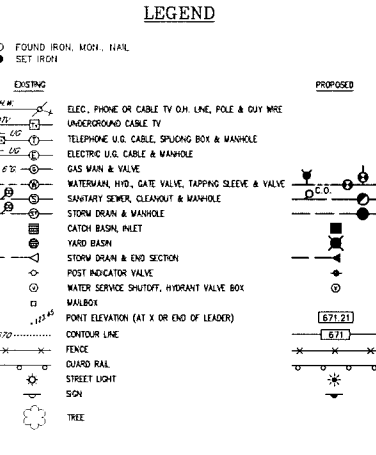
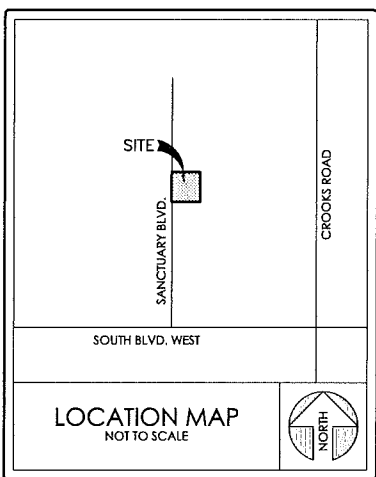


PARCEL DESCRIPTION
 Lots 82, 83, 94-98; part of Lots 84, 92, 93, 99; the vacated Grant Road adjacent to the above mentioned Lots; and the vacated Dayton Road adjacent to the above mentioned Lots of "South Boulevard Gardens" according to the plat thereof recorded in Liber 5 of Plats, Page 45, Oakland County Records, more particularly described as:
 Beginning at the northwest corner of vacated Dayton Road adjacent to Lot 86; thence S03°21'02"E 452.14 feet; thence N89°40'14"E 182.95 feet; thence N00°24'02"W 112.95 feet; thence N89°40'14"E 318.11 feet; thence N00°24'02"W 352.79 feet; thence S88°06'58"W 524.50 feet to the point of beginning.
 Containing 4.57 acres of land, more or less.



NOTE:
 ALL WORK WILL BE CONDUCTED USING BEST MANAGEMENT PRACTICES (BMP) TO ENSURE FLOW AND CIRCULATION PATTERNS AND CHEMICAL AND BIOLOGICAL CHARACTERISTICS OF WETLANDS ARE NOT IMPACTED.

SITE DATA
 CURRENT ZONING: R-4
 PROPOSED ZONING: P.U.D.
 PID: 15-32-476-001
 PID: 15-32-476-002
 PID: 15-32-476-005
 PID: 15-32-476-006
 PID: 15-32-476-009
 PID: 15-32-477-016
 PID: 15-32-477-009

TOTAL SITE AREA 1199,285 SF
 24.57 AC
TOTAL UNITS 14
TOTAL BUILDINGS 7
REQUIRED DENSITY 3.4 UNITS PER ACRE
 4.57 x 3.4 = 15.5 UNITS
PROPOSED DENSITY 14 UNITS / 4.57 ACRES = 3.06 UNITS PER ACRE
SETBACKS FRONT 25 FT
 SIDE 10 FT MIN.
 REAR 20 FT TOTAL
 15 FT
MAX BLDG. HEIGHT = 2.5 STORIES OR 30.0 FT.
REQUIRED OPEN SPACE 5.0%, 0.23 AC.
PROPOSED OPEN SPACE 5.0%, 0.23 AC.

FIRE DEPARTMENT NOTES:
 1. Fire lanes shall be designated by the Fire Code Official, and shall be conspicuously posted on both sides of the fire lane, with fire lane signs, spaced no more than 100 feet apart. Fire lane signs shall read "No Stopping, Standing, Parking, Fire Lane" and shall conform to Michigan Manual of Uniform Traffic Control Devices.
 2. Construction site shall be safeguarded in accordance with IFC 2008 Chapter 14.
 3. Open burning is not permitted including the burning of trash, debris, or land clearing materials. Open burning for warming of sand and/or water for the preparation of motor shall be within the City of Rochester Hills Burn Permit Guidelines.

Fenn & Associates, Inc.
 Land Surveying and Civil Engineering
 14933 Commercial Drive, Shelby Township, MI 48315
 Phone: 586-254-9577 Fax: 586-254-9020
 www.fennsurveying.com

SITE PLAN
SANCTUARY IN THE HILLS EAST
 PART OF THE SE 1/4 OF SECTION 32, T3N, R11E,
 CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

DISTRIBUTION	
●	PRELIMINARY
○	APPROVAL
○	CONSTRUCTION
○	AS-BUILT
REVISIONS	
DATE	REMARKS
08/05/15	PER ASTI
01/28/16	PER CITY/CLIENT
4/12/16	PER CITY/ASTI

SEAL

CLIENT
 MACLEISH BUILDING
 CORNERSTONE VILLAGE
 SUITE F
 650 E. BIG BEAVER ROAD
 TROY, MI 48068

PROJECT NAME
 SANCTUARY IN THE HILLS EAST

PROJECT NUMBER
 C15-011.04

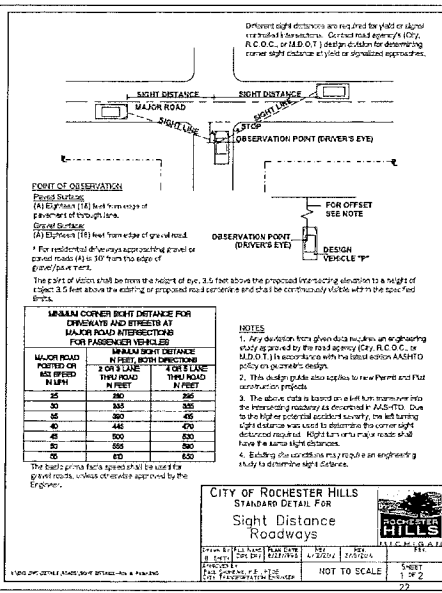
SHEET NAME
 UTILITY PLAN

DRAWING SCALE: 1" = 30'
DATE: 07/17/15
PROJECT MANAGER/T.W.D.: WAS
DRAWN BY: MAS/J.S.P.E.
FIELD BY: A.C., B.H.
CHECKED BY: TWB/SR, P.E.

SHEET NUMBER
 1 OF 7

SANITARY SEWER BASIS OF DESIGN

TOTAL NUMBER OF UNITS/LOTS	14 UNITS/LOTS
2.5 PEOPLE PER UNIT * NO. OF UNITS	35 PEOPLE
$Ave Q = \frac{(100 \text{ G.P.C.P.D.} * \text{NO PEOPLE})}{(86,400 \text{ SEC/DAY} * 7.48 \text{ GAL./C.F.})}$	= 0.005 cfs.
$G.P.C.P.D. = \frac{100 * (18 + SQ.P)/(4+SQ.P)}{(P=POP. IN THOUSANDS)}$	= 434
$PEAK Q = \frac{(G.P.C.P.D. * \text{NO. PEOPLE})}{(86,400 \text{ SEC/DAY} * 7.48 \text{ GAL./C.F.})}$	= 0.02 cfs.
SIZE OF SANITARY SEWER	= 18 inch
PIPE SLOPE	= 0.40 %
PIPE CAPACITY	= 6.65 cfs.



NOTE:
 FLOOD PLAIN ELEVATION BASED ON THE SANCTUARY IN THE HILLS CONDOMINIUM DEVELOPMENT
 ELEVATION = 800.80

NOTE: PRIVATE ROAD MAINTENANCE AGREEMENT WILL BE REQUIRED.

NOTE: SIDEWALK WAIVER WILL BE REQUIRED.

BENCHMARKS

SITE BMM#1
 ARROW ON HYDRANT ON W. SIDE OF SANCTUARY BLVD RD. 200' NORTH OF SOUTH PROPERTY LINE
 ELEV. = 805.83 (NGVD29 DATUM)

