MORRISON HILLS

SCIO TOWNSHIP, WASHTENAW, MICHIGAN

PRIVATE ROAD

OWNER/APPLICANT

BRIDGEWOOD HILLS II, LLC
2723 SOUTH STATE STREET, SUITE250
ANN ARBOR, MICHIGAN 48104
CONTACT: GREG COPP
734-930-6700

DEVELOPER

BRIDGEWOOD HILLS II, LLC
2723 SOUTH STATE STREET, SUITE250
ANN ARBOR, MICHIGAN 48104
CONTACT: GREG COPP
734-930-6700

ENGINEER / LAND SURVEY OR LANDSCAPE ARCHITECT

MIDWESTERN CONSULTING, LLC
3815 PLAZA DR.
ANN ARBOR, MI 48108
CONTACT: TOM COVERT, RLA, AICP
734-995-0200

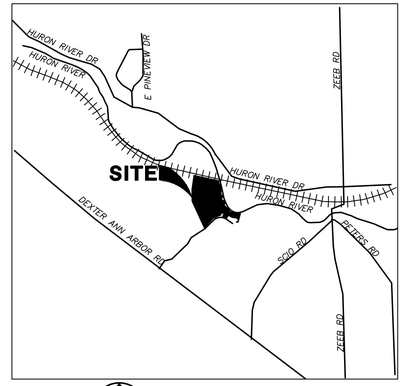
PROJECT NARRATIVE

THE PROJECT CONTAINS TWO EXISTING PARCELS TOTALING ±23.13 ACRE PARCEL LOCATED ON THE NORTH SIDE OF MORRISON ROAD NORTHEAST FROM DEXTER ANN ARBOR ROAD IN SICO TOWNSHIP, WASHTENAW COUNTY, MICHIGAN. CURRENT ZONING A-1, GENERAL AGRICULTURE.

THE PROJECT IS TO BUILD A PAVED CLASS B PRIVATE ROADWAY ENDING IN A CUL-DE-SAC PROVIDING ACCESS FROM MORRISON ROAD TO 6 PROPOSED LAND DIVISIONS

ALL PROPOSED PARCELS WILL BE SOLD FOR SINGLE FAMILY HOME CONSTRUCTION.

SITE MAP
SCALE : 1" = 200'



VICINITY MAP
SCALE : NTS

SHEET INDEX

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PER EGLE AND COUNTY SESC REVIEW 1/30/23

MORRISON HILLS

JOB No. **21188A**

DATE: 03/16/22
SHEET 01 OF 19
CADD: RMLII
ENG: HTH
PM: TJC
TECH: RMLII
/21188CV01

01

REVISIONS:	REV. DATE
TOWNSHIP REVIEW	6/17/22
TOWNSHIP REVIEW	07/25/22
TOWNSHIP REVIEW	08/12/22
TOWNSHIP REVIEW	08/25/22
PER EGLE REVIEW	12/19/22
TOWNSHIP SUBMITTAL	12/21/22

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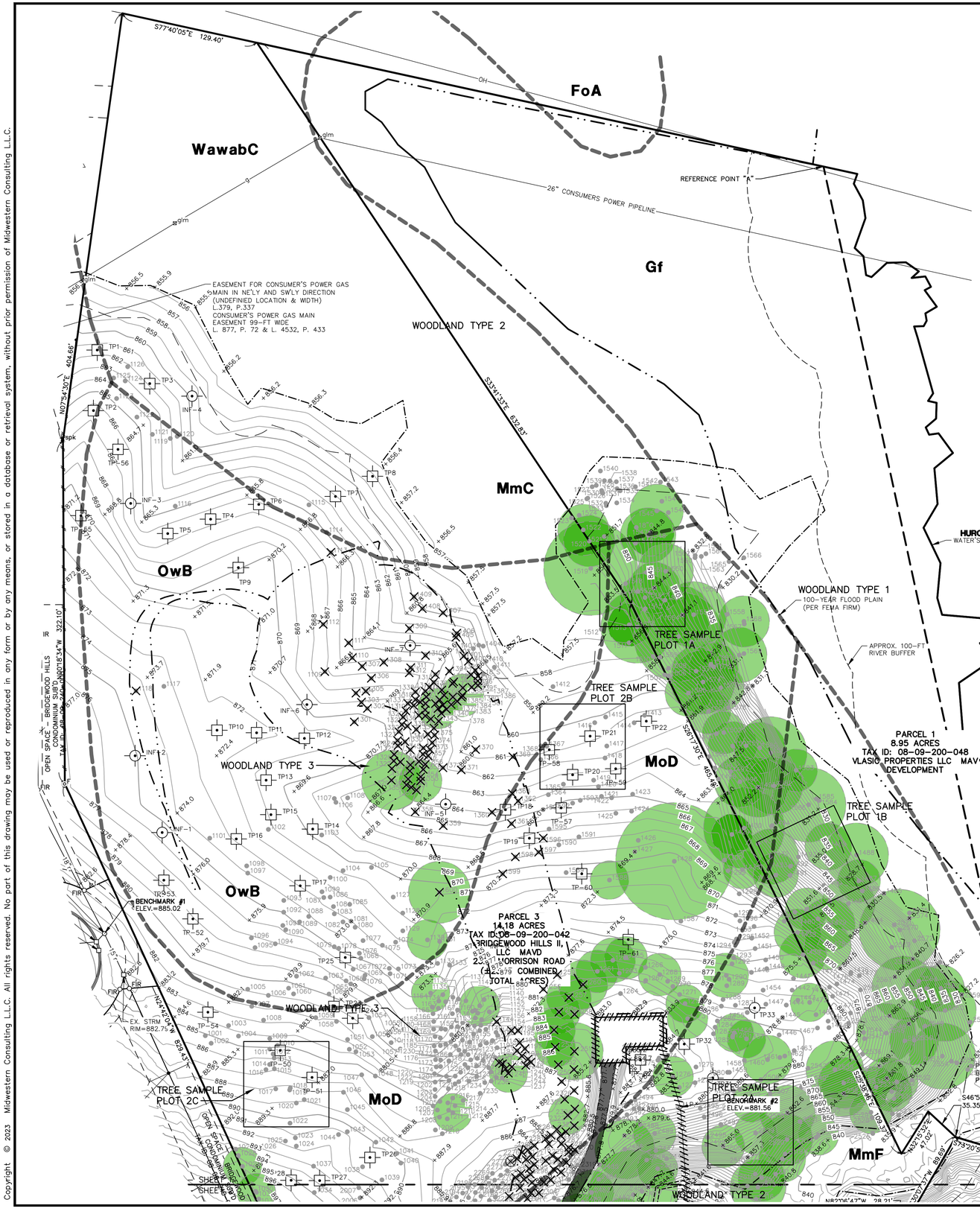
Land Development • Land Survey • Institutional • Municipal
Wireless Communications • Transportation • Landfill Services

RELEASED FOR:	DATE

STATE OF MICHIGAN
HEATH HARTT
ENGINEER
No. 56247
PROFESSIONAL ENGINEER

P.E. #



LEGAL DESCRIPTIONS

(per Midwestern Consulting LLC. Job No.: 13109. Dated 08/09/13)
PARCEL 1

Commencing at the West 1 /4 corner of Section 9, T2S, R5E, Scio Township, Washtenaw County, Michigan; thence S 89°23'30" E 327.49 feet along the E–W 1/4 line of said Section 9, as monumented; thence N 47°05'04" E 365.60 feet along the centerline of Morrison Road (66.00' wide); thence N 63°02'56" W 35.16 feet; thence along the northwesterly line of said Morrison Road, as recorded in Liber 1051, Pages 107–108, W.C.R, in the following eight (8) described courses:

N 47°05'04" E 12.95 feet,
N 50°04'34" E 306.60 feet,
N 23°46'34" E 201.65 feet,
N 61°08'34" E 455.75 feet,
N 43°59'34" E 359.25 feet,
N 66°34'20" E 193.26 feet measured (193.54 feet recorded),
S 80°20'42" E 28.21 feet measured (28.24 feet recorded) and
N 31°53'42" E 89.69 feet measured (90.00 feet recorded) to the POINT OF BEGINNING;

thence N 45°13'49" W 35.35 feet;
thence S 34°01'37" W 47.02 feet;
thence N 23°52'41" W 109.37 feet;
thence N 24°31'25" W 465.49 feet;
thence N 31°55'28" W 632.83 feet;
thence S 75°54'00" E 544.06 feet along the southerly right–of–way line of the Michigan Central Railroad (variable width) to intermediate reference point 'A';
thence continuing S 75°54'00" E 35 feet (more or less) from said reference point 'A' to the water's edge of the Huron River;
thence southeasterly along the westerly edge of said Huron River;
thence S 17°12'22" W 35 feet (more or less) to intermediate reference point 'B', said intermediate reference point 'B' being the following three courses from aforementioned reference point 'A':

S 10°32'07" E 733.42 feet, S 46°22'00" E 370.69 feet and N 88°09'46"E 207.57 feet;

thence continuing S 17°12'22" W 222.99 feet along the westerly line of lands for which flowage rights were conveyed by George H. Scriber & wife to Huron Farms Company by deed, dated June 26, 1926 and recorded in Liber 260 of Deeds, Page 506, W.C.R.;
thence N 89°22'21" W 55.18 feet to reference point 'C';
thence from said reference point 'C', northerly and westerly along a contour at elevation 835 feet above sea level, U.S. Geological Survey Datum, as determined by surveys made under the direction of Gardner S. Williams, a consulting Engineer, in 1908 and 1909 to reference point 'D', said reference point 'D' being distant from reference point 'C' along an intermediate traverse line for the following three courses:

N 56°55'40" E 65.67 feet,
N 08°57'49" E 81.47 feet and
N 73°41'42" W 291.57 feet,

thence S 31°44'19" W 102.16 feet along the East line of the West 1/ 2 of Lot 3 of said Morrison's River Front Subdivision;
thence N 58°58'28" W 124.71 feet along the North line of River Street (66.00' wide);
thence N 29°43'36" E 83.54 feet measured (81.80 feet recorded) along the easterly right–of–way line of said Morrison Road;
thence N 71°34'47" W 64.87 feet measured (67.25 feet recorded) along the northerly right–of–way line of said Morrison Road to the POINT OF BEGINNING. Being a part of the NW ¼ of said Section 9, T2S, R5E, Scio Township, Washtenaw County, Michigan, containing 7.8 acres of land, more or less, and all riparian rights thereof. Being subject to easements and restrictions of record, if any.

(per Midwestern Consulting LLC. Job No.: 13109. Dated 08/09/13)
PARCEL 3

Commencing at the West 1/4 corner of Section 9, T2S, R5E, Scio Township, Washtenaw County, Michigan; thence S 89°23'30" E 327.49 feet along the E–W 1/4 line of said Section 9, as monumented; thence N 47°05'04" E 365.60 feet along the centerline of Morrison Road (66.00 feet wide) as recorded in Liber 1051, Pages 107–108, W.C.R.; thence N 63°02'56" W 35.16 feet; thence along the northwesterly right–of–way line of said Morrison Road, in the following four (4) described courses: N 47°05'04" E 12.95 feet; N 50°04'34" E 306.60 feet; N 23°46'34" E 201.65 feet; N 61°08'34" E 455.75 feet to the POINT OF BEGINNING,

thence N 22°55'59" W 829.43 feet;
thence N 01°27'31" E 322.10 feet;
thence N 09°40'35" E 404.66 feet;
thence S 75°54'00" E 129.40 feet along the South right–of–way line of the Michigan Central Railroad;
thence S 31°55'28" E 632.83 feet;
thence S 24°31'25" E 465.49 feet;
thence S 23°52'41" E 109.37 feet;
thence N 34°01'37" E 47.02 feet;
thence S 45°13'49" E 35.35 feet;
thence along the Northwesterly right–of–way line of said Morrison Road in the following four (4) courses:

S 31°53'42" W 89.69 feet;
N 80°20'42" W 28.21 feet;
S 66°34'20" W 193.26 feet;
S 43°59'34" W 359.25 feet to the POINT OF BEGINNING. Being a part of the NW 1/4 of Section 9, T2S, R5E, Scio Township, Washtenaw County, Michigan and containing 14.18 acres of land, more or less. Being subject to easements and restrictions of record, if any.

SITE SOILS

WASHTENAW COUNTY, MICHIGAN (MI161)			
MAP UNIT SYMBOL	MAP UNIT NAME		
FOA	FOX SANDY LOAM, TILL PLAIN, 0 TO 2 PERCENT SLOPES	MOD	MORLEY LOAM, 12 TO 18 PERCENT SLOPES
GF	GILFORD SANDY LOAM, TILL PLAIN, 0 TO 2 PERCENT SLOPES	OWB	OWOSSO–MIAMI COMPLEX, 2 TO 6 PERCENT SLOPES
MMF	MIAMI LOAM, 25 TO 35 PERCENT SLOPES	WAA	WASEPI SANDY LOAM, 0 TO 4 PERCENT SLOPES
		MMC	MIAMI LOAM, 6 TO 12 PERCENT SLOPES
		MMD	MIAMI LOAM, 12 TO 18 PERCENT SLOPES

LEGEND

- 838 — EXIST. CONTOUR
- ×836.2 — EXIST. SPOT ELEVATION
- U.P. — EXIST. UTILITY POLE
- GUY WIRE
- g — EXIST. GAS LINE
- r — EXIST. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- END SECTION
- glm — GAS LINE MARKER
- TP1 — TEST PIT LOCATION
- F — FOUND MONUMENT
- FIR — FOUND IRON ROD
- F — FOUND IRON PIPE
- CONTROL PT.
- t — TELEPHONE RISER
- POST
- FENCE
- EXISTING SINGLE TREE
- INF–# — INFILTRATION TEST LOCATION
- TP–# — TEST PIT LOCATION
- LANDMARK TREE
- MoD — SOIL TYPE AND BOUNDARY

REMOVAL LEGEND

- GRAVEL TO BE REMOVED
- UTILITY TO BE REMOVED OR ABANDONED
- TREE TO BE REMOVED
- (REL) — ITEM TO BE RELOCATED
- (REM) — ITEM TO BE REMOVED
- TREE TO REMAIN BUT INCLUDED IN IMPACT/MITIGATION CALCULATIONS
- LIMITS OF GRADING

NOTES

1. ALL ON–SITE FEATURES AND UTILITIES ARE TO BE REMOVED UNLESS OTHERWISE NOTED.
2. ALL EXISTING FRANCHISE UTILITIES ARE TO BE REMOVED BY OR PER THE PARTY HAVING JURISDICTION.
3. UTILITY SERVICE LEADS SERVING THE EXISTING STRUCTURE TO BE DEMOLISHED MUST BE PERMANENTLY KILLED AT THEIR RESPECTIVE UTILITY MAIN.
4. LIMITED TREE SURVEY WAS PERFORMED.

BENCHMARKS

BENCHMARK #1: TOP OF STORM MANHOLE RIM AT EAST END OF HILLSDALE COURT CUL–DE–SAC
ELEVATION=885.02 (NAVD88)

BENCHMARK #2: SET SPIKE IN N. FACE OF UTILITY POLE STANDING ±60' SE OF HOUSE & ±200' N. OF MORRISON RD.
ELEVATION=881.56 (NAVD88)

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SCALE: 1" = 50'
0 50 100 150

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MORRISON HILLS
PRIVATE ROAD
EXISTING CONDITIONS AND DEMOLITION PLAN

02

DATE: 03/16/22
SHEET 02 OF 19
CADD: RMLII
ENG: HTH
PM: TJC
TECH: RMLII
21188EX01

REVISIONS:	REV. DATE
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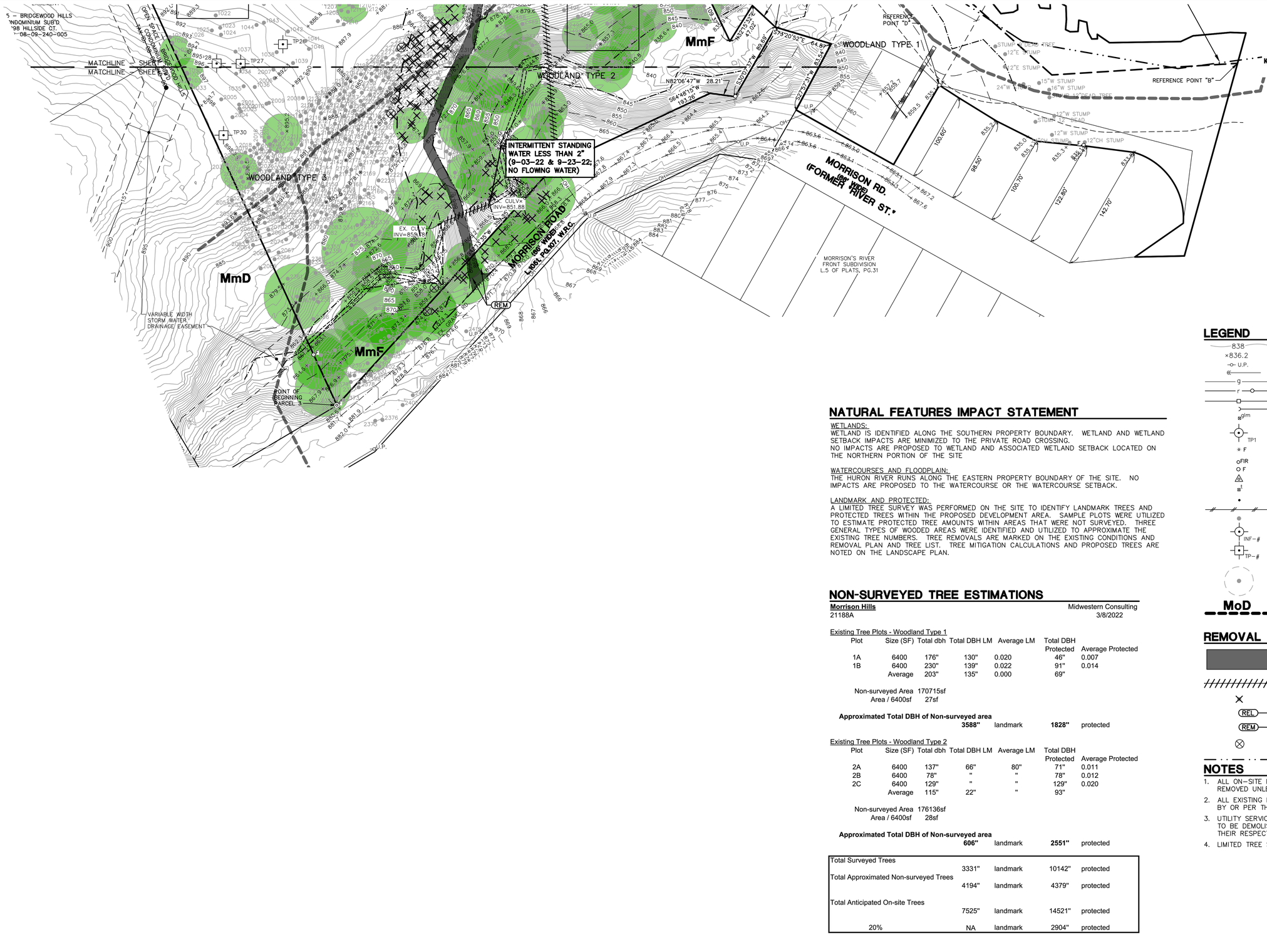
TOWNSHIP SUBMITTAL	12/01/22
PER TOWNSHIP AND COUNTY SESC REVIEW	01/20/23

JOB No. 21188A



NATURAL FEATURES IMPACT STATEMENT

WETLANDS:
WETLAND IS IDENTIFIED ALONG THE SOUTHERN PROPERTY BOUNDARY. WETLAND AND WETLAND SETBACK IMPACTS ARE MINIMIZED TO THE PRIVATE ROAD CROSSING.
NO IMPACTS ARE PROPOSED TO WETLAND AND ASSOCIATED WETLAND SETBACK LOCATED ON THE NORTHERN PORTION OF THE SITE

WATERCOURSES AND FLOODPLAIN:
THE HURON RIVER RUNS ALONG THE EASTERN PROPERTY BOUNDARY OF THE SITE. NO IMPACTS ARE PROPOSED TO THE WATERCOURSE OR THE WATERCOURSE SETBACK.

LANDMARK AND PROTECTED:
A LIMITED TREE SURVEY WAS PERFORMED ON THE SITE TO IDENTIFY LANDMARK TREES AND PROTECTED TREES WITHIN THE PROPOSED DEVELOPMENT AREA. SAMPLE PLOTS WERE UTILIZED TO ESTIMATE PROTECTED TREE AMOUNTS WITHIN AREAS THAT WERE NOT SURVEYED. THREE GENERAL TYPES OF WOODED AREAS WERE IDENTIFIED AND UTILIZED TO APPROXIMATE THE EXISTING TREE NUMBERS. TREE REMOVALS ARE MARKED ON THE EXISTING CONDITIONS AND REMOVAL PLAN AND TREE LIST. TREE MITIGATION CALCULATIONS AND PROPOSED TREES ARE NOTED ON THE LANDSCAPE PLAN.

NON-SURVEYED TREE ESTIMATIONS

Morrison Hills — Midwestern Consulting
21188A — 3/8/2022

Existing Tree Plots - Woodland Type 1

Plot	Size (SF)	Total dbh	Total DBH LM	Average LM	Total DBH Protected	Average Protected
1A	6400	176"	130"	0.020	46"	0.007
1B	6400	230"	139"	0.022	91"	0.014
	Average	203"	135"	0.000	69"	

Non-surveyed Area 170715sf
Area / 6400sf 27sf

Approximated Total DBH of Non-surveyed area
3588" landmark **1828"** protected

Existing Tree Plots - Woodland Type 2

Plot	Size (SF)	Total dbh	Total DBH LM	Average LM	Total DBH Protected	Average Protected
2A	6400	137"	66"	80"	71"	0.011
2B	6400	78"	"	"	78"	0.012
2C	6400	129"	"	"	129"	0.020
	Average	115"	22"	"	93"	

Non-surveyed Area 176136sf
Area / 6400sf 28sf

Approximated Total DBH of Non-surveyed area
606" landmark **2551"** protected

Total Surveyed Trees	3331"	landmark	10142"	protected
Total Approximated Non-surveyed Trees	4194"	landmark	4379"	protected
Total Anticipated On-site Trees	7525"	landmark	14521"	protected
20%	NA	landmark	2904"	protected

LEGEND

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- END SECTION
- g/m — GAS LINE MARKER
- TP1 — TEST PIT LOCATION
- ∘ F — FOUND MONUMENT
- ∘FIR — FOUND IRON ROD
- ○ F — FOUND IRON PIPE
- CONTROL PT.
- t — TELEPHONE RISER
- POST
- FENCE
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MORRISON HILLS
PRIVATE ROAD
EXISTING CONDITIONS AND DEMOLITION PLAN 2 OF 2

03

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SHEET 03 OF 19
CADD: RMJII
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21188EX01

JOB No. 21188A

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TOWNSHIP SUBMITTAL	12/20/22
PER EGLE AND COUNTY SESC REVIEW	01/30/23

LEGEND

Symbol	Description
805	EXIST. CONTOUR
	PROP. CURB & GUTTER
	PROP. DITCH
	PROP. BITUMINOUS PAVEMENT
	PROP. COBBLE SLOPE AREA
	PROP. GRAVE ROAD 23A
	PROP. SHOULDER CL 2 GRAVEL
	PROP. BUILDING ENVELOPE
	PROP. WETLAND IMPACT
	PROP. WELL
	PROP. LOT BUILDING SETBACKS
	PROP. STORM
	PROP. SEPTIC FIELD, SIZED FOR 5 BEDROOM HOME W/ MEDIUM SAND
	SINGLE TREE – EXIST.
WL	PROP. WETLAND SIGN (9)

ROADWAY EASEMENT

LEGAL DESCRIPTION FOR A 66– FOOT WIDE ROADWAY EASEMENT ON A PARCEL OF LAND IN THE NW 1/4 OF SECTION 9, T2S, R5E, SCIO TOWNSHIP, WASHTENAW COUNTY, MICHIGAN

Commencing at the West 1/4 corner of Section 9, T2S, R5E, Scio Township, Washtenaw County, Michigan; thence S89°23'30"E 327.49 feet along the E–W 1/4 line of said Section 9; thence N47°05'04"E 365.60 feet along the centerline of Morrison Road (66 feet wide) as recorded in Liber 1051, Pages 107–108, W.C.R.; thence N63°02'56"W 35.16 feet; thence along the northwesterly right–of–way line of said Morrison Road, in the following four (4) described courses: 1) N47°05'04"E 12.95 feet; 2) N50°04'34"E 306.60 feet; 3) N23°46'34"E 201.65 feet; 4) N61°08'34"E 455.75 feet; thence N43°59'40"E 199.56 feet to the POINT OF BEGINNING,

thence N46°00'20"W 20.17 feet;

thence 242.02 feet along a tangential curve to the right, radius 208.00 feet, central angle 66°40'01", long chord N12°40'19"W 228.60 feet;

thence N20°39'41"E 50.25 feet;

thence 99.75 feet along a tangential curve to the left, radius 142.00 feet, central angle 40°14'52", long chord N00°32'15"E 97.71 feet;

thence N19°35'11"W 286.04 feet;

thence 39.03 feet along a tangential curve to the left, radius 30.00 feet, central angle 74°32'02", long chord N56°51'12"W 36.33 feet;

thence 360.72 feet along a reverse curve to the right, radius 75.00 feet, central angle 275°34'24", long chord N43°39'59"E 100.78 feet;

thence 11.02 feet along a reverse curve to the left, radius 30.00 feet, central angle 21°02'22", long chord S09°04'00"E 10.95 feet;

thence S19°35'11"E 349.55 feet;

thence 146.11 feet along a tangential curve to the right, radius 208.00 feet, central angle 40°14'52", long chord S00°32'15"W 143.13 feet;

thence S20°39'41"W 50.25 feet;

thence 165.23 feet along a tangential curve to the left, radius 142.00 feet, central angle 66°40'01", long chord S12°40'19"E 156.06 feet;

