ALL SIZES OF MAIN SEWER PIPES VITRIFIED CLAY

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



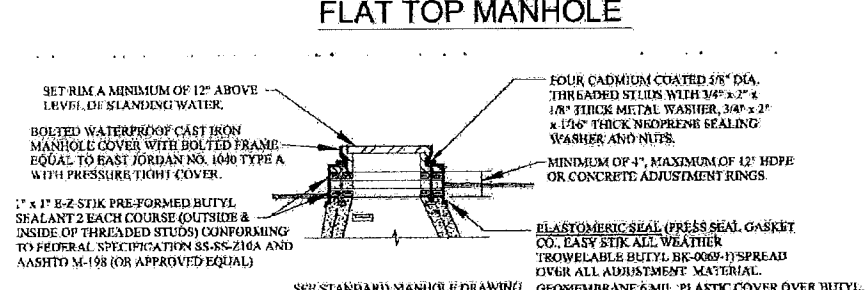
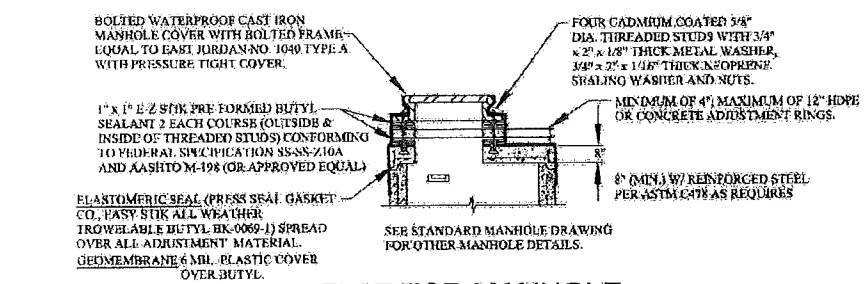
GAP BETWEEN PIPE ENDS SHALL BE AS SMALL AS POSSIBLE WITH A MAXIMUM OF 1/2".
MECHANICALLY CUT PIPE OR PLAIN END PIPE.
FERNCO FLEXIBLE COUPLING, OR APPROVED EQUAL USE MANUFACTURER'S DUSHINGS IF DISSIMILAR PIPE ARE CONNECTED. WATER MAIN REPAIR CLAMPS, SMITH-BLAIR, BAKER, FORD OR EQUAL (ALL STAINLESS STEEL) MAY ALSO BE USED.
NOTE: PIPES SHALL BE BEDDED IN STANDARD PLASTIC PIPE BEDDING.

WYE PIPE INSERTION WITH FLEXIBLE COUPLINGS (RIGID PIPE)

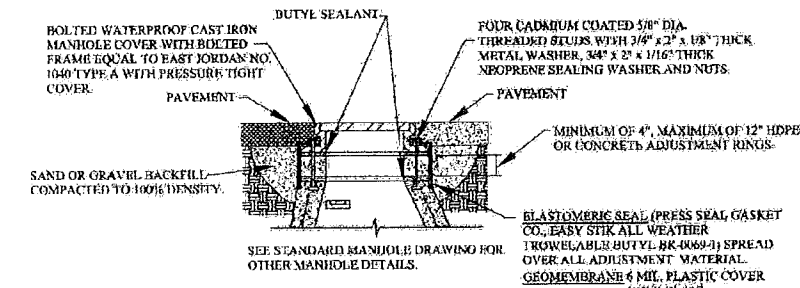


PROFILE OF BULKHEADS AND ONE FOOT SUMP

FLAT TOP MANHOLE

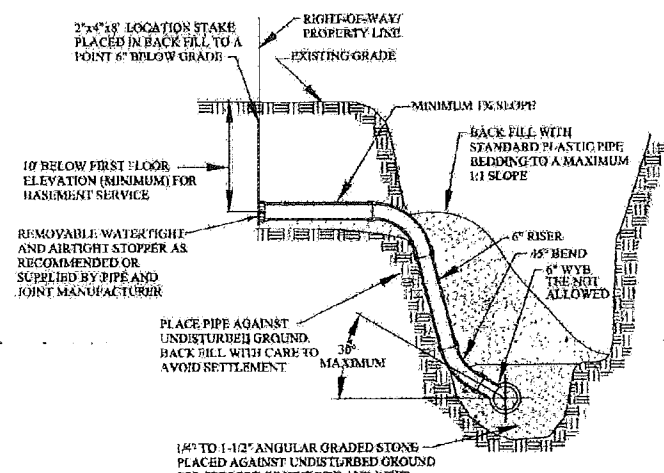


ADJUSTMENT DETAIL FOR MANHOLE TOPS WITHIN FLOOD PRONE AREAS

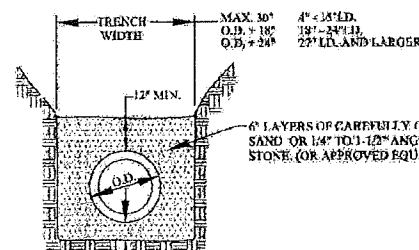


ADJUSTMENT DETAIL MANHOLE TOPS WITHIN PAVEMENT AREAS

HOUSE LEAD DETAIL



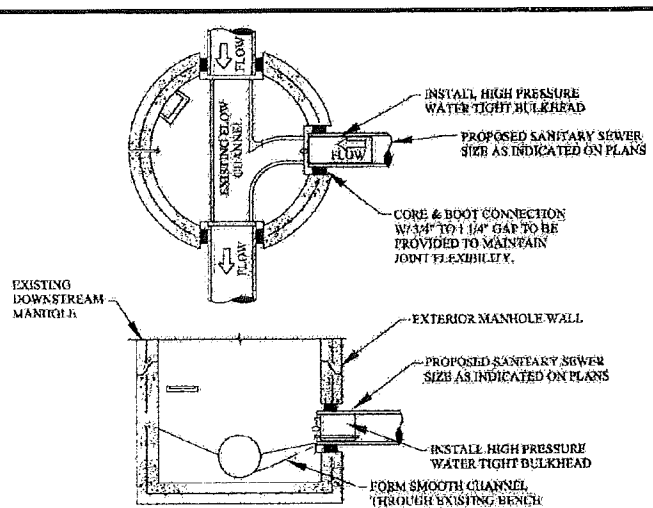
HOUSE LEAD DETAIL



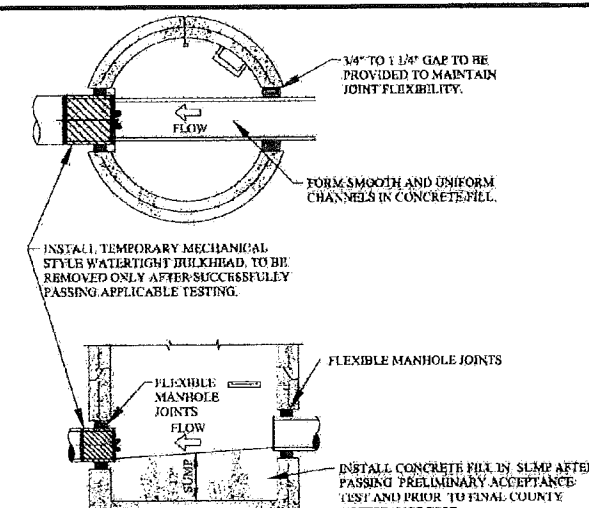
STANDARD BEDDING (CLASS B)

3" TO 4" FOR PVC TRUSS PIPE
6" MIN. FOR CONCRETE PIPE

TESTING BULKHEAD IN EXISTING MANHOLE



FIRST MANHOLE UPSTREAM FROM SANITARY TAP



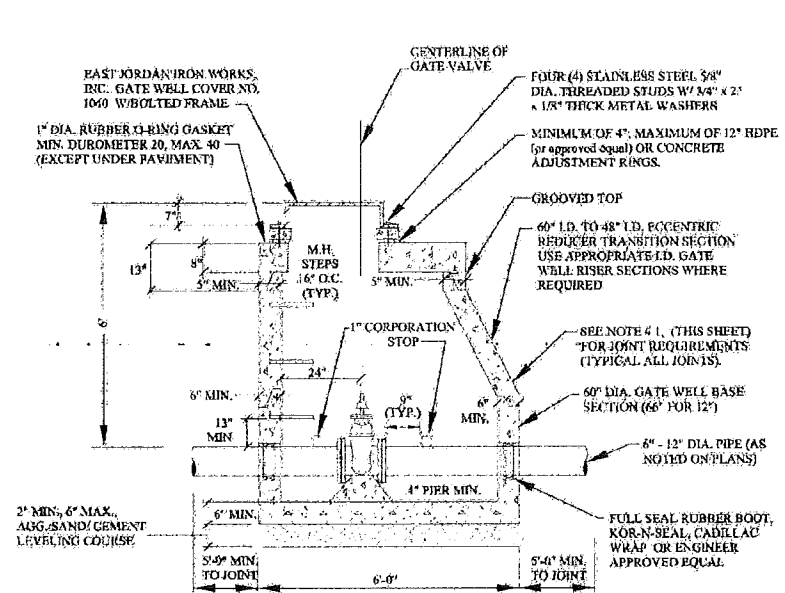
I HEREBY CERTIFY THAT OUR FIRM HAS PREPARED THESE AS-BUILT DRAWINGS OF THE IMPROVEMENTS AS CONSTRUCTED, AND THAT TO THE BEST OF MY KNOWLEDGE, THOSE IMPROVEMENTS NOTED AS "AS-BUILT" WERE CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED CONSTRUCTION PLANS, AND ALSO THAT THE SANITARY SEWER AND STRUCTURES,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

(COMPANY NAME)
(ENGINEER'S SIGNATURE)
PROFESSIONAL ENGINEER NO. _____

ENGINEER SEAL

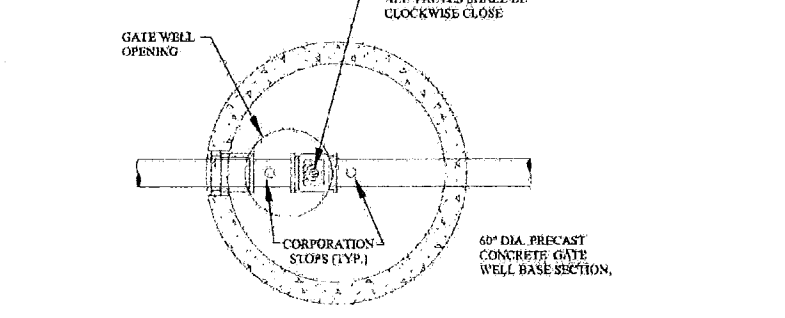
3. THE MAXIMUM SCALE SHALL BE ONE (1) INCH EQUALS FIFTY (50) FEET.
5. THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
6. THE SIZE, MANUFACTURER AND MODEL NUMBERS OF ALL VALVES AND PUMPS INSTALLED SHALL BE INDICATED.
7. A TOTAL AS-BUILT DRAWING QUANTITY LIST SHALL BE INCLUDED.
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 TEE/ARV 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.