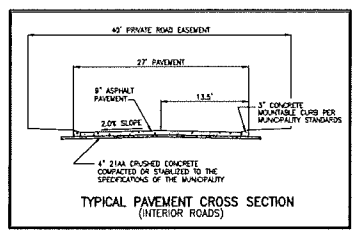
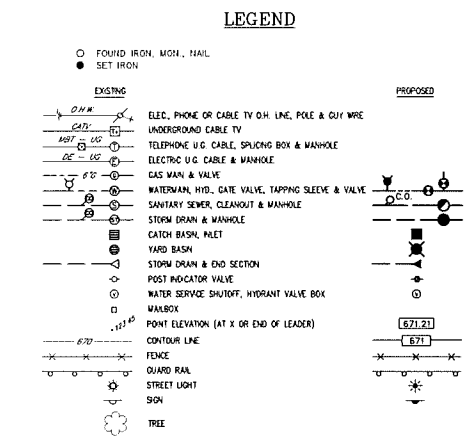
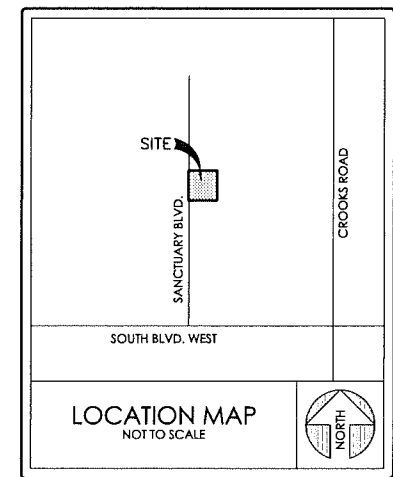
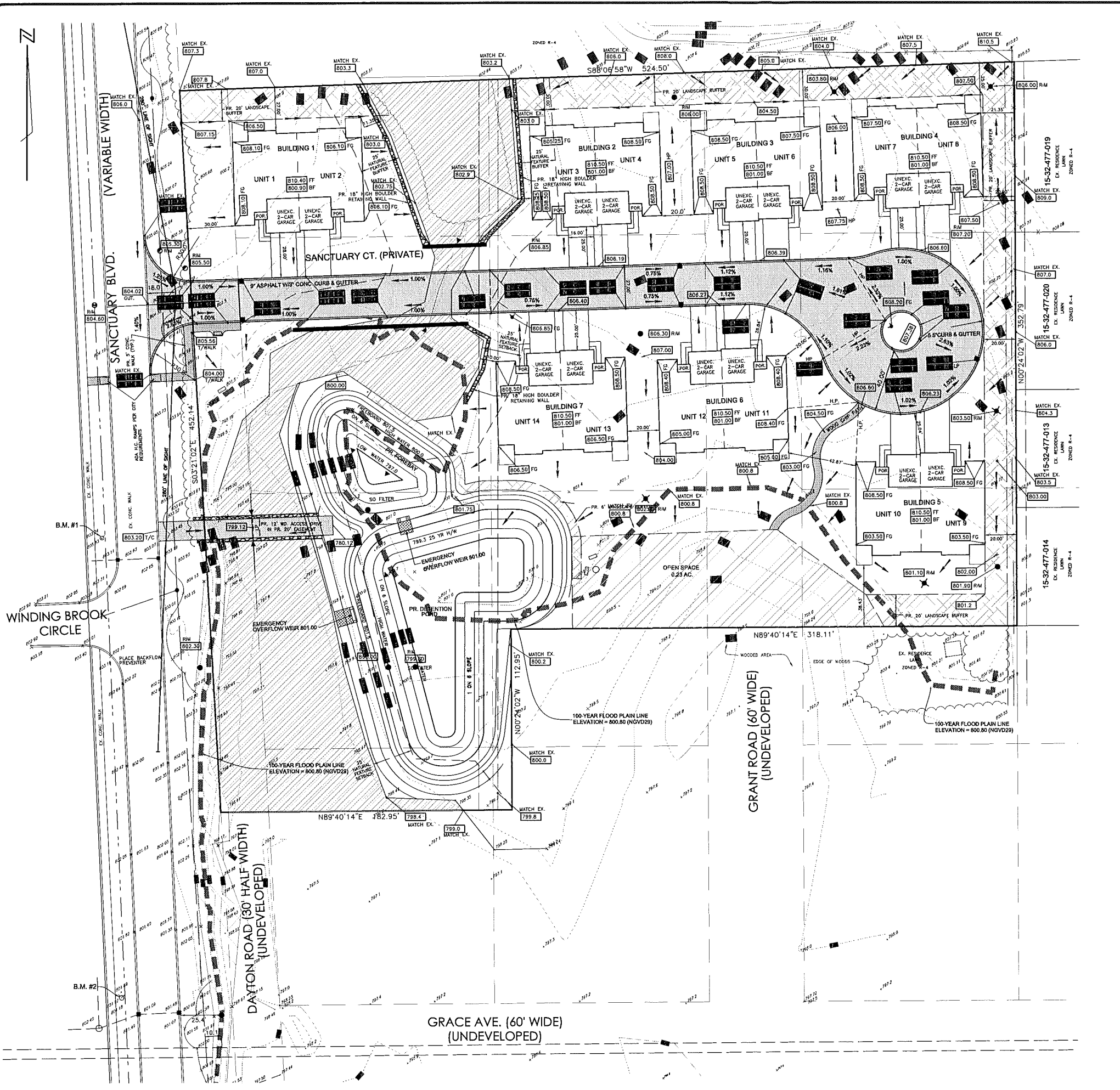
SITE BMM#2
 ARROW ON HYDRANT ON W. SIDE OF SANCTUARY BLVD RD. AT SOUTH PROPERTY LINE
 ELEV. = 804.18 (NGVD29 DATUM)

NOTE: BENCHMARK ELEVATIONS ARE BASED ON EXISTING "SANCTUARY IN THE HILLS" BENCHMARKS.

NOTE: UTILITY INFORMATION, AS SHOWN, INDICATES APPROXIMATE LOCATIONS AND TYPES OF FACILITIES ONLY. AS DISCLOSED TO THIS FIRM BY THE VARIOUS UTILITY COMPANY'S RECORDS. NO GUARANTEE IS GIVEN OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY.

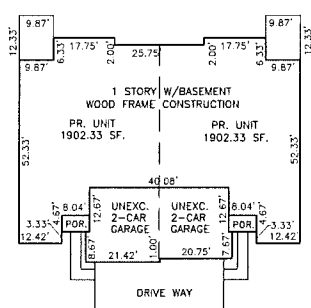
CALL MISS DIG

811 BEFORE YOU DIG CALL MISS DIG
 1-800-482-7171
 (TOLL FREE)



NOTE: A PRIVATE ROAD MAINTENANCE AGREEMENT WILL BE REQUIRED.

NOTE: FLOOD PLAIN ELEVATION BASED ON THE SANCTUARY IN THE HILLS CONDOMINIUM DEVELOPMENT NGVD29 = 800.80



2 UNIT BUILDING

NOTE: ALL WORK WILL BE CONDUCTED USING BEST MANAGEMENT PRACTICES (BMP) TO ENSURE FLOW AND CIRCULATION PATTERNS AND CHEMICAL AND BIOLOGICAL CHARACTERISTICS OF WETLANDS ARE NOT IMPACTED.

NOTE: PRIVATE ROAD MAINTENANCE AGREEMENT WILL BE REQUIRED.

NOTE: SIDEWALK WAIVER WILL BE REQUIRED.

BENCHMARKS

SITE BM#1
ARROW ON HYDRANT ON W. SIDE OF SANCTUARY BLVD RD. 200' NORTH OF SOUTH PROPERTY LINE ELEV. 805.83 (NGVD29 DATUM)

SITE BM#2
ARROW ON HYDRANT ON W. SIDE OF SANCTUARY BLVD RD. AT SOUTH PROPERTY LINE ELEV. 804.18 (NGVD29 DATUM)

NOTE: BENCHMARK ELEVATIONS ARE BASED ON EXISTING 'SANCTUARY IN THE HILLS' BENCHMARKS.

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SANCTUARY IN THE HILLS EAST
PART OF THE SE 1/4 OF SECTION 32, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

DISTRIBUTION	
●	PRELIMINARY
○	APPROVAL
○	CONSTRUCTION
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08/06/15	PER ASTI
01/29/16	PER CITY/CLIENT
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SEAL