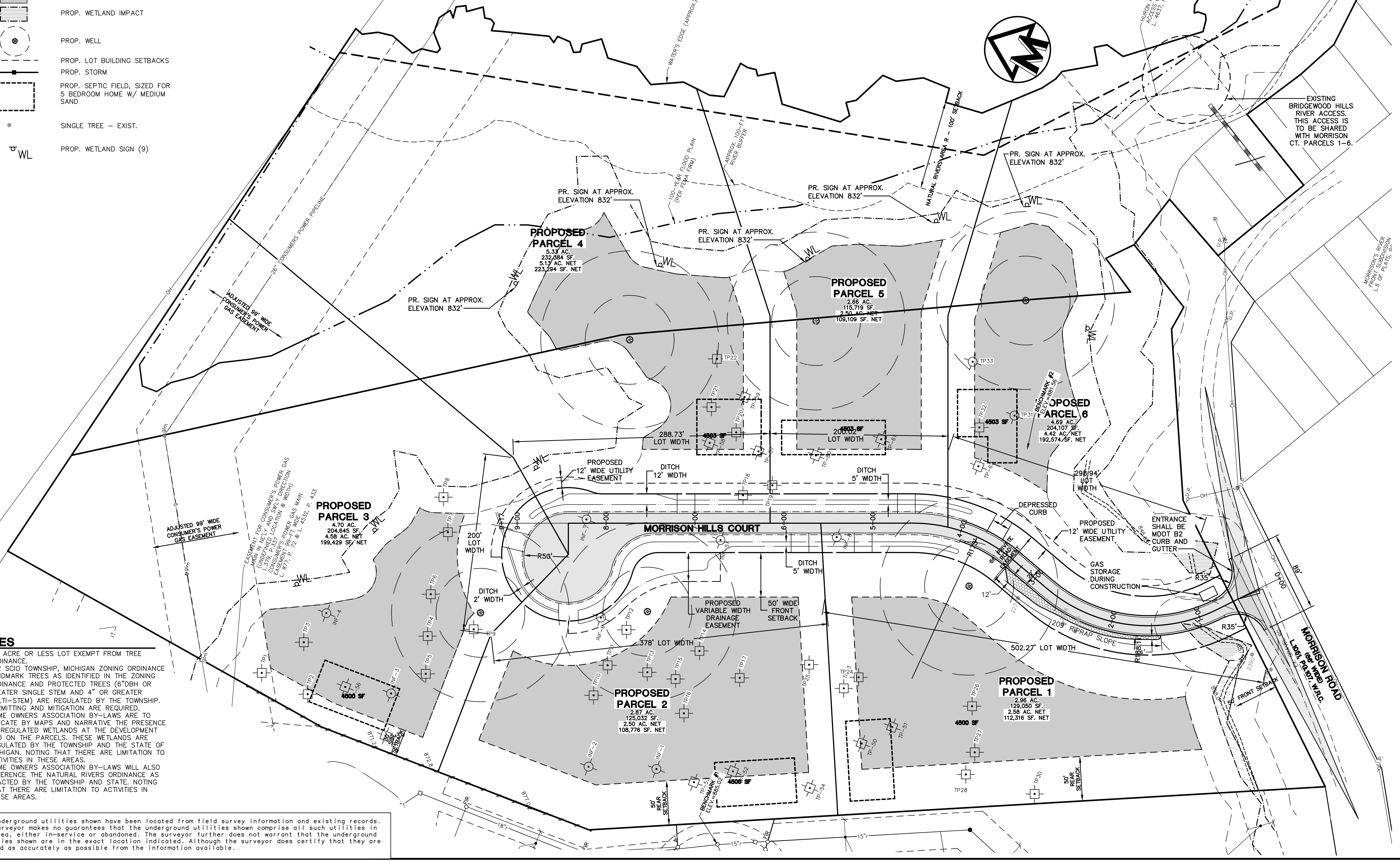
thence S46°00'20"E 20.17 feet;

thence S43°59'40"W 66.00 feet along said Northwesterly right–of–way line of Morrison Road to the POINT OF BEGINNING. Being a part of the NW 1/4 of said Section 9. Being subject to any easements and restrictions of record, if any.

SCALE: 1" = 50'

0 50 100 150

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



PROPOSED PARCEL 1
2.96 AC.
129,050 SF.
2.58 AC. NET
112,316 SF. NET
PROPOSED PARCEL 2
2.87 AC.
125,032 SF.
2.50 AC. NET
108,776 SF. NET
PROPOSED PARCEL 3
4.70 AC.
204,645 SF.
4.58 AC. NET
199,429 SF. NET
PROPOSED PARCEL 4
5.33 AC.
232,384 SF.
5.13 AC. NET
223,294 SF. NET
PROPOSED PARCEL 5
2.66 AC.
115,719 SF.
2.50 AC. NET
109,109 SF. NET
PROPOSED PARCEL 6
4.69 AC.
204,107 SF.
4.42 AC. NET
192,574 SF. NET
MORRISON HILLS COURT
MORRISON ROAD
L.1051, PG.107, W.C.R.
EXISTING BRIDGEWOOD HILLS RIVER ACCESS. THIS ACCESS IS TO BE SHARED WITH MORRISON CT. PARCELS 1–6.
HURON RIVER ACCESS EASEMENT L. 4637, P. 141
NATURAL RIVERS AREA R – 100' SETBACK
WATER'S EDGE (APPROX.)
100–YEAR FLOOD PLAIN (PER FEMA FIRM)
APPROX. 100–FT RIVER BUFFER
PR. SIGN AT APPROX. ELEVATION 832'
ADJUSTED 99' WIDE CONSUMER'S POWER GAS EASEMENT
26" CONSUMERS POWER PIPELINE
PROPOSED 12' WIDE UTILITY EASEMENT
DITCH 12' WIDTH
DITCH 5' WIDTH
DITCH 2' WIDTH
288.73' LOT WIDTH
200.02' LOT WIDTH
298.94' LOT WIDTH
200' LOT WIDTH
378' LOT WIDTH
502.27' LOT WIDTH
PROPOSED VARIABLE WIDTH DRAINAGE EASEMENT
50' WIDE FRONT SETBACK
50' REAR SETBACK
50' FRONT SETBACK
DEPRESSED CURB
ENTRANCE SHALL BE MDOT B2 CURB AND GUTTER
GAS STORAGE DURING CONSTRUCTION
20' RIPRAP SLOPE
R50'
R35'
4500 SF
4503 SF
BENCHMARK #1
BENCHMARK #2
MORRISON'S RIVER FRONT SUBDIVISION L.5 OF PLATS, PG.

NOTES

1. 2.5 ACRE OR LESS LOT EXEMPT FROM TREE ORDINANCE.
2. PER SCIO TOWNSHIP, MICHIGAN ZONING ORDINANCE LANDMARK TREES AS IDENTIFIED IN THE ZONING ORDINANCE AND PROTECTED TREES (6"DBH OR GREATER SINGLE STEM AND 4" OR GREATER MULTI–STEM) ARE REGULATED BY THE TOWNSHIP. PERMITTING AND MITIGATION ARE REQUIRED.
3. HOME OWNERS ASSOCIATION BY–LAWS ARE TO INDICATE BY MAPS AND NARRATIVE THE PRESENCE OF REGULATED WETLANDS AT THE DEVELOPMENT AND ON THE PARCELS. THESE WETLANDS ARE REGULATED BY THE TOWNSHIP AND THE STATE OF MICHIGAN. NOTING THAT THERE ARE LIMITATION TO ACTIVITIES IN THESE AREAS.
4. HOME OWNERS ASSOCIATION BY–LAWS WILL ALSO REFERENCE THE NATURAL RIVERS ORDINANCE AS ENACTED BY THE TOWNSHIP AND STATE. NOTING THAT THERE ARE LIMITATION TO ACTIVITIES IN THESE AREAS.

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M:\Civil3d_Proj\21188\Road Plans\21188SP01.dwg, 2/20/2023 3:36 PM, Heath Hartt, 04 LAYOUT PLAN, MCLLC PDF.pc3

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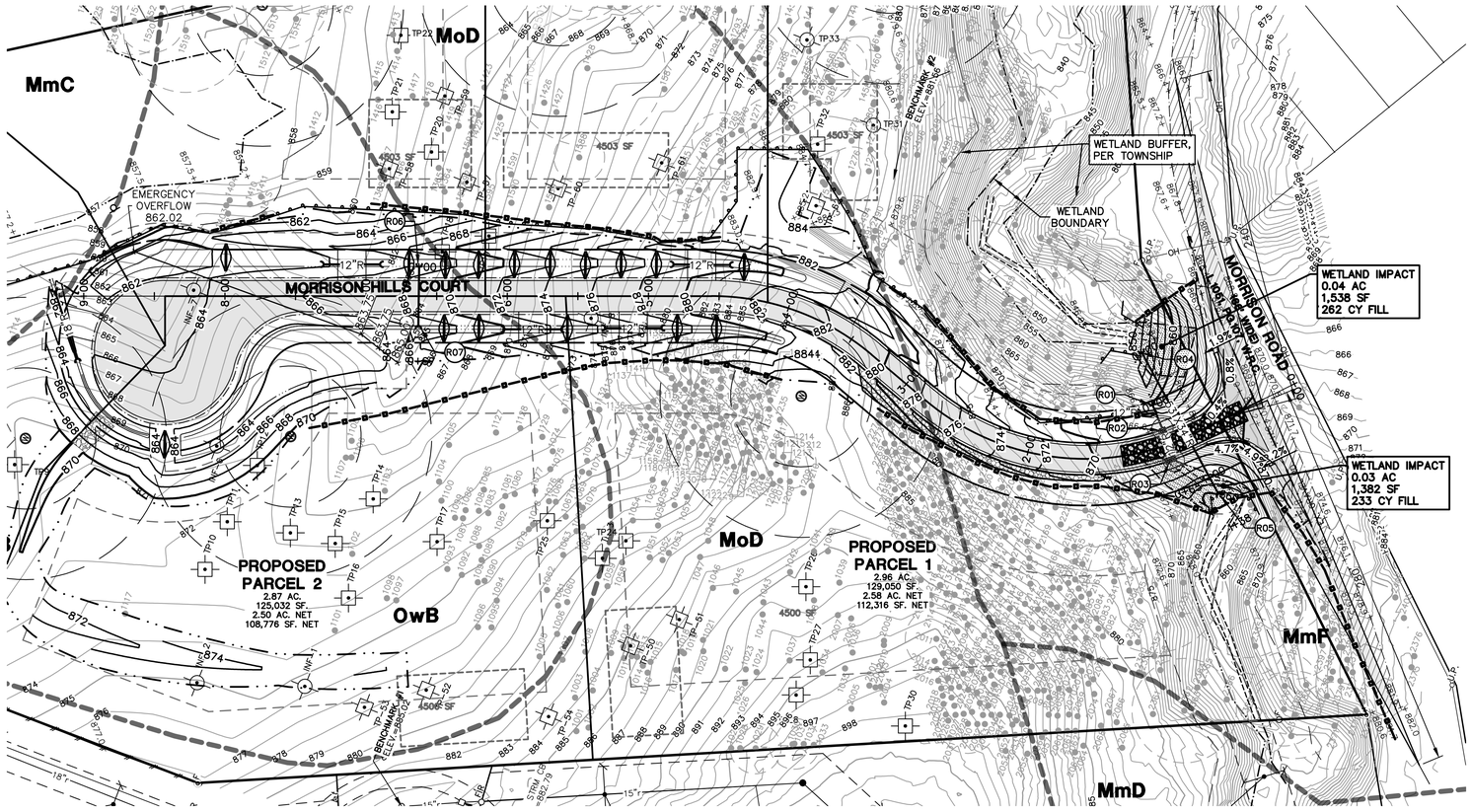
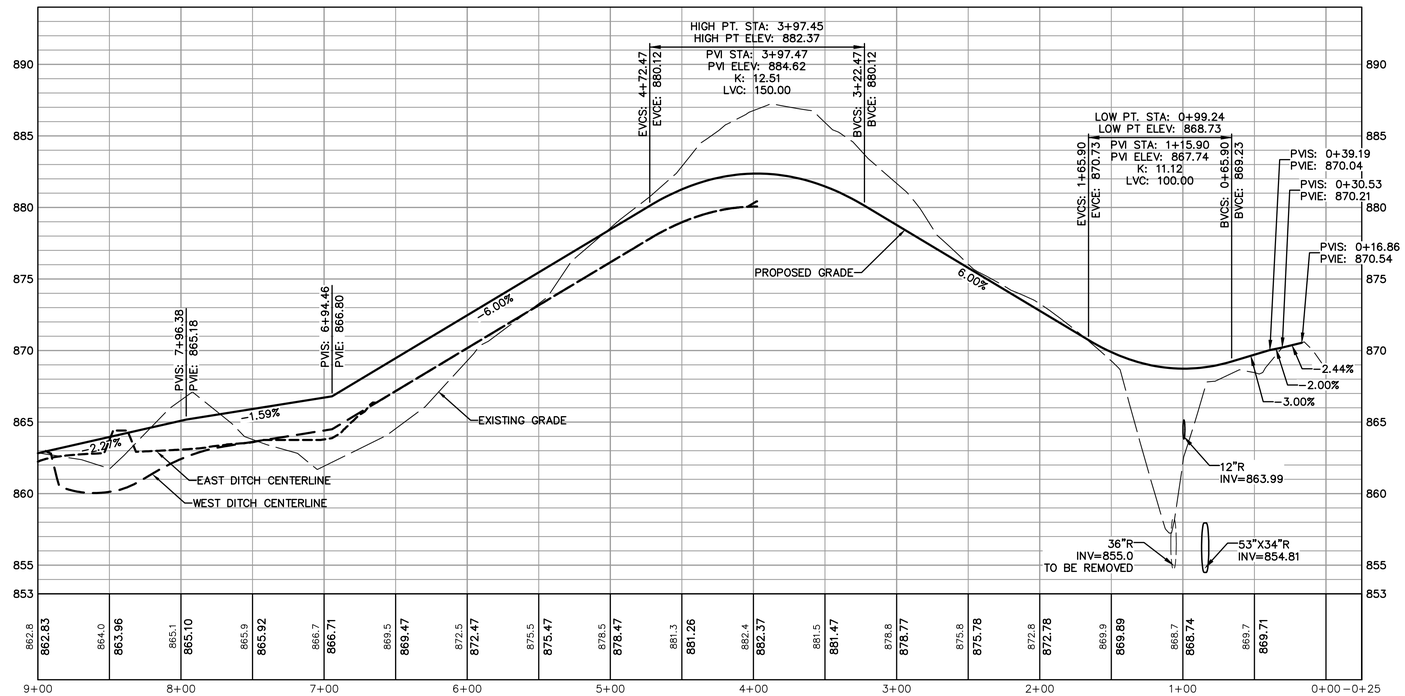
DATE: 03/16/22
SHEET 04 OF 19

REVISIONS:	REV. DATE	
UPDATE TEST PITS AND DRAINFIELD	5/4/22	CADD: RMLII
TOWNSHIP REVIEW	6/17/22	ENG: HTH
TOWNSHIP REVIEW	07/25/22	PM: TJC
TOWNSHIP REVIEW	08/16/22	TECH: RMLII
PER EGLE REVIEW	12/19/22	/21188SP01
TOWNSHIP SUBMITTAL	12/21/22	

PER EGLE AND COUNTY SESC REVIEW 01/30/23





SITE SOILS

MAP UNIT SYMBOL	MAP UNIT NAME
FOA	FOX SANDY LOAM, TILL PLAIN, 0 TO 2 PERCENT SLOPES
GF	GILFORD SANDY LOAM, TILL PLAIN, 0 TO 2 PERCENT SLOPES
MMF	MIAMI LOAM, 25 TO 35 PERCENT SLOPES
MOD	MORLEY LOAM, 12 TO 18 PERCENT SLOPES
OWB	OWOSSO–MIAMI COMPLEX, 2 TO 6 PERCENT SLOPES
WAA	WASEPI SANDY LOAM, 0 TO 4 PERCENT SLOPES
MMC	MIAMI LOAM, 6 TO 12 PERCENT SLOPES
MMD	MIAMI LOAM, 12 TO 18 PERCENT SLOPES

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

SCALE: 1" = 50'

0 50 100 150

LEGEND

- 838 EXIST. CONTOUR
- 838 PROP. CONTOUR
- ×836.2 EXIST. SPOT ELEVATION
- 36.60 PROP. SPOT ELEVATION
- U.P. EXIST. UTILITY POLE
- U.P. EXIST. UTILITY POLE W/ TRANS.
- GUY WIRE
- OH EXIST. OVERHEAD UTILITY LINE
- EXIST. LIGHT POLE
- PROP. LIGHT POLE
- t EXIST. TELEPHONE LINE
- e EXIST. ELECTRIC LINE
- g EXIST. GAS LINE
- g EXIST. GAS VALVE
- r EXIST. STORM SEWER
- R PROP. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- PROP. CATCH BASIN OR INLET
- EXIST. BEEHIVE INLET
- PROP. BEEHIVE INLET
- END SECTION
- HEAD WALL
- C/L OF DITCH
- DRAINAGE DIRECTION
- SIGN
- EXIST. GRAVEL
- SINGLE TREE
- TREE OR BRUSH LIMIT
- FENCE
- SILTFENCE
- LIMITS OF DISTURBANCE
- CONSTRUCTION FENCE
- FF FINISH FLOOR ELEVATION
- GF GARAGE FLOOR ELEVATION
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- 55t SOIL EROSION CONTROL MEASURE
- MoD SOIL TYPE AND BOUNDARY
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- PROP. WETLAND IMPACT

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ANN ARBOR, MICHIGAN 48104
GREG COPP
734-930-6700

MORRISON HILLS
PRIVATE ROAD
GRADING PLAN AND PROFILE

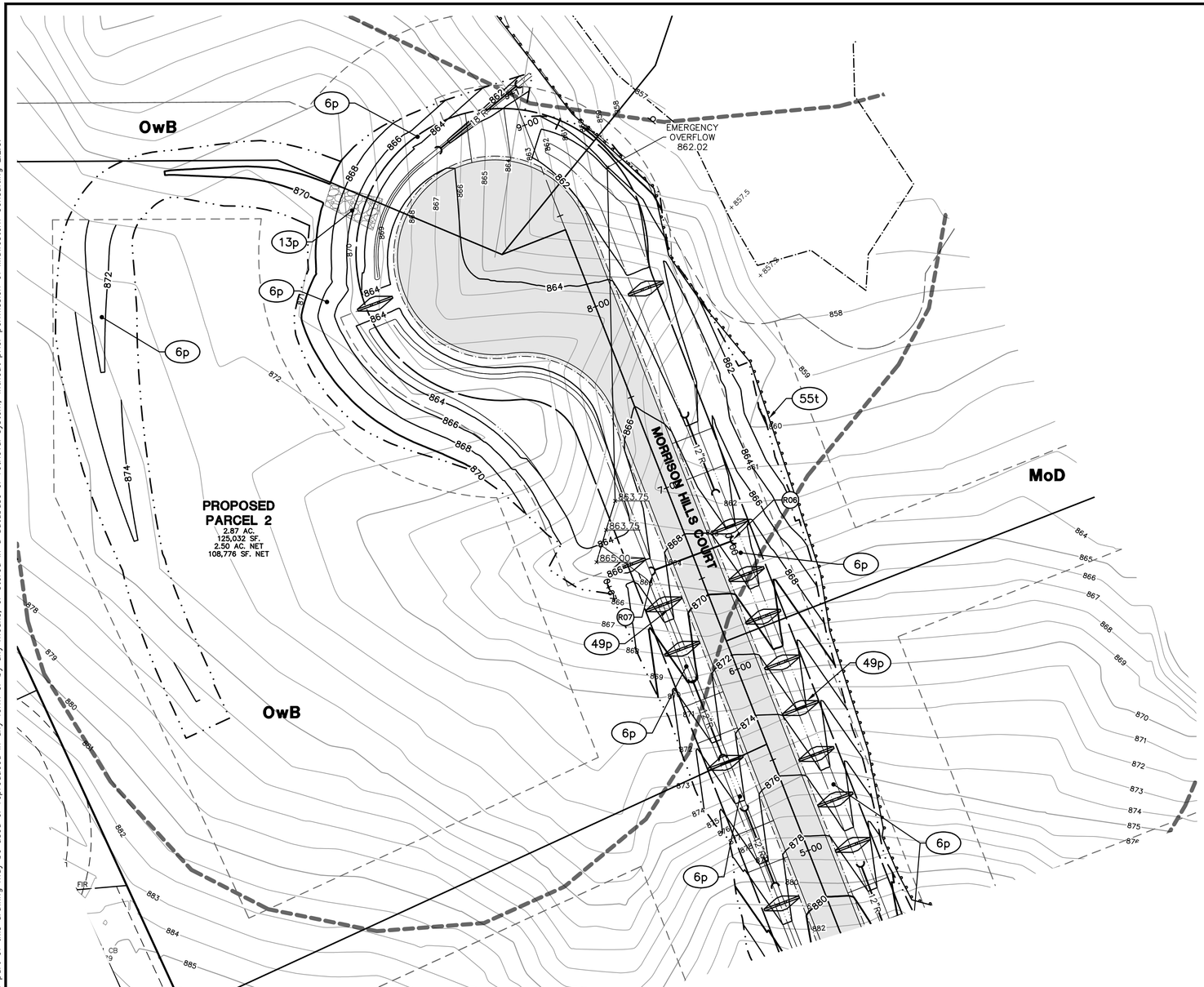
05

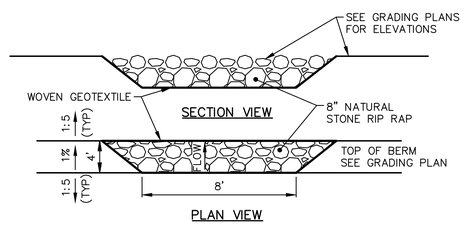
JOB No. 21188A

DATE: 03/16/22
SHEET 05 OF 19
CADD: RWLII
ENG: HTH
PM: TJC
TECH: RWLII
21188PR01

REVISIONS:	REV. DATE
TOWNSHIP REVIEW	04/27/22
TOWNSHIP REVIEW	06/12/22
PER EGALE REVIEW	12/19/22
TOWNSHIP SUBMITAL	12/21/22
PER EGLE AND COUNTY SESC REVIEW	01/30/23
PER COUNTY SESC REVIEW	02/17/23

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.





RIP-RAP EMERGENCY OVERFLOW
SCALE : NTS

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SITE SOILS

MAP UNIT SYMBOL	MAP UNIT NAME
WASHTENAW COUNTY, MICHIGAN (MI161)	
FOA	FOX SANDY LOAM, TILL PLAIN, 0 TO 2 PERCENT SLOPES
GF	GILFORD SANDY LOAM, TILL PLAIN, 0 TO 2 PERCENT SLOPES
MMF	MIAMI LOAM, 25 TO 35 PERCENT SLOPES
MOD	MORLEY LOAM, 12 TO 18 PERCENT SLOPES
OWB	OWOSSO–MIAMI COMPLEX, 2 TO 6 PERCENT SLOPES
WAA	WASEPI SANDY LOAM, 0 TO 4 PERCENT SLOPES
MMC	MIAMI LOAM, 6 TO 12 PERCENT SLOPES
MMD	MIAMI LOAM, 12 TO 18 PERCENT SLOPES

SOIL EROSION CONTROL MEASURES

t = temporary p = permanent

6	SEEDING WITH STRAW MATTING	55	GEOTEXTILE SILT FENCE
13	RIPRAP, RUBBLE, GABIONS	58	CURB INLET FILTER
15	PAVING	59	C.B./INLET FILTER
49	CHECK DAMS	60	MUD TRACKING MAT
54	CONSTRUCTION FENCE OR SNOW FENCE	63	SILT FENCE WITH STONE FILTER

SOIL EROSION CONSTRUCTION NOTES

1. ALL SOIL EROSION CONTROL MEASURES SHALL COMPLY WITH THE CURRENT WASHTENAW COUNTY STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND STATE OF MICHIGAN "SOIL EROSION AND SEDIMENTATION CONTROL ACT" (ACT #347).
2. PRIOR TO COMMENCING EARTHMOVING OPERATIONS, THE GRADING CONTRACTOR SHALL INSTALL THE MUD TRACKING MAT, THE SILT FENCE AND TEMPORARY GRAVEL FILTER(S) SHOWN ON THE PLANS.
3. ANY LAWN AREA WHICH WILL HAVE A SLOPE STEEPER THAN 6:1 (6 FT. MEASURED HORIZONTALLY AND 1 FT. MEASURED VERTICALLY) SHALL BE SODDED AND PEGGED OR SEEDED AND MULCHED USING A SOIL EROSION CONTROL FABRIC OR BLANKET. HYDROSEEDING MAY BE USED IN LIEU OF SEED AND MULCH OR SOD WHERE SLOPES ARE FLATTER THAN 6:1.
4. THE ACTUAL LOCATION OF THE MUD TRACKING MATS AND THE GRAVEL FILTERS MAY BE ADJUSTED BY THE CONTRACTOR TO MATCH CONTRACTOR'S OPERATIONS AND FIELD CONDITIONS BUT ONLY IF APPROVED BY THE ENGINEER.
5. ALL DISTURBED AREAS, EVEN WHERE FUTURE PAVEMENT AND BUILDINGS ARE PROPOSED, ARE TO BE REVEGETATED PER COUNTY STANDARDS FOR TEMPORARY SEEDING.
6. ESTIMATED EARTHWORK FOR THIS PROJECT IS 4000 CY CUT AND 3500 CY FILL. THIS IS AN ESTIMATE ONLY AND IS NOT TO BE USED FOR CONSTRUCTION OR ESTIMATING PURPOSES.
7. THE ESTIMATED COST OF PROTECTING ALL EXPOSED SURFACES FROM EROSION SHOULD CONSTRUCTION CEASE IS $1,500. (RESPREAD 3" TOPSOIL AND SEEDING)
8. WORK DONE WITHIN THE CREEK BED SHALL BE DONE DURING THE DRY SEASON. IF WORK CAN NOT HAPPEN DURING THE DRY SEASON CHECK DAMS SHALL BE PROVIDED.
9. ALL AREAS CALLED FOR SLOPE STABILIZATION MIX SHALL INCLUDE INSTALLATION OF BLANKETS.