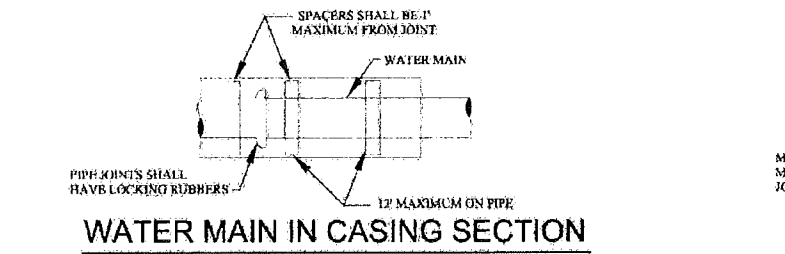


ALL GATE WELLS

MANHOLE STEPS TO BE PLASTIC COATED STEEL MEETING THE REQUIREMENTS IN ASTM D 2146, TYPE II, GRADE 40K. M.A. INDUSTRIES P.S.I. POLYPROPYLENE OR APPROVED EQUAL STEPS TO BE INSTALLED DURING MANHOLE MANUFACTURE, PLACED AT 18" C.T.C.



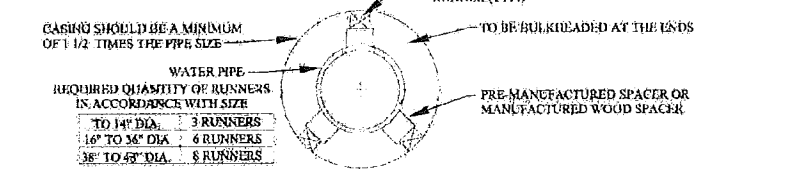
GATE WELL (TYPICAL)



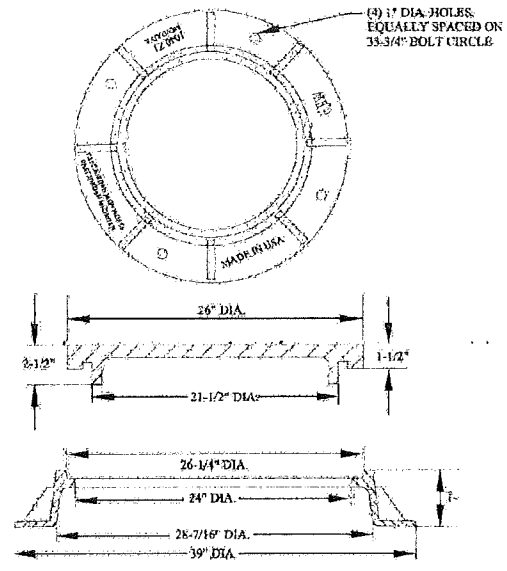
WATER MAIN IN CASING SECTION

UNLESS OTHERWISE SPECIFIED, MINIMUM CASING PIPE SHALL BE ASTM A-139 GRADE B, WALL THICKNESS AS FOLLOWS:

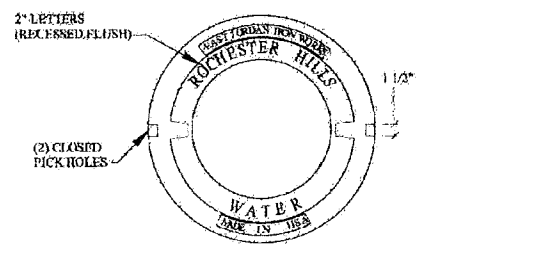
NOMINAL SIZE	MINIMUM WALL THICKNESS
8" - 42"	0.375
48" - 60"	0.500



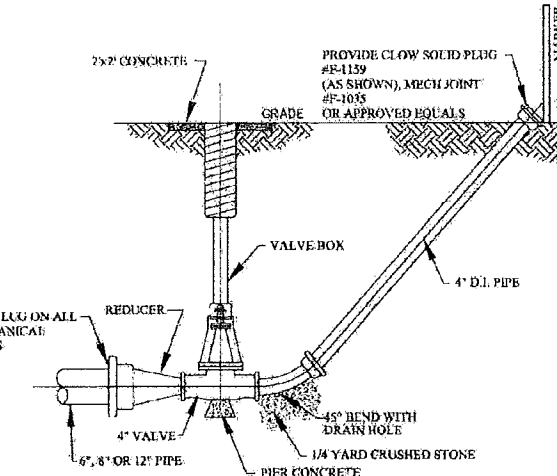
SUPPORT FOR WATER MAIN CONSTRUCTED IN CASING PIPE



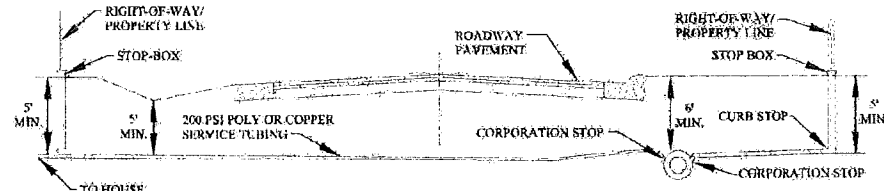
FRAME



LETTERING LAYOUT FOR GATE WELL COVERS

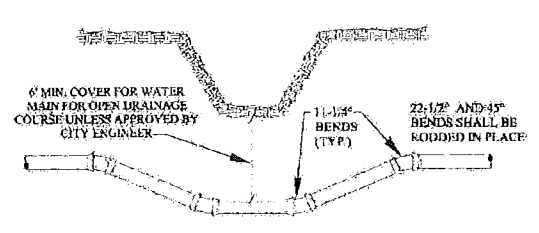


DETAIL OF 4" BLOWOFF

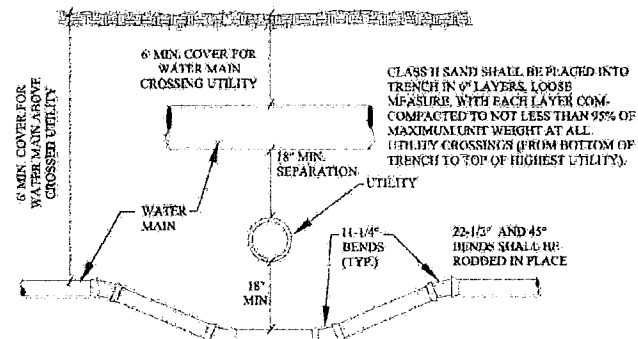


TYPICAL PUBLIC ROAD WATER SERVICE CONNECTION

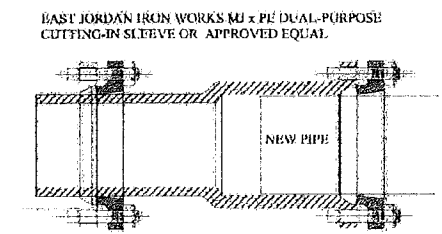
NOTES:
 1. WATER SERVICE SHUT-OFF TO BE PLACED AT PROPERTY LINE.
 2. LATERAL LOCATION SHALL BE AS REQUESTED BY THE ADJOINING PROPERTY OWNER.
 3. ROCHESTER HILLS DPW PERFORMS SERVICE LEAD TAPS UP TO 2" DIAMETER.



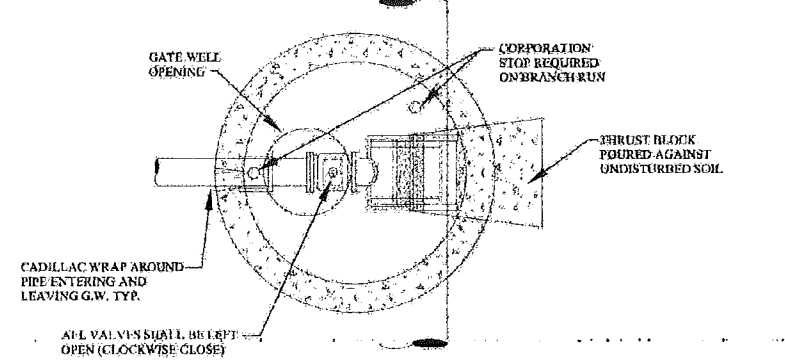
DITCH CROSSING



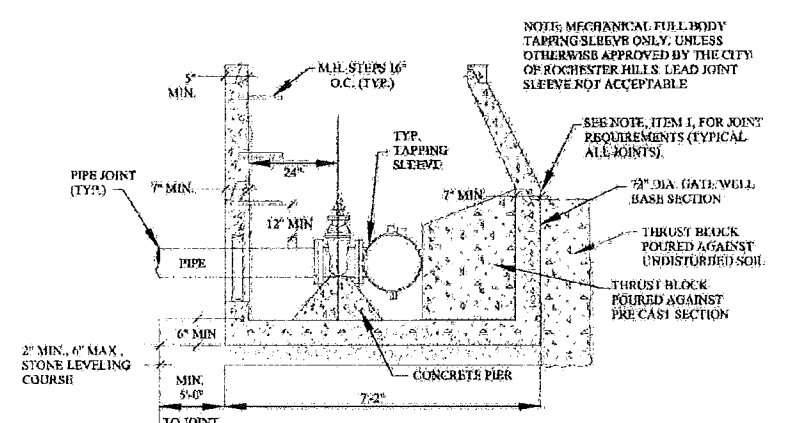
UTILITY CROSSING



BOTTLE SLEEVE

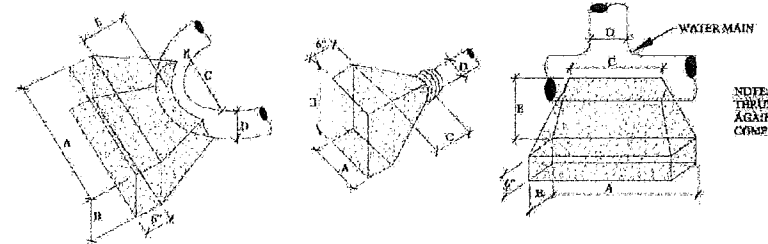


PLAN TAPPING SLEEVE VALVE & WELL (TYPICAL)



TAPPING SLEEVE, VALVE AND WELL (TYPICAL)

- NOTES:**
- ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE MANUFACTURED TO CONFORM WITH A.S.T.M. C-478, 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-415, 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 16 & 2'-0" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING SUT) 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-PLAIR 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.P. 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.