CLIENT
MACLEISH BUILDING
CORNERSTONE VILLAGE
SUITE F
650 E. BIG BEAVER ROAD
TROY, MI 48063

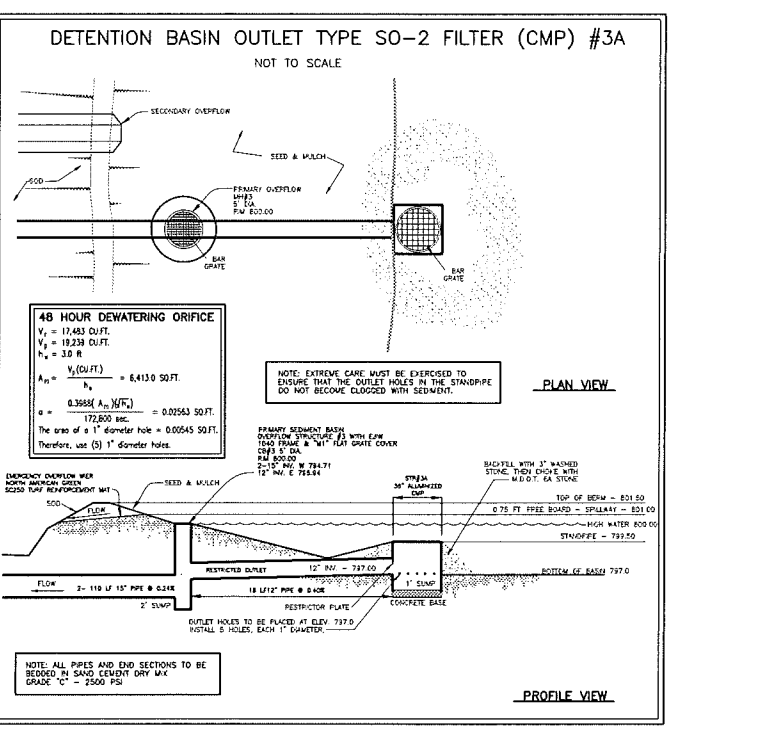
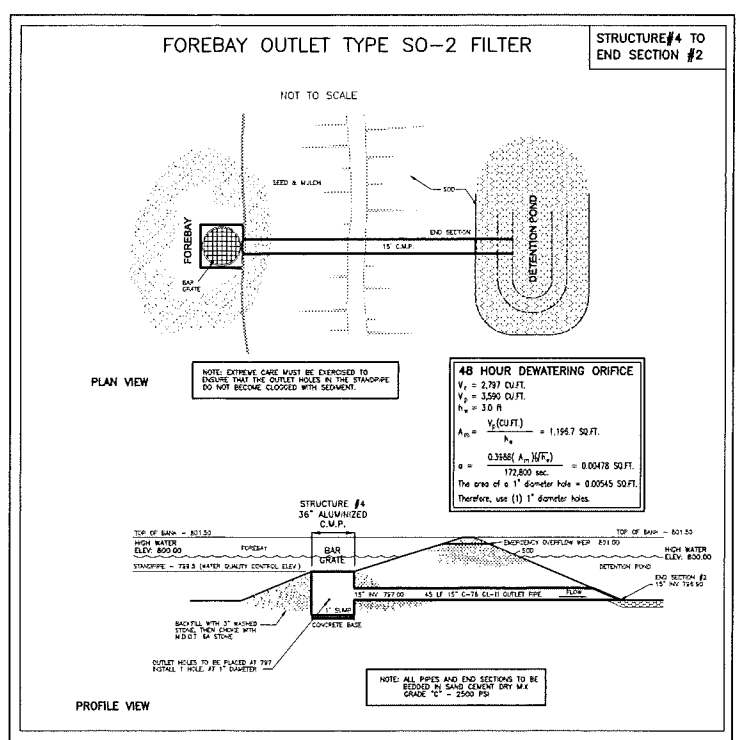
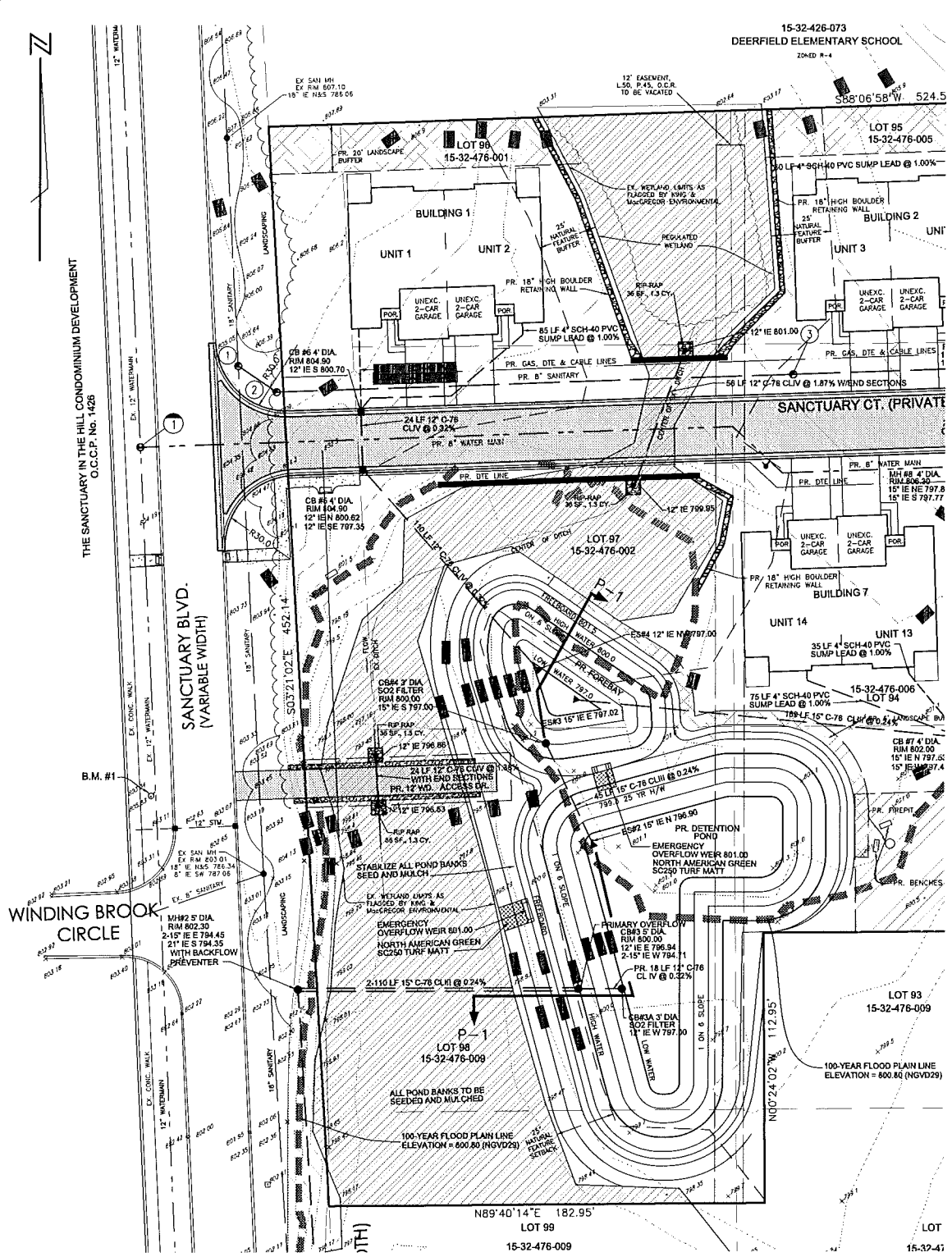
PROJECT NAME
SANCTUARY IN THE HILLS EAST

PROJECT NUMBER
C15-011.04

SHEET NAME
GRADING PLAN

DRAWING SCALE: 1" = 30'
DATE: 07/15/16
PROJECT MANAGER: T.W.D.
DESIGNED BY: MAS
DRAWN BY: MAS/JUS, P.E.
FIELD BY: A.C., B.H.
CHECKED BY: TW/DJR, P.E.

SHEET NUMBER
2 OF 7



ALLOWABLE DISCHARGE	C1 = 0.20 CFS/ACRE
AREA	A = 4.57 ACRES
RUNOFF COEFF	C = 0.45
TOTAL ALLOWABLE DISCHARGE	QA = C1 x A = 0.91 CFS
ALLOWABLE OUTFLOW	Q0 = QA / (A x C) = 0.44 CFS/ACRE
PEAK STORAGE TIME	T = 25 / (SQRT(0.0125 / Q0)) = 52.84 MINUTES
MAX. STORAGE VOLUME/ACRE	VS = (4320 x T) / (T + 25) = (40 x Q0 x T) = 1993.16 CU FT/ACRE
TOTAL STORAGE REQUIRED	VT = VS x A x C = 4098.94 CU FT
STORAGE HEIGHT PROVIDED	H = 3.00 FEET
TOP AREA OF BASIN	A1 = 3006.00 SQ FT
BOTTOM AREA OF BASIN	A2 = 258.00 SQ FT
TOTAL STORAGE VOLUME PROVIDED	V = ((A1 + A2 + SQRT(A1 x A2)) x H) / 3 = 4144.65 CU FT
AREA OF ORIFICE	AR = C1 x A / (0.62 x SQRT(32.2 x H)) = 0.11 SQ FT
DIAMETER OF OUTLET	D = 2 x SQRT(144 x AR / PI) = 4.41 INCHES

ALLOWABLE DISCHARGE	C1 = 0.20 CFS/ACRE
AREA	A = 4.57 ACRES
RUNOFF COEFF	C = 0.45
TOTAL ALLOWABLE DISCHARGE	QA = C1 x A = 0.91 CFS
ALLOWABLE OUTFLOW	Q0 = QA / (A x C) = 0.44 CFS/ACRE
PEAK STORAGE TIME	T = 25 / (SQRT(0.0125 / Q0)) = 127.33 MINUTES
MAX. STORAGE VOLUME/ACRE	VS = (16500 x T) / (T + 25) = (40 x Q0 x T) = 11528.42 CU FT/ACRE
TOTAL STORAGE REQUIRED	VT = VS x A x C = 23708.19 CU FT
STORAGE HEIGHT PROVIDED	H = 3.00 FEET
TOP AREA OF BASIN	A1 = 11975.00 SQ FT
BOTTOM AREA OF BASIN	A2 = 4455.00 SQ FT
TOTAL STORAGE VOLUME PROVIDED	V = ((A1 + A2 + SQRT(A1 x A2)) x H) / 3 = 23734.01 CU FT
AREA OF ORIFICE	AR = C1 x A / (0.62 x SQRT(32.2 x H)) = 0.11 SQ FT
DIAMETER OF OUTLET	D = 2 x SQRT(144 x AR / PI) = 4.41 INCHES

TOTAL AREA OF SITE	= 4.57 AC = 199,069 SF
AREA OF BUILDINGS AND PAVEMENT	= 57,241 SF C = 0.05
AREA OF LAWN	= 141,828 SF C = 0.25
$C_{avg} = \frac{57,241(0.05) + 141,828(0.25)}{199,069} = 0.25$	USE C = 0.45

25 YEAR STORM EMERGENCY OVERFLOW CALCULATIONS (FOREBAY) SEDIMENT BASIN

Calculation of Flow Rate Over a Rectangular Weir (Sharp-crested, Contracted)