SOIL EROSION MAINTENANCE REQUIREMENTS

1. ALL STRAW BALE AND/OR SILT FENCE SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. IF AT ANY TIME THE DEPTH OF SILT AND SEDIMENT COMES TO WITHIN 6" OF THE TOP OF ANY STRAW BALE OR WITHIN 12" OF THE TOP OF ANY SILT FENCE, ALL SILT AND SEDIMENT SHALL BE REMOVED TO ORIGINAL GRADE.
2. ALL TEMPORARY GRAVEL FILTERS SHOULD BE ADJUSTED AS TO LOCATION PER ACTUAL FIELD CONDITIONS. THE REMOVAL OF TRAPPED SEDIMENT AND THE CLEANOUT OR REPLACEMENT OF CLOGGED STONE MAY BE NECESSARY AFTER EACH STORM EVENT DURING THE PROJECT.
3. ONLY UPON STABILIZATION OF ALL DISTURBED AREAS MAY THE SILT FENCE, AND TEMPORARY GRAVEL FILTERS BE REMOVED. ALSO, ALL STORM SEWERS MUST BE CLEANED OF ALL SEDIMENT.

CONSTRUCTION SEQUENCE

CONSTRUCTION SEQUENCE	OPERATION TIME SCHEDULE – BEGINNING 2022						
	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
INSTALL AND MAINTAIN SOIL EROSION CONTROL MEASURES AS REQUIRED AND TREE REMOVALS							
STRIP AND MASS GRADE SITE							
INSTALL STORMWATER MANAGMENT							
CONSTRUCT ROADWAY							
INSTALL PAVING							
FINE GRADE SITE							
SEEDING AND PLANTINGS							
CLEANUP SITE							

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

SCALE: 1" = 30'
0 30 60 90

LEGEND

838	EXIST. CONTOUR
838	PROP. CONTOUR
×836.2	EXIST. SPOT ELEVATION
36.60×	PROP. SPOT ELEVATION
U.P.	EXIST. UTILITY POLE
U.P.	EXIST. UTILITY POLE W/ TRANS.
	GUY WIRE
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
	PROP. LIGHT POLE
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g	EXIST. GAS VALVE
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	EXIST. DITCH WIDTH
	DRAINAGE DIRECTION
P	SIGN
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MoD	SOIL TYPE AND BOUNDARY
	LANDMARK TREE
	PROP. BITUMINOUS PAVEMENT
	PROP. COBBLE SLOPE AREA
	PROP. GRAVEL ROAD 23A
	PROP. SHOULDER 23A GRAVEL
	PROP. BUILDING ENVELOPE
	PROP. WETLAND IMPACT

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MORRISON HILLS
PRIVATE ROAD
SOIL EROSION CONTROL PLAN

5A

DATE: 03/16/22
SHEET 5A OF 19
CADD: RMLII
ENG: HTH
PM: TJC
TECH: RMLII
I:\21188SE01

REVISIONS:	REV. DATE
PER COUNTY SESC REVIEW	02/17/23
TOWNSHIP REVIEW	05/25/22
TOWNSHIP REVIEW	07/27/22
PER EGLE REVIEW	12/19/22
TOWNSHIP REVIEW	08/29/22
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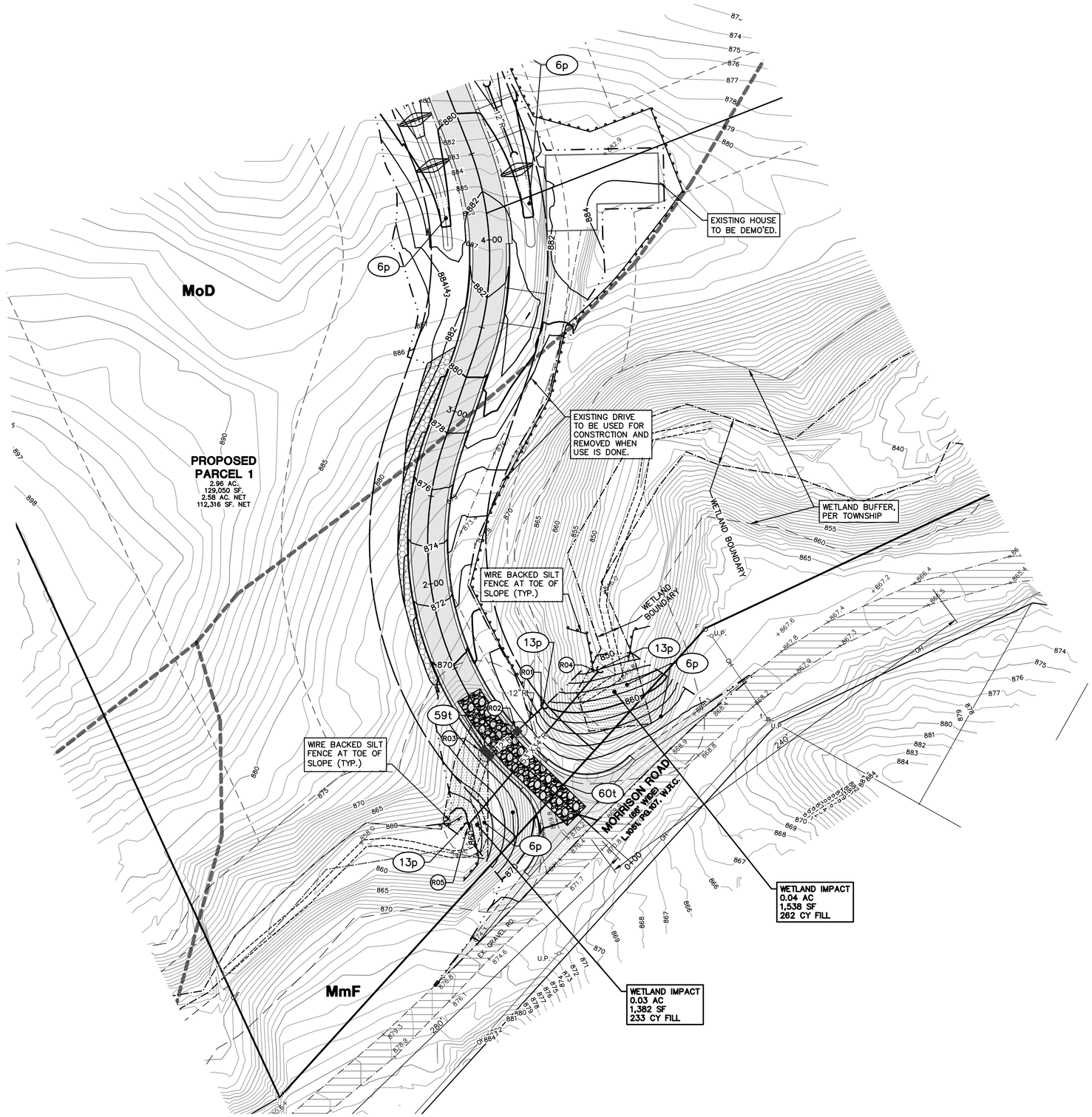
TOWNSHIP SUBMITAL	12/21/22

JOB No. 21188A



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MORRISON HILLS
PRIVATE ROAD
SOIL EROSION CONTROL PLAN 2 OF 2

5B

PER COUNTY SESC REVIEW 02/17/23

JOB No. 21188A

DATE: 03/16/22
SHEET 5B OF 19
CADD: RMLII
ENG: HTH
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21188SE01

REVISIONS:	REV. DATE
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TOWNSHIP REVIEW	09/26/22
PER EGALE REVIEW	12/19/22
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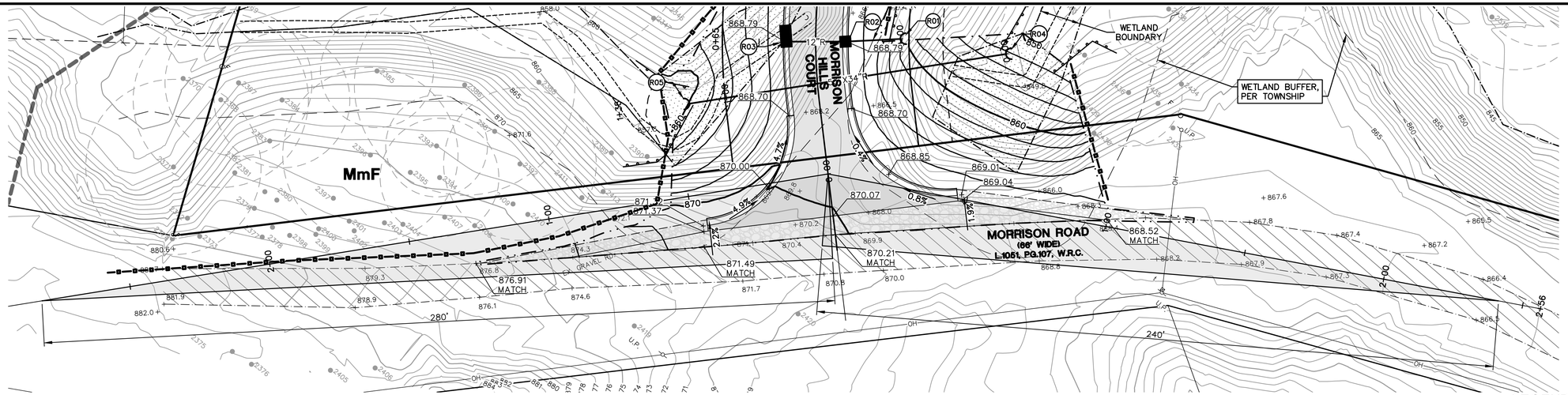
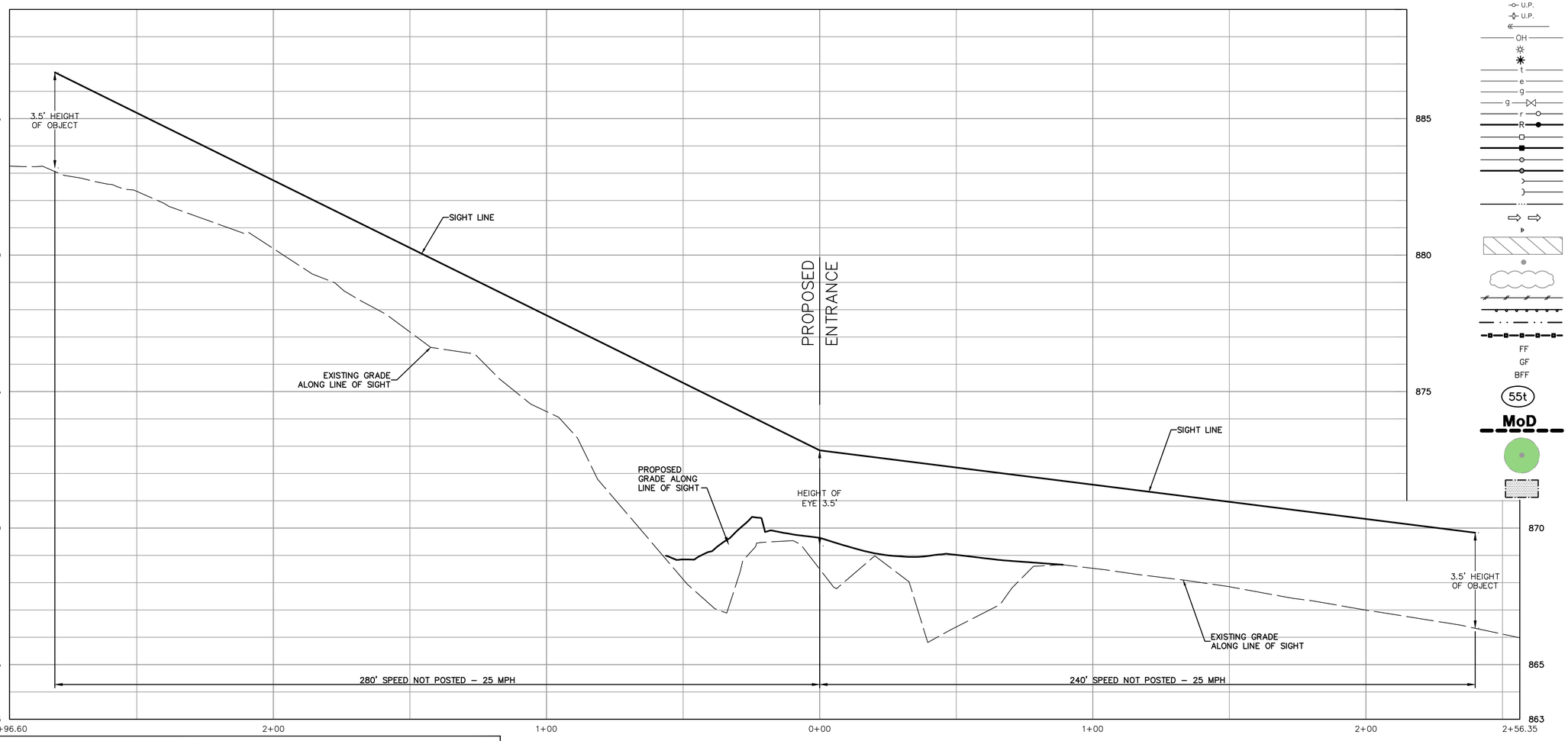
PER EGLE REVIEW	12/19/22
TOWNSHIP SUBMITTAL	12/21/22





ENTRANCE SIGHT DISTANCE

LEGEND

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838	PROP. CONTOUR
×836.2	EXIST. SPOT ELEVATION
36.60×	PROP. SPOT ELEVATION
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U.P.	EXIST. UTILITY POLE W/ TRANS.
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OH	EXIST. OVERHEAD UTILITY LINE
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MORRISON HILLS
PRIVATE ROAD
ENTRANCE DETAIL

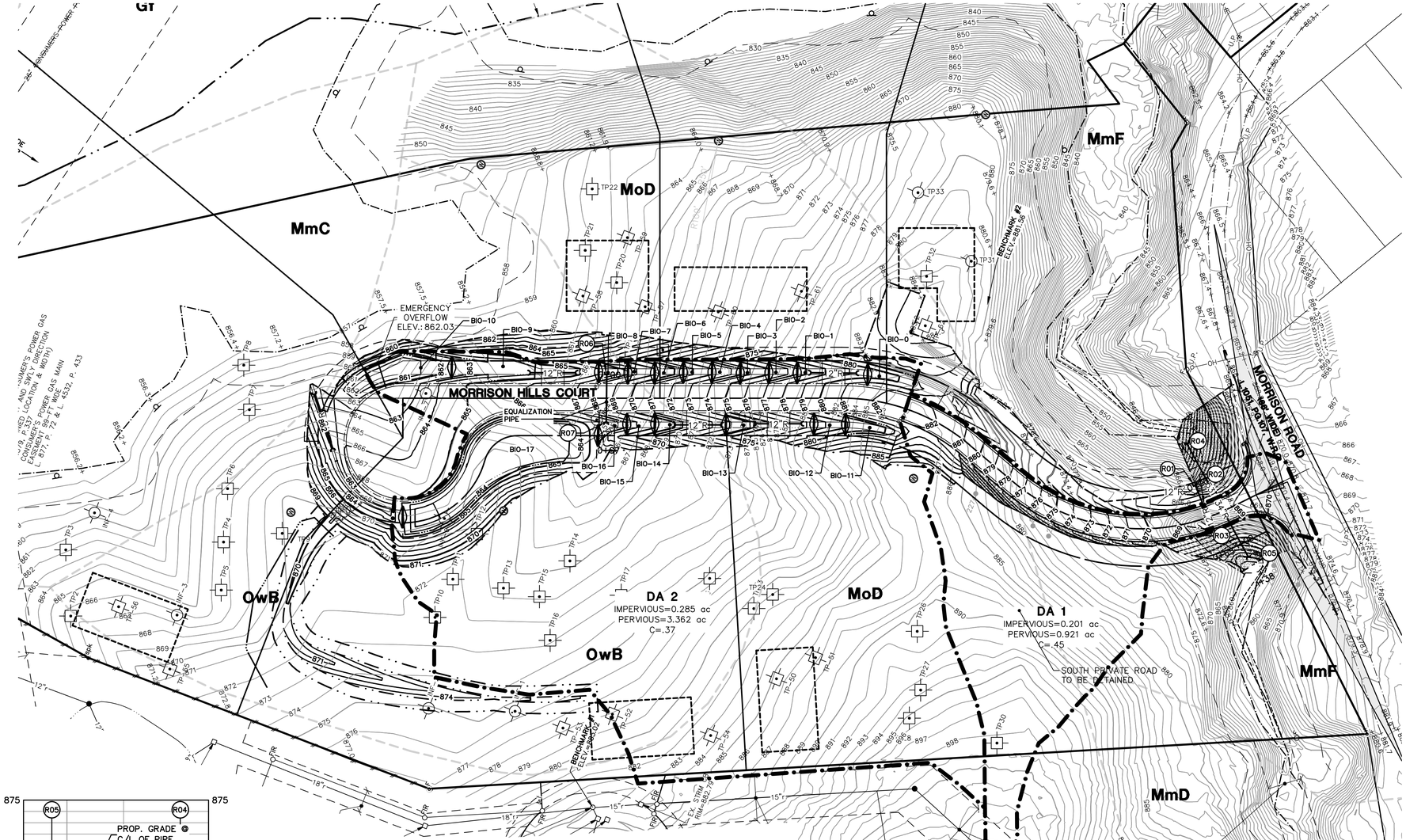
06

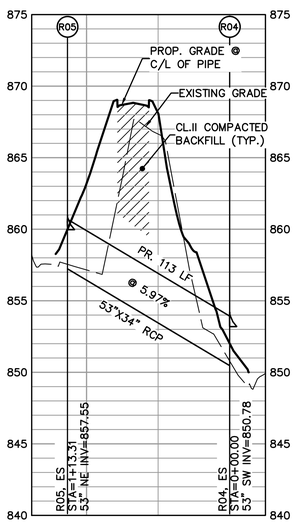
JOB No. 21188A

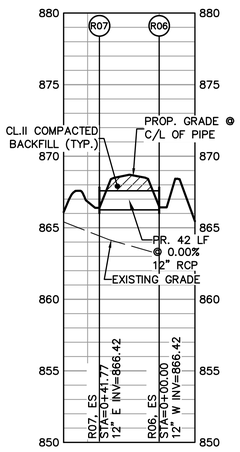
REVISIONS:	REV. DATE
PER TOWNSHIP REVIEW	12/7/22
PER EGLE REVIEW	12/19/22

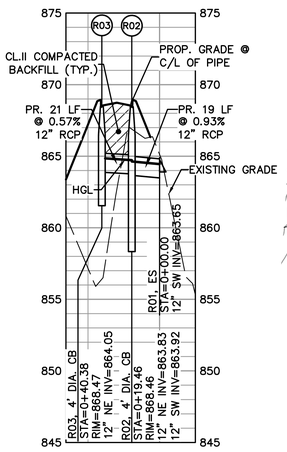
DATE: 03/16/22
SHEET 06 OF 19
CADD: RMJII
ENG: HTH
PM: TJC
TECH: RMJII
21188PR01

TOWNSHIP SUBMITTAL 12/21/22









PROPOSED STORM SEWER R04-R05 **PROPOSED STORM SEWER R6-R7** **PROPOSED STORM SEWER R01-R03**

STRUCTURE TABLE

STRUCTURE NO.	TYPE	RIM ELEV.	INV.	SUMP
R01	PR RCP ES	864.90	12" SW 863.65	0'
R02	CONTECH CDS-4 W/ INLET	868.46	12" NE 863.83 12" SW 863.92	5'
R03	PR 4' CB	868.47	12" NE 864.05	2'
R04	PR RCP ES	854.20	53"X34" SW 850.78	0'
R05	PR RCP ES	860.97	53"X34" NE 857.55	0'
R06	PR 12" END SECTION	867.83	12" W 866.42	0'
R07	PR 12" END SECTION	867.83	12" E 866.42	0'

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

SCALE: 1" = 50'

0 50 100 150

LEGEND

- 838 EXIST. CONTOUR
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- EXIST. STORM SEWER
- PROP. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- PROP. CATCH BASIN OR INLET
- EXIST. BEEHIVE INLET
- PROP. BEEHIVE INLET
- PROP. ROOF DRAIN
- END SECTION
- INF-1 INFILTRATION TEST PIT LOCATION
- TP-1 TEST PIT LOCATION
- LIMITS OF DISTURBANCE
- IMPERVIOUS ROADWAY AREA TO BE DETAINED
- MoD SOIL TYPE AND BOUNDARY
- PROP. WETLAND IMPACT

STORMWATER NARRATIVE

THE EXISTING SITE CONDITIONS CONSIST OF UNDEVELOPED GRASS AND WOODED AREAS. THE SITE IS BOUNDED BY A STEEP SWALE TO THE SOUTH ADJACENT TO MORRISON ROAD, THE HURON RIVER TO THE EAST AND WETLANDS TO THE NORTH. THERE IS A RIDGE ACROSS THE LAND WHICH SEPARATES THE DRAINAGE INTO A NORTHERLY AND SOUTHERLY DRAINAGE AREAS. THE NORTHERN DRAINAGE AREA CONSISTS OF GENTLY SLOPING LAND TO THE NORTH WITH STEEPER SLOPES LOCATED TO THE EAST. DRAINAGE FROM THE NORTHERN DRAINAGE AREA FLOWS IN A GENERAL NORTHEASTLY DIRECTION TO THE WETLAND AREA TO THE NORTH AND TO THE HURON RIVER TO THE EAST. THE SOUTHERLY DRAINAGE AREA DRAINS TO THE SOUTH AND THEN WATER IS COLLECTED IN AN EXISTING SWALE WHICH FLOWS EAST TO THE HURON RIVER.

SOIL TEST PITS THAT WERE EXCAVATED ON THE SITE SHOW A GENERAL PRESENCE OF WELL DRAINED SANDY SOIL WITH DEEP GROUNDWATER PRESENCE. THE EXCEPTION OF THIS IS THE SOILS ADJACENT TO THE WETLANDS WHICH SHOWED A HIGHER CLAY CONTENT WITH SHALLOW WATER TABLES. THE PROPOSED STORMWATER FACILITIES ARE PROPOSED IN THE SANDY SOIL AREAS WITH HIGH INFILTRATION POTENTIAL.

THE PROPOSED DEVELOPMENT WILL INCLUDE THE CONSTRUCTION OF A PRIVATE ROAD WHICH WILL SERVE 6 SINGLE FAMILY RESIDENCES. IT IS PROPOSED THAT STORMWATER MANAGEMENT WILL BE PROVIDED FOR THE IMPERVIOUS SURFACE OF THE PRIVATE ROAD.

THE NORTHERN PORTION OF THE ROADWAY WILL PROVIDE FOR THE 100-YR STORMWATER DETENTION REQUIREMENT FOR THE FULL ROADWAY. STORAGE OF PROPOSED AND EXISTING OFFSITE RESIDENTIAL LOTS WILL PROVIDE FOR THE DRAINAGE TO THIS SYSTEM. DETENTION AND INFILTRATION WILL BE PROVIDED THROUGH THE APPLICATION OF CHECK DAMS IN THE ROADSIDE SWALES. CHECKDAMS HAVE BEEN PLACED IN THE SWALES TO ALLOW FOR A MAXIMUM PONDING DEPTH OF 18" WITH AN AVERAGE PONDING DEPTH OF 9".

THE SOUTHERN PORTION OF THE ROADWAY WILL PROVIDE FOR WATER QUALITY PRIOR TO DISCHARGE INTO THE EXISTING SWALE LOCATED PARALLEL TO MORRISON ROAD.

INFILTRATION TEST RESULTS

Table 1 – Infiltration Test Results

Test Pit	Test Elevation (ft)	Test No.	Stabilized Infiltration Rate (in/hr)	Average Infiltration Rate (in/hr)	Design Infiltration Rate (in/hr)
INF-1	873.5	1.1	10 1/2	8 1/4	4 1/8
		1.2	6		
INF-2	872.7	2.1	6	8 1/4	4 1/8
		2.2	10 1/2		
INF-3	862.7	3.1	1/2	1 3/4	7/8
		3.2	3		
INF-4	855.2	4.1	12	14 1/4	7 1/8
		4.2	16 1/2		

TEST REPORT BY MATERIALS TESTING CONSULTANTS, AUGUST 11, 2021

Table 1 – Infiltration Test Results

Test Pit	Test Elevation (ft)	Test No.	Stabilized Infiltration Rate (in/hr)	Average Infiltration Rate (in/hr)	Design Infiltration Rate (in/hr)
INF-5	862	5.1	7 1/2	5 1/4	2 5/8
		5.2	3		
INF-6	868	6.1	1 1/2	2	1
		6.2	2 1/2		
INF-7	860	7.1	21	21 3/4	10*
		7.2	22 1/2		
INF-8	871	8.1	2 1/2	1 3/4	7/8
		8.2	1		

*WCWRC Procedures and Design Criteria for Stormwater Management specify a maximum design infiltration of 10 in/hr.

TEST REPORT BY MATERIALS TESTING CONSULTANTS, MAY 11, 2022

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MORRISON HILLS
PRIVATE ROAD
STORM WATER MANAGEMENT

07

DATE: 03/16/22
SHEET 07 OF 19
CADD: RMLII
ENG: HTH
PM: TJC
TECH: RMLII
21188DA01

JOB No. 21188A

REVISIONS:	REV. DATE
TOWNSHIP REVIEW	8/12/22
LANDSCAPE REVIEW	8/12/22
PER EGALE REVIEW	12/19/22
TOWNSHIP SUBMITTAL	12/21/22

PRIVATE ROAD RIGHT-OF-WAY STORMWATER MANAGEMENT CALCULATIONS

Required Detention for Private Road R.O.W. Calculations

These calculations represent the required detention requirements for the entire private road within the private road easement area. This includes all pavement, shoulders, stabilized slopes and ditches within this area. The detention volumes represent the required detention that will be provided on the site for the construction of the private roadway.