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"	4-8"	2.5"	2.75"
12"	4"	3"	2"	1.75"	12"	4-4"	3"	1.5"	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"	3"	2"	2"	1.3"	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"

THRUST BLOCK DETAILS



MATERIAL LIST:

SHADE TREES

QTY	KEY	BOTANICAL / COMMON NAME	SIZE	ROOT	Unit Cost	Total / Item
9	AS	Acer Saccharum 'Commemoration' / Commemoration Sugar Maple	3" cal	B&B	330.00	2,970.00
6	BN	Betula Nigra / River Birch	3" cal	B&B	335.00	2,010.00
3	CE	Celtis occidentalis / Common hackberry	3" cal	B&B	320.00	960.00
4	GB	Ginkgo biloba 'Lakeview' / Lakeview Maidenhair Tree	3" cal	B&B	365.00	1,460.00
5	GT	Gleditsia triacanthos inermis / Thornless Honeylocust	3" cal	B&B	320.00	1,600.00
18	LD	Liriodendron / Tulip Tree	3" cal	B&B	320.00	5,760.00
6	MG	Metasequoia Glyptostroboides / Dawn Redwood	3" cal	B&B	335.00	2,010.00
27	TG	Tilia cordata 'Greenspire' / Greenspire Linden	3" cal	B&B	335.00	9,045.00

EVERGREEN TREES

QTY	KEY	BOTANICAL / COMMON NAME	SIZE	ROOT	Unit Cost	Total / Item
8	AB	Abies Concolor / Concolor White Fir	10' Ht x 5" Sp	B&B	335.00	2,680.00
18	PG	Picea Glauca / White Spruce	10' Ht x 5" Sp	B&B	320.00	5,760.00
11	PS	Pinus Strobus / White Pine	10' Ht x 5" Sp	B&B	315.00	3,465.00
15	TC	Tsuga Canadensis / Canadian Hemlock	10' Ht x 5" Sp	B&B	315.00	4,725.00

ORNAMENTAL TREES

QTY	KEY	BOTANICAL / COMMON NAME	SIZE	ROOT	Unit Cost	Total / Item
8	AC	Amelanchier canadensis / Shadblow Serviceberry	2" cal or 6" Ht.	B&B	250.00	2,000.00
6	AcR	Amelanchier canadensis 'Reizam' / Reflection Shadblow Serviceberry	2" cal or 6" Ht.	B&B	250.00	1,500.00
7	BnK	Betula Nigra 'Little King Fox Valley	2" cal or 6" Ht.	B&B	265.00	1,855.00
6	MP	Malus 'Prairifire' / Prairifire Crab	2" cal or 6" Ht.	B&B	265.00	1,590.00
4	SR	Syringa reticulata 'Ivory Silk' / Ivory Silk Lilac	2" cal or 6" Ht.	B&B	265.00	1,060.00

SHRUBS for Buffers & Detention Areas

QTY	KEY	BOTANICAL / COMMON NAME	SIZE / Spacing	ROOT	Unit Cost	Total / Item
21	AA	Aronia arbutifolia 'Brilliantissima' / Brilliant Red Chokeberry	30"ht, 24"sp	No. 3 Cont.	50.00	1,050.00
23	AM	Aronia melanocarpa 'Elatea' / Glossy Black Chokeberry	30"ht, 24"sp	No. 3 Cont.	45.00	1,035.00
20	CA	Cornus alba 'Regnzam' / Red Grome Dogwood	30"ht, 24"sp	No. 3 Cont.	45.00	900.00
14	CR	Cornus racemosa / Gray Dogwood	30"ht, 24"sp	No. 3 Cont.	45.00	630.00
6	RR	Rosa 'Radiko' The Double Knock Out / The Double Knock Out Rose	30"ht, 24"sp	No. 3 Cont.	50.00	300.00
11	TM	Taxus x media 'Densiflora' / Densiflora Yew	30"ht, 24"sp	No. 3 Cont.	50.00	550.00
29	SJ	Spiraea japonica 'Little Princess' / Little Princess Spiraea	18"ht, 18"sp	No. 3 Cont.	45.00	1,305.00
31	VC	Virburnum carlesii / Koreanspice Viburnum	30"ht, 24"sp	No. 3 Cont.	50.00	1,550.00
3	VO	Virburnum opulus 'Nanum' / Nanum Dwarf Cranberry Bush	24"ht, 24"sp	No. 3 Cont.	45.00	135.00

PERENNIALS

QTY	KEY	BOTANICAL / COMMON NAME	SIZE	ROOT	Unit Cost	Total / Item
116	NR	Nepeta x Faassenii 'Walker's Low' / Walker's Low Nepeta	1' o.c.	No. 3	12.00	1,392.00
88	RS	Rudbeckia speciosa 'Little Suzy' / Little Suzy Dwarf Orange Coneflower	1' o.c.	No. 3	12.00	1,056.00

PLANTING MATERIALS

QTY	UNIT	Unit Cost	Total / Item
+/-	Plant Mix	T.B.D.	
55	CY	25.00	1,375.00
+/-	Shredded Hardwood Mulch Installed	T.B.D.	
55	CY	45.00	2,475.00
+/-	Terra Sorb or Approved Equal included in plant installation cost	LBS	
8,633	SY	1.25	10,791.00
+/-	Seed	T.B.D.	
+/-	Sod (owner's option)	SY	

IRRIGATION

Refer to Sheet IR - 1 for plan and material list prepared by SiteOne LS 28,000.00

LANDSCAPE PROBABLE COST SUMMARY:

LANDSCAPE MATERIAL PER SHEET LA - 1.1	73,489.00
COST FOR 8 - SINGLE FAMILY UNITS. Refer to sheet LA - 1.2	10,000.00
COST FOR 4 - DUPLEX FAMILY UNIT BUILDINGS. Refer to sheet LA - 1.3	7,540.00
IRRIGATION COST	28,000.00
TOTAL LANDSCAPE COST	\$119,029.00

ALL EVERGREEN AND DECIDUOUS TREES MUST BE FIELD VERIFIED AND PLANTED AT LEAST 15' FEET FROM OVERHEAD UTILITY WIRES.

THE MATURE MAXIMUM HEIGHT FOR ALL GROUNDCOVERS AND PLANTINGS WITHIN THE 25' CLEARZONE IS 30" IN HEIGHT UNMAINTAINED.

AN AUTOMATIC IRRIGATION SYSTEM IS INCLUDED FOR ALL LANDSCAPE AREAS AS REQUIRED BY CITY OF ROCHESTER HILLS REQUIREMENTS FINAL REVIEW.



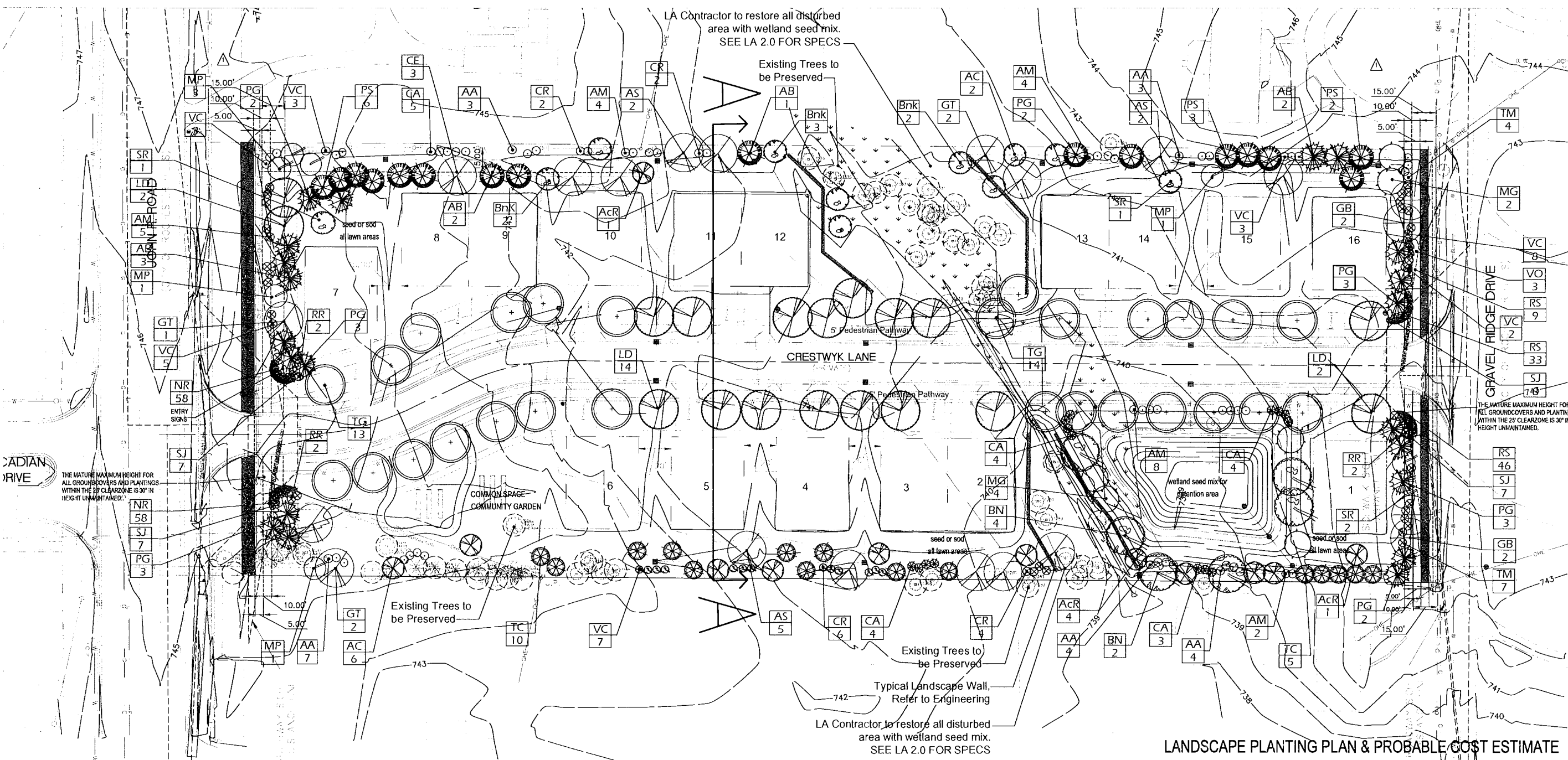
PROJECT:
CRESTWYK ESTATES PUD
SECTION 24 TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
CITY FILE # 17-013

CLIENT:
M2J1, LLC
JIM POLYZOIS
14955 TECHNOLOGY DRIVE
SHELBY TOWNSHIP, MI
48315
Phone: 585.421.5729

Revised per City Review 12/7/17
CITY SUBMITTAL 10/9/2017
PRELIM DESIGN 04/25/2017
Date: 04/21/2017

NÚÑEZ DESIGN
249 Park Street
Troy, Michigan 48063
P: 248.224.5933
nunezdesigninc@gmail.com
Designed / Drawn RN
Checked / Approved JN/RN
Job # N01-20

811
Know what's below.
Call before you dig.
CITY FILE: #17-013
SHEET
LA - 1.1



LANDSCAPE PLANTING PLAN & PROBABLE COST ESTIMATE

NOTES:

THIS PARCEL IS EXEMPT FROM THE CITY TREE PROTECTION ORDINANCE.