Inputs	Calculations
Height of weir crest above channel invert, P = 3 ft	$(B - L)4H = 0.50$
Width of channel, B = 6 ft	$(B - L)4H \geq 1?$ yes
Length of weir, L = 4 ft	$P/2H = 1.50$
Measured head over the weir, H = 1 ft	$P/2H \geq 1?$ yes
	$H/L = 0.25$
	$H/L \leq 0.33?$ yes

If all three answers are yes, flow is fully contracted.

$$Q = 3.33(L - 0.2H)(H^{3/2})$$

Flow Rate, Q = 12.65 cfs

100 YEAR STORM EMERGENCY OVERFLOW CALCULATIONS DETENTION BASIN

Calculation of Flow Rate Over a Rectangular Weir (Sharp-crested, Contracted)

Inputs	Calculations
Height of weir crest above channel invert, P = 3 ft	$(B - L)4H = 0.50$
Width of channel, B = 6 ft	$(B - L)4H \geq 1?$ yes
Length of weir, L = 4 ft	$P/2H = 1.50$
Measured head over the weir, H = 1 ft	$P/2H \geq 1?$ yes
	$H/L = 0.25$
	$H/L \leq 0.33?$ yes

If all three answers are yes, flow is fully contracted.

$$Q = 3.33(L - 0.2H)(H^{3/2})$$

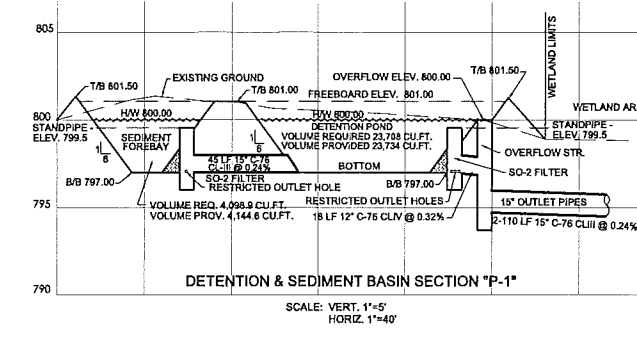
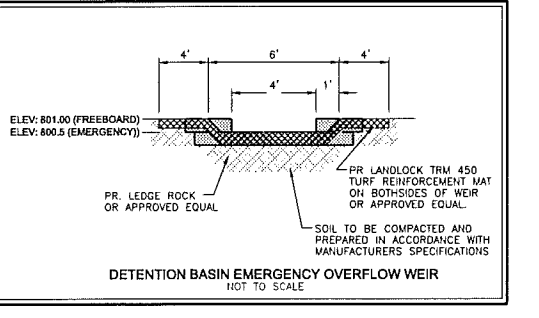
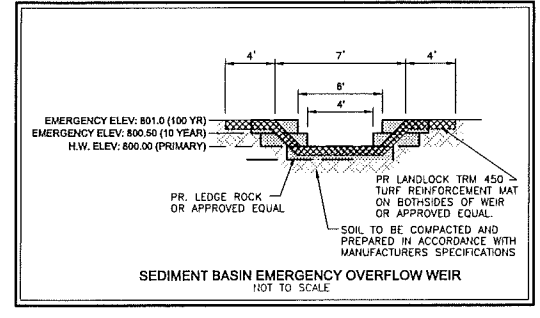
Flow Rate, Q = 12.65 cfs

POND OVERFLOW CAPACITY CALCULATIONS 100-YEAR STORM (EMERGENCY)

REQUIRED FLOW - 100 YEAR STORM	189.5 cfs
RUNOFF COEFF (C)	0.45
INTENSITY (I)	5.80 in/hr
AREA (A)	4.57 AC.
$Q_r = CIA = 11.92$ c.f.s.	

SEDIMENT BASIN OVERFLOW CALCULATIONS 25-YEAR STORM (EMERGENCY)

REQUIRED FLOW - 25 YEAR STORM	189.5 cfs
RUNOFF COEFF (C)	0.45
INTENSITY (I)	4.76 in/hr
AREA (A)	4.57 AC.
$Q_r = CIA = 9.78$ c.f.s.	



ALLOWABLE DISCHARGE	C1 = 0.20 CFS/ACRE
AREA	A = 20.00 ACRES
RUNOFF COEFF	C = 0.35
TOTAL ALLOWABLE DISCHARGE	QA = C1 x A = 0.91 CFS
ALLOWABLE OUTFLOW	Q0 = QA / (A x C) = 0.57 CFS/ACRE
PEAK STORAGE TIME	T = 25 / (SQRT(0.0125 / Q0)) = 87.78 MINUTES
MAX. STORAGE VOLUME/ACRE	VS = (12900 x T) / (T + 25) = (40 x Q0 x T) = 6041.35 CU FT/ACRE
TOTAL STORAGE REQUIRED	VT = VS x A x C = 12862.15 CU FT
STORAGE HEIGHT PROVIDED	H = 2.30 FEET
TOP AREA OF BASIN	A1 = 8095.00 SQ FT
BOTTOM AREA OF BASIN	A2 = 3021.00 SQ FT
TOTAL STORAGE VOLUME PROVIDED	V = ((A1 + A2 + SQRT(A1 x A2)) x H) / 3 = 13133.04 CU FT
AREA OF ORIFICE	AR = C1 x A / (0.62 x SQRT(32.2 x H)) = 0.11 SQ FT
DIAMETER OF OUTLET	D = 2 x SQRT(144 x AR / PI) = 4.41 INCHES

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ENGINEERING PLANS FOR
SANCTUARY IN THE HILLS EAST
PART OF THE SE 1/4 OF SECTION 32, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

DISTRIBUTION	
PRELIMINARY	
APPROVAL	
CONSTRUCTION	
AS-BUILT	
REVISIONS	
DATE	REMARKS
4-12-16	PER CITY REVIEW

SEAL

CLIENT
MACLEISH BUILDING
CORNERSTONE VILLAGE
SUITE F
650 E. BIG BEAVER ROAD
TROY, MI 48068

PROJECT NAME
SANCTUARY IN THE HILLS EAST

PROJECT NUMBER
C15-011.04

SHEET NAME
DETENTION BASIN CALCULATIONS & DETAILS

DRAWING SCALE: 1" = 30'

DATE: 2/2/16

PROJECT MANAGER: T.W.D.

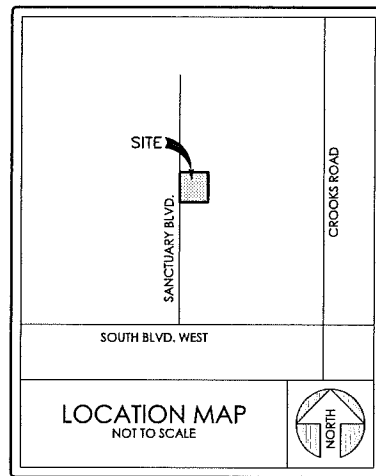
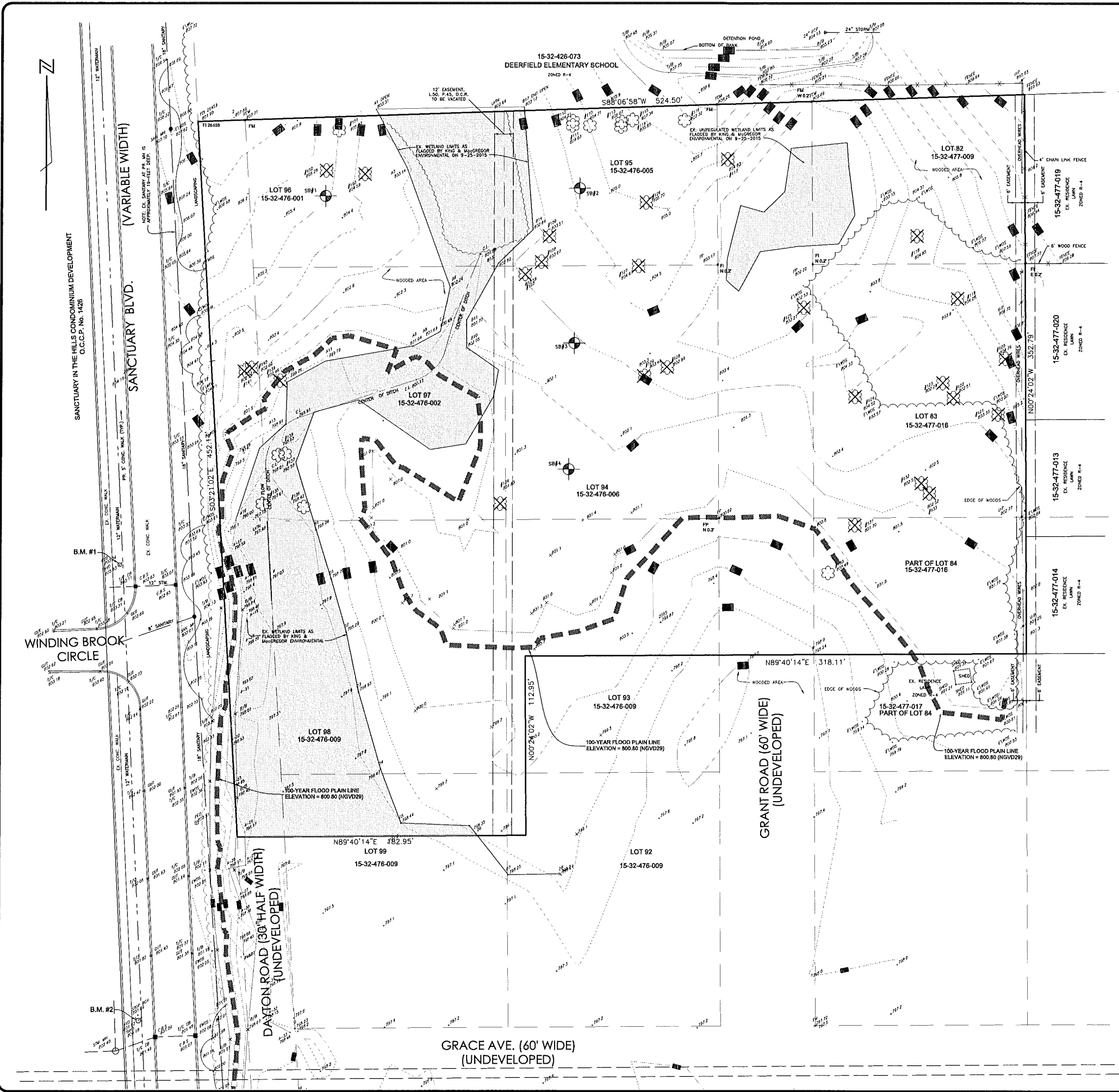
DESIGNED BY: MAS