W1 - Determining Post-Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients

Rational Method Variables

Cover Type	Soil Type	Area (sft)	Area (ac)	Runoff Coeff. (C)	(C) x (Area)
Building/Pavement		26,547	0.61	0.95	0.58
Shoulder/Rip Rap		3,939	0.09	0.85	0.08
Grass	B	23,128	0.53	0.30	0.16
Grass	C	13,028	0.30	0.35	0.10
Total		66,642	1.53		0.92

Weighted C = (Sum(C)x(Area))/(Area Total)= 0.60

NRCS Variables (Pervious)

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) x (Area)
Grass	B	23,128	0.53	61	0.32
Grass	C	13,028	0.30	74	0.22
Total		36,156	0.83		0.55

Weighted CN = (Sum(CN)x(Area))/(Area Total)= 66

NCRS Variables (Impervious)

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) x (Area)
Building/Pavement		26,547	0.61	98	0.60
Shoulder/Rip Rap		3,939	0.09	85	0.08
Total		30,486	0.70		0.67

Weighted CN = (Sum(CN)x(Area))/(Area Total)= 96

W2 - W2 - First Flush Runoff Calculations (Vff)

A. Vff = 1" x 1/12" x 43560 sft/ac x A x C — where A= 1.53 and where C= 0.60

Vff = 1" x 1/12" x 43560 sft/ac x 1.53 x 0.60 = 3,332 cf

W3 - W3 - Pre-Development Bankfull Runoff Calculations (Vbf-pre)

A.	2 year / 24 hour storm event:	P= 2.35 in
B.	Pre-Development CN (Good Cover Woods, Type B/C Soils)	CN= 66
C.	S = (1000 / CN) - 10	S= 5.152 in
D.	Q = [(P-0.2S)^2] / [P+0.8S]	Q= 0.269 in
E.	Total Site Area excluding "Self-Crediting" BMPs	66,642 sft
F.	Vbf-pre = Q x (1/12) x Area	Vbf-pre = 1,495 cft

W4 - Pervious Cover Post-Development Bankfull Runoff Calculations (Vbf-per-post)

A.	2 year / 24 hour storm event:	P= 2.35 in
B.	Pervious Cover CN From Worksheet 1	CN= 66
C.	S = (1000 / CN) - 10	S= 5.224 in
D.	Q = [(P-0.2S)^2] / [P+0.8S]	Q= 0.261 in
E.	Pervious Cover Area from Worksheet 1	36,156 sft
F.	Vbf-per-post = Q x (1/12) x Area	Vbf-per-post = 786 cft

W5 - W5 - Impervious Cover Post-Development Bankfull Runoff Calculations (Vbf-imp-post)

A.	2 year / 24 hour storm event:	P= 2.35 in
B.	Impervious Cover CN From Worksheet 1	CN= 96
C.	S = (1000 / CN) - 10	S= 0.382 in
D.	Q = [(P-0.2S)^2] / [P+0.8S]	Q= 1.947 in
E.	Impervious Cover Area from Worksheet 1	30,486 sft
F.	Vbf-imp-post = Q x (1/12) x Area	Vbf-imp-post = 4,945 cft

W6 - W6 - Pervious Cover Post-Development 100-Year Runoff Calculations (V100-per-post)

A.	100 year / 24 hour storm event:	P= 5.11 in
B.	Pervious Cover CN From Worksheet 1	CN= 66
C.	S = (1000 / CN) - 10	S= 5.224 in
D.	Q = [(P-0.2S)^2] / [P+0.8S]	Q= 1.779 in
E.	Pervious Cover Area from Worksheet 1	36,156 sft
F.	V100-per-post = Q x (1/12) x Area	V100-per-post = 5,360 cft

W7 - W7 - Impervious Cover Post-Development 100-Year Runoff Calculations (V100-imp-post)

A.	2 year / 24 hour storm event:	P= 5.11 in
B.	Impervious Cover CN From Worksheet 1	CN= 96
C.	S = (1000 / CN) - 10	S= 0.382 in
D.	Q = [(P-0.2S)^2] / [P+0.8S]	Q= 4.679 in
E.	Impervious Cover Area from Worksheet 1	30,486 sft
F.	Vbf-imp-post = Q x (1/12) x Area	Vbf-imp-post = 11,886 cft

W8 - Time of Concentration (Tc-hrs)

A. Assume 15-minute minimum time of concentration Tc= 0.25 hr

W9 - Runoff Summary & On-Site Infiltration Requirement

A. Summary from Previous Worksheets

First Flush Volume (Vff)	**3,332 cft**
Pre-Development Bankfull Runoff Volume (Vbf-pre)	**1,495 cft**
Pervious Cover Post-Development Bankfull Volume (Vbf-per-post)	*786 cft*
Impervious Cover Post-Development Bankfull Volume (Vbf-imp-post)	*4,945 cft*
Total BF Volume (Vbf-post)	**5,731 cft**
Pervious Cover Post-Development 100-Year Volume (V100-per-post)	*5,360 cft*
Impervious Cover Post-Development 100-Year Volume (V100-imp-post)	*11,886 cft*
Total 100-Year Volume (V100)	**17,246 cft**

B. Determine Onsite Infiltration Requirement

Subtract the Pre-Development Bankfull from the Post-Development Bankfull Volume

Total Post-Development Bankfull Volume (Vbf-post)	5,731 cft
Pre-Development Bankfull Runoff Volume (Vbf-pre)	1,495 cft
Bankfull Volume Difference	**4,237 cft**
Infiltration Requirement (Vinf)	**4,237 cft**

W10 - Detention/Retention Requirement

A. Q_P = 238.6 Tc^-0.82	743.63 cfs/(in x sq. mi)
B. Total Site Area excluding "Self-Crediting" BMPs	1.53 ac
C. $Q_{100} = Q_{100\text{-per}} + Q_{100\text{-imp}}$ (from W6 and W7, respectively)	6.457 in
D. Peak Flow (PF) = Q_P x Q_{100} x Area / 640	11.48 cfs
E. Delta = PF - 0.15 x Area (ac)	11.25 cfs
[0.15 x Area (ac)]	*0.23 cfs*
F. V_{det} = Delta / PF x V_{100}	16,901 cft
Required Detention not including infiltration credit or penalty.	
Sediment Forebay Volume Required (5% of V100)	862 cft

W13 - Site Summary of Infiltration & Detention

A. Stormwater Management Summary

Min Infiltration Requirement (V_{inf})	4,237 cft
Designed/Provided Infiltration Volume	0 cft
% Minimum Required Infiltration Provided	0 %
Total Calculated Detention Volume, V_{det}	16,901 cft
Net Required Detention Volume (V_{det} - Designed/Provided Infiltration Volume)	16,901 cft

Detention Outlet Calculcations

A. Required Detention Volumes required for construction of Private Road

Storm Event	Req'd Volume	less	Infil. Credit	=	Final Volume
First Flush	3,332 cft	-	0 cft	=	**3,332 cft**
Bankfull	5,731 cft	-	0 cft	=	**5,731 cft**
100 -year	16,901 cft	-	0 cft	=	**16,901 cft**

PROVIDED STORMWATER MANAGEMENT CALCULATIONS

Northern Road Bioswales Stormwater Calculations

The below calculations represent the actual stormwater detention/infiltration provided located along the northern section of the proposed private roadway. The treated stormwater runoff represents the actual drainage area contributing to the stormwater BMP's which is in excess of the runoff generated for the entire private road right-of-way.

W1 - Determining Post-Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients

Rational Method Variables

Cover Type	Soil Type	Area (sft)	Area (ac)	Runoff Coeff. (C)	(C) x (Area)
Building/Pavement		10,682	0.25	0.95	0.23
Shoulder/Gravel		1,726	0.04	0.85	0.03
Grass	B	77,595	1.78	0.30	0.53
Grass	C	68,834	1.58	0.35	0.55
Total		158,837	3.65		1.35

Weighted C = (Sum(C)x(Area))/(Area Total)= 0.37

NRCS Variables (Pervious)

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) x (Area)
Grass	B	77,595	1.78	61	1.09
Grass	C	68,834	1.58	74	1.17
Total		146,429	3.36		2.26

Weighted CN = (Sum(CN)x(Area))/(Area Total)= 67

NCRS Variables (Impervious)

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) x (Area)
Building/Pavement		10,682	0.25	98	0.24
Shoulder/Gravel		1,726	0.04	85	0.03
Water Surface		0	0.00	98	0.00
Total		12,408	0.28		0.27

Weighted CN = (Sum(CN)x(Area))/(Area Total)= 96

W2 - W2 - First Flush Runoff Calculations (Vff)

A. Vff = 1" x 1/12" x 43560 sft/ac x A x C — where A= 3.65 and where C= 0.37

Vff = 1" x 1/12" x 43560 sft/ac x 3.65 x 0.37 = 4,897 cf

W3 - W3 - Pre-Development Bankfull Runoff Calculations (Vbf-pre)

A.	2 year / 24 hour storm event:	P= 2.35 in
B.	Pre-Development CN (Good Cover Woods, Type D Soils)	CN= 62
C.	S = (1000 / CN) - 10	S= 6.129 in
D.	Q = [(P-0.2S)^2] / [P+0.8S]	Q= 0.174 in
E.	Total Site Area excluding "Self-Crediting" BMPs	158,837 sft
F.	Vbf-pre = Q x (1/12) x Area	Vbf-pre = 2,306 cft

W4 - Pervious Cover Post-Development Bankfull Runoff Calculations (Vbf-per-post)

A.	2 year / 24 hour storm event:	P= 2.35 in
B.	Pervious Cover CN From Worksheet 1	CN= 67
C.	S = (1000 / CN) - 10	S= 4.901 in
D.	Q = [(P-0.2S)^2] / [P+0.8S]	Q= 0.299 in
E.	Pervious Cover Area from Worksheet 1	146,429 sft
F.	Vbf-per-post = Q x (1/12) x Area	Vbf-per-post = 3,652 cft

W5 - W5 - Impervious Cover Post-Development Bankfull Runoff Calculations (Vbf-imp-post)

A.	2 year / 24 hour storm event:	P= 2.35 in
B.	Impervious Cover CN From Worksheet 1	CN= 96
C.	S = (1000 / CN) - 10	S= 0.396 in
D.	Q = [(P-0.2S)^2] / [P+0.8S]	Q= 1.934 in
E.	Impervious Cover Area from Worksheet 1	12,408 sft
F.	Vbf-imp-post = Q x (1/12) x Area	Vbf-imp-post = 1,999 cft

W6 - W6 - Pervious Cover Post-Development 100-Year Runoff Calculations (V100-per-post)

A.	100 year / 24 hour storm event:	P= 5.11 in
B.	Pervious Cover CN From Worksheet 1	CN= 67
C.	S = (1000 / CN) - 10	S= 4.901 in
D.	Q = [(P-0.2S)^2] / [P+0.8S]	Q= 1.889 in
E.	Pervious Cover Area from Worksheet 1	146,429 sft
F.	V100-per-post = Q x (1/12) x Area	V100-per-post = 23,046 cft

W7 - W7 - Impervious Cover Post-Development 100-Year Runoff Calculations (V100-imp-post)

A.	2 year / 24 hour storm event:	P= 5.11 in
B.	Impervious Cover CN From Worksheet 1	CN= 96
C.	S = (1000 / CN) - 10	S= 0.396 in
D.	Q = [(P-0.2S)^2] / [P+0.8S]	Q= 4.664 in
E.	Impervious Cover Area from Worksheet 1	12,408 sft
F.	Vbf-imp-post = Q x (1/12) x Area	Vbf-imp-post = 4,822 cft

W8 - Time of Concentration (Tc-hrs)

A. Assume 15-minute minimum time of concentration Tc= 0.25 hr

W9 - Runoff Summary & On-Site Infiltration Requirement

A. Summary from Previous Worksheets

First Flush Volume (Vff)	**4,897 cft**
Pre-Development Bankfull Runoff Volume (Vbf-pre)	**2,306 cft**
Pervious Cover Post-Development Bankfull Volume (Vbf-per-post)	*3,652 cft*
Impervious Cover Post-Development Bankfull Volume (Vbf-imp-post)	*1,999 cft*
Total BF Volume (Vbf-post)	**5,651 cft**
Pervious Cover Post-Development 100-Year Volume (V100-per-post)	*23,046 cft*
Impervious Cover Post-Development 100-Year Volume (V100-imp-post)	*4,822 cft*
Total 100-Year Volume (V100)	**27,869 cft**

B. Determine Onsite Infiltration Requirement

Subtract the Pre-Development Bankfull from the Post-Development Bankfull Volume

Total Post-Development Bankfull Volume (Vbf-post)	5,651 cft
Pre-Development Bankfull Runoff Volume (Vbf-pre)	2,306 cft
Bankfull Volume Difference	**3,345 cft**
Infiltration Requirement (Vinf)	**4,897 cft**

W10 - Detention/Retention Requirement

A. Q_P = 238.6 Tc^-0.82	743.63 cfs/(in x sq. mi)
B. Total Site Area excluding "Self-Crediting" BMPs	3.65 ac
C. $Q_{100} = Q_{100\text{-per}} + Q_{100\text{-imp}}$ (from W6 and W7, respectively)	6.552 in
D. Peak Flow (PF) = Q_P x Q_{100} x Area / 640	27.76 cfs
E. Delta = PF - 0.15 x Area (ac)	27.21 cfs
[0.15 x Area (ac)]	*0.55 cfs*
F. V_{det} = Delta / PF x V_{100}	27,320 cft
Required Detention not including infiltration credit or penalty.	

W11 - Determine Applicable BMPs and Associated Volume Credits

Infiltration test pits were excavated and reviewed for the subsurface conditions. Based on the infiltration testing results, the infiltration rate for INF-8 was used along the South section of bioswales. The infiltration testing results for INF-5 was used along the Mid section. The infiltration testing results for INF-7 was used along the North section -East side. The infiltration testing results for INF-6 was used along the North Section - West side.

		Storage Volume (cft)		Design Infilt. Rate	Infilt. Volume in 6-hr	Total Volume
Proposed BMP	Area (sft)	Surface	In Soil	(in/hr)	Drawdown (cft)	Reduction (cft)
Bioswale South Sec (BIO 0-4,11-13)	2256	1,376		0.88	987	2,363
Bioswale Mid Section (BIO 5-8,14-16)	1974	1,204		2.63	2,591	3,795
Bioswale N Section - E Side (BIO 9-10)	2924	2,314		10.00	14,620	16,934
Bioswale N Section -W Side (BIO 17)	5482	5,547		1.00	2,741	8,288

Total Volume Reduction Credit by Proposed Structural BMPs (cft) **31,380**

Runoff Volume Infiltration Requirement (Vinf) from W9 (cft) 4,897

Runoff Volume Credit (cft) 26,482

W12 - Natural Features Inventory

Refer to plan sheets for location and size of natural features.

W13 - Site Summary of Infiltration & Detention

A. Stormwater Management Summary

Min Infiltration Requirement (V_{inf})	4,897 cft
Designed/Provided Infiltration Volume	**31,380 cft**
% Minimum Required Infiltration Provided	641 %
Total Calculated Detention Volume, V_{det}	**27,320 cft**
Net Required Detention Volume	**-4,060 cft**
(V_{det} - Designed/Provided Infiltration Volume)	

Detention Volumes Provided

BIO-1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 16 (ELEVATIONS VARY)

Elevation	Area (sft)	Depth (ft)	Volume (cft)	Cum. Volume (cft)
100.0	0	0.0	0	0
100.5	63	0.5	11	11
101.0	157	0.5	53	64
101.5	282	0.5	108	172
			Total Volume =	172

BIO-9

Elevation	Area (sft)	Depth (ft)	Volume (cft)	Cum. Volume (cft)
862.5	0	0.0	0	0
863.0	223	0.5	37	37
863.5	650	0.5	209	246
864.0	1,214	0.5	459	705
			Total Volume =	705

BIO-10

Elevation	Area (sft)	Depth (ft)	Volume (cft)	Cum. Volume (cft)
860.5	525	0.0	0	0
861.0	867	0.5	344	344
861.5	1,252	0.5	527	871
862.0	1,710	0.5	738	1,609
			Total Volume =	1,609

BIO-17

Elevation	Area (sft)	Depth (ft)	Volume (cft)	Cum. Volume (cft)
863.0	307	0.0	0	0
863.5	2,484	0.5	611	611
864.0	5,482	0.5	1,943	2,553
864.5	6,509	0.5	2,994	5,547
			Total Volume =	5,547

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MORRISON HILLS
PRIVATE ROAD
STORM WATER CALCULATIONS 1 OF 2

08

JOB No. **21188A**

REVISIONS:	REV. DATE
TOWNSHIP REVIEW	6/17/22

DATE: 03/16/22
SHEET 08 OF 19
CADD: RMJII
ENG: HTH
PM: TJC
TECH: RMJII
/21188DA01

TOWNSHIP SUBMITTAL 12/21/22

STORM SEWER CALCULATIONS

STORM DRAINAGE CALCULATION SHEET

Runoff Formula: Q = CIA

I = x/T+y x = 175 y= 25 (10 Year Storm Event)

Type of Pipe = rcp

n = 0.013

MIDWESTERN CONSULTING, L.L.C.
3815 Plaza Drive
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PROJECT/CLIENT: MORRISON PRIVATE RD
Job No.: 21188A
Date: 03/11/22
By: HTH
Revised: 06/07/22

Structure No. From	To	Drainage Area A (Acres)	Runoff Coeff. C	CxA	ADD. CxA	Σ CxA	Time T (min.)	Rainfall I (in./hr.)	Q (cfs)	Pipe Dia. (in.)	Pipe Length (ft.)	Pipe Slope %	H.G. Slope %	Velocity Flowing Full (ft./sec.)	Travel Time (min.)	Pipe Capacity (cfs)	Surface Elev. Upstr.	H.G. Upstr.	H.G. Dwnstr.	Invert Elev. Upstr.	Invert Elev. Dwnstr.
R03	R02	1.02	0.40	0.41		0.41	15.00	4.38	1.79	12	21	0.57	0.25	3.43	0.10	2.70	868.47	864.85	864.72	864.05	863.92
R02	R01	0.10	0.95	0.10	0.41	0.50	15.10	4.36	2.20	12	19	0.93	0.38	4.39	0.07	3.45	868.46	864.63	864.45	863.83	863.65
ROADSIDE SWALE		4.16	0.29	1.21		1.21	15.00	4.38	5.28												
	CALCULATION OF PEAK ROADSIDE SWALE FLOW AT NORTHERN LOCATION																				
R05	R04									36	113	7.54					863.84			860.44	851.88
R07	R06	THIS IS EQUALIZATION PIPE SET AT ZERO SLOPE								12	42	0.00					867.83			866.42	866.42

DRIVEWAY CULVERT CAPACITY ANALYSIS

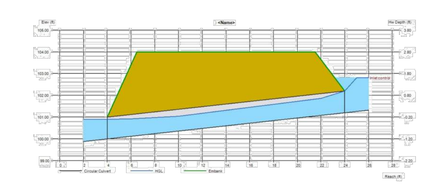
ALL DRIVEWAY CULVERTS SHALL BE 12" CMP EXCEPT THOSE CULVERTS TO BE INSTALLED IN THE CUL-DE-SAC WHICH SHALL BE 18" CMP.

Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. — Wednesday, Mar 9 2022

Circular Culvert

Invert Elev Dn (ft)	= 100.00	**Calculations**	
Pipe Length (ft)	= 20.00	Qmin (cfs)	= 1.00
Slope (%)	= 6.00	Qmax (cfs)	= 6.00
Invert Elev Up (ft)	= 101.20	Tailwater Elev (ft)	= (dc+D)/2
Rise (in)	= 12.0	**Highlighted**	
Shape	= Circular	Qtotal (cfs)	= 3.50
Span (in)	= 12.0	Qpipe (cfs)	= 3.50
No. Barrels	= 1	Qovertop (cfs)	= 0.00
n-Value	= 0.022	Veloc Dn (ft/s)	= 4.70
Culvert Type	= Circular Corrugate Metal Pipe	Veloc Up (ft/s)	= 5.20
Culvert Entrance	= Projecting	HGL Dn (ft)	= 100.90
Coeff. K,M,c,Y,k	= 0.034, 1.5, 0.0553, 0.54, 0.9	HGL Up (ft)	= 102.00
Embankment		Hw Elev (ft)	= 102.81
Top Elevation (ft)	= 104.00	Hw/D (ft)	= 1.61
Top Width (ft)	= 15.00	Flow Regime	= Inlet Control
Crest Width (ft)	= 15.00		

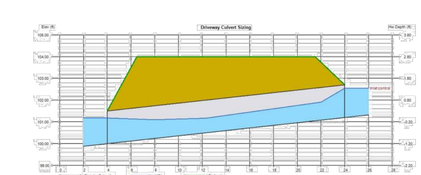


Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. — Friday, Mar 11 2022

Driveway Culvert Sizing

Invert Elev Dn (ft)	= 100.00	**Calculations**	
Pipe Length (ft)	= 20.00	Qmin (cfs)	= 1.00
Slope (%)	= 6.00	Qmax (cfs)	= 6.00
Invert Elev Up (ft)	= 101.20	Tailwater Elev (ft)	= (dc+D)/2
Rise (in)	= 18.0	**Highlighted**	
Shape	= Circular	Qtotal (cfs)	= 5.00
Span (in)	= 18.0	Qpipe (cfs)	= 5.00
No. Barrels	= 1	Qovertop (cfs)	= 0.00
n-Value	= 0.022	Veloc Dn (ft/s)	= 3.35
Culvert Type	= Circular Corrugate Metal Pipe	Veloc Up (ft/s)	= 4.77
Culvert Entrance	= Projecting	HGL Dn (ft)	= 101.18
Coeff. K,M,c,Y,k	= 0.034, 1.5, 0.0553, 0.54, 0.9	HGL Up (ft)	= 102.06
Embankment		Hw Elev (ft)	= 102.55
Top Elevation (ft)	= 104.00	Hw/D (ft)	= 0.90
Top Width (ft)	= 15.00	Flow Regime	= Inlet Control
Crest Width (ft)	= 15.00		



C FACTOR CALCULATIONS

		C	A (SF)	A (ac)	C*A
R03	SURFACE				
	ROAD	0.95	4376	0.1	4157
	GRASS B	0.3	10590	0.243	3177
	GRASS C	0.35	29498	0.677	10324
	TOTAL	0.4	44464	1.02	17658
R02	SURFACE	C	A (SF)	A (ac)	C*A
	ROAD	0.95	4376	0.1	4157
	GRASS	0.25	0	0	0
	TOTAL	0.95	4376	0.1	4157

ROADSIDE SWALE CAPACITY ANALYSIS

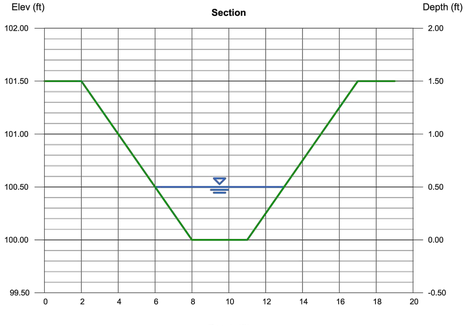
THE PROPOSED SWALE CAN EFFECTIVELY HANDLE THE PEAK FLOW (CALCULATED AT THE NORTH END) WITH A PONDING OF DEPTH OF LESS THAN 6".

Channel Report

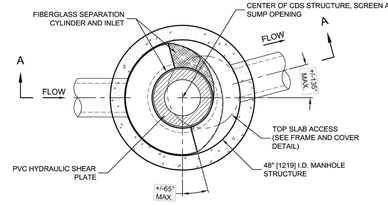
Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. — Friday, Mar 11 2022

Roadside Swale Capacity Analysis

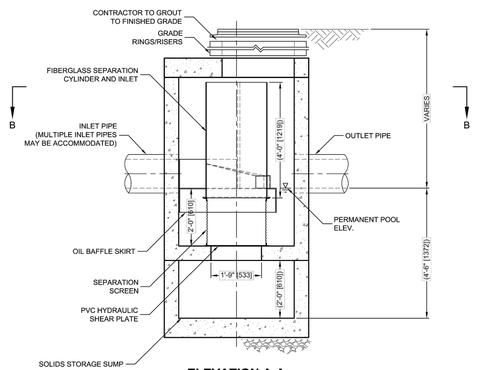
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 3.00	Depth (ft)	= 0.50
Side Slopes (z:1)	= 4.00, 4.00	Q (cfs)	= 12.93
Total Depth (ft)	= 1.50	Area (sqft)	= 2.50
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 5.17
Slope (%)	= 6.00	Wetted Perim (ft)	= 7.12
N-Value	= 0.035	Crit Depth, Yc (ft)	= 0.63
		Top Width (ft)	= 7.00
Calculations		EGL (ft)	= 0.92
Compute by:	Q vs Depth		
No. Increments	= 15		



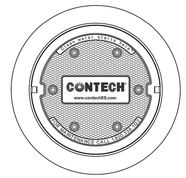
CDS-4 WATER QUALITY UNIT TYPICAL DETAIL



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



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

CDS2015-4-C DESIGN NOTES

THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			
* PER ENGINEER OF RECORD			

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

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

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

CDS2015-4-C
INLINE CDS
STANDARD DETAIL

CDS-4 NET ANNUAL SOLIDS LOAD REDUCTION

Estimated Net Annual Solids Load Reduction
Based on the Rational Rainfall Method

Morrison Hills
Scio Township, MI
Water Quality Unit

AREA (acres): 1.11
WEIGHTED C: 0.42
Tc (minutes): 15

CDS MODEL: 2015-4
PARTICLE SIZE (µm): 110

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Removal Efficiency (%)	Incremental Removal (%)
0.02	12.53%	12.53%	0.01	100.00	12.53
0.04	11.32%	23.85%	0.02	100.00	11.32
0.06	10.08%	33.93%	0.03	100.00	10.08
0.08	7.49%	41.42%	0.04	100.00	7.49
0.10	7.44%	48.86%	0.05	99.80	7.42
0.12	5.31%	54.17%	0.06	99.48	5.28
0.14	4.18%	58.35%	0.07	99.17	4.15
0.16	4.82%	63.17%	0.07	98.85	4.76
0.18	3.40%	66.57%	0.08	98.53	3.35
0.20	2.89%	69.46%	0.09	98.22	2.84
0.25	6.22%	75.68%	0.12	97.42	6.06
0.30	4.12%	79.80%	0.14	96.63	3.98
0.35	3.37%	83.17%	0.16	95.84	3.23
0.40	2.90%	86.07%	0.19	95.1	2.8
0.45	2.65%	88.72%	0.21	94.3	2.5
0.50	1.68%	90.40%	0.23	93.5	1.6
0.75	5.11%	95.51%	0.35	89.5	4.6
1.00	2.18%	97.69%	0.47	85.6	1.9
1.50	1.50%	99.19%	0.70	77.6	1.2
2.00	0.50%	99.69%	0.93	58.3	0.3
2.10	0.31%	100.00%	0.98	55.5	0.2
					97.39
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.3%
				Predicted Net Annual Load Removal Efficiency =	**90.9%**

1 - Based on 26 Years of Rainfall Data from NCDC Station Ann Arbor University of Michigan
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CDS-4 WATER QUALITY FLOW RATE CALCULATION

Project: Morrison Hills
Location: *Scio Township*
Prepared For: Midwestern Consulting

CONTECH ENGINEERED SOLUTIONS

Purpose: To calculate the first flush runoff flow rate (WQF) over a given site area. In this situation the WQV to be analyzed is the runoff produced by the first 1" of rainfall.