AN AUTOMATIC IRRIGATION SYSTEM IS INCLUDED FOR THE LANDSCAPE AREAS AS REQUIRED BY CITY OF ROCHESTER HILLS REQUIREMENTS AT FINAL APPROVAL.
 PROBABLE COST OF THE LANDSCAPE MATERIAL IS INCLUDED ON THE PLANS FOR FINAL APPROVAL. Refer to Sheet LA - 1.1

CITY OF ROCHESTER HILLS MAINTENANCE NOTES 138-12.109
 1. LANDSCAPING SHALL BE KEPT IN A NEAT, ORDERLY AND HEALTHY GROWING CONDITION, FREE FROM DEBRIS AND REFUSE
 2. PRUNING SHALL BE MINIMAL AT TIME OF INSTALLATION, ONLY TO REMOVE DEAD OR DISEASED BRANCHES. SUBSEQUENT PRUNING SHALL ASSURE PROPER MATURATION OF PLANTS TO ACHIEVE THEIR APPROVED PURPOSE
 3. ALL DEAD, DAMAGED OR DISEASED PLANT MATERIAL SHALL BE REMOVED IMMEDIATELY AND REPLACED WITHIN (6) SIX MONTHS AFTER IT DIES OR IN THE NEXT PLANTING SEASON, WHICH EVER COMES FIRST. THE PLANTING SEASON FOR DECIDUOUS PLANTS SHALL BE BETWEEN MARCH 1 AND JUNE 1 AND FROM OCT 1 UNTIL THE PREPARED SOIL FREEZES. 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
 4. THE APPROVED LANDSCAPE PLAN SHALL BE CONSIDERED A PERMANENT RECORD AND INTEGRAL PART OF THE SITE PLAN APPROVAL. UNLESS OTHERWISE APPROVED, ANY REVISIONS OR REMOVAL OF PLANT MATERIALS, OR NON-COMPLIANCE WITH THE MAINTENANCE REQUIREMENTS OF SECTION 138-12.109 WILL PLACE THE PARCEL IN NON-CONFORMITY WITH THE APPROVED LANDSCAPE PLAN AND BE A VIOLATION OF THE ORDINANCE
 5. 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

LANDSCAPE BUFFER STANDARDS

JOHN R - FRONTAGE
EAST PROPERTY BOUNDARY: TYPE 'C' BUFFER - 267 LF

	REQUIRED	EXISTING	PROPOSED
Deciduous Shade Trees	2 67 x 2 = 5.34	6	2
Evergreen Trees	2 67 x 4 = 10.66	11	11
Ornamental Trees	2 67 x 1.5 = 4	4	4
Shrubs	2 67 x 6 = 16	16	17

NORTH PROPERTY BOUNDARY: TYPE 'B' BUFFER - 725 LF

	REQUIRED	EXISTING	PROPOSED
Deciduous Shade Trees	7 25 x 2 = 14.5	15	6
Evergreen Trees	7 25 x 4 = 14.5	15	16
Ornamental Trees	7 25 x 1.5 = 11.8	12	12
Shrubs	7 25 x 4 = 29	29	29

GRAVEL RIDGE DRIVE - FRONTAGE
WEST PROPERTY BOUNDARY: TYPE 'C' BUFFER - 267 LF

	REQUIRED	EXISTING	PROVIDED
Deciduous Shade Trees	2 67 x 2 = 5.34	6	8
Evergreen Trees	2 67 x 4 = 10.66	11	10
Ornamental Trees	2 67 x 1.5 = 4	4	2
Shrubs	2 67 x 6 = 16	16	24

SOUTH PROPERTY BOUNDARY: TYPE 'B' BUFFER - 725 LF

	REQUIRED	EXISTING	PROPOSED
Deciduous Shade Trees	7 25 x 2 = 14.5	15	10
Evergreen Trees	7 25 x 4 = 14.5	15	15
Ornamental Trees	7 25 x 1.5 = 11.8	12	12
Shrubs	7 25 x 4 = 29	29	41

STORMWATER DETENTION BUFFER: 400 LF

	REQUIRED	EXISTING	PROPOSED
Deciduous Shade Trees	4 0 x 1.5 = 6	2	8
Evergreen Trees	4 0 x 1 = 4	-	-
Ornamental Trees	NA	-	-
Shrubs	4 0 x 4 = 16	-	16

STREET R.O.W. TREES:

	REQUIRED	PROPOSED
ROAD LENGHT (732 65 LF / 1.35' = 21 X 2)	42	42 TREES
3 CALIPER INCHES STREET TREES		

PLANT MATERIAL REQUIREMENTS:

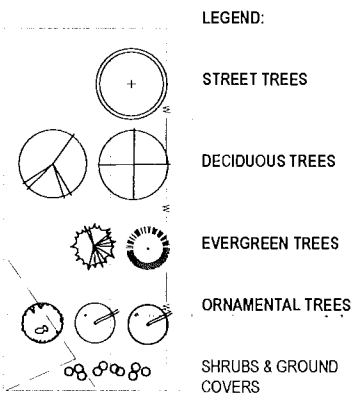
	REQUIRED
Deciduous Shade Trees	3 CALIPER INCHES*
Evergreen Trees	10 FEET HEIGHT AND 5 FEET SPREAD
Ornamental Trees	2 CALIPER INCHES* OR 6 FEET OVERALL HEIGHT
Shrubs	30 INCHES IN HEIGHT, 24 INCHES IN SPREAD WHEN USED FOR SCREENING OR BUFFERING PURPOSES, 3 GALLON CONTAINED SIZE WHEN USED FOR OTHER PURPOSES
Groundcovers	SHALL BE FROM FLATS

TREE PRESERVATION LIST:

Saved Trees	Species	DBH (in)	Condition
1203	Blue Spruce	7	Far
1204	White Oak	24	Good
1205*	White Oak	19.5	Good
1206	Red Oak	21.5	Far
1207*	Norway Spruce	11	Far
1208*	Norway Spruce	10	Poor
1214	Red Oak	41.5	Good Landmark
1215	White Oak	26.5	Good
1216	Black Oak	21.5	Far
1217	Black Oak	29	Far
1218	Norway Maple	7	Good
1746	White Mulberry	7	Far
1280	Basswood	8.5	Good
1283	Shagbark Hickory	7	Good

TREE PRESERVATION LIST:

Wetland Trees	Species	DBH (in)	Condition
7132	Bitternut Hickory	6	Good
1285	Shagbark Hickory	7.5	Good
1286	American Elm	17	Dead
1289	Pignut Hickory	7.5	Good
1290	White Oak	9.5	Fair
1299	Shagbark Hickory	7.5	Fair
7130	Boxelder	6	Fair
1538	Red Maple	12.5	Good
1537	Swamp White Oak	9	Good
1536	Red Maple	7	Good
1535	Silver Maple	27.5	Good
1534	Red Maple	7.5	Good
1533	Swamp White Oak	9	Good
1532	Silver Maple	8	Good
1531	Silver Maple	18	Good
1530	Silver Maple	18	Good
1529*	Silver Maple	9.5	Good
1528	Red Maple	21	Poor
1527	Silver Maple	16	Good
1526	Swamp White Oak	11	Good
7137	American Elm	6	Good
1516	Red Maple	17.5	Good
1515	Silver Maple	14	Fair
1514	Red Maple	28.5	Good
1514	Silver Maple	29.5	Good
1520	Red Maple	19	Good
1519	Red Maple	32	Fair
1518	Red Maple	19	Good
1517	Red Maple	7	Good
1506	Red Maple	10	Good



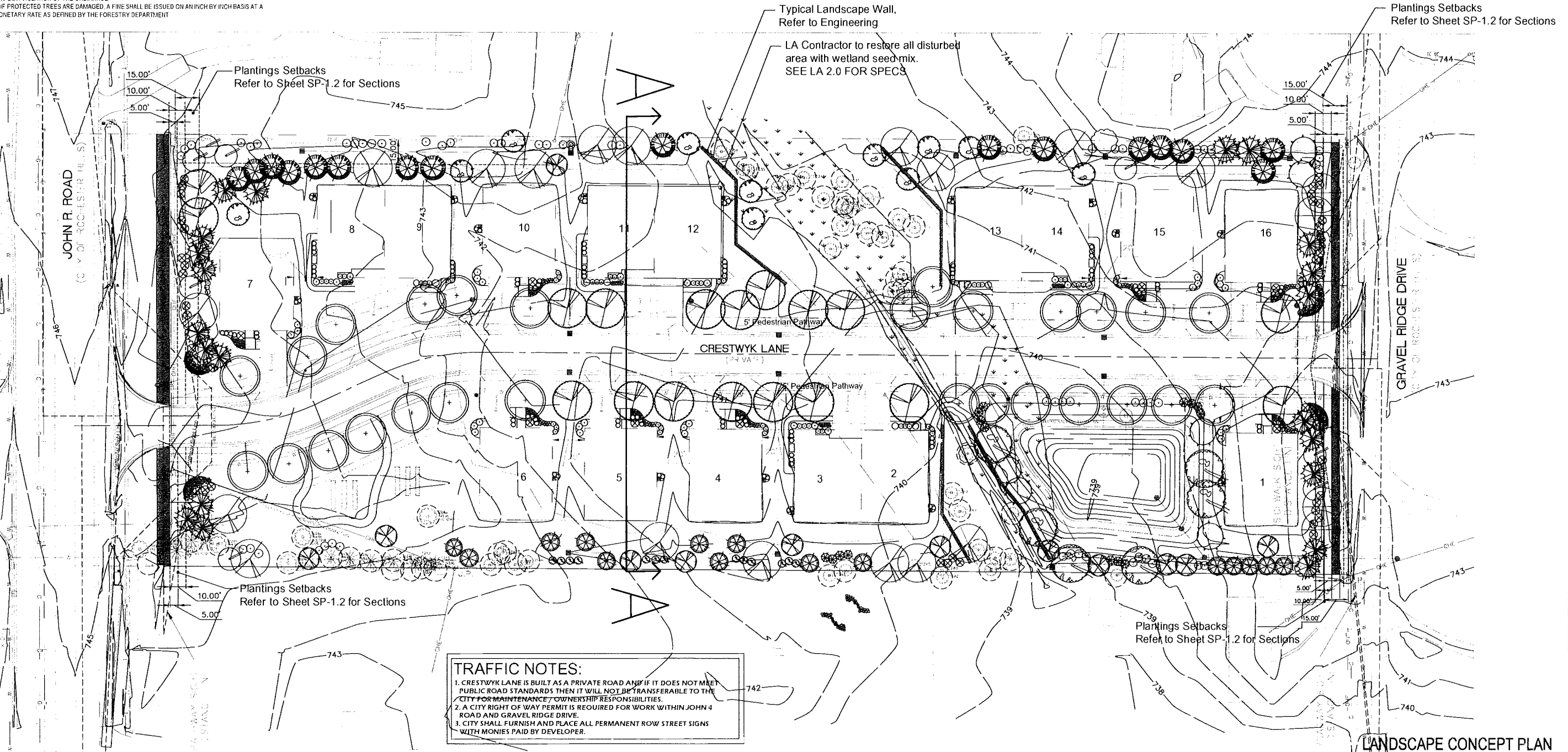
PROJECT:
 CRESTWYK ESTATES PUD
 SECTION 24 TOWN 3 NORTH, RANGE 11 EAST
 CITY OF ROCHESTER HILLS
 CITY FILE # 17-013