DRAWN BY: MAS/J.S.P.E.

FIELD BY: A.C., B.H.

CHECKED BY: TWB/S.P.E.

SHEET NUMBER
3 OF 7



LEGEND

- SECTION CORNER
- FOUND W/CH. MON., NAIL
- SET IRON
- RECORDED
- MEASURED
- CALCULATED

EXISTING

- ELEC. POLE OR CABLE TV ON LINE. POLE & GUY WIRE
- UNDERGROUND CABLE TV
- TELEPHONE U.G. CABLE, SPlicing BOX & MANHOLE
- ELECTRIC U.G. CABLE & MANHOLE
- GAS MAIN & VALVE
- WATERMAIN, HD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM DRAIN & MANHOLE
- COVERED SEWER & MANHOLE
- CATCH BASIN, INLET
- YARD BASH
- STORM DRAIN & END SECTION
- POST INDICATOR VALVE
- WATER SERVICE SHUTOFF, HYDRANT VALVE BOX
- MALBOX
- POINT ELEVATION (AT X OR END OF LEADER)
- CONTOUR LINE
- FENCE
- QUAD PILL
- STREET LIGHT
- SIGN
- TREE

BENCHMARKS

SITE BM#1
ARROW ON HYDRANT ON W. SIDE OF SANCTUARY BLVD RD. 290' NORTH OF SOUTH PROPERTY LINE ELEV. 805.83 (NGVD29 DATUM)

SITE BM#2
ARROW ON HYDRANT ON W. SIDE OF SANCTUARY BLVD RD. AT SOUTH PROPERTY LINE ELEV. 804.18 (NGVD29 DATUM)

NOTE: BENCHMARK ELEVATIONS ARE BASED ON EXISTING "SANCTUARY IN THE HILLS" BENCHMARKS.

TAG #	SIZE (IN.)	SPECIES	REMOVE	NOTES
101	9.5	BURR OAK		
102	7.5	OAK	X	
103	12	OAK	X	
107	10.5	ELM		
108	8	CHOKO CHERRY		
109	16	RED MAPLE	X	
130	11	OAK		
131	9.5	OAK		
132	11	OAK		
133	10	OAK		
134	8	OAK		
135	19	WALNUT		
136	15.5	OAK		
137	22.5	RED MAPLE	X	
138	27	ELM	X	
139	(2x)13	RED MAPLE	X	TWIN
140	11	FIR		
141	10	SPRUCE		
142	13	RED MAPLE	X	
143	14.5	RED MAPLE	X	
144	(7x)15	WHITE PINES & NORWAY SPRUCE	X	GROVE
145	20	RED MAPLE	X	
146	13	WALNUT	X	
147	10	RED MAPLE	X	
148	11	RED MAPLE	X	
149	18.5	RED MAPLE		
150	(3x)20 & 8	RED MAPLE	X	GROVE
151	19.5	RED MAPLE	X	
152	17.5	RED MAPLE	X	
153	20	RED MAPLE	X	
154	22.5	WALNUT		
155	16	RED MAPLE		
156	11.5	RED MAPLE		
157	17.5	RED MAPLE		
158	11	RED MAPLE		
159	22	WALNUT		
160	21	WALNUT		
161	17	WALNUT		

PARCEL DESCRIPTION
 Lots 82, 83, 94-98; part of Lots 84, 92, 93, 99; the vacated Grant Road adjacent to the aforementioned Lots; and the vacated Dayton Road adjacent to the aforementioned Lots of "South Boulevard Gardens" according to the plat thereof recorded in Liber 5 of Plats, Page 45, Oakland County Records, more particularly described as:
 Beginning at the northwest corner of vacated Dayton Road adjacent to Lot 88; thence S03°21'02"E 452.14 feet; thence N89°40'14"E 162.95 feet; thence N00°24'02"W 112.95 feet; thence N89°40'14"E 318.11 feet; thence N00°24'02"W 352.79 feet; thence S88°06'58"W 524.50 feet to the point of beginning.
 Containing 4.57 acres of land, more or less.

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BOUNDARY AND TOPOGRAPHIC SURVEY
SANCTUARY IN THE HILLS EAST
 PART OF THE SE 1/4 OF SECTION 32, T3N, R11E,
 CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

DISTRIBUTION

- PRELIMINARY
- APPROVAL
- CONSTRUCTION
- AS-BUILT

REVISIONS

DATE	REMARKS
08/06/15	PER ASTI
01/22/16	PER CITY/CLIENT
4/7/16	PER CITY/ASTI

SEAL

CLIENT
 MACLEISH BUILDING
 CORNERSTONE VILLAGE
 SUITE F
 650 E. BIG BEAVER ROAD
 TROY, MI 48063

PROJECT NAME
 SANCTUARY IN THE HILLS EAST

PROJECT NUMBER
 C15-011

SHEET NAME
 BOUNDARY AND TOPOGRAPHIC SURVEY

DRAWING SCALE: 1" = 30'

DATE: 8/8/15

PROJECT MANAGER: T.W.D.

DESIGNED BY: MAS

DRAWN BY: MAS/JJS, P.E.

CHECKED BY: A.C., B.H.

FIELD BY: T.W.D./J.S.R., P.E.

SHEET NUMBER
 4 OF 7



McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21333 Fletcher Avenue • Farmdale, MI 48323
Phone: (248) 599-2166 • Fax: (248) 599-2157

LOG OF SOIL BORING NO. 1
PROJECT Proposed Houses - Lots 84 through 87
LOCATION Sanctuary and South Boulevards
Rochester Hills, Michigan

Level	Depth	Layer	SOIL DESCRIPTION	Penetration Resistance Blow Count	Moisture % M.P.C.F.	Unit Weight pcf	Unit Comp. pcf	Dr. %
	0.7'		Moist dark brown organic silty fine sandy TOPSOIL with vegetation and trace of clay					
A	2		Very stiff to extremely stiff moist brown silty CLAY with traces of sand and pebbles and silty sand lenses					
B	4		Very stiff to extremely stiff moist brown silty CLAY with occasional silt lenses					
C	7		Very stiff to extremely stiff moist brown silty CLAY with occasional silt lenses					
D	9		Very compact wet brown clayey fine sandy SILT					
E	14		Very stiff moist variegated silty CLAY with gray silt lenses					
F	19		Stiff moist blue silty CLAY with trace of sand					
	20'		Note: Used track rig.					



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LOG OF SOIL BORING NO. 2
PROJECT Proposed Houses - Lots 84 through 87
LOCATION Sanctuary and South Boulevards
Rochester Hills, Michigan

Level	Depth	Layer	SOIL DESCRIPTION	Penetration Resistance Blow Count	Moisture % M.P.C.F.	Unit Weight pcf	Unit Comp. pcf	Dr. %
	0.6'		Moist dark brown silty fine sandy TOPSOIL with vegetation and trace of clay					
A	2		Compact moist brown silty clayey fine SAND with trace of pebbles					
B	4		Very stiff moist brown silty CLAY with sand and gray silt lenses					
C	7		Extremely stiff moist variegated silty CLAY with trace of sand and pebbles and some gray silt lenses					
D	9		Extremely stiff moist variegated silty CLAY with sand and pebbles					
E	14		Stiff moist blue silty sandy CLAY with pebbles and wet sand lenses					
F	19		Stiff moist blue silty CLAY with sand and pebbles					
	20'		Note: 1. Used track rig 2. Boring located about 10' south of Tree #3137.					