Reference: United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Given:

Structure Name	A (acres)	A (miles²)	Runoff Coefficient	Percent Imp. (%)*	t_c (min)	t_c (hr)
WQU	1.11	0.00173	0.42	20.00	15.2	0.253

* Assumes runoff coefficient of 0.3 for pervious areas and 0.9 for impervious areas.

Procedure:

The Water Quality Flow (WQF) is calculated using the Water Quality Volume (WQV). This WQV, converted to watershed inches, is substituted for the runoff depth (Q) in the Natural Resources Conservation Service (formerly Soil Conservation Service), TR-55 Gr

1. Compute WQV in watershed inches using the following equation:

$$WQV = P * R$$

where: WQV = water quality volume (watershed inches)
P = design precipitation (inches)
R = volumetric runoff coefficient = 0.05 + 0.009(I)
I = percent impervious cover

Structure Name	Percent Imp. (%)	R	P (in)	WQV (in)
WQU	20.00	0.230	1	0.230

WQV (CF) 926.74

2. Compute the NRCS Runoff Curve Number (CN) using the following equation, or graphically using Figure 2-1 from TR-55 (USDA, 1986):

$$CN = 1000 / [10+5P+10Q-10(Q^2+1.25QP)^{1/2}]$$

where: CN = Runoff Curve Number
P = design precipitation (inches)
Q = runoff depth (watershed inches)

Structure Name	Q (in)	CN
WQU	0.230	87.22

3. Using computed CN, read initial abstraction (I_a) from Table 4-1 in Chapter 4 of TR-55; compute I_a/P, interpolating when appropriate.

Structure Name	I_a (in)	I_a/P
WQU	0.299	0.299

4. Compute the time of concentration (t_c) in hours and the drainage area in square miles. A minimum t_c of 0.167 hours (10 minutes) should be used.

Structure Name	t_c (hr)	A (miles²)
WQU	0.253	0.00173

5. Read the unit peak discharge (q_u) from Exhibit 4-II in Chapter 4 of TR-55 for appropriate t_c for type II rainfall distribution.

Structure Name	t_c (hr)	I_a/P	q_u (csm/in)
WQU	0.253	0.299	622

6. Substituting WQV (watershed inches) for runoff depth (Q), compute the water quality flow (WQF) from the following equation:

$$WQF = (q_u)*(A)*(Q)$$

where: WQF = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi²/inch)
A = drainage area (mi²)
Q = runoff depth (watershed inches)

Structure Name	q_u (csm/in)	A (miles²)	Q (in)	WQF (cfs)
WQU	622	0.00173	0.230	0.25

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BRIDGEWOOD HILLS II, LLC
2723 SOUTH STATE STREET, SUITE250
ANN ARBOR, MICHIGAN 48104
GREG COPP
734-930-6700

MORRISON HILLS
PRIVATE ROAD
STORM WATER CALCULATIONS 2 OF 2

09

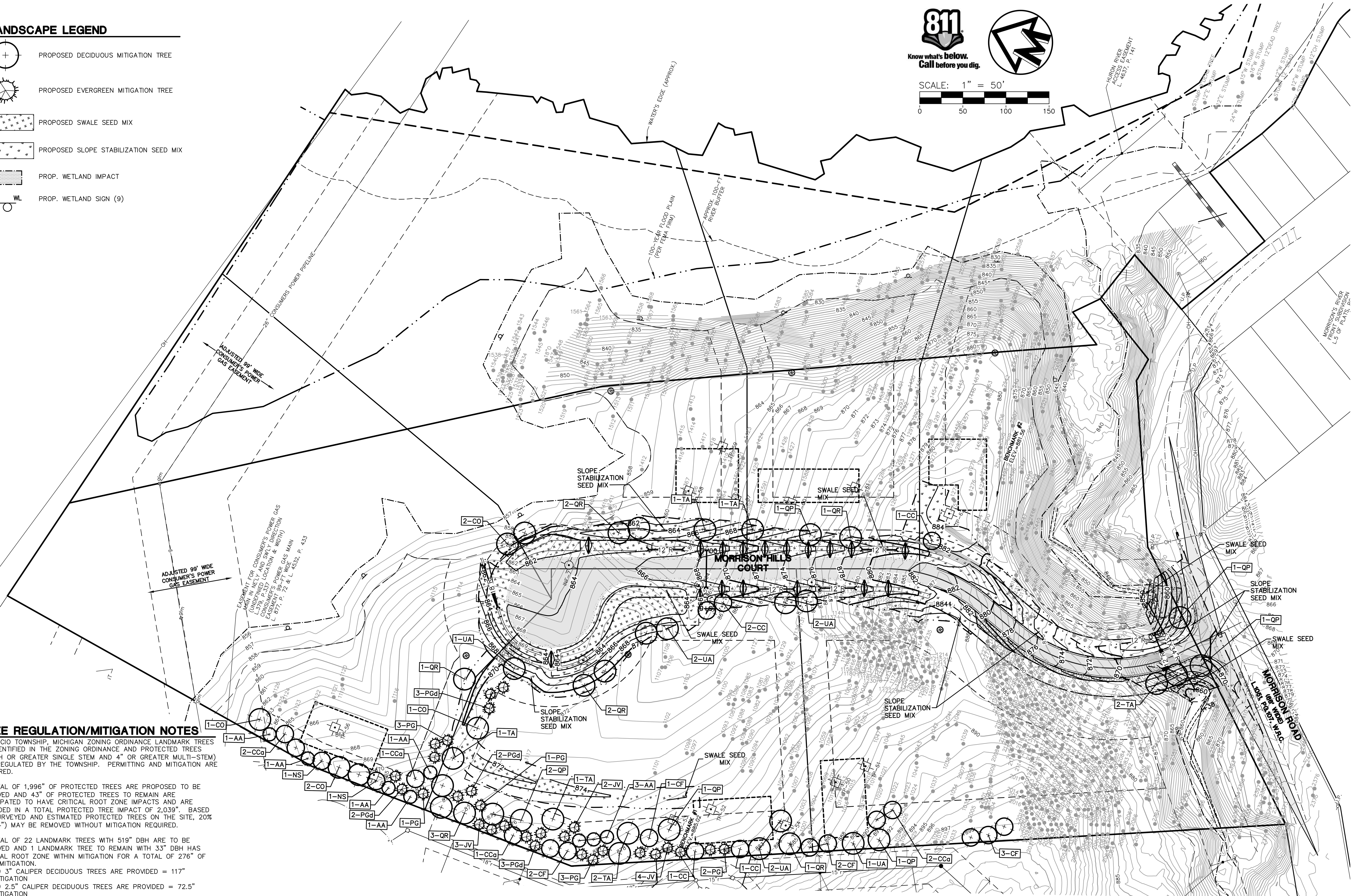
DATE: 03/16/22
SHEET 09 OF 19
CADD: RMLII
ENG: HTH
PM: TJC
TECH: RMLII
/21188DA01

REVISIONS:	REV. DATE
TOWNSHIP REVIEW	5/12/22
TOWNSHIP REVIEW	6/7/22
TOWNSHIP SUBMITAL	12/21/22

JOB No. **21188A**

LANDSCAPE LEGEND

- PROPOSED DECIDUOUS MITIGATION TREE
- PROPOSED EVERGREEN MITIGATION TREE
- PROPOSED SWALE SEED MIX
- PROPOSED SLOPE STABILIZATION SEED MIX
- PROP. WETLAND IMPACT
- WL PROP. WETLAND SIGN (9)



TREE REGULATION/MITIGATION NOTES

PER SCIO TOWNSHIP, MICHIGAN ZONING ORDINANCE LANDMARK TREES AS IDENTIFIED IN THE ZONING ORDINANCE AND PROTECTED TREES (6"DBH OR GREATER SINGLE STEM AND 4" OR GREATER MULTI-STEM) ARE REGULATED BY THE TOWNSHIP. PERMITTING AND MITIGATION ARE REQUIRED.

A TOTAL OF 1,996" OF PROTECTED TREES ARE PROPOSED TO BE REMOVED AND 43" OF PROTECTED TREES TO REMAIN ARE ANTICIPATED TO HAVE CRITICAL ROOT ZONE IMPACTS AND ARE INCLUDED IN A TOTAL PROTECTED TREE IMPACT OF 2,039". BASED ON SURVEYED AND ESTIMATED PROTECTED TREES ON THE SITE, 20% (2,904") MAY BE REMOVED WITHOUT MITIGATION REQUIRED.

A TOTAL OF 22 LANDMARK TREES WITH 519" DBH ARE TO BE REMOVED AND 1 LANDMARK TREE TO REMAIN WITH 33" DBH HAS CRITICAL ROOT ZONE WITHIN MITIGATION FOR A TOTAL OF 276" OF TREE MITIGATION.

- 39 3" CALIPER DECIDUOUS TREES ARE PROVIDED = 117" MITIGATION
- 29 2.5" CALIPER DECIDUOUS TREES ARE PROVIDED = 72.5" MITIGATION
- 29 8FT HEIGHT EVERGREEN TREES (3" EQUIVALENT) ARE PROVIDED = 87" MITIGATION
- TOTAL MITIGATION PROVIDED = 276.5"

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.

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MORRISON HILLS

PRIVATE ROAD
LANDSCAPE PLAN

10

DATE: 03/16/22
SHEET 10 OF 19

REVISIONS:	REV. DATE	
TOWNSHIP REVIEW	6/17/22	CADD: RMLII
TOWNSHIP REVIEW	07/25/22	ENG: HTH
TOWNSHIP REVIEW	8/12/22	PM: TJC
PER EGALE REVIEW	12/19/22	TECH: RMLII
TOWNSHIP SUBMITTAL	12/21/22	/21188LP01
PER EGLE AND COUNTY SESC REVIEW	01/30/23	

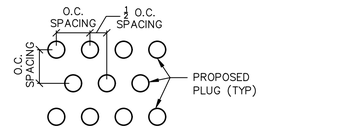
JOB No. 21188A

LANDSCAPE NOTES

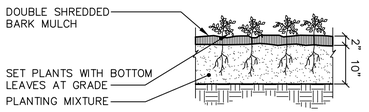
1. For any plant quantity discrepancies between the plan view and the plant schedules, the plant schedule shall take precedence.
2. Plant materials shall be selected and installed in accordance with standards established by Scio Township.
3. All diseased, damaged or dead material shown on the site plan as proposed plantings shall be replaced by the end of the following growing season.
4. Restore disturbed areas with a minimum of four (4) inches of topsoil and then seed/ fertilize/mulch.
5. After the first growing season, only fertilizers that contain NO phosphorus shall be used on the site.
6. All disturbed area shall be seeded and stabilized. Areas identified on the Landscape Plan with seed mixes shall be seeded with specified seed mixes from Cardno, or equivalent as approved by landscape architect. Temporary cover crop shall be included with all seed mixes. Seeding rates and installation techniques shall be confirmed with supplier.
7. All seeded areas with slopes less than 1:6 (one vertical foot for every 6 horizontal feet) shall be mulched with straw mulch at the rate of two (2) bales per 1,000 square feet. All seeded areas with slopes greater than 1:3 shall be seeded and biodegradable erosion control blanket North American Green SC150, or equivalent, shall be applied with biodegradable stakes.
8. Deciduous plants shall be planted between March 1 and May 15 and from October 1 until the prepared soil becomes frozen. Evergreen plants shall be planted between March 1 and June 1 and from August 15 to September 15.
9. Native seeding areas shall be seeded after May 1, (when soil is free of frost and in workable condition), but before June 15 or after October 1, but before November 30 (or prior to ground freezing) or as approved by Landscape Architect or guaranteed by the supplier. If seeding is performed outside planting window, contractor shall perform regularly scheduled watering for installed seed and as needed based on weather conditions to ensure germination and establishment of seed.
10. All trees to be located a minimum of 10 feet from public utilities.
11. All single trunk, deciduous trees shall have a straight and a symmetrical crown with a central leader. One sided trees or those with thin or open crowns shall not be accepted.
12. All evergreen trees shall be branched fully to the ground, symmetrical in shape and have not been sheared in the last three (3) growing seasons.
13. Proposed trees will be planted a minimum of 15 feet apart.
14. Planting Soil: Existing, in-place or stockpiled topsoil. Supplement with imported topsoil as needed. Verify suitability of existing surface soil to produce viable planting soil. Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with the following soil amendments to produce planting soil:
    a. Ratio of Loose Compost to Topsoil by Volume: 1:4.
    b. Weight of Lime per 1000 Sq. Ft.: Amend with lime only on recommendation of soil test to adjust soil pH.
    c. Weight of Sulfur or Aluminum Sulfate per 1,000 Sq. Ft.: Amend with sulfur or aluminum sulfate only on recommendation of soil test to adjust soil pH.
    d. Volume of Sand: Amend with sand only on recommendation of Landscape Architect to adjust soil texture.
    e. Weight of Slow-Release Fertilizer per 1,000 Sq. Ft.: Amend with fertilizer only on recommendation of soil test to adjust soil fertility.
15. Native seeding installation shall be performed by a qualified contractor with documented experience of successful established native seeding. Seed shall be installed per manufacturer's specification via hand broadcast
16. At the time of plant and seed delivery for the detention basins, including native seed and live plantings, a Washtenaw County Water Resource Commissioner landscape reviewer must be present. Contact Catie Wytychak at wytychakc@ewashtenaw.org or 734-222-6813 to coordinate.

Maintenance:

1. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
2. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
3. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.
4. During the establishment period for the installed deciduous mitigation trees (1-2 years as to be determined by certified arborist):
    a. The trunk of young trees shall be wrapped in late autumn and wrap shall be removed in early spring
    b. Burlap screening or wrapping shall be installed on the southwest and windward sides from late autumn to early spring.
    c. Trees shall be watered in spring and autumn and during dry conditions at a frequency determined by certified arborist.
    d. Mulching around trees shall be maintained at a depth of 2 to 3 inches
5. Watering: The contractor shall keep seed moist for optimum plant growth (1" of total water per week, including rainfall) until the grass and/or flowers are four (4) inches high typical
6. Contractor shall warranty all plant material and trees to remain alive and be in healthy, vigorous and like new condition for the specified period from installation to Substantial Completion. The entire Landscaping Project, including but not limited to: plants (perennials), trees, shrubs, mulches, shrubs, etc are to be under Warranty for Two Years after Substantial Completion date of the Project. At the end of the specified Two Year Warranty period the Owner's Representative will inspect plant material for compliance. Contractor shall replace, in accordance with the drawings and specifications, all plants, trees, shrubs, etc or as determined by the Owner's Representative, are in an unhealthy or unsightly condition. Warranty shall not include damage or loss of plants, trees, and shrubs caused by fires, floods, freezing rains, lightning storms, or winds over 75 miles per hour, acts of vandalism or negligence on the part of the owner, or any other incident beyond landscape contractor's control.
7. Protection from traffic and erosion in newly seeded areas is the responsibility of the contractor. Safety fences and/or silt fence with appropriate signage may be used at the contractor's expense until the grasses and flowers are fully established.
8. Erosion shall be repaired by the contractor.
9. Native seeding installation areas shall meet the following criteria as determined by Owner:
    a. The contractor shall review native seed sources with owner prior to ordering and shall submit an invoice following purchase and delivery of the seed.
    b. Establishment of a dense stand of perennial grasses and/or flowers as specified is the responsibility of the contractor. Any part of the area that fails to show a uniform germination (80% for Native Planting Areas) shall be re-seeded, and such re-seeding shall continue until a dense planting in these areas is established
    c. Bare spots over three (3) percent of the area or greater than one (1) square foot in size will not be allowed, unless otherwise approved by the owner.
    d. Initial mowing of the native planting areas (using flail mower) shall occur after one season of growth when the weeds are ten (10) inches high or prior to invasive weeds setting seed. Mowed height shall be 5". Weeds on slopes 3:1 or greater shall be mowed with a hand-held flail mower or common weed whacker.
    e. Provisional Acceptance: By the end of the first full growing season, 20% of the native species seeded and 80% total cover shall be established as determined by the Owner.
    f. Second Year Acceptance: By the end of the second growing season, 40% of the native species seeded and 90% total cover shall be established as determined by the Owner.
10. Turf installations shall meet the following criteria as determined by Owner:
    a. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
    b. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
    c. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.



PLANT PLUG SPACING DETAIL

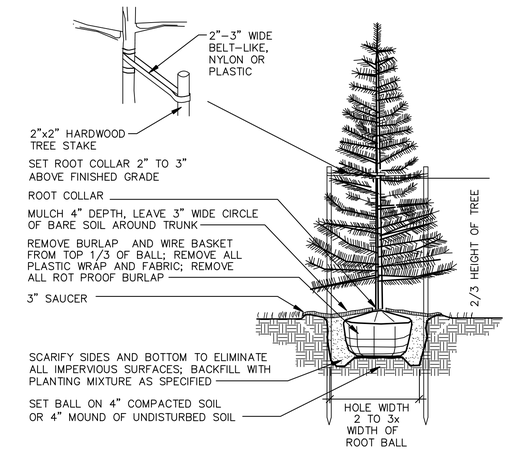


1. HERBACEOUS PLANTS SHOULD BE PEAT POT GROWN. PLANT PLUG WITH PEAT POT INTACT.
2. HERBICIDES SHALL NOT BE USED WITHIN THE BIO-SWALE AREA TO REMOVE EXISTING WEED GROWTH.
3. FERTILIZERS SHALL NOT BE USED WITHIN THE BIO-SWALE AREA.
4. PLANTING SHALL TAKE PLACE IMMEDIATELY AFTER PREPARATION.
5. LAYOUT OF SPECIES SHALL BE A MIXED COMPOSITION THROUGHOUT THE SPECIFIED PLANTING AREA. SEE PLANT SCHEDULE FOR SPACING FOR EACH SPECIES.
6. PLANTING MIXTURE SHALL CONSIST OF 30% COMPOST MIXED WITH EXISTING, IN-PLACE OR STOCKPILED TOPSOIL.

LIVE PLANTING PLUG DETAIL

NOT TO SCALE

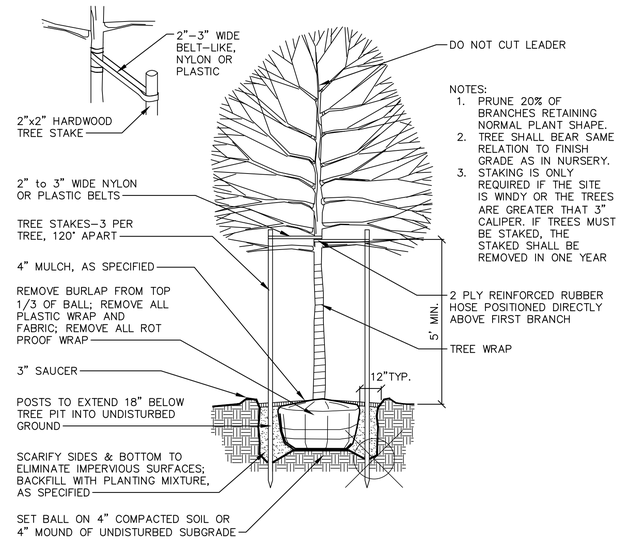
NOTE: REMOVE STAKING/GUYING MATERIAL AFTER ONE YEAR.



EVERGREEN TREE PLANTING DETAIL

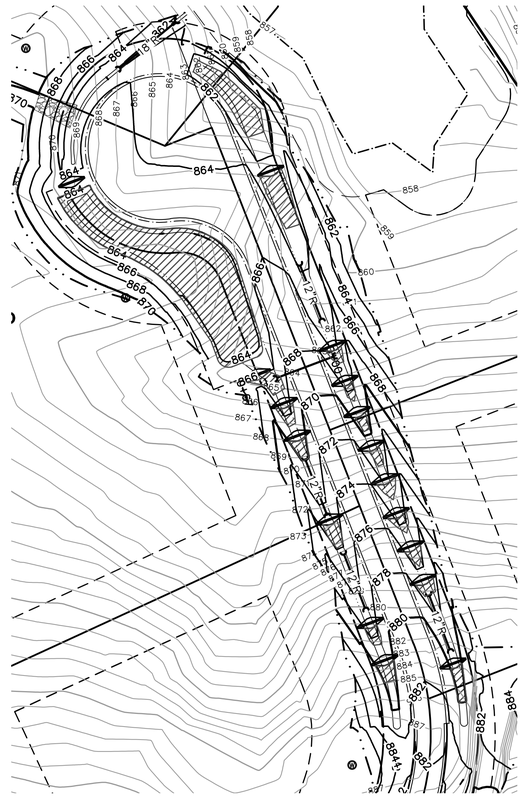
NOT TO SCALE

NOTE: REMOVE STAKING/GUYING MATERIAL AFTER ONE YEAR.



DECIDUOUS TREE PLANTING DETAIL

2-1/2" CAL. OR SMALLER
SCALE: NTS



LIVE PLANTING PLUG LOCATION DETAIL

NOT TO SCALE

SWALE SEED MIX

Swale Seed Mix
Source: Cardno Native Plant Nursery

Botanical Name	Common Name	PLS Ounces/Acre
Permanent Grasses/Sedges:		
Andropogon gerardii	Big Bluestem	4.00
Carex cristatella	Crested Oval Sedge	0.50
Carex lurida	Bottlebrush Sedge	3.00
Carex spp.	Prairie Sedge Species	8.00
Carex vulpinoidea	Brown Fox Sedge	3.00
Elymus canadensis	Canada Wild Rye	16.00
Elymus virginicus	Virginia Wild Rye	16.00
Juncus canadensis	Canadian Rush	1.00
Panicum virgatum	Switch Grass	3.00
Scirpus atrovirens	Dark Green Rush	2.00
Scirpus cyperinus	Wool Grass	0.50
Spartina pectinata	Prairie Cord Grass	3.00
	Total	**60.00**
Temporary Cover:		
Avena sativa	Common Oat	512.00
	Total	**512.00**
Forbs:		
Alisma subcordatum	Common Water Plantain	1.00
Asclepias incarnata	Swamp Milkweed	2.00
Coreopsis tripteris	Tall Coreopsis	1.00
Euthamia graminifolia	Common Grass-Leaved Goldenrod	0.50
Eutrochium maculatum	Spotted Joe-Pye Weed	1.00
Iris virginica v. shrevei	Blue Flag	4.00
Liatris spicata	Marsh Blazing Star	1.00
Lycopus americanus	Common Water Horehound	0.50
Mimulus ringens	Monkey Flower	0.50
Penthorum sedoides	Ditch Stonecrop	1.00
Pycnanthemum virginianum	Common Mountain Mint	0.50
Rudbeckia triloba	Brown-Eyed Susan	1.00
Senna hebecarpa	Wild Senna	1.00
Silphium terebinthinaceum	Prairie Dock	1.00
Symphyotrichum novae-angliae	New England Aster	0.50
Verbena hastata	Blue Vervain	1.50
Zizia aurea	Golden Alexanders	2.00
	Total	**20.00**

Mix Statistics

Native Component	PLS lbs./Acre	PLS Seeds/Acre	PLS Seeds/Sq. Ft.	% of Native Mix
Forbs	1.25	1,181,855	27.13	31.09%
Grasses	3.75	2,619,949	60.15	68.91%
Total Natives	5.00	3,801,804	87.28	100.00%
Cover	32.00	576,000	13.22	
Totals	37.00	4,377,804	100.50	

SLOPE STABILIZATION SEED MIX

Slope Stabilization Seed Mix
Source: Cardno Native Plant Nursery

Botanical Name	Common Name	PLS Ounces/Acre
Permanent Grasses:		
Andropogon gerardii	Big Bluestem	48.00
Bouteloua curtipendula	Side-Oats Grama	16.00
Carex spp.	Prairie Sedge Species	4.00
Elymus canadensis	Canada Wild Rye	32.00
Elymus virginicus	Virginia Wild Rye	24.00
Panicum virgatum	Switch Grass	12.00
Schizachyrium scoparium	Little Bluestem	32.00
Sorghastrum nutans	Indian Grass	32.00
	Total	**200.00**
Temporary Cover:		
Avena sativa	Common Oat	640.00
Lolium multiflorum	Annual Rye	120.00
	Total	**760.00**

NOTE:
ALL AREAS CALLED FOR SLOPE STABILIZATION MIX SHALL INCLUDE INSTALLATION OF BLANKETS.