CLIENT:
 M2J1, LLC
 JIM POLYZOIS
 14955 TECHNOLOGY DRIVE
 SHELBY TOWNSHIP, MI 48315
 Phone: 585.421.5729

Final PUD SUBMITTAL 3/2/2018
 CITY SUBMITTAL 10/9/2017
 PRELIM DESIGN 09/25/2017
 Date 04/21/2017

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 Checked / Approved: JNRN
 Job # N01-20

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 Know what's below. Call before you dig.
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 SHEET
 LA - SP 1.0



PLAN SUBMITTED FOR SITE PLAN REVIEW - NOT FOR CONSTRUCTION

MATERIAL LIST: Single Family Unit

SHRUBS

QTY	KEY	BOTANICAL / COMMON NAME	SIZE	ROOT	Unit Cost	Total / Item
1	BS	Buxus sempervirens 'Highlander' / Highlander Common Boxwood	36"ht, 24"sp	No. 3	60.00	60.00
3	HM	Hydrangea m. 'Glowing Embers' / Glowing Embers Hydrangea	24"ht, 24"sp	No. 3	50.00	150.00
3	RM	Rosa 'Meivahyni' / Knockout Rose	18"ht, 18"sp	No. 3	50.00	150.00
6	SJ	Spiraea japonica 'Little Princess' / Little Princess Spiraea	18"ht, 18"sp	No. 3	45.00	270.00
2	TM	Taxus x media 'Densiflora' / Densiflora Yew	30"ht, 24"sp	No. 5	55.00	110.00

PERENNIALS

15	NF	Nepeta x faassenii 'Walker's Low' / 'Walker's Low Nepeta'	18"ht, 12"sp	No. 3	12.00	180.00
10	RF	Rudbeckia Fulgida 'Goldsturm' / Black Eyed Susan	18"ht, 18"sp	No. 3	12.00	120.00

PLANTING MATERIALS

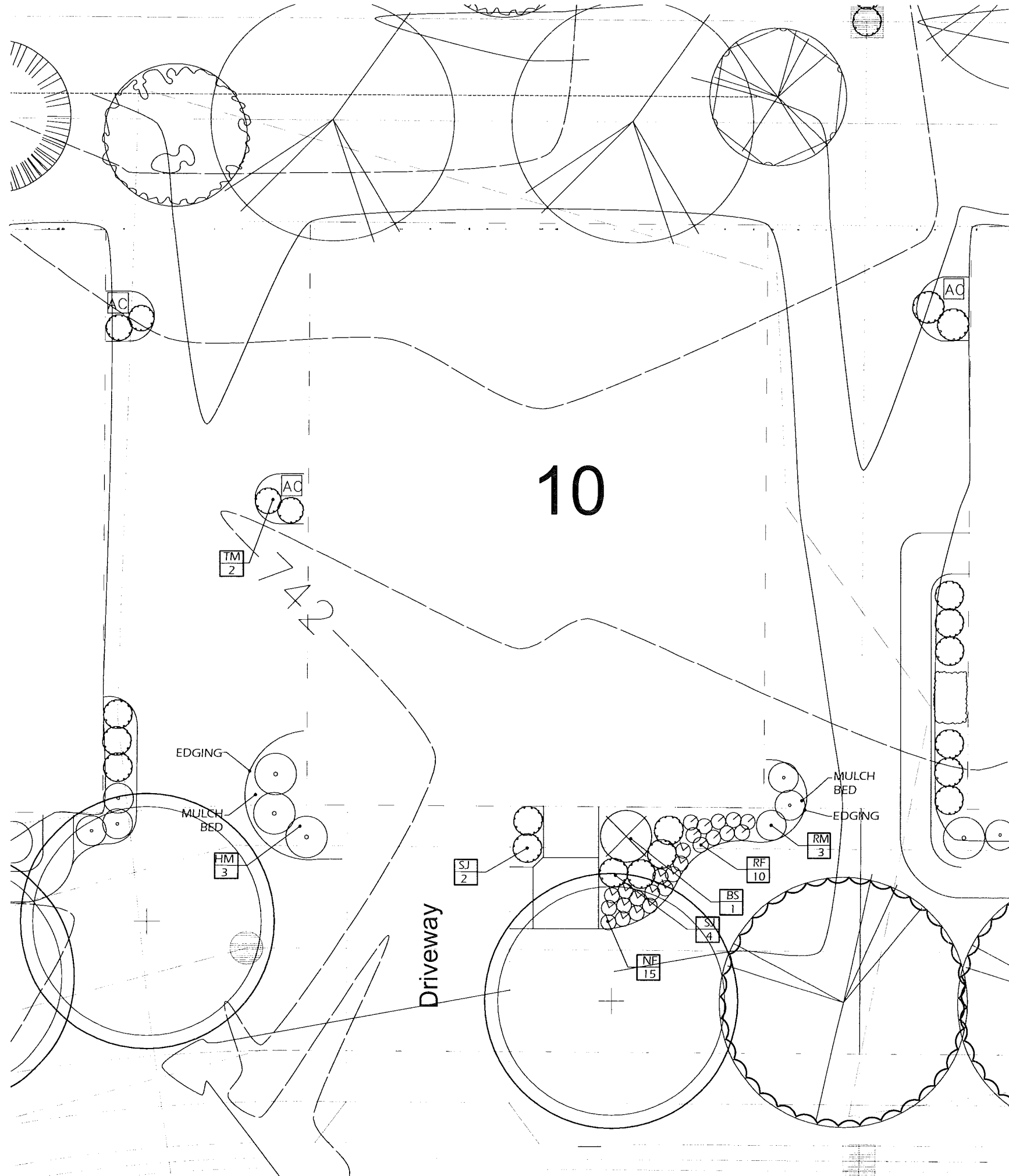
+/-	3	Plant Mix			25.00 CY	75.00
+/-	3	Shredded Hardwood Mulch Installed			45:00 CY	135.00
+/-		Terra Sorb or Approved Equal				
+/-		Edging T.B.D.				

PER UNIT COST \$ 1,250.00

UNIT COST FOR 8 - SINGLE FAMILY UNITS \$10,000.00

THE MATURE MAXIMUM HEIGHT FOR ALL GROUNDCOVERS AND PLANTINGS WITHIN THE 25' CLEARZONE IS 30" IN HEIGHT UNMAINTAINED.

AN AUTOMATIC IRRIGATION SYSTEM HAS BEEN PROVIDED FOR THE LANDSCAPE AREAS AS REQUIRED BY CITY OF ROCHESTER HILLS REQUIREMENTS FOR FINAL REVIEW. REFER TO SHEET IR-1



TYPICAL SINGLE UNIT PLANTING PLAN LA -1.2



PROJECT:
 CRESTWYK ESTATES PUD
 SECTION 24 TOWN 3 NORTH, RANGE 11 EAST
 CITY OF ROCHESTER HILLS
 CITY FILE # 17-013

CLIENT:
 M2J1, LLC
 JIM POLYZOIS
 14955 TECHNOLOGY DRIVE
 SHELBY TOWNSHIP, MI
 48315
 Phone: 585.421.5729

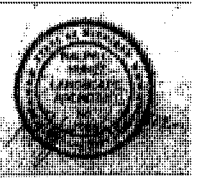
Final PUD SUBMITTAL 3/2/2018
 CITY SUBMITTAL 10/9/2017
 PRELIM DESIGN 04/26/2017
 Date: 08/11/2017

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 LA -1.2



PROJECT:
CRESTWYK ESTATES PUD
 SECTION 24 TOWN 3 NORTH, RANGE 11 EAST
 CITY OF ROCHESTER HILLS
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MATERIAL LIST: Duplex Unit

SHRUBS

QTY.	KEY SCIENTIFIC / COMMON NAME	SPECIFICATION	Unit Cost	Total / Item
4	HM Hydrangea m. 'Glowing Embers' / Glowing Embers Hydrangea	24"ht, 24"sp No. 3	50.00	200.00
11	SJ Spiraea japonica 'Little Princess' / Little Princess Spiraea	18"ht, 18"sp No. 3	45.00	495.00
7	TM Taxus x media 'Densiflora' / Densiflora Yew	30"ht, 24"sp No. 5	60.00	420.00
6	BS Buxus Sinica insularis 'Wintergreen' / Wintergreen Korean Boxwood	18"ht, 18"sp No. 3	50.00	300.00
10	NF Nepeta x Faassenii 'Walker's Low' / 'Walker's Low' Nepeta	18"ht, 18"sp No. 3	12.00	120.00

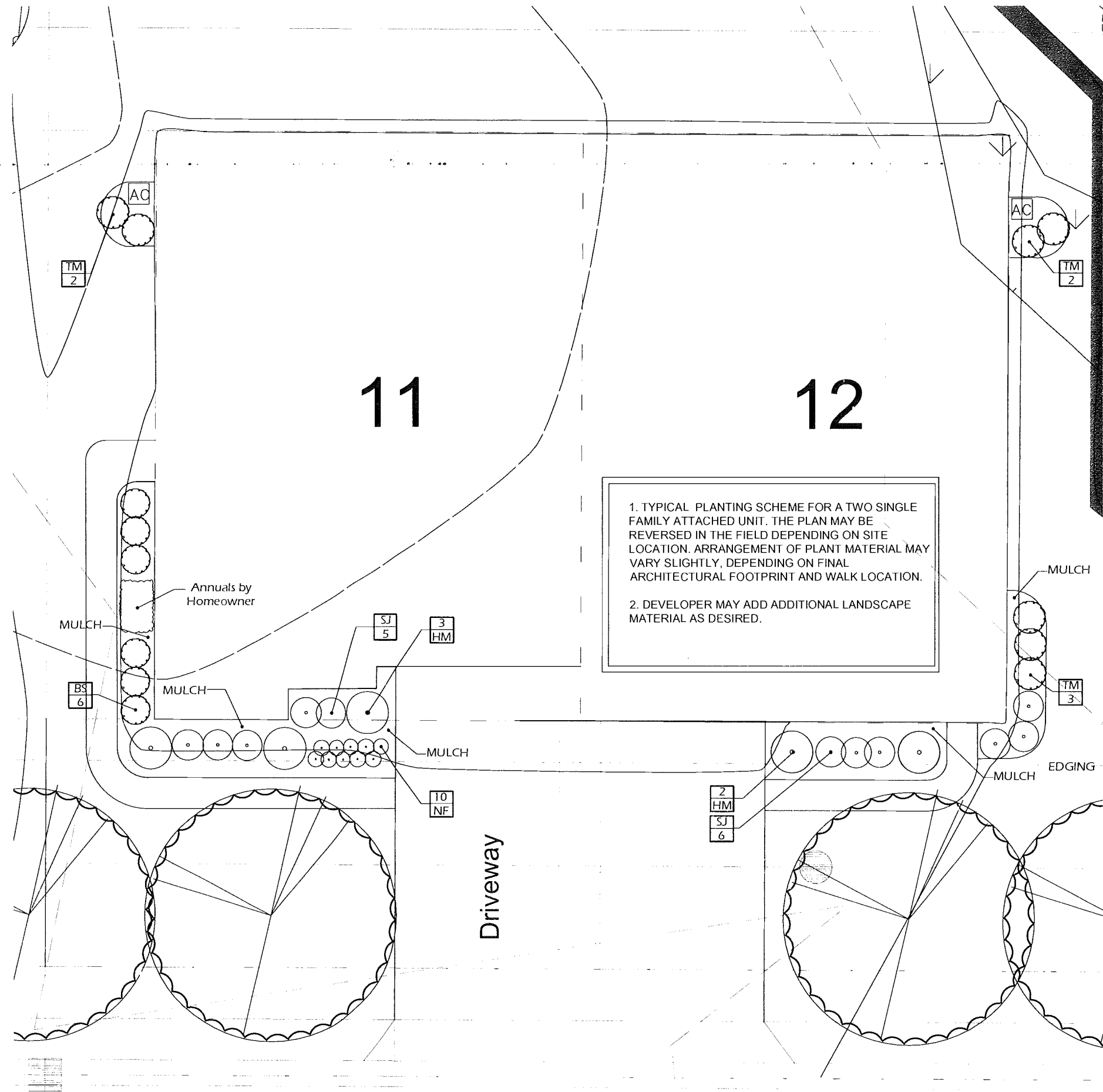
ANNUALS - by home owners

PLANTING MATERIALS	Unit Cost	Total / Item
+/- 5 Plant Mix	25.00	125.00
+/- 5 Shredded Hardwood Mulch Installed	45.00	225.00
+/- Terra Sorb or Approved Equal		
+/- Edging T.B.D.		