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LOG OF SOIL BORING NO. 3
PROJECT Proposed Houses - Lots 84 through 97
LOCATION Sanctuary and South Boulevards
Rochester Hills, Michigan

Level	Depth	Layer	SOIL DESCRIPTION	Penetration Resistance Blow Count	Moisture % M.P.C.F.	Unit Weight pcf	Unit Comp. pcf	Dr. %
	0.8'		Moist dark brown organic silty fine sandy TOPSOIL with vegetation and trace of clay					
A	2		Compact moist variegated silty clayey fine SAND with trace of pebbles					
B	4		Stiff moist variegated silty sandy CLAY with trace of pebbles					
C	7		Very stiff to extremely stiff moist variegated silty CLAY with some sand and pebbles and occasional silt lenses					
D	9		Extremely stiff moist blue silty CLAY with sand and pebbles					
E	14		Very stiff moist blue silty CLAY with sand and pebbles					
F	19		Stiff moist blue silty CLAY with sand and pebbles					
	20'		Note: 1. Used track rig 2. Boring located about 30' east of Tree #2433					



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LOG OF SOIL BORING NO. 4
PROJECT Proposed Houses - Lots 84 through 97
LOCATION Sanctuary and South Boulevards
Rochester Hills, Michigan

Level	Depth	Layer	SOIL DESCRIPTION	Penetration Resistance Blow Count	Moisture % M.P.C.F.	Unit Weight pcf	Unit Comp. pcf	Dr. %
	0.6'		Moist dark brown organic silty fine sandy TOPSOIL with vegetation					
A	2		Stiff moist variegated slightly organic silty sandy CLAY with pebbles and sand lenses					
B	4		Very stiff moist variegated silty CLAY with trace of pebbles					
C	7		Extremely stiff moist brown silty CLAY with sand and pebbles					
D	9		Very stiff moist variegated silty CLAY with sand and pebbles					
E	14		Stiff moist blue silty CLAY with sand and pebbles and occasional silt lenses					
F	19		Stiff moist blue silty CLAY with sand and pebbles					
	20'		Note: 1. Used track rig 2. Boring located about 10' west of Tree #2453					

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SOIL BORINGS
SANCTUARY IN THE HILLS EAST
PART OF THE SE 1/4 OF SECTION 32, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

DISTRIBUTION

- PRELIMINARY
- APPROVAL
- CONSTRUCTION
- AS-BUILT

REVISIONS

DATE	REMARKS
06/06/15	PER ASTI
01/28/16	PER CITY/CLIENT
4/12/16	PER CITY/ASTI

SEAL

CLIENT
MACLEISH BUILDING
CORNERSTONE VILLAGE
SUITE F
650 E. BIG BEAVER ROAD
TROY, MI 48063

PROJECT NAME
SANCTUARY IN THE HILLS EAST

PROJECT NUMBER
C15-011.04

SHEET NAME
SOIL BORINGS

DRAWING SCALE: N/A
DATE: 07/17/15
PROJECT MANAGER: T.W.D.
DESIGNED BY: MAS
DRAWN BY: MAS/J.S.P.E.
FIELD BY: A.C., B.H.
CHECKED BY: T.W.D./S.R.P.E.

SHEET NUMBER
5 OF 7



(VARIABLE WIDTH)

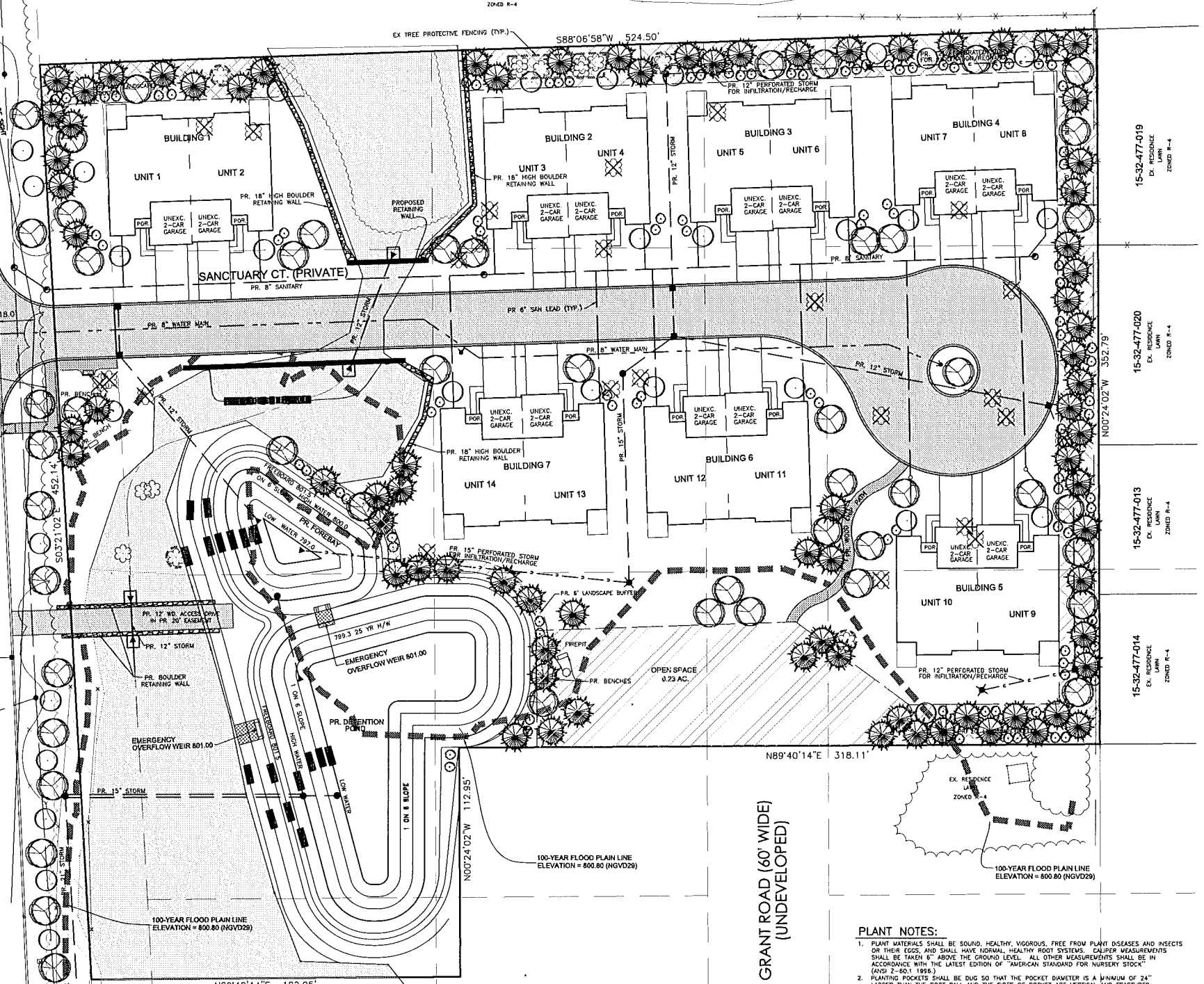
SANCTUARY BLVD.

WINDING BROOK CIRCLE

DAYTON ROAD (UNDEVELOPED)

GRANT ROAD (60' WIDE) (UNDEVELOPED)

GRACE AVE. (60' WIDE) (UNDEVELOPED)



NOTE: UTILITY INFORMATION, AS SHOWN, INDICATES APPROXIMATE LOCATIONS AND TYPES OF FACILITIES ONLY, AS DISCLOSED TO THIS FIRM BY THE VARIOUS UTILITY COMPANY'S RECORDS. NO GUARANTEE IS GIVEN OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY.

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NOTE: CONTRACTOR SHALL MAKE EVERY EFFORT TO PROTECT AND PRESERVE QUALITY TREES WHERE APPROPRIATE, WHETHER INDICATED ON THIS PLAN OR NOT. IF TREE PROTECTION CANNOT BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD, REPLACEMENT OF THAT TREE MAY BE REQUIRED TO SATISFY CITY/TWP. ORDINANCES.

GENERAL NOTES:
1. ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF ALL GOVERNING AGENCIES.
2. ALL AREAS NOT BUILT OR PAVED UPON SHALL BE SOODED.
3. ALL LAWN AREAS AND SHRUBS/ORNAMENTAL GRASS BEDS SHALL BE IRRIGATED WITH AN AUTOMATIC IRRIGATION SYSTEM. IRRIGATION SYSTEM DESIGN BY OTHERS.

LANDSCAPE CONTRACTOR'S "ONE-YEAR IRRIGATION REQUIREMENT PERIOD"

IT SHALL BE THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR TO PROGRAM AND PERIODICALLY ADJUST THE IRRIGATION SYSTEM (PROVIDED BY OTHERS) AS REQUIRED TO INSURE DELIVERY OF PROPER AND ADEQUATE WATER SUPPLY TO ALL PLANT MATERIALS, SOO AND SEEDING LAWN AREAS (SERVICED BY THE IRRIGATION SYSTEM) TO INSURE THE ESTABLISHMENT OF HEALTHY PLANT MATERIALS AND LAWNS FOR THEIR FIRST YEAR OF GROWTH. FOLLOWING THE LANDSCAPE CONTRACTOR'S "ONE-YEAR IRRIGATION REQUIREMENT PERIOD" THE LANDSCAPE CONTRACTOR SHALL PROVIDE THE OWNER WITH A SUGGESTED "IRRIGATION MAINTENANCE SCHEDULE" FOR HIS USE.