Mix Statistics

Native Component	PLS lbs./Acre	PLS Seeds/Acre	PLS Seeds/Sq. Ft.	% of Native Mix
Forbs	-	-	-	0.00%
Grasses	12.50	1,788,635	41.06	100.00%
Total Natives	12.50	1,788,635	41.06	100.00%
Cover	47.50	2,422,560	55.61	
Totals	60.00	4,211,195	96.68	

PLANT SCHEDULE

Total	Code	Scientific Name	Common Name	Root	Size	Spacing	Notes
Deciduous Trees (3" mitigation equivalent)							
6	CO	Celtis Occidentalis	Norther Hackberry	B&B	3" cal.	25' o.c.	
8	TA	Tilia americana	American Basswood	B&B	3" cal	25' o.c.	
7	QP	Quercus palustris	Pin Oak	B&B	3" cal.	25' o.c.	
10	QR	Quercus rubra	Northern Red Oak	B&B	3" cal	25' o.c.	
8	UA	Ulmus americana 'Princeton'	Princeton American Elm	B&B	3" cal.	25' o.c.	
39	**Total**						
Deciduous Trees (2.5" mitigation equivalent)							
8	AA	Amelanchier arborea	Serviceberry	B&B	8' ht	15' o.c.	Tree form
5	CC	Carpinus caroliniana	American Hornbeam	B&B	3" cal	15' o.c.	
6	Cca	Cercis canadensis	Eastern Redbud	B&B	8' ht	12' o.c.	Tree form
8	CF	Cornus florida	Flowering Dogwood	B&B	8' ht	15' o.c.	Tree form
2	NS	Nyssa sylvatica	Black Gum	B&B	8' ht	20' o.c.	Tree form
29	**Total**						
Evergreen Trees (3" mitigation equivalent)							
9	JV	Juniperus virginiana	Eastern Red Cedar	B&B	8' ht	15' o.c.	Full
10	PG	Picea glauca	White Spruce	B&B	8' ht	15' o.c.	Full
10	PGd	Picea glauca 'densata'	Black Hills Spruce	B&B	8' ht	15' o.c.	Full
29	**Total**						

STORMWATER LIVE PLUG PLANTINGS

Qty	Botanical Name	Common Name	Size	Spacing	Remarks
318	*Asclepias incarnata*	Swamp Milkweed	Plug	24" o.c.	Quantity per flat varies by supplier
318	*Carex vulpinoidea*	Fox Sedge	Plug	24" o.c.	Quantity per flat varies by supplier
318	*Juncus effusus*	Soft Rush	Plug	24" o.c.	Quantity per flat varies by supplier
318	*Panicum virgatum*	Switchgrass	Plug	24" o.c.	Quantity per flat varies by supplier
318	*Scirpus cyperinus*	Wool Grass	Plug	24" o.c.	Quantity per flat varies by supplier
318	*Spartina spectinata*	Prairie Cordgrass	Plug	24" o.c.	Quantity per flat varies by supplier
318	*Symphyotrichum novae-angliae*	New England Aster	Plug	24" o.c.	Quantity per flat varies by supplier

Species to be planted as a mixed composition at bottom of basin to 6" vertical on side slopes.

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ANN ARBOR, MICHIGAN 48104
GREG COPP
734-930-6700

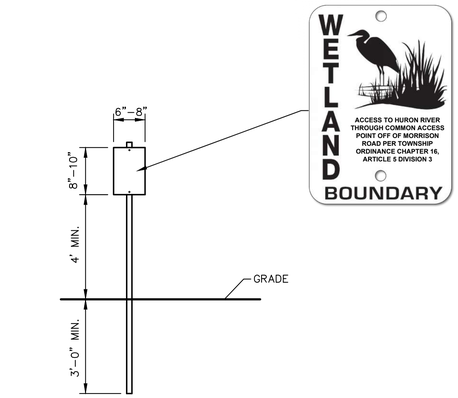
MORRISON HILLS
PRIVATE ROAD
LANDSCAPE NOTES AND DETAILS

11

DATE: 03/16/22
SHEET 11 OF 19
CADD: RMLII
ENG: HTH
PM: TJC
TECH: RMLII
/21188LP01

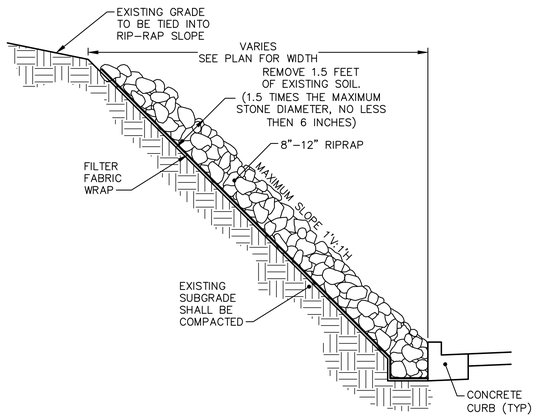
REVISIONS:	REV. DATE
TOWNSHIP REVIEW	6/17/22
TOWNSHIP REVIEW	8/12/22
TOWNSHIP SUBMITAL	12/21/22

JOB No. **21188A**



WETLAND SIGN DETAILS

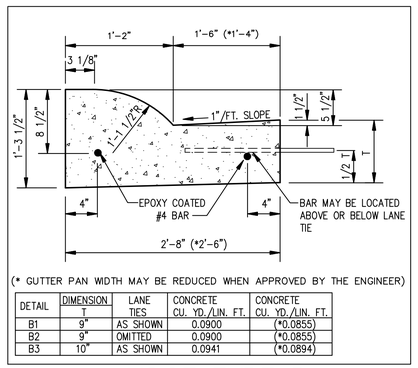
NOT TO SCALE



RIPRAP SLOPE

SCALE : NTS

SCALE: 1"=1'

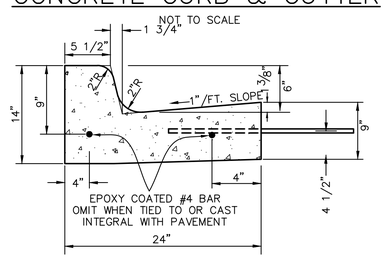


(* GUTTER PAN WIDTH MAY BE REDUCED WHEN APPROVED BY THE ENGINEER)

DETAIL	DIMENSION T	LANE TIES	CONCRETE CU. YD./LIN. FT.	CONCRETE CU. YD./LIN. FT.
B1	9"	AS SHOWN	0.0900	(*0.0855)
B2	9"	OMITTED	0.0900	(*0.0855)
B3	10"	AS SHOWN	0.0941	(*0.0894)

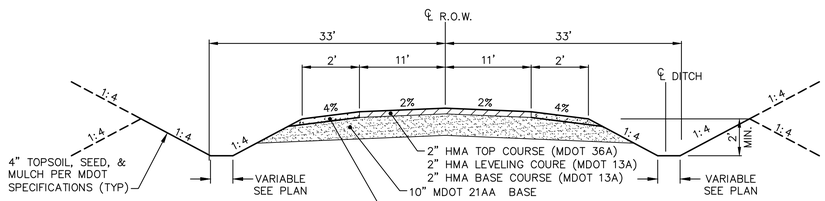
MDOT TYPE B

CONCRETE CURB & GUTTER



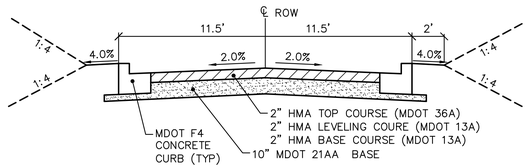
MDOT F4 BARRIER CURB AND GUTTER

NOt TO SCALE



NOTE: * REFER TO CURRENTLY APPROVED WCRC HMA MIX DESIGNS & BINDER REQUIREMENT

TYPICAL BITUMINOUS ROAD CROSS SECTION



NOTE: * REFER TO CURRENTLY APPROVED WCRC HMA MIX DESIGNS & BINDER REQUIREMENT

TYPICAL BITUMINOUS CROSS–SECTION

CURB ON BOTH SIDES OF ROAD
NOT TO SCALE

Mixture Type	Marshall Mixture					Superpave Mixture			
	36A	13A	2C	3C	4C	2E_	3E_	4E_	5E_
Min. #/syd	110	165	350	220	165	435	330	165	165
Max. #/syd	165	275	500	330	275	550	410	275	220

HMA APPLICATION RATES

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MORRISON HILLS

PRIVATE ROAD
SITE DETAILS

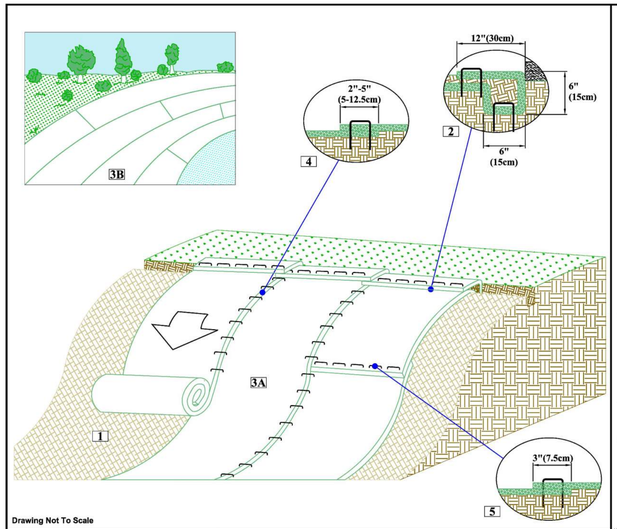
12

DATE: 03/16/22
SHEET 12 OF 19
CADD: RMLII
ENG: HTH
PM: TJC
TECH: RMLII
12/19/22 /21188SP01

PER EGLE AND COUNTY SESC REVIEW 1/30/23

JOB No. 21188A

REVISIONS:	REV. DATE
TOWNSHIP REVIEW	07/25/22
TOWNSHIP REVIEW	08/12/22
TOWNSHIP REVIEW	08/25/22
TOWNSHIP REVIEW	12/19/22
TOWNSHIP SUBMITTAL	1/23/23



SLOPE INSTALLATION DETAIL

1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed.
2. Begin at the top of the slope by anchoring the RECPs in a 6"(15cm) deep X 6"(15cm) wide trench with approximately 12" (30cm) of RECPs extended beyond the up-slope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12" (30cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12"(30cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12"(30cm) apart across the width of the RECPs.
3. Roll the RECPs (A) down or (B) horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. The edges of parallel RECPs must be stapled with approximately 2" - 5" (5-12.5cm) overlap depending on the RECPs type.
5. Consecutive RECPs spliced down the slope must be end over end (Shingle style) with an approximate 3"(7.5cm) overlap. Staple through overlapped area, approximately 12"(30cm) apart across entire RECPs width.

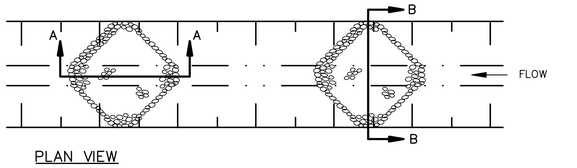
*NOTE:
In loose soil conditions, the use of staple or stake lengths greater than 6"(15cm) may be necessary to properly secure the RECP's.

Tensar. NORTH AMERICAN GREEN
5401 St. Wendel - Cynthiana Rd. PH: 800-772-2040
Poseyville, IN 47633 www.tensarnagreen.com

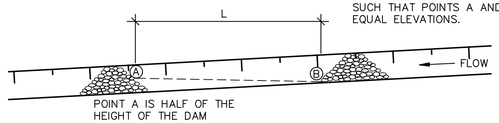
Disclaimer:
The information presented herein is general design information only. For specific applications, consult an independent professional for further design guidance.

Drawn on: 3-16-11

EROSION CONTROL BLANKET 6P
NOT TO SCALE

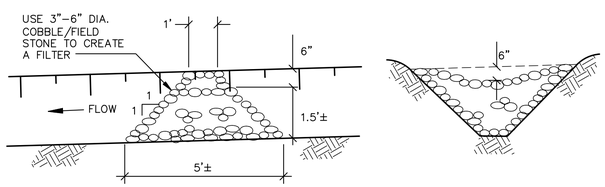


PLAN VIEW



L = DISTANCE BETWEEN CHECK DAMS SUCH THAT POINTS A AND B ARE AT EQUAL ELEVATIONS.

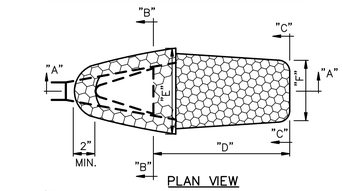
CROSS-SECTION



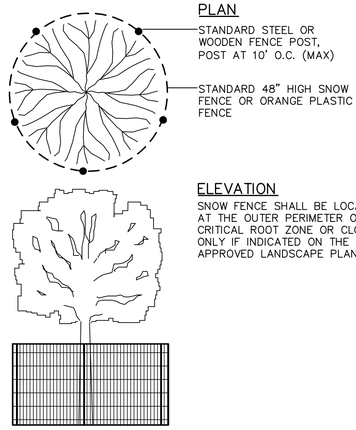
SECTION A-A SECTION B-B

STONE CHECK DAM DETAIL 49p
SCALE : NTS

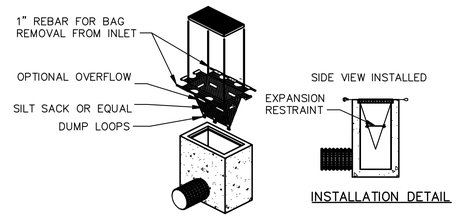
PIPE ø	D	E	F	SQ. YDS.
12"	5'-0"	6'-6"	3'-0"	4
15"	5'-0"	7'-0"	3'-0"	4
18"	5'-0"	7'-6"	3'-6"	4
21"	5'-6"	8'-0"	4'-0"	5
24"	6'-0"	8'-6"	4'-6"	6
27"	6'-6"	9'-0"	5'-0"	7
30"	7'-0"	9'-6"	5'-6"	8
33"	7'-6"	10'-3"	5'-6"	9
36"	8'-0"	10'-9"	6'-0"	10
42"	9'-0"	11'-9"	6'-6"	12
48"	10'-0"	13'-0"	7'-0"	14



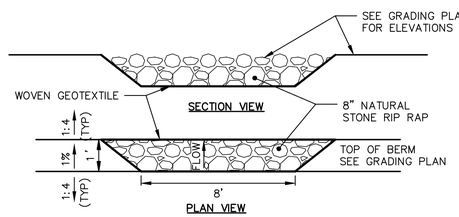
RIP-RAP DETAIL 13p
NOT TO SCALE



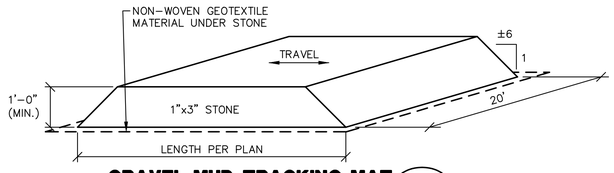
TREE PROTECTION DETAIL 54t
NOT TO SCALE



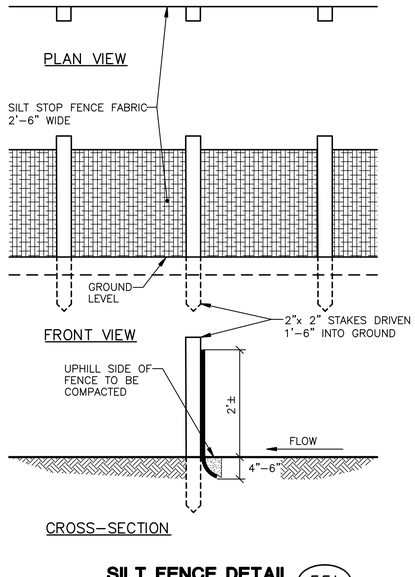
INLET SILT SACK DETAIL 58t
NOT TO SCALE



RIP-RAP EMERGENCY OVERFLOW
SCALE : NTS



GRAVEL MUD TRACKING MAT 60t
NOT TO SCALE



SILT FENCE DETAIL 55t
NOT TO SCALE

MAINTENANCE TASK AND SCHEDULE

MAINTENANCE TASK AND SCHEDULE DURING CONSTRUCTION (by Contractor)

TASKS:	Streets	Storm Sewer System	Catch Basin Sumps	Catch Basin Inlet Silt Sacks	Ditches & Swales	Water Quality Units	Emergency Overflow	SCHEDULE:	ESTIMATED COST:
Inspect for sediment accumulation	X	X	X	X	X	X	X	Weekly and after every 1" storm event	$ 200
Removal of sediment accumulation	X	X	X	X	X	X	X	As needed and prior to turnover	$ 1,200
Inspect for floatable and debris	X		X	X	X	X	X	Quarterly and after every 1" storm event	$ 100
Cleaning of floatable and debris	X		X	X	X	X		Quarterly, as needed, and at turnover	$ 200
Inspect for erosion	X				X	X	X	Weekly*	$ 200
Establish permanent vegetation on eroded slopes					X	X	X	As needed and prior to turnover	$ 2,000
								Total Construction Phase Cost Estimate	**$ 3,900**

* And as required for NPDES
**As Needed" means when sediment has accumulated to one foot depth.

MAINTENANCE TASK AND SCHEDULE POST-CONSTRUCTION (by Owner)

TASKS:	Streets	Storm Sewer System	Catch Basin Sumps	Catch Basin Inlet Casing	Ditches & Swales	Water Quality Units	Emergency Overflow	SCHEDULE:	ESTIMATED COST:
Inspect for sediment accumulation	X	X	X		X	X	X	Annually	$ 200
Removal of sediment accumulation		X	X		X	X	X	Every 2 yrs as need	$ 1,200
Cleaning of Floatables and debris				X			X		
Clean Streets	X						X	Semi-annually	$ 400
Inspect BMP's following 1" storm event				X			X	As Needed	$ 300
Inspect storm water system components during wet weather and compare to as-built plans (by professional engineer)		X	X	X	X	X	X	Annually	$ 600
Make adjustment or replacements as determined by annual wet weather inspection		X	X	X	X	X	X	As Needed	$ 1,200
Mowing					X		X	As Needed 2x/yr max	$ 400
Keep records of all inspections and maintenance activities								Annually	$ 200
Keep records of all costs for inspections, maintenance and repairs								Annually	$ 200
								Total Annual Post Construction Cost Estimate	**$ 4,700**

* And as required for NPDES
**As Needed" means when sediment has accumulated to one foot depth.
No chemicals are allowed in storm water features or buffer zones with the following exception: invasive species may be treated with chemicals by a certified applicator

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MORRISON HILLS
PRIVATE ROAD
SESC DETAILS

13

JOB No. 21188A

REVISIONS:	REV. DATE
TOWNSHIP REVIEW	12/21/22
TOWNSHIP SUBMITTAL	01/30/23
PER EGLE AND COUNTY SESC REVIEW	

DATE: 1/28/22
SHEET OF
CADD: RMLII
ENG: HTH
PM: TJC
TECH: RMLII
/21188PR01

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
1001	7"	Black Walnut	Juglans nigra				X		
1002	11"	Black Cherry	Prunus serotina				X		
1003	15"	Black Cherry	Prunus serotina				X		
1004	15"	Black Cherry	Prunus serotina				X		
1005	14"	Norway Spruce	Picea abies				X		
1006	7"	Black Cherry	Prunus serotina				X		
1007	7"	Black Walnut	Juglans nigra				X		
1008	10"	Red Oak	Quercus rubra				X		
1009	10"	White Spruce	Picea glauca				X		
1010	10"	Black Cherry	Prunus serotina				X		
1011	12"	Black Cherry	Prunus serotina				X		
1012	10"	Black Cherry	Prunus serotina				X		
1013	9"	Black Cherry	Prunus serotina				X		
1014	9"	Black Cherry	Prunus serotina				X		
1015	8"	Black Cherry	Prunus serotina				X		
1016	10"	Black Cherry	Prunus serotina				X		
1017	12"	Black Cherry	Prunus serotina	twin			X		
1018	9"	Black Cherry	Prunus serotina				X		
1019	9"	Black Cherry	Prunus serotina				X		
1020	7"	Black Cherry	Prunus serotina	twin			X		
1021	13"	Black Cherry	Prunus serotina				X		
1022	11"	Red Oak	Quercus rubra				X		
1023	9"	Black Cherry	Prunus serotina				X		
1024	11"	Black Cherry	Prunus serotina				X		
1025	9"	Red Oak	Quercus rubra				X		
1026	9"	Red Pine	Pinus resinosa				X		
1027	12"	Black Cherry	Prunus serotina				X		
1028	14"	Black Cherry	Prunus serotina				X		
1029	18"	Black Cherry	Prunus serotina			X			
1030	16"	Sugar Maple	Acer saccharum				X		
1031	18"	Black Cherry	Prunus serotina			X			
1032	18"	Red Oak	Quercus rubra			X			
1033	13"	Black Cherry	Prunus serotina				X		
1034	9"	Black Walnut	Juglans nigra				X		
1035	8"	Red Oak	Quercus rubra				X		
1036	8"	Red Oak	Quercus rubra				X		
1037	10"	American Elm	Ulmus americana				X		
1038	9"	Black Walnut	Juglans nigra				X		
1039	9"	Red Oak	Quercus rubra				X		
1040	8"	Black Walnut	Juglans nigra				X		
1041	10"	Black Walnut	Juglans nigra				X		
1042	11"	Black Walnut	Juglans nigra				X		
1043	8"	Black Cherry	Prunus serotina				X		
1044	12"	Black Cherry	Prunus serotina	twin			X		
1045	9"	Black Cherry	Prunus serotina				X		
1046	11"	Black Cherry	Prunus serotina				X		
1047	9"	Black Cherry	Prunus serotina				X		
1048	7"	Black Cherry	Prunus serotina				X		
1049	8"	Black Cherry	Prunus serotina				X		
1050	11"	Black Cherry	Prunus serotina				X		
1051	10"	Black Walnut	Juglans nigra				X		
1052	10"	Black Walnut	Juglans nigra				X		
1053	9"	Black Walnut	Juglans nigra				X		
1054	9"	Black Walnut	Juglans nigra				X		
1055	11"	Red Oak	Quercus rubra				X		
1056	9"	Red Oak	Quercus rubra				X		
1057	9"	White Spruce	Picea glauca				X		
1058	11"	Black Cherry	Prunus serotina				X		
1059	10"	Black Walnut	Juglans nigra				X		
1060	13"	Red Oak	Quercus rubra				X		
1061	8"	Black Cherry	Prunus serotina				X		
1062	13"	Black Cherry	Prunus serotina				X		
1063	10"	Black Cherry	Prunus serotina				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
1127	9"	Black Walnut	Juglans nigra				X		
1128	8"	Black Walnut	Juglans nigra				X		
1129	6"	Red Oak	Quercus rubra				X		
1130	19"	Red Oak	Quercus rubra			X			
1131	8"	Black Walnut	Juglans nigra				X		
1132	8"	Red Oak	Quercus rubra				X		
1133	9"	Black Cherry	Prunus serotina				X		
1134	19"	Tuliptree	Liriodendron tulipifera				X		
1135	12"	Red Pine	Pinus resinosa				X		
1136	11"	Red Pine	Pinus resinosa				X		
1137	11"	Red Pine	Pinus resinosa				X		
1138	10"	Red Pine	Pinus resinosa				X		
1139	11"	Red Pine	Pinus resinosa				X		
1140	6"	Red Pine	Pinus resinosa				X		
1141	19"	Norway Spruce	Picea abies			X			
1142	10"	Red Pine	Pinus resinosa				X		
1143	9"	Black Cherry	Prunus serotina				X		
1144	9"	Red Pine	Pinus resinosa				X		X
1145	7"	Red Pine	Pinus resinosa				X		
1146	7"	Red Pine	Pinus resinosa				X		
1147	7"	Red Pine	Pinus resinosa				X		
1148	7"	Red Pine	Pinus resinosa				X		
1149	7"	Red Pine	Pinus resinosa				X		
1150	8"	Red Pine	Pinus resinosa				X		
1151	6"	Red Pine	Pinus resinosa				X		
1152	7"	Red Pine	Pinus resinosa				X		
1153	8"	Red Pine	Pinus resinosa				X		
1154	9"	Red Pine	Pinus resinosa				X		
1155	8"	Red Pine	Pinus resinosa				X		
1156	7"	Red Pine	Pinus resinosa				X		
1157	6"	Red Pine	Pinus resinosa				X		
1158	7"	Red Pine	Pinus resinosa				X		
1159	6"	Red Pine	Pinus resinosa				X		
1160	8"	Red Pine	Pinus resinosa				X		
1161	9"	Red Pine	Pinus resinosa				X		
1162	7"	Red Pine	Pinus resinosa				X		
1163	11"	Red Pine	Pinus resinosa				X		
1164	18"	Red Pine	Pinus resinosa			X			
1165	12"	Red Pine	Pinus resinosa				X		
1166	14"	Red Pine	Pinus resinosa				X		
1167	7"	Red Pine	Pinus resinosa				X		
1168	13"	Red Pine	Pinus resinosa				X		
1169	10"	Red Pine	Pinus resinosa				X		
1170	13"	Red Pine	Pinus resinosa				X		
1171	12"	Red Pine	Pinus resinosa				X		
1172	15"	Red Pine	Pinus resinosa				X		
1173	15"	Red Pine	Pinus resinosa				X		
1174	12"	Red Pine	Pinus resinosa				X		
1175	9"	Red Pine	Pinus resinosa				X		
1176	8"	Red Pine	Pinus resinosa				X		
1177	7"	Red Pine	Pinus resinosa				X		
1178	7"	Red Pine	Pinus resinosa				X		
1179	8"	Red Pine	Pinus resinosa				X		
1180	8"	Red Pine	Pinus resinosa				X		
1181	7"	Red Pine	Pinus resinosa				X		
1182	9"	Red Pine	Pinus resinosa				X		
1183	7"	Red Pine	Pinus resinosa				X		
1184	8"	Red Pine	Pinus resinosa				X		
1185	6"	Red Pine	Pinus resinosa				X		
1186	6"	Red Pine	Pinus resinosa				X		
1187	8"	Red Pine	Pinus resinosa				X		
1188	7"	Red Pine	Pinus resinosa				X		
1189	7"	Red Pine	Pinus resinosa				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
1253	19"	Norway Spruce	Picea abies			X			X
1254	20"	Norway Spruce	Picea abies			X			X
1255	20"	Norway Spruce	Picea abies			X			X
1256	12"	Black Walnut	Juglans nigra				X		X
1257	21"	Norway Spruce	Picea abies			X			X
1258	19"	Tuliptree	Liriodendron tulipifera				X		X
1259	8"	Red Oak	Quercus rubra				X		X
1260	23"	Norway Spruce	Picea abies			X			X
1261	20"	Norway Spruce	Picea abies			X			
1262	21"	Norway Spruce	Picea abies			X			
1263	17"	Tuliptree	Liriodendron tulipifera				X		
1264	18"	Tuliptree	Liriodendron tulipifera				X		
1265	20"	Norway Spruce	Picea abies			X			
1266	21"	Norway Spruce	Picea abies			X			
1267	16"	Tuliptree	Liriodendron tulipifera				X		
1268	20"	Norway Spruce	Picea abies			X			
1269	15"	Tuliptree	Liriodendron tulipifera				X		
1270	16"	Norway Spruce	Picea abies				X		
1271	14"	Tuliptree	Liriodendron tulipifera				X		
1272	18"	Norway Spruce	Picea abies			X			
1273	19"	Norway Spruce	Picea abies			X			
1274	15"	Paper Birch	Betula papyrifera				X		
1275	11"	Paper Birch	Betula papyrifera				X		
1276	19"	Norway Spruce	Picea abies			X			
1277	16"	Norway Spruce	Picea abies				X		
1278	16"	White Spruce	Picea glauca				X		
1279	15"	Norway Spruce	Picea abies				X		
1280	12"	Red Oak	Quercus rubra				X		
1281	15"	Red Oak	Quercus rubra				X		
1282	16"	Red Oak	Quercus rubra				X		
1283	15"	Norway Spruce	Picea abies				X		
1284	8"	Norway Spruce	Picea abies				X		
1285	12"	Norway Spruce	Picea abies				X		
1286	15"	Pignut Hickory	Carya glabra				X		
1287	12"	Pignut Hickory	Carya glabra				X		
1288	8"	Norway Spruce	Picea abies				X		
1289	15"	Norway Spruce	Picea abies				X		
1290	7"	Norway Spruce	Picea abies				X		
1291	21"	Red Oak	Quercus rubra			X			
1292	11"	Norway Spruce	Picea abies				X		
1293	14"	Norway Spruce	Picea abies				X		
1294	17"	Red Oak	Quercus rubra				X		
1295	8"	Norway Spruce	Picea abies				X		
1296	13"	Shagbark Hickory	Carya ovata				X		
1297	10"	Red Oak	Quercus rubra				X		
1298	7"	Shagbark Hickory	Carya ovata				X		
1299	15"	White Oak	Quercus alba				X		
1300	17"	White Oak	Quercus alba				X		
1301	16"	Red Pine	Pinus resinosa				X		X
1302	7"	Red Oak	Quercus rubra				X		X
1303	10"	Black Cherry	Prunus serotina				X		X
1304	10"	Black Cherry	Prunus serotina				X		X
1305	11"	Red Oak	Quercus rubra				X		X
1306	9"	Black Walnut	Juglans nigra				X		X
1307	7"	Black Walnut	Juglans nigra				X		X
1308	10"	Red Oak	Quercus rubra				X		X
1309	9"	White Oak	Quercus alba				X		X
1310	7"	Norway Spruce	Picea abies				X		X
1311	7"	Norway Spruce	Picea abies				X		X
1312	7"	Norway Spruce	Picea abies				X		X
1313	16"	Norway Spruce	Picea abies				X		X
1314	8"	Red Pine	Pinus resinosa				X		X
1315	8"	Red Pine	Pinus resinosa				X		X