COST PER DUPLEX UNIT \$1,885.00
 COST FOR 4 - DUPLEX UNIT BUILDINGS \$7,540.00

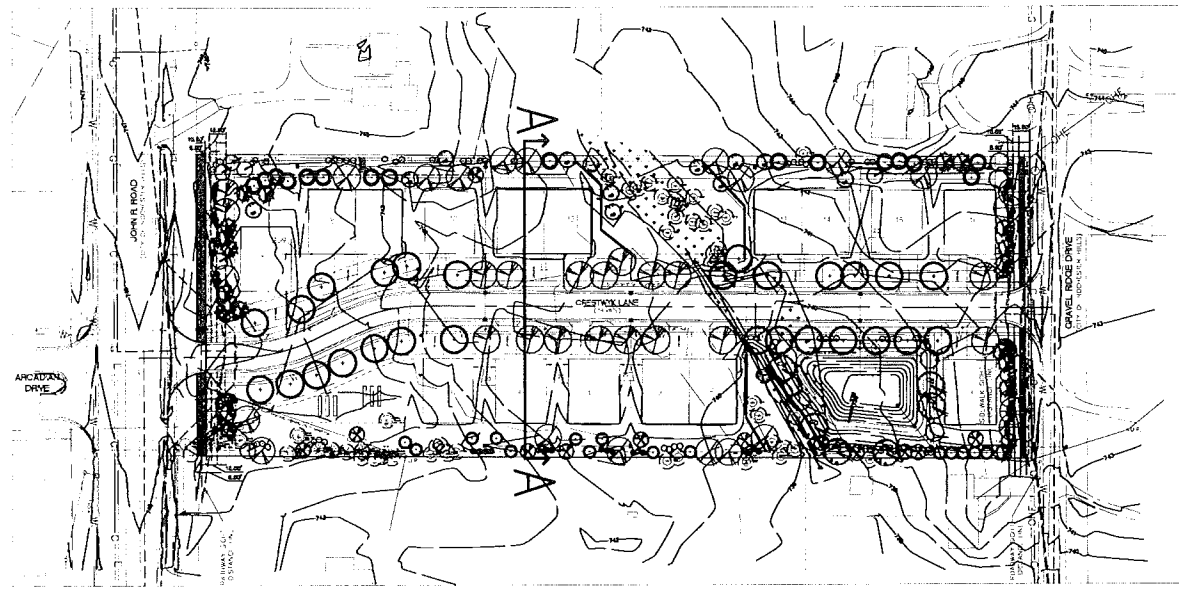
THE MATURE MAXIMUM HEIGHT FOR ALL GROUNDCOVERS AND PLANTINGS WITHIN THE 25' CLEARZONE IS 30" IN HEIGHT UNMAINTAINED.

AN AUTOMATIC IRRIGATION SYSTEM HAS BEEN PROVIDE FOR THE LANDSCAPE AREAS AS REQUIRED BY CITY OF ROCHESTER HILLS REQUIREMENTS AT FINAL. REFER TO SHEET IR-1

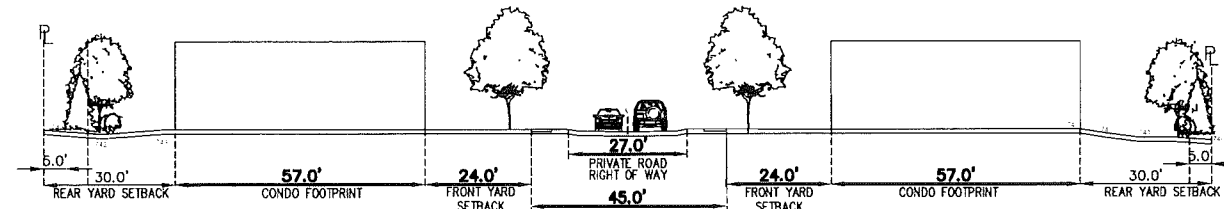


1. TYPICAL PLANTING SCHEME FOR A TWO SINGLE FAMILY ATTACHED UNIT. THE PLAN MAY BE REVERSED IN THE FIELD DEPENDING ON SITE LOCATION. ARRANGEMENT OF PLANT MATERIAL MAY VARY SLIGHTLY, DEPENDING ON FINAL ARCHITECTURAL FOOTPRINT AND WALK LOCATION.
 2. DEVELOPER MAY ADD ADDITIONAL LANDSCAPE MATERIAL AS DESIRED.

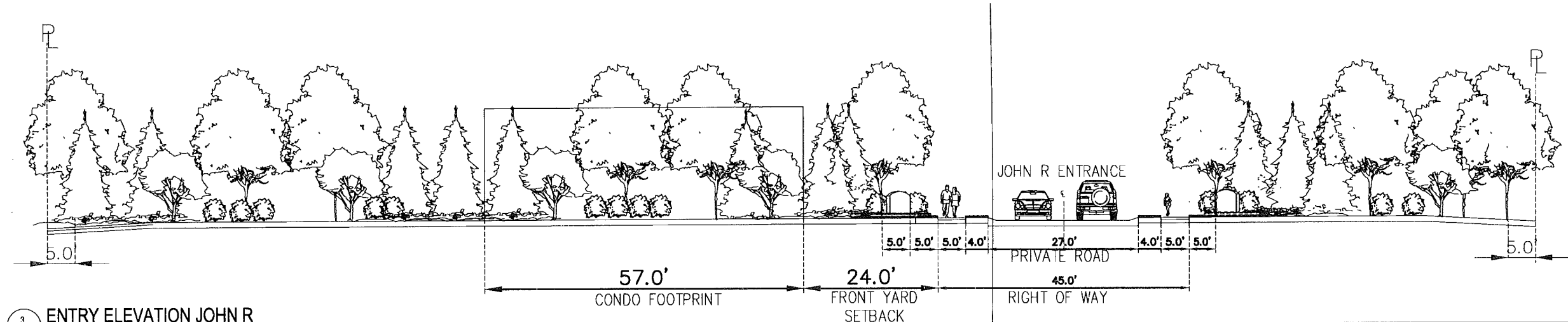
TYPICAL TWO FAMILY ATTACHED UNITS PLANTING PLAN



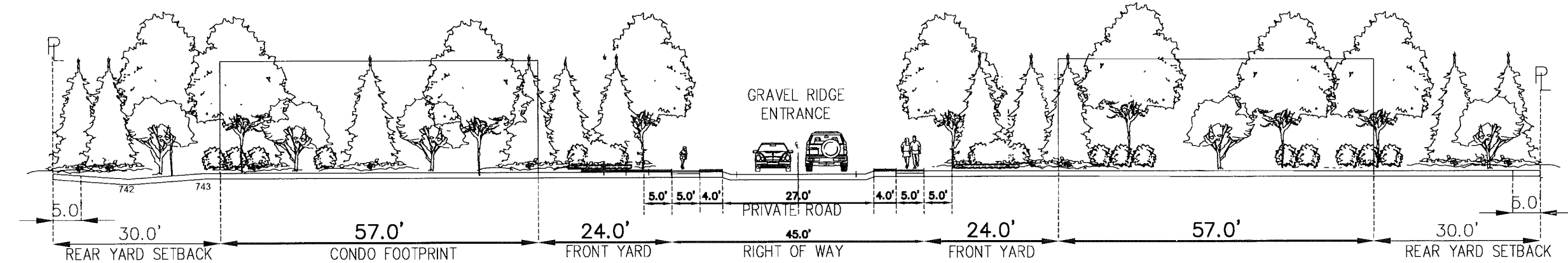
1 SECTION KEY
SCALE: 1" = 50'



2 SECTION A-A: GRAVEL RIDGE DRIVE
SCALE: 1" = 20'



3 ENTRY ELEVATION JOHN R
SCALE: 1" = 10'



4 SECTION A-A
SCALE: 1" = 10'



PROJECT:
CRESTWYK ESTATES PUD
SECTION 24 TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
CITY FILE # 17-013

CLIENT:
M2J1, LLC
JIM POLYZOIS
14955 TECHNOLOGY DRIVE
SHELBY TOWNSHIP, MI
48315
Phone: 585.421.5729

Final PUD SUBMITTAL 3/2/2018
CITY SUBMITTAL 10/9/2017
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JOHN R. ROAD

GRAVEL RIDGE DRIVE

PLANTING SETBACK REQUIREMENTS:

15' PLANTING SETBACK LINE FROM PROPOSED OVERHEAD UTILITY LINE AND EXISTING OVERHEAD UTILITY LINE. ALL EVERGREEN AND DECIDUOUS TREES MUST BE FIELD VERIFIED AND PLANTED A MINIMUM OF 15' FROM OVERHEAD UTILITY LINES.

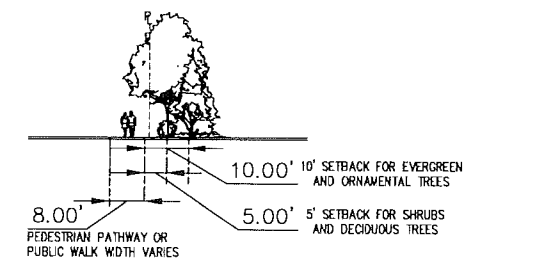
10' PLANTING SETBACK LINE ORNAMENTAL TREES AND EVERGREEN TREES MUST BE PLANTED A MINIMUM OF 10' FROM A WALK OR PEDESTRIAN PATHWAY

5' PLANTING SETBACK FOR SHRUBS AND DECIDUOUS TREES FROM A PUBLIC WALK OR PEDESTRIAN PATHWAY. (5' SETBACK APPLIES TO DECIDUOUS TREES IF NO OVERHEAD UTILITIES EXIST.)