PLANT NOTES:

- PLANT MATERIALS SHALL BE SOUND, HEALTHY, VIGOROUS, FREE FROM PLANT DISEASES AND INSECTS OR THEIR EGGS, AND SHALL HAVE NORMAL HEALTHY ROOT SYSTEMS. CALIPER MEASUREMENTS SHALL BE TAKEN 6" ABOVE THE GROUND LEVEL. ALL OTHER MEASUREMENTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "AMERICAN STANDARDS FOR NURSERY STOCK" (ANSI Z-60.1 1996.)
- PLANTING POCKETS SHALL BE DUG SO THAT THE POCKET DIAMETER IS A MINIMUM OF 24" LARGER THAN THE ROOT BALL AND THE SIDES OF POCKET ARE VERTICAL AND FRACTURED. INDIGENOUS SOILS SHALL BE TAMPED AND WATERED DURING BACK FILLING PROCEDURE.
- PLANTING POCKETS SHALL BE NO DEEPER THAN THE HEIGHT OF THE ROOT BALL. SAUKER SHALL BE MADE ON THE EDGES OF PLANTING POCKET.
- INDIGENOUS SOILS SHALL BE GUARANTEED FOR ONE COMPLETE GROWING SEASON (12 MONTHS). DEAD MATERIALS SHALL BE REPLACED AS NEEDED PRIOR TO THE EXPIRATION OF THE GUARANTEE PERIOD. IN ACCORDANCE WITH THE LOCAL ORDINANCE REQUIREMENTS, CONTRACTOR SHALL PROVIDE IN WRITING A LIST OF RECOMMENDED MAINTENANCE PROCEDURES FOR THE FIRST GROWING SEASON.
- REMOVE TOP 1/2 OF BURLAP ON ROOT BALL OR ALL IF WRAPPED IN PLASTIC COVERING AND/OR ALL NYLON CORD.
- PLANT MATERIALS SHALL BE USED IN COMPLIANCE WITH THE PROVISIONS OF THE LOCAL ORDINANCE AND SHALL BE HARVESTED GROWN, FREE OF PESTS AND DISEASES, HARVEST IN THIS COUNTY, IN CONFORMANCE WITH THE STANDARDS OF THE AMERICAN ASSOCIATION OF NURSESMEN AND SHALL HAVE PASSED INSPECTIONS REQUIRED UNDER STATE REGULATIONS. IN ADDITION, PLANT MATERIALS SHALL CONFORM TO THE STANDARDS OF COUNTY COOPERATIVE EXTENSION SERVICE. A COPY OF WHICH SHALL BE KEPT ON FILE WITH THE PLANNING OFFICIAL.
- SOO SHALL BE CERTIFIED TURF GRASS SOO CONFORMING WITH A.S.P.A. SPECIFICATIONS FOR MACHINE-CUT THICKNESS, SIZE, STRENGTH, MOISTURE CONTENT, AND MOWED HEIGHT, AND FREE OF WEEDS AND UNDESIRABLE NATIVE GRASSES. PROVIDE VISIBLE SOO OF UNIFORM DENSITY, COLOR, AND TEXTURE. SOO SHALL BE STRONGLY ROOTED AND CAPABLE OF VIGOROUS GROWTH AND DEVELOPMENT WHEN PLANTED. CUT SOO SHALL NOT BE PERMITTED TO DRY OUT AND SHALL BE LAB WITHIN 24 HOURS OF WHEN CUT. FERTILIZE AND WATER THE SOO AS REQUIRED DURING THE FIRST GROWING SEASON TO MAINTAIN A DENSE AND VIGOROUS GROWING SOO.
- PLANTING BED SOO FOR ANNUALS SHALL BE "PRE-EMERGED" TOPSOIL. TO DETOUR WEED GROWTH DURING THE ESTABLISHMENT OF ANNUAL BED, APPLY A PRE-EMERGENT (PREY) OR EQUAL) AFTER PLANTING ANNUALS, 2-3 TIMES PER GROWING SEASON, AT A RATE AS PER RECOMMENDATION OF PRODUCT MANUFACTURER.
- TREES OF 2" CALIPER AND GREATER SHALL BE WRAPPED WITH 6" WIDE KRAFT CREPE. WRAP THE LOWER PARTS OF THE FIRST LAMBS AND THE TRUNK. OVERLAP HALF OF EACH SPIRAL WRAP TO FORM A DOUBLE WRAPPING. SECURE WRAPPING WITH TRAIL. DO NOT WRAP SPECIES SUBJECT TO BARKS.

REQUIRED LANDSCAPING

NORTH PROPERTY LINE: 524.5' -	10 DECIDUOUS
	8 ORNAMENTAL
	21 EVERGREEN
	31 SHRUBS
EAST PROPERTY LINE: 465.7' -	9 DECIDUOUS
	7 ORNAMENTAL
	19 EVERGREEN
	28 SHRUBS
SOUTH PROPERTY LINE: 501.0' -	10 DECIDUOUS
	8 ORNAMENTAL
	20 EVERGREEN
	30 SHRUBS
SANCTUARY BLVD. R.O.W.: 452.1' -	13 DECIDUOUS
	8 ORNAMENTAL
DETENTION POND & FOREBAY: 283.0' -	4 DECIDUOUS
	3 EVERGREEN
	11 SHRUBS
TOTAL REQUIRED LANDSCAPING:	46 DECIDUOUS
	63 ORNAMENTAL
	61 EVERGREEN
	100 SHRUBS

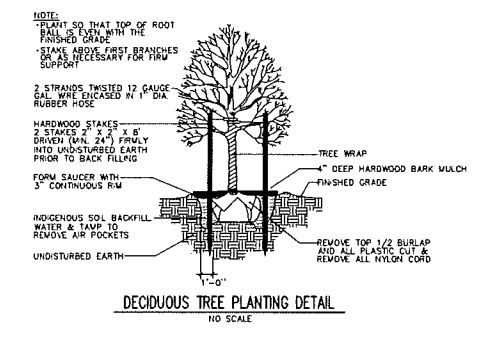
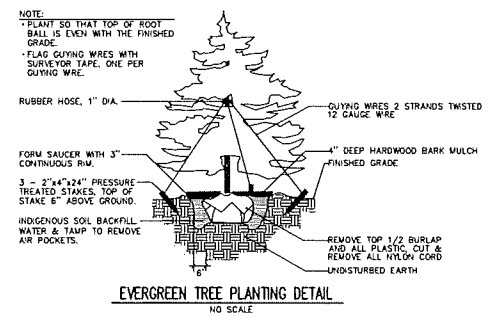
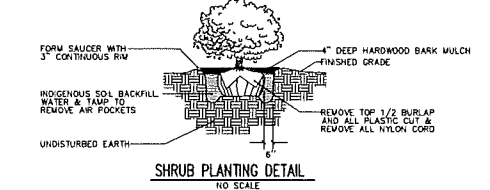
EXISTING TREES TO REMAIN

15 DECIDUOUS TREES

PLANT LIST:

NO.	COMMON NAME	BOTANICAL NAME	SIZE
49	NORWAY MAPLE	ACER PLANTANODIES	3" CAL. B&B
31	CHANTICLEER PEAR	PYRUS CALLERYANA	2" CAL. B&B
79	WHITE SPRUCE	PICEA GLAUCA	10' HT. B&B
100	BURNING BUSH	EUCONYMUS ALATUS	24" SPD., 3 GAL.

EX. TREES TO BE REMOVED
EX. TREES TO REMAIN



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LANDSCAPE PLAN
SANCTUARY IN THE HILLS EAST
PART OF THE SE 1/4 OF SECTION 32, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

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01/28/18	PER CITY/CLIENT
4/12/18	PER CITY/ASTI

SEAL

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MACLEISH BUILDING
CORNERSTONE VILLAGE
SUITE F
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TROY, MI 48063