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
1379	19"	Red Pine	Pinus resinosa			X			X
1380	8"	Red Pine	Pinus resinosa				X		X
1381	7"	Red Pine	Pinus resinosa				X		X
1382	7"	Red Pine	Pinus resinosa				X		X
1383	11"	Red Pine	Pinus resinosa				X		X
1384	8"	Red Pine	Pinus resinosa				X		X
1385	9"	Red Pine	Pinus resinosa				X		X
1386	7"	Red Pine	Pinus resinosa				X		X
1387	20"	Red Oak	Quercus rubra			X			X
1388	9"	Red Pine	Pinus resinosa				X		X
1389	9"	Red Pine	Pinus resinosa				X		X
1390	7"	Red Pine	Pinus resinosa				X		X
1391	7"	Red Pine	Pinus resinosa				X		X
1392	8"	Red Pine	Pinus resinosa				X		X
1393	8"	Red Pine	Pinus resinosa				X		X
1394	8"	Red Pine	Pinus resinosa				X		X
1394	8"	Red Pine	Pinus resinosa				X		X
1395	11"	Red Pine	Pinus resinosa				X		X
1396	8"	Red Pine	Pinus resinosa				X		X
1397	8"	Red Pine	Pinus resinosa				X		X
1398	8"	Red Pine	Pinus resinosa				X		X
1399	9"	Red Pine	Pinus resinosa				X		X
1400	8"	Red Pine	Pinus resinosa				X		X
1401	10"	Red Pine	Pinus resinosa				X		X
1402	12"	Red Pine	Pinus resinosa				X		
1403	24"	Red Oak	Quercus rubra			X			
1404	8"	White Oak	Quercus alba				X		
1405	7"	Norway Spruce	Picea abies				X		X
1406	7"	Norway Spruce	Picea abies				X		X
1407	9"	Red Oak	Quercus rubra				X		X
1408	10"	Red Oak	Quercus rubra				X		X
1409	10"	Red Oak	Quercus rubra				X		X
1410	18"	Tuliptree	Liriodendron tulipifera				X		
1411	17"	Bur Oak	Quercus macrocarpa				X		
1412	11"	Bur Oak	Quercus macrocarpa				X		
1413	8"	Red Oak	Quercus rubra				X		
1414	7"	Red Oak	Quercus rubra				X		
1415	10"	Red Oak	Quercus rubra				X		
1416	8"	White Oak	Quercus alba				X		
1417	8"	Red Oak	Quercus rubra				X		
1418	8"	White Oak	Quercus alba				X		
1419	8"	Black Walnut	Juglans nigra				X		
1420	9"	Black Walnut	Juglans nigra				X		
1421	7"	Black Cherry	Prunus serotina				X		
1422	6"	Red Oak	Quercus rubra				X		
1423	13"	Black Walnut	Juglans nigra				X		
1424	7"	Red Oak	Quercus rubra				X		
1425	8"	Red Oak	Quercus rubra				X		
1426	10"	White Spruce	Picea glauca				X		
1427	7"	Black Cherry	Prunus serotina				X		
1428	55"	Red Oak	Quercus rubra			X			
1429	19"	Red Oak	Quercus rubra			X			
1430	38"	Black Oak	Quercus velutina			X			
1431	15"	Black Oak	Quercus velutina				X		
1432	26"	Black Oak	Quercus velutina			X			
1433	7"	Black Cherry	Prunus serotina				X		
1434	21"	Shagbark Hickory	Carya ovata			X			
1435	18"	Red Oak	Quercus rubra			X			
1436	10"	Black Cherry	Prunus serotina				X		
1437	11"	Red Oak	Quercus rubra				X		
1438	22"	Shagbark Hickory	Carya ovata			X			
1439	22"	Red Oak	Quercus rubra			X			
1440	12"	White Oak	Quercus alba				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
1504	21"	Red Oak	Quercus rubra			X			
1505	22"	Red Oak	Quercus rubra			X			
1506	8"	Pignut Hickory	Carya glabra				X		
1507	9"	Red Oak	Quercus rubra				X		
1508	7"	Red Oak	Quercus rubra				X		
1509	8"	Red Oak	Quercus rubra				X		
1510	10"	Red Oak	Quercus rubra				X		
1511	13"	Black Cherry	Prunus serotina				X		
1512	40"	Cottonwood	Populus deltoides				X		
1513	20"	Pignut Hickory	Carya glabra			X			
1514	34"	Bur Oak	Quercus macrocarpa			X			
1515	8"	Black Cherry	Prunus serotina				X		
1516	23"	Red Oak	Quercus rubra			X			
1517	8"	Black Cherry	Prunus serotina				X		
1518	9"	Black Cherry	Prunus serotina				X		
1519	44"	Bur Oak	Quercus macrocarpa			X			
1520	24"	Pignut Hickory	Carya glabra			X			
1521	20"	Red Oak	Quercus rubra			X			
1522	24"	Red Oak	Quercus rubra			X			
1523	10"	Pignut Hickory	Carya glabra				X		
1524	8"	Pignut Hickory	Carya glabra				X		
1525	10"	Bur Oak	Quercus macrocarpa				X		
1526	8"	Pignut Hickory	Carya glabra				X		
1527	8"	Bitternut Hickory	Carya cordiformis				X		
1528	9"	Bitternut Hickory	Carya cordiformis				X		
1529	7"	White Oak	Quercus alba				X		
1530	8"	Bitternut Hickory	Carya cordiformis				X		
1531	8"	Pignut Hickory	Carya glabra				X		
1532	6"	Bitternut Hickory	Carya cordiformis				X		
1533	6"	Bitternut Hickory	Carya cordiformis				X		
1534	7"	American Elm	Ulmus americana				X		
1535	15"	Red Oak	Quercus rubra				X		
1536	8"	Pignut Hickory	Carya glabra				X		
1537	15"	Black Cherry	Prunus serotina				X		
1538	8"	Bur Oak	Quercus macrocarpa				X		
1539	8"	Bur Oak	Quercus macrocarpa				X		
1540	16"	Bur Oak	Quercus macrocarpa				X		
1541	10"	Bitternut Hickory	Carya cordiformis				X		
1542	10"	Bitternut Hickory	Carya cordiformis				X		
1543	9"	Bitternut Hickory	Carya cordiformis				X		
1544	12"	Black Cherry	Prunus serotina				X		
1545	25"	Red Oak	Quercus rubra			X			
1546	7"	Black Cherry	Prunus serotina				X		
1547	22"	Red Oak	Quercus rubra			X			
1548	26"	Red Oak	Quercus rubra			X			
1549	7"	Shagbark Hickory	Carya ovata				X		
1550	26"	Red Oak	Quercus rubra			X			
1551	7"	Pignut Hickory	Carya glabra				X		
1552	24"	Shagbark Hickory	Carya ovata			X			
1553	7"	Black Cherry	Prunus serotina				X		
1554	27"	Red Oak	Quercus rubra			X			
1555	42"	Red Oak	Quercus rubra			X			
1556	13"	Norway Maple	Acer platanoides					X	
1557	31"	Red Oak	Quercus rubra			X			
1558	12"	Black Walnut	Juglans nigra				X		
1559	10"	Shagbark Hickory	Carya ovata				X		
1560	16"	Bitternut Hickory	Carya cordiformis				X		
1561	13"	Bitternut Hickory	Carya cordiformis				X		
1562	16"	Bitternut Hickory	Carya cordiformis				X		
1563	9"	Bitternut Hickory	Carya cordiformis				X		
1564	16"	Bitternut Hickory	Carya cordiformis				X		
1565	10"	White Mulberry	Morus alba					X	
1566	13"	Red Oak	Quercus rubra				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
1064	8"	Black Walnut	Juglans nigra				X		
1065	13"	Red Oak	Quercus rubra				X		
1066	12"	Red Oak	Quercus rubra				X		
1067	8"	Red Oak	Quercus rubra				X		
1068	11"	Red Oak	Quercus rubra				X		
1069	10"	Red Oak	Quercus rubra				X		
1070	10"	Red Oak	Quercus rubra				X		
1071	8"	Red Oak	Quercus rubra				X		
1072	10"	Red Oak	Quercus rubra				X		
1073	10"	Red Oak	Quercus rubra				X		
1074	8"	Red Oak	Quercus rubra				X		
1075	11"	Red Oak	Quercus rubra				X		
1076	10"	Red Oak	Quercus rubra				X		
1077	7"	Red Oak	Quercus rubra				X		
1078	10"	Black Cherry	Prunus serotina				X		
1079	12"	Red Oak	Quercus rubra				X		
1080	10"	Red Oak	Quercus rubra				X		
1081	10"	Red Oak	Quercus rubra				X		
1082	11"	Red Oak	Quercus rubra				X		
1083	11"	Red Oak	Quercus rubra				X		
1084	8"	Red Oak	Quercus rubra				X		
1085	9"	Red Oak	Quercus rubra				X		
1086	7"	Red Oak	Quercus rubra				X		
1087	7"	Red Oak	Quercus rubra				X		
1088	9"	Red Oak	Quercus rubra				X		
1089	12"	Red Oak	Quercus rubra				X		
1090	11"	Red Oak	Quercus rubra				X		
1091	13"	Red Oak	Quercus rubra				X		
1092	7"	Red Oak	Quercus rubra				X		
1093	15"	Red Oak	Quercus rubra				X		
1094	8"	Red Oak	Quercus rubra				X		
1095	12"	Red Oak	Quercus rubra				X		
1096	8"	Red Oak	Quercus rubra				X		
1097	9"	Red Oak	Quercus rubra				X		
1098	9"	Black Walnut	Juglans nigra				X		
1099	9"	Red Oak	Quercus rubra				X		
1100	15"	Red Oak	Quercus rubra				X		
1101	10"	Red Oak	Quercus rubra				X		
1102	7"	Red Oak	Quercus rubra				X		
1103	12"	Red Oak	Quercus rubra				X		
1104	9"	Red Oak	Quercus rubra				X		
1105	10"	Black Walnut	Juglans nigra				X		
1106	9"	Black Walnut	Juglans nigra				X		
1107	9"	Red Oak	Quercus rubra				X		
1108	7"	Black Walnut	Juglans nigra				X		
1109	15"	Red Oak	Quercus rubra				X		X
1110	8"	Red Oak	Quercus rubra				X		X
1111	10"	Black Walnut	Juglans nigra				X		X
1112	10"	Red Oak	Quercus rubra				X		X
1113	11"	Black Cherry	Prunus serotina				X		X
1114	7"	Red Oak	Quercus rubra				X		
1115	6"	Black Walnut	Juglans nigra				X		
1116	7"	Black Walnut	Juglans nigra				X		
1117	10"	Black Cherry	Prunus serotina				X		
1118	14"	Black Cherry	Prunus serotina				X		X
1119	10"	Black Cherry	Prunus serotina				X		
1120	8"	Black Cherry	Prunus serotina				X		
1121	9"	Red Oak	Quercus rubra				X		
1122	7"	Black Cherry	Prunus serotina				X		
1123	9"	Black Cherry	Prunus serotina				X		
1124	9"	Red Oak	Quercus rubra				X		
1125	8"	Black Cherry	Prunus serotina	triple			X		
1126	9"	Red Oak	Quercus rubra				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
1190	8"	Red Pine	Pinus resinosa				X		
1191	8"	Red Pine	Pinus resinosa				X		
1192	8"	Red Pine	Pinus resinosa				X		
1193	8"	Red Pine	Pinus resinosa				X		X
1194	8"	Red Pine	Pinus resinosa				X		X
1195	10"	Red Pine	Pinus resinosa				X		X
1196	9"	Black Cherry	Prunus serotina				X		X
1197	11"	Red Pine	Pinus resinosa				X		X
1198	7"	Red Pine	Pinus resinosa				X		X
1199	8"	Red Pine	Pinus resinosa				X		X
1200	7"	Red Pine	Pinus resinosa				X		
1201	11"	Red Pine	Pinus resinosa				X		
1202	14"	Red Pine	Pinus resinosa				X		
1203	10"	Red Pine	Pinus resinosa				X		
1204	13"	Red Pine	Pinus resinosa				X		
1205	7"	Red Pine	Pinus resinosa				X		
1206	13"	Red Pine	Pinus resinosa				X		
1207	9"	Red Pine	Pinus resinosa				X		
1208	14"	Red Pine	Pinus resinosa				X		
1209	9"	Black Cherry	Prunus serotina				X		
1210	8"	Red Oak	Quercus rubra				X		
1211	14"	Red Pine	Pinus resinosa				X		
1212	18"	Norway Spruce	Picea abies			X			
1213	7"	Red Pine	Pinus resinosa				X		
1214	8"	Red Pine	Pinus resinosa				X		
1215	8"	Red Pine	Pinus resinosa				X		
1216	12"	Norway Spruce	Picea abies				X		
1217	14"	White Pine	Pinus strubus				X		
1218	11"	Red Pine	Pinus resinosa				X		
1219	7"	Red Pine	Pinus resinosa				X		
1220	6"	Red Pine	Pinus resinosa				X		
1221	7"	Norway Spruce	Picea abies				X		
1222	7"	Red Pine	Pinus resinosa				X		
1223	6"	Norway Spruce	Picea abies				X		
1224	7"	Red Pine	Pinus resinosa				X		
1225	8"	Red Pine	Pinus resinosa				X		
1226	7"	Red Pine	Pinus resinosa				X		
1227	9"	Red Pine	Pinus resinosa				X		
1228	6"	Red Pine	Pinus resinosa				X		
1229	7"	Red Pine	Pinus resinosa				X		
1230	6"	Red Pine	Pinus resinosa				X		
1231	6"	Red Pine	Pinus resinosa				X		
1232	8"	Red Pine	Pinus resinosa				X		
1233	7"	Norway Spruce	Picea abies				X		
1234	6"	Red Pine	Pinus resinosa				X		
1235	10"	Red Pine	Pinus resinosa				X		
1236	9"	Red Pine	Pinus resinosa				X		
1237	7"	Red Pine	Pinus resinosa				X		
1238	7"	Red Pine	Pinus resinosa				X		
1239	6"	Red Pine	Pinus resinosa				X		
1240	8"	Red Pine	Pinus resinosa				X		
1241	8"	Red Pine	Pinus resinosa				X		X
1242	7"	Red Pine	Pinus resinosa				X		X
1243	7"	Red Pine	Pinus resinosa				X		X
1244	9"	Red Pine	Pinus resinosa				X		
1245	18"	Norway Spruce	Picea abies			X			X
1246	7"	Red Pine	Pinus resinosa				X		X
1247	8"	Red Pine	Pinus resinosa				X		X
1248	9"	Red Pine	Pinus resinosa				X		X
1249	16"	Norway Spruce	Picea abies				X		X
1250	17"	Sugar Maple	Acer saccharum				X		X
1251	27"	Sugar Maple	Acer saccharum			X			X
1252	17"	Norway Spruce	Picea abies				X		X

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
1316	8"	Red Pine	Pinus resinosa				X		X
1317	9"	Red Pine	Pinus resinosa				X		X
1318	16"	Norway Spruce	Picea abies				X		X
1319	11"	Red Pine	Pinus resinosa				X		X
1320	13"	Red Pine	Pinus resinosa				X		X
1321	11"	Red Pine	Pinus resinosa				X		X
1322	7"	Red Pine	Pinus resinosa				X		X
1323	11"	Red Pine	Pinus resinosa				X		X
1324	10"	Red Pine	Pinus resinosa				X		X
1325	9"	Red Pine	Pinus resinosa				X		X
1326	12"	Red Pine	Pinus resinosa				X		X
1327	11"	Red Pine	Pinus resinosa				X		X
1328	11"	Red Pine	Pinus resinosa				X		X
1329	28"	Norway Spruce	Picea abies			X			X
1330	9"	Red Pine	Pinus resinosa				X		X
1331	9"	Red Pine	Pinus resinosa				X		X
1332	8"	Red Pine	Pinus resinosa				X		X
1333	8"	Red Pine	Pinus resinosa				X		X
1334	8"	Red Pine	Pinus resinosa				X		X
1335	9"	Red Pine	Pinus resinosa				X		X
1336	8"	Red Pine	Pinus resinosa				X		X
1337	8"	Red Pine	Pinus resinosa				X		X
1338	6"	Red Pine	Pinus resinosa				X		X
1339	9"	Red Pine	Pinus resinosa				X		X
1340	8"	Red Pine	Pinus resinosa				X		X
1341	6"	Red Pine	Pinus resinosa				X		X
1342	8"	Red Pine	Pinus resinosa				X		X
1343	8"	Red Pine	Pinus resinosa				X		X
1344	10"	Red Pine	Pinus resinosa				X		X
1345	9"	Red Pine	Pinus resinosa				X		X
1346	6"	Red Pine	Pinus resinosa				X		X
1347	6"	Red Pine	Pinus resinosa				X		X
1348	8"	Red Pine	Pinus resinosa				X		X
1349	8"	Red Pine	Pinus resinosa				X		X
1350	9"	Red Pine	Pinus resinosa				X		X
1351	10"	Red Pine	Pinus resinosa				X		X
1352	12"	Red Pine	Pinus resinosa				X		X
1353	20"	Norway Spruce	Picea abies			X			X
1354	11"	Red Pine	Pinus resinosa				X		X
1355	12"	Red Pine	Pinus resinosa				X		X
1356	10"	Red Pine	Pinus resinosa				X		X
1357	9"	Norway Spruce	Picea abies				X		X
1358	8"	Black Walnut	Juglans nigra				X		X
1359	10"	Bur Oak	Quercus macrocarpa				X		X
1360	8"	Red Oak	Quercus rubra				X		X
1361	8"	Black Walnut	Juglans nigra				X		X
1362	10"	Black Walnut	Juglans nigra				X		X
1363	18"	Black Walnut	Juglans nigra				X		X
1364	9"	Black Walnut	Juglans nigra				X		
1365	10"	Black Walnut	Juglans nigra				X		
1366	9"	Black Walnut	Juglans nigra				X		
1367	8"	Black Walnut	Juglans nigra				X		
1368	11"	Black Walnut	Juglans nigra				X		
1369	8"	Red Oak	Quercus rubra				X		X
1370	11"	Black Walnut	Juglans nigra				X		X
1371	8"	Red Oak	Quercus rubra				X		X
1372	7"	Red Pine	Pinus resinosa				X		X
1373	12"	Red Pine	Pinus resinosa				X		X
1374	12"	Red Pine	Pinus resinosa				X		X
1375	10"	Red Pine	Pinus resinosa				X		X
1376	11"	Red Pine	Pinus resinosa				X		X
1377	13"	Red Pine	Pinus resinosa				X		X
1378	7"	Red Pine	Pinus resinosa				X		X