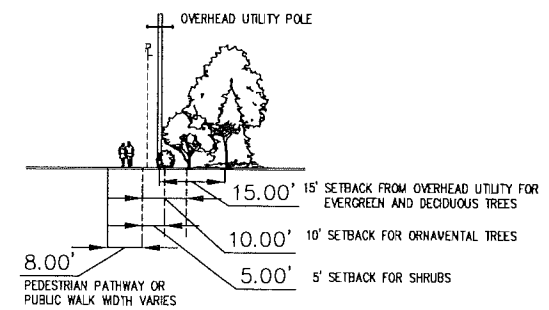
A CITY RIGHT OF WAY PERMIT IS REQUIRED FOR WORK WITHIN JOHN R ROAD AND GRAVEL RIDGE DRIVE.
CITY SHALL FURNISH AND PLACE ALL PERMANENT ROW STREET SIGNS WITH MONIES PAID BY DEVELOPER.

THE MATURE MAXIMUM HEIGHT FOR ALL GROUNDCOVERS AND PLANTINGS WITHIN THE 25' CLEARZONE IS 30" IN HEIGHT UNMAINTAINED.

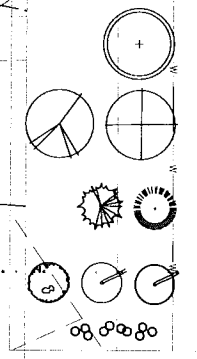
NO LARGE SHRUBS OR TREES TO BE PLANTED WITHIN THE VISIBILITY SIGHTLINES FOR THE PEDESTRIAN PATHWAY, PUBLIC WALK OR WITHIN THE VISIBILITY SIGHTLINE FOR VEHICULAR TRAFFIC.



SETBACK REQUIREMENTS SECTION FROM PATHWAY:



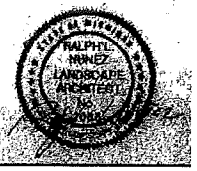
SECTION SETBACK REQUIREMENTS FROM OVERHEAD UTILITY:



- LEGEND:
STREET TREES
DECIDUOUS TREES
EVERGREEN TREES
ORNAMENTAL TREES
SHRUBS & GROUND COVERS



NÚÑEZ DESIGN



PROJECT:
CRESTWYK ESTATES PUD
SECTION 24 TOWN 3 NORTH, RANGE 11 EAST
CITY OF ROCHESTER HILLS
CITY FILE # 17-013

CLIENT:
M2J1, LLC
JIM POLYZOIS
14955 TECHNOLOGY DRIVE
SHELBY TOWNSHIP, MI
48315
Phone: 585.421.5729

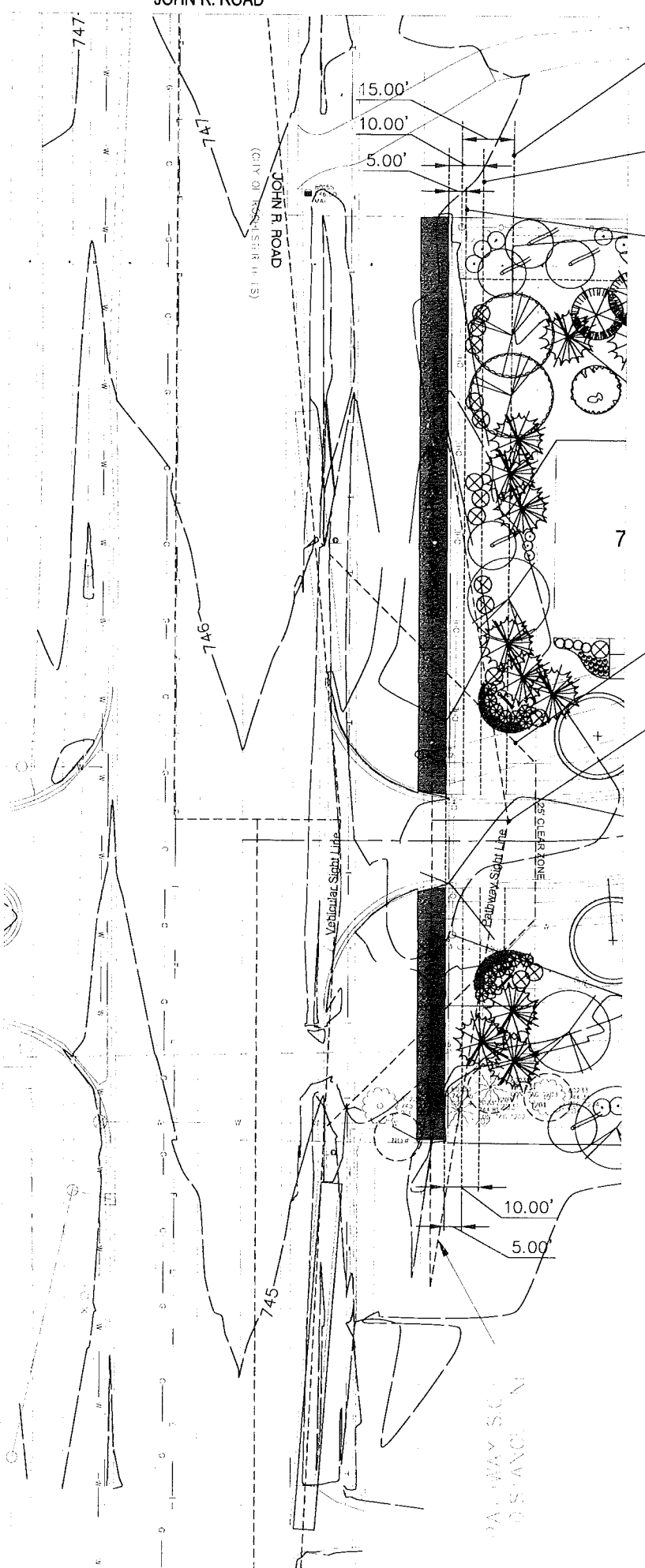
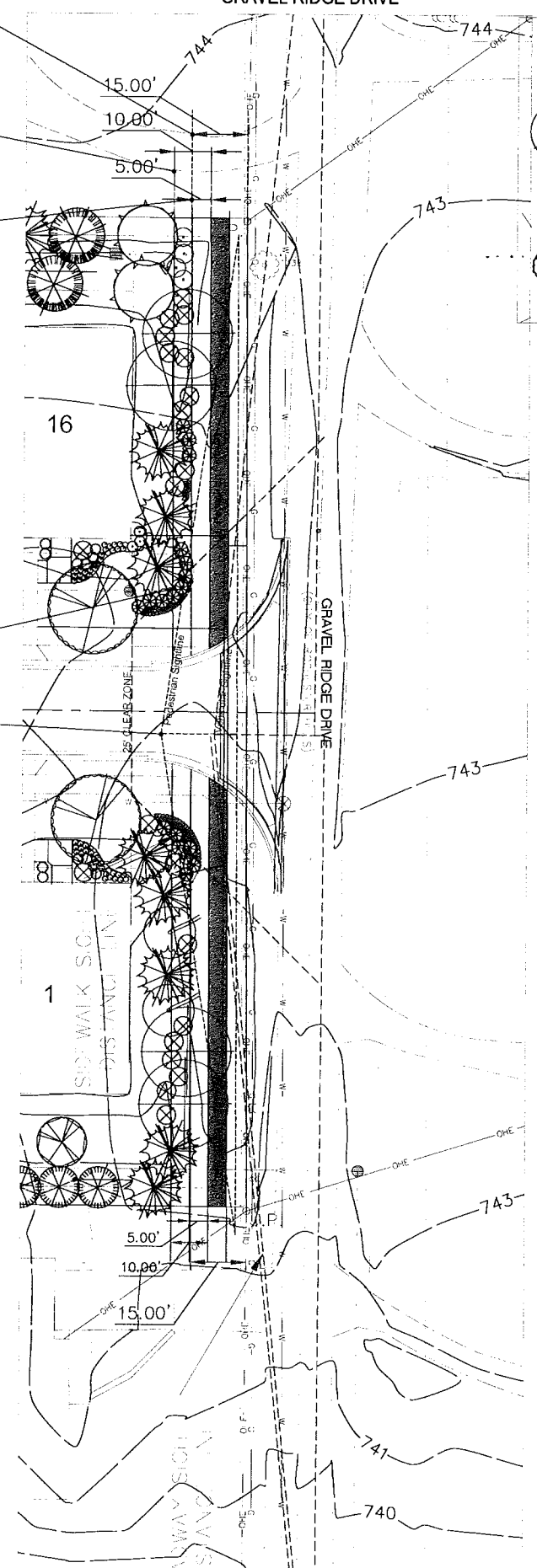


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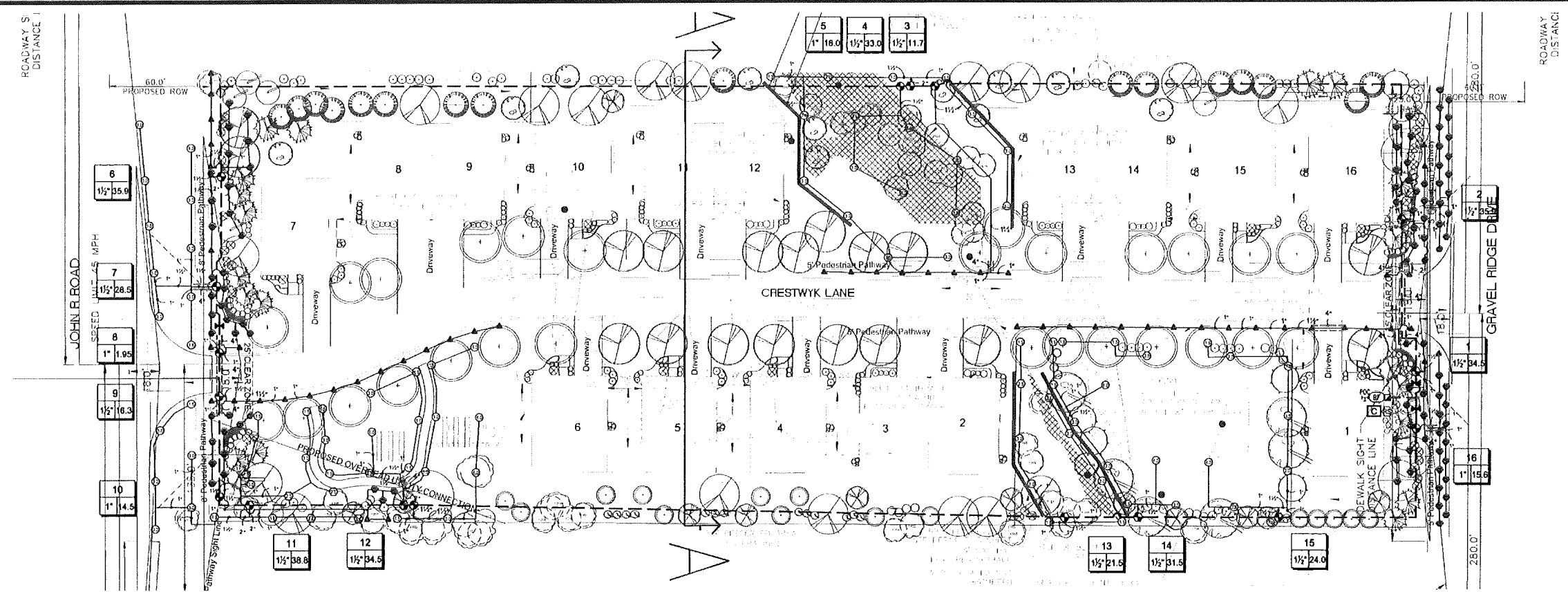
CITY FILE: #17-013
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PLANTING SETBACK REQUIREMENTS & SECTIONS