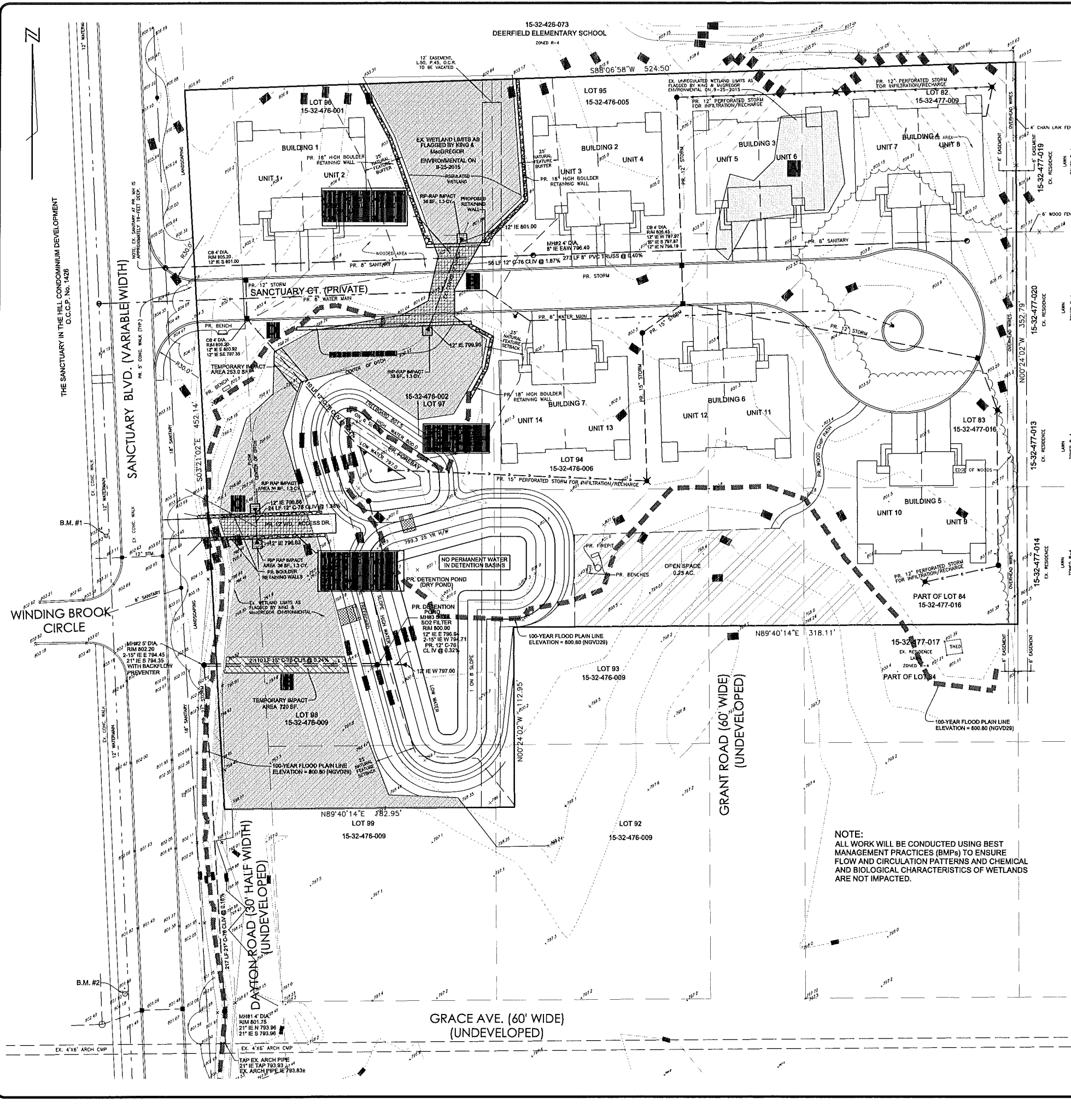
PROJECT NAME
SANCTUARY IN THE HILLS EAST

PROJECT NUMBER
C15-011.04

SHEET NAME
LANDSCAPE PLAN

DRAWING SCALE: 1" = 30'
DATE: 7/21/15
PROJECT MANAGER: T.W.D.
DESIGNED BY: MAS
DRAWN BY: J.S.P.E.
FIELD BY: A.C.B.H.
CHECKED BY: TWJ/SR, P.E.

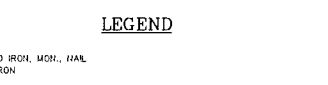
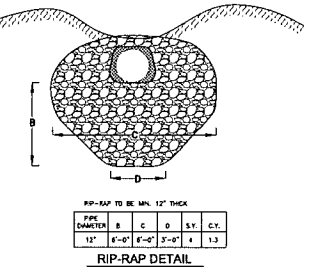
SHEET NUMBER
6 OF 7



PARCEL DESCRIPTION
 Lots 82, 83, 84-88; part of Lots 84, 92, 93, 99; the vacated Grant Road adjacent to the above mentioned Lots; and the vacated Dayton Road adjacent to the above mentioned Lots of "South Boulevard Gardens" according to the plat thereof recorded in Liber 5 of Plats, Page 45, Oakland County Records, more particularly described as:
 Beginning at the northwest corner of vacated Dayton Road adjacent to Lot 96; thence S03°2'10"E 452.14 feet; thence N69°40'14"E 162.85 feet; thence N00°24'02"W 112.95 feet; thence N89°40'14"E 318.11 feet; thence N00°24'02"W 352.79 feet; thence S88°06'58"W 524.50 feet to the point of beginning.
 Containing 4.57 acres of land, more or less.

SITE DATA
 CURRENT ZONING: R-4
 PROPOSED ZONING: P.U.D.
 PID: 15-32-476-001
 PID: 15-32-476-002
 PID: 15-32-476-005
 PID: 15-32-476-006
 PID: 15-32-476-009
 PID: 15-32-477-016
 PID: 15-32-477-009

TOTAL REGULATED WETLAND AREA	2819 SF	0.08 AC
UNREGULATED WETLAND AREA	3754 SF	0.09 AC
TOTAL	6573 SF	0.15 AC
PERMANENT WETLAND IMPACT AREA		
R	1437 SF	0.03 AC
G	326 SF	0.02 AC
TOTAL	2353 SF	0.05 AC
TEMPORARY WETLAND IMPACT AREA		
D	253 SF	
TOTAL TEMPORARY IMPACT	973 SF	0.02 AC
COVERED TOTAL	3326 SF	0.08 AC
TOTAL WETLAND NONE IMPACT AREA	26993 SF	0.60 AC



LEGEND

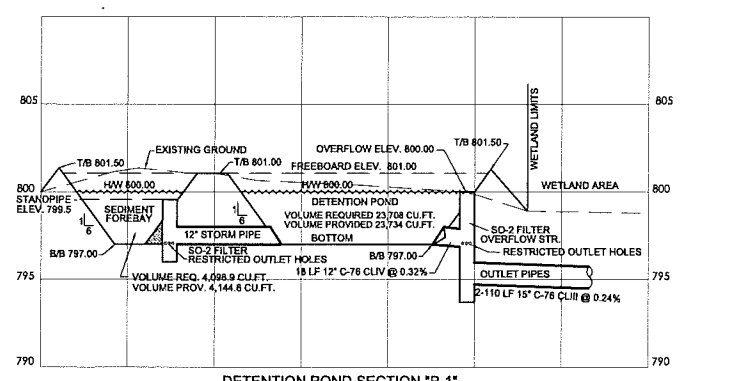
100-YEAR FLOOD PLAIN LINE (NON REGULATED)	ELEVATION = 800.80 (NGVD29)
PERMANENT IMPACT AREA	(Hatched pattern)
TEMPORARY IMPACT AREA	(Diagonal lines)
UNREGULATED WETLAND AREA	(Stippled pattern)
REGULATED WETLAND AREA	(Cross-hatched pattern)

EXISTING

- FOUND IRON, MON., HAIL
- SET IRON
- D.H.W.
- CATV
- M/S
- EC
- GS
- WATERMAN, H.D., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM DRAIN & MANHOLE
- CATCH BASIN, INLET
- YARD BASH
- STORM DRAIN & END SECTION
- POST INDICATOR VALVE
- WATER SERVICE SHUTOFF, HYDRANT VALVE BOX
- WALBOX
- POINT ELEVATION (AT X OR END OF LEADER)
- 671.21
- 671

PROPOSED

- ELEC. PHONE OR CABLE TV OH LINE, POLE & CUT WIRE
- UNDERGROUND CABLE TV
- TELEPHONE U.G. CABLE, SPlicing BOX & MANHOLE
- ELECTRIC U.G. CABLE & MANHOLE
- GAS MAIN & VALVE
- WATERMAIN, H.D., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM DRAIN & MANHOLE
- CATCH BASIN, INLET
- YARD BASH
- STORM DRAIN & END SECTION
- POST INDICATOR VALVE
- WATER SERVICE SHUTOFF, HYDRANT VALVE BOX
- WALBOX
- POINT ELEVATION (AT X OR END OF LEADER)
- 671.21
- 671
- CONTOUR LINE
- FENCE
- GUARD RAIL
- STREET LIGHT
- SOI
- TREE



BENCHMARKS

SITE BM#1
 ARROW ON HYDRANT ON W. SIDE OF SANCTUARY BLVD RD. 290'± NORTH OF SOUTH PROPERTY LINE ELEV. 806.83 (NGVD29 DATUM)

SITE BM#2
 ARROW ON HYDRANT ON W. SIDE OF SANCTUARY BLVD RD. AT SOUTH PROPERTY LINE ELEV. 804.18 (NGVD DATUM)

NOTE: BENCHMARK ELEVATIONS ARE BASED ON EXISTING "SANCTUARY IN THE HILLS" BENCHMARKS.

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WETLAND IMPACT PLAN
SANCTUARY IN THE HILLS EAST
 PART OF THE SE 1/4 OF SECTION 32, T3N, R11E
 CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

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REVISIONS

DATE	REMARKS
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01/28/16	PER TWP/CLIENT
4/1/16	PER CITY/ASIT

SEAL

CLIENT
 MACLEISH BUILDING
 CORNERSTONE VILLAGE
 SUITE F
 650 E. BIG BEAVER ROAD
 TROY, MI 48063

PROJECT NAME
 SANCTUARY IN THE HILLS EAST

PROJECT NUMBER
 C15-011.08X

SHEET NAME
 WETLAND IMPACT PLAN

DRAWING SCALE: 1" = 30'
DATE: 2/10/16
PROJECT MANAGER T.W.D.
DESIGNED BY: MAS
DRAWN BY: MAS/JJS, P.E.
FIELD BY: A.C., B.H.
CHECKED BY: TWD/JJS, P.E.

SHEET NUMBER
 7 OF 7