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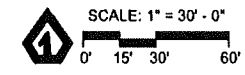


IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL	QTY
ES	Hunter PROS-04 5' strip spray	53
LS	Hunter PROS-04 10' radius	63
MS	Hunter PROS-04 12' radius	25
CS	Hunter PROS-04 15' radius	14
PGP-04-LA	Hunter PGP-04-LA	3
PGP-04	Hunter PGP-04	25
PGP-04	Hunter PGP-04	53
PGP-04	Hunter PGP-04	6
PGV-101G 1"	Hunter PGV-101G 1"	5
PGV-151 Globe 1-1/2"	Hunter PGV-151 Globe 1-1/2"	12
HQ 5/8C 1"	Hunter HQ 5/8C 1"	1
ISV	Isolation Valve Mainline Size	3
F765	Febco 765 1-1/2"	1
IC-1800-M	Hunter IC-1800-M	1
Solar-Sync	Hunter Solar-Sync	1
Top 1-1/2"	Top 1-1/2"	1
---	Irrigation Lateral Line: Polyethylene Pipe 100 PSI 1"	3,980 L.F.
---	Irrigation Lateral Line: Polyethylene Pipe 100 PSI 1 1/2"	665.8 L.F.
---	Irrigation Lateral Line: Polyethylene Pipe 100 PSI 2"	43.1 L.F.
---	Irrigation Mainline: PVC Class 150 SDR 26 2"	1,572 L.F.
---	Pipe Sleeve: PVC Class 150 SDR 26 2"	11.0 L.F.
---	Pipe Sleeve: PVC Class 150 SDR 26 4"	123.6 L.F.
---	Valve Capnut	
---	Valve Monitor	
---	Valve Floor	
---	Valve Box	

IRRIGATION SPECIFICATIONS

- IRRIGATION SYSTEM DESIGN BASED ON 35 GPM AT 55 PSI.
- IRRIGATION DESIGN IS FROM THE POINT OF CONNECTION (POC) ONLY. THE DESIGN IS BASED ON GALLONS PER MINUTE (GPM) AND POUNDS PER SQUARE INCH (PSI) FURNISHED BY OTHERS.
- IRRIGATION CONTRACTOR IS TO VERIFY POINT OF CONNECTION IN THE FIELD. INSTALLER IS TO CONFIRM THE MINIMUM DISCHARGE REQUIREMENTS OF THE POINT OF CONNECTION AS INDICATED ON THE LEGEND PRIOR TO INSTALLATION.
- THE PRESSURE REQUIREMENT AT THE POINT OF CONNECTION IS BASED ON NO MORE THAN 5 FEET OF ELEVATION CHANGE IN THE AREAS OF IRRIGATION.
- ALL PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ACCORDING TO LOCAL BUILDING, ELECTRICAL, AND PLUMBING CODES.
- IRRIGATION CONTRACTOR WILL ARRANGE INSPECTIONS REQUIRED BY LOCAL AGENCIES AND ORDINANCES DURING THE COURSE OF CONSTRUCTION AS REQUIRED. ALL WIRING TO BE PER LOCAL CODE. BACKFLOW PREVENTION TO BE PER LOCAL CODE.
- LOCATION OF IRRIGATION COMPONENTS SHOWN ON DRAWING IS APPROXIMATE. ACTUAL PLACEMENT MAY VARY SLIGHTLY AS REQUIRED TO ACHIEVE FULL, EVEN COVERAGE.
- ALL SPRINKLER HEADS SHALL BE INSTALLED PERPENDICULAR TO FINISH GRADES, EXCEPT AS OTHERWISE INDICATED.
- INSTALL IRRIGATION MAINS WITH A MINIMUM 18" OF COVER BASED ON FINISH GRADES. INSTALL IRRIGATION LATERALS WITH MINIMUM 12" OF COVER BASED ON FINISH GRADES.
- PIPE LOCATIONS ARE DIAGRAMMATIC. VALVES AND MAINLINE SHOWN IN PAVED AREAS ARE FOR GRAPHIC CLARITY ONLY.
- THE IRRIGATION CONTRACTOR SHALL COMPLY WITH PIPE SIZES AS INDICATED.
- ALL WIRE SPLICES OR CONNECTIONS SHALL BE MADE WITH APPROVED WATERPROOF WIRE CONNECTIONS AND BE IN A VALVE OR SPLICE BOX.
- ALL CONTROL WIRING DOWNSTREAM OF THE CONTROLLER IS TO BE 14 AWG, UL APPROVED DIRECT BURY.
- THE DESIGN IS BASED ON THE SITE INFORMATION AND/OR DRAWING SUPPLIED WITH THE DESIGN CRITERIA BEING SET (AREA TO BE IRRIGATED, EQUIPMENT MANUFACTURER AND MODEL TO BE USED, WATER SOURCE INFORMATION, ELECTRICAL POWER AVAILABILITY, ETC...). SITEONE LANDSCAPE SUPPLY BEARS NO RESPONSIBILITY OR LIABILITY FOR ANY ERRORS IN DESIGN OR INSTALLATION THAT ARISE DUE TO INACCURACIES IN THE ABOVE REFERENCED INFORMATION SUPPLIED TO SITEONE LANDSCAPE SUPPLY LANDSCAPES IN RELATION TO THIS PROJECT, UNLESS OTHERWISE NOTED.



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Project Services

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Troy, Michigan 48063
Phone 248 588 2100
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800.347.4272

Project Name:
**CRESTWYK ESTATES
ROCHESTER HILLS**
ROCHESTER HILLS, MI, 48309

Customer Name:

Design Date: 01/11/18

Drawn By: J. LOVELL

REVISIONS

Description	Date

Drawing Title:
IRRIGATION DESIGN

Drawing Scale: 1" = 30'

Project Services Number: 146728

Sheet Number:

IR-1

Crestwyk Estates Duplex

MJ LLC



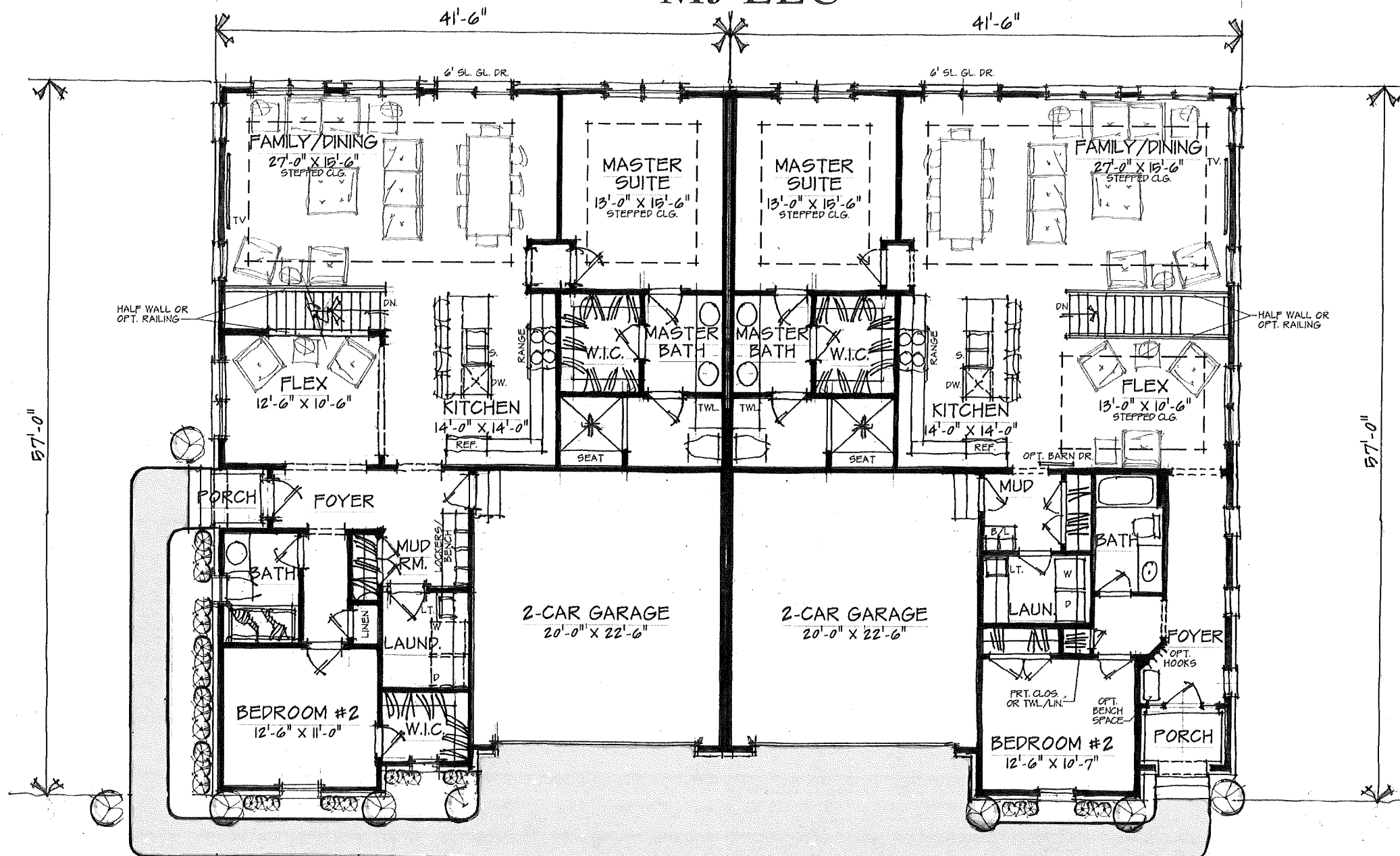
ELEVATION CONCEPT
SCALE: 1/4" = 1'-0"



Crestwyk Estate v.6 2/07/18

Crestwyk Estates Duplex

MJ LLC



LEFT UNIT PLAN

SCALE: 1/4" = 1'-0"

RIGHT UNIT: 1,845 SQ. FT.

RIGHT UNIT PLAN

SCALE: 1/4" = 1'-0"

RIGHT UNIT: 1,795 SQ. FT.



Crestwyk Estate v.6 2/07/18