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
1441	17"	Red Oak	Quercus rubra				X		
1442	16"	Black Cherry	Prunus serotina				X		
1443	7"	Pignut Hickory	Carya glabra				X		
1444	8"	Pignut Hickory	Carya glabra				X		
1445	9"	Pignut Hickory	Carya glabra				X		
1446	17"	Red Oak	Quercus rubra				X		
1447	12"	Tuliptree	Liriodendron tulipifera				X		
1448	15"	Pignut Hickory	Carya glabra				X		
1449	12"	Red Oak	Quercus rubra				X		
1450	9"	Red Oak	Quercus rubra				X		
1451	8"	Pignut Hickory	Carya glabra				X		
1452	11"	Pignut Hickory	Carya glabra				X		
1453	8"	Shagbark Hickory	Carya ovata				X		
1454	7"	Black Walnut	Juglans nigra				X		
1455	9"	Norway Spruce	Picea abies				X		
1456	18"	Red Oak	Quercus rubra			X			
1457	18"	Red Oak	Quercus rubra			X			
1458	10"	Norway Spruce	Picea abies				X		
1459	12"	Red Oak	Quercus rubra				X		
1460	23"	Red Oak	Quercus rubra			X			
1461	9"	Black Cherry	Prunus serotina				X		
1462	7"	Pignut Hickory	Carya glabra				X		
1463	17"	Red Oak	Quercus rubra				X		
1464	10"	Norway Spruce	Picea abies				X		
1465	7"	Norway Spruce	Picea abies				X		
1466	7"	Pignut Hickory	Carya glabra				X		
1467	13"	White Oak	Quercus alba				X		
1468	15"	Red Oak	Quercus rubra				X		
1469	10"	Red Oak	Quercus rubra				X		
1470	9"	Red Oak	Quercus rubra				X		
1471	7"	White Oak	Quercus alba				X		
1472	18"	Red Oak	Quercus rubra			X			
1473	9"	Black Cherry	Prunus serotina				X		
1474	14"	White Oak	Quercus alba				X		
1475	14"	White Oak	Quercus alba				X		
1476	8"	Pignut Hickory	Carya glabra				X		
1477	14"	Black Walnut	Juglans nigra				X		
1478	22"	Red Oak	Quercus rubra			X			
1479	25"	Red Oak	Quercus rubra			X			
1480	7"	Shagbark Hickory	Carya ovata				X		
1481	20"	Red Oak	Quercus rubra			X			
1482	9"	Shagbark Hickory	Carya ovata				X		
1483	25"	Red Oak	Quercus rubra			X			
1484	16"	Red Oak	Quercus rubra				X		
1485	15"	Red Oak	Quercus rubra				X		
1486	11"	Black Cherry	Prunus serotina				X		
1487	20"	Pignut Hickory	Carya glabra			X			
1488	30"	Black Walnut	Juglans nigra			X			
1489	22"	Red Oak	Quercus rubra			X			
1490	17"	Pignut Hickory	Carya glabra				X		
1491	8"	Black Cherry	Prunus serotina				X		
1492	8"	Black Cherry	Prunus serotina				X		
1493	17"	Sugar Maple	Acer saccharum				X		
1494	15"	Shagbark Hickory	Carya ovata				X		
1495	28"	Black Walnut	Juglans nigra			X			
1496	24"	Red Oak	Quercus rubra			X			
1497	10"	Black Cherry	Prunus serotina				X		
1498	8"	Red Oak	Quercus rubra				X		
1499	12"	Red Oak	Quercus rubra				X		
1500	12"	Red Oak	Quercus rubra				X		
1501	23"	Red Oak	Quercus rubra			X			
1502	20"	Pignut Hickory	Carya glabra			X			
1503	14"	Shagbark Hickory	Carya ovata				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
1567	7"	Pignut Hickory	Carya glabra				X		
1568	24"	Red Oak	Quercus rubra			X			
1569	7"	Black Cherry	Prunus serotina				X		
1570	26"	Red Oak	Quercus rubra			X			
1571	8"	Black Cherry	Prunus serotina				X		
1572	23"	Red Oak	Quercus rubra			X			
1573	23"	Red Oak	Quercus rubra			X			
1574	30"	Red Oak	Quercus rubra			X			
1575	22"	Red Oak	Quercus rubra			X			
1576	13"	Shagbark Hickory	Carya ovata				X		
1577	16"	Shagbark Hickory	Carya ovata				X		
1578	17"	Pignut Hickory	Carya glabra				X		
1579	7"	Pignut Hickory	Carya glabra				X		
1580	24"	Red Oak	Quercus rubra			X			
1581	34"	Red Oak	Quercus rubra			X			
1582	27"	Red Oak	Quercus rubra			X			
1583	20"	Red Oak	Quercus rubra			X			
1584	10"	Black Cherry	Prunus serotina				X		
1585	6"	Black Cherry	Prunus serotina				X		
1586	35"	Red Oak	Quercus rubra			X			
1587	13"	Norway Spruce	Picea abies				X		
1588	18"	Red Oak	Quercus rubra			X			
1589	16"	Black Walnut	Juglans nigra				X		
1590	14"	Black Walnut	Juglans nigra				X		
1591	7"	Black Walnut	Juglans nigra				X		
1592	10"	Red Oak	Quercus rubra				X		
1593	9"	Black Walnut	Juglans nigra				X		
1594	9"	Black Walnut	Juglans nigra				X		
1595	11"	Black Walnut	Juglans nigra				X		
1596	12"	Black Walnut	Juglans nigra				X		X
1597	12"	Black Walnut	Juglans nigra				X		X
1598	10"	Red Oak	Quercus rubra				X		X
1599	13"	Black Cherry	Prunus serotina				X		X
1600	29"	Red Oak	Quercus rubra			X			X
2001	6"	Red Oak	Quercus rubra				X		
2002	6"	Box Elder	Acer negundo				X		
2003	6"	Red Oak	Quercus rubra				X		
2004	11"	Black Walnut	Juglans nigra				X		
2005	7"	Black Walnut	Juglans nigra				X		
2006	7"	Black Walnut	Juglans nigra				X		
2007	6"	Black Walnut	Juglans nigra				X		
2008	7"	Black Cherry	Prunus serotina				X		
2009	6"	Red Cedar	Juniperus virginiana				X		
2010	8"	Black Walnut	Juglans nigra				X		
2011	22"	Black Cherry	Prunus serotina	twin		X			
2012	9"	White Spruce	Picea glauca				X		
2013	10"	White Spruce	Picea glauca				X		
2014	7"	Red Pine	Pinus resinosa				X		
2015	12"	Red Pine	Pinus resinosa				X		
2016	10"	Red Pine	Pinus resinosa				X		
2017	12"	White Spruce	Picea glauca				X		
2018	10"	Red Pine	Pinus resinosa				X		
2019	10"	Red Pine	Pinus resinosa				X		
2020	12"	Red Pine	Pinus resinosa				X		
2021	10"	White Spruce	Picea glauca				X		
2022	6"	Red Pine	Pinus resinosa				X		
2023	7"	White Pine	Pinus strobus				X		
2024	6"	White Spruce	Picea glauca				X		
2025	11"	Red Pine	Pinus resinosa				X		
2026	16"	Red Pine	Pinus resinosa				X		
2027	7"	White Spruce	Picea glauca				X		
2028	12"	White Pine	Pinus strobus				X		
2029	7"	White Pine	Pinus strobus				X		
2030	21"	White Pine	Pinus strobus			X			
2031	7"	Red Oak	Quercus rubra				X		
2032	15"	White Pine	Pinus strobus				X		
2033	12"	White Pine	Pinus strobus				X		

NOTE: REMOVALS NOTED AS CRZ ARE TREES TO REMAIN BUT ARE INCLUDED IN THE TREE IMPACT/MITIGATION CALCULATIONS DUE TO CRITICAL ROOT ZONE (CRZ) IMPACTS.

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.

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BRIDGEWOOD HILLS II, LLC
2723 SOUTH STATE STREET, SUITE250
ANN ARBOR, MICHIGAN 48104
GREG COPP
734-930-6700

MORRISON HILLS
PRIVATE ROAD
TREE INVENTORY LIST 1 OF 2

14

DATE: 03/16/22
SHEET 14 OF 19
CADD: RMLII
ENG: HTH
PM: TJC
TECH: RMLII
/21188EX01

JOB No. 21188A

REVISIONS:	REV. DATE
TOWNSHIP REVIEW	6/17/22
TOWNSHIP REVIEW	07/25/22
TOWNSHIP REVIEW	8/12/22
TOWNSHIP SUBMITTAL	12/21/22
PER EGLE AND COUNTY SESC REVIEW	01/30/23

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
2034	7"	White Pine	Pinus strobus				X		
2035	12"	White Pine	Pinus strobus				X		
2036	9"	White Pine	Pinus strobus				X		
2037	10"	White Pine	Pinus strobus				X		
2038	11"	White Pine	Pinus strobus				X		
2039	7"	White Pine	Pinus strobus				X		
2040	12"	White Pine	Pinus strobus				X		
2041	12"	White Spruce	Picea glauca				X		
2042	11"	White Spruce	Picea glauca				X		
2043	12"	White Pine	Pinus strobus				X		
2044	12"	White Pine	Pinus strobus				X		
2045	9"	White Pine	Pinus strobus				X		
2046	9"	White Pine	Pinus strobus				X		
2047	13"	White Pine	Pinus strobus				X		
2048	10"	White Pine	Pinus strobus				X		
2049	8"	Shagbark Hickory	Carya ovata				X		
2050	9"	White Pine	Pinus strobus				X		
2051	10"	White Pine	Pinus strobus				X		
2052	15"	White Spruce	Picea glauca				X		
2053	9"	White Spruce	Picea glauca				X		
2054	9"	Red Oak	Quercus rubra				X		
2055	12"	American Elm	Ulmus americana				X		
2056	15"	Cottonwood	Populus deltoides				X		
2057	6"	White Spruce	Picea glauca				X		
2058	10"	White Pine	Pinus strobus				X		
2059	9"	White Pine	Pinus strobus				X		
2060	9"	White Spruce	Picea glauca				X		
2061	7"	White Spruce	Picea glauca				X		
2062	6"	White Spruce	Picea glauca				X		
2063	14"	Red Oak	Quercus rubra				X		
2064	8"	Black Cherry	Prunus serotina				X		
2065	15"	Black Cherry	Prunus serotina				X		
2066	8"	Red Oak	Quercus rubra				X		
2067	17"	Red Oak	Quercus rubra	triple			X		
2068	17"	Red Oak	Quercus rubra				X		
2069	6"	White Pine	Pinus strobus				X		
2070	12"	White Pine	Pinus strobus				X		
2071	6"	White Pine	Pinus strobus				X		
2072	10"	White Pine	Pinus strobus				X		
2073	11"	Shagbark Hickory	Carya ovata				X		
2074	6"	White Pine	Pinus strobus				X		
2075	9"	Shagbark Hickory	Carya ovata				X		
2076	12"	Shagbark Hickory	Carya ovata				X		
2077	6"	White Pine	Pinus strobus				X		
2078	6"	White Pine	Pinus strobus				X		
2079	8"	White Pine	Pinus strobus				X		
2080	12"	Shagbark Hickory	Carya ovata				X		
2081	15"	White Pine	Pinus strobus				X		
2082	6"	White Spruce	Picea glauca				X		
2083	10"	White Spruce	Picea glauca				X		
2084	6"	White Spruce	Picea glauca				X		
2085	17"	White Pine	Pinus strobus				X		
2086	8"	White Pine	Pinus strobus				X		
2087	7"	Shagbark Hickory	Carya ovata				X		
2088	9"	White Pine	Pinus strobus				X		
2089	11"	White Pine	Pinus strobus				X		
2090	13"	White Pine	Pinus strobus				X		
2091	6"	White Pine	Pinus strobus				X		
2092	16"	White Pine	Pinus strobus				X		
2093	6"	White Pine	Pinus strobus				X		
2094	14"	White Pine	Pinus strobus				X		
2095	12"	White Pine	Pinus strobus				X		
2096	11"	White Pine	Pinus strobus				X		
2097	7"	White Pine	Pinus strobus				X		
2098	6"	Red Pine	Pinus resinosa				X		
2099	9"	Red Pine	Pinus resinosa				X		
2100	12"	White Pine	Pinus strobus				X		
2101	12"	White Spruce	Picea glauca				X		
2102	9"	White Pine	Pinus strobus				X		
2103	12"	White Pine	Pinus strobus				X		
2104	10"	White Pine	Pinus strobus				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
2105	14"	White Pine	Pinus strobus				X		
2106	10"	White Pine	Pinus strobus				X		
2107	13"	White Pine	Pinus strobus				X		
2108	8"	White Pine	Pinus strobus				X		
2109	6"	White Pine	Pinus strobus				X		
2110	6"	White Pine	Pinus strobus				X		
2111	13"	White Pine	Pinus strobus				X		
2112	8"	White Pine	Pinus strobus				X		
2113	8"	White Pine	Pinus strobus				X		
2114	11"	White Spruce	Picea glauca				X		
2115	10"	Red Pine	Pinus resinosa				X		
2116	15"	White Spruce	Picea glauca				X		
2117	9"	Red Pine	Pinus resinosa				X		
2118	13"	Red Pine	Pinus resinosa				X		
2119	7"	Red Pine	Pinus resinosa				X		
2120	7"	Red Pine	Pinus resinosa				X		
2121	11"	Red Pine	Pinus resinosa				X		
2122	11"	White Spruce	Picea glauca				X		
2123	13"	White Pine	Pinus strobus				X		
2124	6"	White Spruce	Picea glauca				X		
2125	15"	White Pine	Pinus strobus				X		
2126	9"	White Spruce	Picea glauca				X		
2127	12"	White Pine	Pinus strobus				X		
2128	9"	White Pine	Pinus strobus				X		
2129	11"	White Pine	Pinus strobus				X		
2130	8"	White Pine	Pinus strobus				X		
2131	14"	White Pine	Pinus strobus				X		
2132	8"	White Pine	Pinus strobus				X		
2133	10"	White Pine	Pinus strobus				X		
2134	10"	White Pine	Pinus strobus				X		
2135	9"	White Pine	Pinus strobus				X		
2136	12"	White Pine	Pinus strobus				X		
2137	10"	White Pine	Pinus strobus				X		
2138	10"	White Pine	Pinus strobus				X		
2139	7"	White Pine	Pinus strobus				X		
2140	11"	White Pine	Pinus strobus				X		
2141	12"	White Pine	Pinus strobus				X		
2142	8"	White Pine	Pinus strobus				X		
2143	10"	White Pine	Pinus strobus				X		
2144	15"	White Pine	Pinus strobus				X		
2145	12"	White Pine	Pinus strobus				X		
2146	9"	White Pine	Pinus strobus				X		
2147	9"	White Pine	Pinus strobus				X		
2148	10"	White Pine	Pinus strobus				X		
2149	10"	Red Oak	Quercus rubra				X		
2150	10"	White Pine	Pinus strobus				X		
2151	10"	White Pine	Pinus strobus				X		
2152	11"	White Pine	Pinus strobus				X		
2153	7"	White Pine	Pinus strobus				X		
2154	7"	Shagbark Hickory	Carya ovata				X		
2155	7"	White Pine	Pinus strobus				X		
2156	9"	White Pine	Pinus strobus				X		
2157	15"	White Pine	Pinus strobus				X		
2158	8"	White Pine	Pinus strobus				X		
2159	8"	White Pine	Pinus strobus				X		
2160	13"	White Pine	Pinus strobus				X		
2161	7"	White Pine	Pinus strobus				X		
2162	8"	White Pine	Pinus strobus				X		
2163	8"	White Spruce	Picea glauca				X		
2164	7"	White Spruce	Picea glauca				X		
2165	17"	White Pine	Pinus strobus				X		
2166	8"	White Spruce	Picea glauca				X		
2167	7"	Red Oak	Quercus rubra				X		
2168	16"	White Pine	Pinus strobus				X		
2169	16"	White Pine	Pinus strobus				X		
2170	11"	White Pine	Pinus strobus				X		
2171	10"	White Pine	Pinus strobus				X		
2172	9"	White Pine	Pinus strobus				X		
2173	17"	White Pine	Pinus strobus				X		
2174	12"	White Pine	Pinus strobus				X		
2175	6"	Shagbark Hickory	Carya ovata				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
2176	10"	White Pine	Pinus strobus				X		
2177	14"	White Pine	Pinus strobus				X		
2178	12"	White Pine	Pinus strobus				X		
2179	13"	White Pine	Pinus strobus				X		
2180	11"	White Pine	Pinus strobus				X		
2181	9"	White Pine	Pinus strobus				X		
2182	14"	White Pine	Pinus strobus				X		
2183	10"	White Pine	Pinus strobus				X		
2184	11"	White Pine	Pinus strobus				X		
2185	10"	White Pine	Pinus strobus				X		
2186	9"	White Pine	Pinus strobus				X		
2187	8"	White Pine	Pinus strobus				X		
2188	12"	White Spruce	Picea glauca				X		
2189	12"	Red Pine	Pinus resinosa				X		
2190	14"	Red Pine	Pinus resinosa				X		
2191	14"	Red Pine	Pinus resinosa				X		
2192	10"	Red Pine	Pinus resinosa				X		
2193	12"	Red Pine	Pinus resinosa				X		
2194	11"	Red Pine	Pinus resinosa				X		
2195	10"	Red Pine	Pinus resinosa				X		
2196	12"	Red Pine	Pinus resinosa				X		
2197	9"	White Spruce	Picea glauca				X		
2198	12"	White Spruce	Picea glauca				X		
2199	12"	White Pine	Pinus strobus				X		
2200	11"	White Pine	Pinus strobus				X		
2201	11"	White Spruce	Picea glauca				X		
2202	10"	White Spruce	Picea glauca				X		
2203	10"	White Pine	Pinus strobus				X		
2204	13"	White Spruce	Picea glauca				X		
2205	6"	White Spruce	Picea glauca				X		
2206	15"	White Pine	Pinus strobus				X		
2207	13"	White Pine	Pinus strobus				X		
2208	11"	White Pine	Pinus strobus				X		
2209	8"	White Pine	Pinus strobus				X		
2210	7"	White Pine	Pinus strobus				X		
2211	10"	White Pine	Pinus strobus				X		
2212	12"	White Pine	Pinus strobus				X		
2213	10"	White Pine	Pinus strobus				X		
2214	13"	White Pine	Pinus strobus				X		
2215	13"	White Pine	Pinus strobus				X		
2216	11"	White Pine	Pinus strobus				X		
2217	10"	White Pine	Pinus strobus				X		
2218	15"	White Pine	Pinus strobus				X		
2219	10"	White Pine	Pinus strobus				X		
2220	8"	White Pine	Pinus strobus				X		
2221	11"	White Pine	Pinus strobus				X		
2222	9"	White Pine	Pinus strobus				X		
2223	12"	White Pine	Pinus strobus				X		
2224	14"	White Pine	Pinus strobus				X		
2225	6"	White Pine	Pinus strobus				X		
2226	7"	Shagbark Hickory	Carya ovata				X		
2227	17"	Pignut Hickory	Carya glabra				X		
2228	8"	Pignut Hickory	Carya glabra				X		
2229	8"	White Spruce	Picea glauca				X		
2230	8"	Red Oak	Quercus rubra				X		
2231	7"	Shagbark Hickory	Carya ovata				X		
2232	8"	Red Oak	Quercus rubra				X		
2233	8"	White Pine	Pinus strobus				X		
2234	14"	Red Oak	Quercus rubra				X		X
2235	17"	Red Oak	Quercus rubra				X		X
2236	20"	Red Oak	Quercus rubra			X			X
2237	7"	Shagbark Hickory	Carya ovata				X		X
2238	16"	Red Oak	Quercus rubra				X		X
2239	11"	Red Oak	Quercus rubra				X		X
2240	16"	Red Oak	Quercus rubra				X		X
2241	6"	White Spruce	Picea glauca				X		X
2242	6"	White Pine	Pinus strobus				X		X
2243	9"	White Pine	Pinus strobus				X		X
2244	9"	White Pine	Pinus strobus				X		CRZ
2245	9"	White Pine	Pinus strobus				X		
2246	7"	White Pine	Pinus strobus				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
2247	11"	White Pine	Pinus strobus				X		CRZ
2248	10"	White Pine	Pinus strobus				X		X
2249	7"	White Pine	Pinus strobus				X		
2250	7"	White Pine	Pinus strobus				X		
2251	13"	White Pine	Pinus strobus				X		
2252	10"	White Pine	Pinus strobus				X		
2253	9"	White Pine	Pinus strobus				X		
2254	10"	White Pine	Pinus strobus				X		
2255	11"	White Pine	Pinus strobus				X		
2256	13"	White Pine	Pinus strobus				X		
2257	11"	White Pine	Pinus strobus				X		
2258	9"	White Pine	Pinus strobus				X		
2259	9"	White Pine	Pinus strobus				X		X
2260	8"	White Pine	Pinus strobus				X		
2261	8"	White Pine	Pinus strobus				X		X
2262	8"	White Pine	Pinus strobus				X		X
2263	10"	White Pine	Pinus strobus				X		X
2264	11"	White Pine	Pinus strobus				X		
2265	10"	White Pine	Pinus strobus				X		
2266	10"	White Pine	Pinus strobus				X		
2267	11"	White Spruce	Picea glauca				X		
2268	11"	Red Pine	Pinus resinosa				X		
2269	9"	Red Pine	Pinus resinosa				X		
2270	8"	White Spruce	Picea glauca				X		
2271	11"	White Spruce	Picea glauca				X		
2272	11"	White Spruce	Picea glauca				X		
2273	13"	Red Pine	Pinus resinosa				X		
2274	11"	Red Pine	Pinus resinosa				X		CRZ
2275	11"	Red Pine	Pinus resinosa				X		X
2276	12"	Red Pine	Pinus resinosa				X		X
2277	9"	White Spruce	Picea glauca				X		X
2278	12"	White Spruce	Picea glauca				X		X
2279	10"	Red Pine	Pinus resinosa				X		X
2280	10"	Red Pine	Pinus resinosa				X		X
2281	12"	Red Pine	Pinus resinosa				X		X
2282	13"	White Spruce	Picea glauca				X		X
2283	8"	Red Pine	Pinus resinosa				X		X
2284	10"	Red Pine	Pinus resinosa				X		X
2285	12"	White Spruce	Picea glauca				X		X
2286	9"	White Spruce	Picea glauca				X		X
2287	9"	Red Pine	Pinus resinosa				X		X
2288	8"	Shagbark Hickory	Carya ovata				X		X
2289	8"	White Spruce	Picea glauca				X		X
2290	10"	White Spruce	Picea glauca				X		X
2291	11"	White Spruce	Picea glauca				X		X
2292	8"	White Spruce	Picea glauca				X		X
2293	13"	White Spruce	Picea glauca				X		X
2294	7"	White Spruce	Picea glauca				X		X
2295	8"	White Spruce	Picea glauca				X		X
2296	12"	White Pine	Pinus strobus				X		X
2297	13"	White Pine	Pinus strobus				X		X
2298	11"	White Pine	Pinus strobus				X		X
2299	11"	White Pine	Pinus strobus				X		X
2300	10"	White Pine	Pinus strobus				X		X
2301	15"	White Pine	Pinus strobus				X		X
2302	7"	White Pine	Pinus strobus				X		X
2303	13"	White Pine	Pinus strobus				X		X
2304	10"	White Spruce	Picea glauca				X		X
2305	11"	Red Oak	Quercus rubra				X		X
2306	6"	White Oak	Quercus alba				X		X
2307	7"	Black Cherry	Prunus serotina				X		X
2308	7"	White Spruce	Picea glauca				X		X
2309	10"	White Spruce	Picea glauca				X		X
2310	8"	White Spruce	Picea glauca				X		X
2311	6"	White Spruce	Picea glauca				X		
2312	9"	Shagbark Hickory	Carya ovata				X		
2313	8"	White Spruce	Picea glauca				X		X
2314	15"	White Spruce	Picea glauca				X		X
2315	6"	Linden	Tilia americana				X		X
2316	11"	White Spruce	Picea glauca				X		X
2317	8"	White Spruce	Picea glauca				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
2318	7"	White Spruce	Picea glauca				X		
2319	10"	White Spruce	Picea glauca				X		
2320	17"	Norway Spruce	Picea abies				X		X
2321	8"	Black Cherry	Prunus serotina				X		X
2322	18"	Norway Spruce	Picea abies			X			X
2323	13"	Red Oak	Quercus rubra				X		
2324	15"	Tuliptree	Liriodendron tulipifera				X		X
2325	13"	Norway Spruce	Picea abies				X		X
2326	17"	Sugar Maple	Acer saccharum				X		X
2327	18"	Tuliptree	Liriodendron tulipifera				X		X
2328	17"	Tuliptree	Liriodendron tulipifera				X		X
2329	16"	Black Cherry	Prunus serotina		40%				X
2330	13"	American Elm	Ulmus americana				X		X
2331	11"	Black Cherry	Prunus serotina				X		X
2332	32"	Bur Oak	Quercus macrocarpa			X			X
2333	8"	Black Cherry	Prunus serotina				X		
2334	8"	Red Oak	Quercus rubra				X		
2335	16"	Red Oak	Quercus rubra				X		
2336	13"	Red Oak	Quercus rubra				X		
2337	15"	Red Oak	Quercus rubra				X		
2338	7"	Red Oak	Quercus rubra				X		
2339	17"	Red Oak	Quercus rubra				X		
2340	12"	Black Cherry	Prunus serotina				X		
2341	11"	Red Oak	Quercus rubra				X		
2342	8"	Pignut Hickory	Carya glabra				X		
2343	11"	Silver Maple	Acer saccharinum				X		
2344	12"	Silver Maple	Acer saccharinum				X		
2345	9"	Red Oak	Quercus rubra				X		
2346	31"	Red Oak	Quercus rubra		40%				
2347	7"	Black Cherry	Prunus serotina				X		
2348	7"	American Elm	Ulmus americana				X		X
2349	7"	American Elm	Ulmus americana				X		X
2350	22"	Red Oak	Quercus rubra			X			
2351	14"	Pignut Hickory	Carya glabra				X		
2352	17"	Pignut Hickory	Carya glabra				X		
2353	6"	Linden	Tilia americana				X		
2354	10"	Red Oak	Quercus rubra				X		
2355	11"	Shagbark Hickory	Carya ovata				X		
2356	11"	Shagbark Hickory	Carya ovata				X		
2357	7"	Shagbark Hickory	Carya ovata				X		
2358	11"	Black Cherry	Prunus serotina				X		
2359	7"	Black Cherry	Prunus serotina				X		
2360	14"	Black Cherry	Prunus serotina				X		
2361	8"	Red Oak	Quercus rubra				X		
2362	37"	White Oak	Quercus alba			X			
2363	6"	Black Cherry	Prunus serotina				X		
2364	8"	Linden	Tilia americana				X		
2365	16"	Black Cherry	Prunus serotina				X		
2366	10"	Black Cherry	Prunus serotina				X		
2367	26"	Red Oak	Quercus rubra			X			
2368	31"	Red Oak	Quercus rubra			X			
2369	11"	Linden	Tilia americana				X		
2370	7"	Linden	Tilia americana				X		
2371	31"	Red Oak	Quercus rubra		40%				
2372	12"	Bitternut Hickory	Carya cordiformis				X		
2373	6"	Black Cherry	Prunus serotina				X		
2374	6"	Bitternut Hickory	Carya cordiformis				X		
2375	11"	Red Oak	Quercus rubra				X		
2376	6"	Red Oak	Quercus rubra				X		
2377	7"	Sweet Cherry	Prunus avuim				X		
2378	15"	Linden	Tilia americana				X		
2379	8"	Bitternut Hickory	Carya cordiformis				X		
2380	11"	Linden	Tilia americana				X		
2381	8"	Linden	Tilia americana				X		
2382	9"	Black Cherry	Prunus serotina				X		
2383	6"	White Oak	Quercus alba				X		
2384	24"	Linden	Tilia americana			X			
2385	20"	Red Oak	Quercus rubra			X			
2386	39"	Red Oak	Quercus rubra		40%				
2387	9"	Linden	Tilia americana				X		
2388	9"	Sassafras	Sassafras albidum				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
2389	11"	Black Cherry	Prunus serotina				X		
2390	12"	Linden	Tilia americana				X		CRZ
2391	13"	Linden	Tilia americana				X		X
2392	27"	Red Oak	Quercus rubra			X			
2393	18"	White Oak	Quercus alba			X			
2394	21"	Red Oak	Quercus rubra		40%				
2395	8"	Silver Maple	Acer saccharinum				X		
2396	31"	White Oak	Quercus alba			X			
2397	8"	Black Cherry	Prunus serotina	twin			X		
2398	12"	Linden	Tilia americana				X		
2399	12"	Black Cherry	Prunus serotina				X		
2400	8"	Linden	Tilia americana				X		
2401	11"	Red Oak	Quercus rubra				X		
2402	11"	Black Cherry	Prunus serotina				X		
2403	13"	Linden	Tilia americana				X		
2404	11"	Linden	Tilia americana				X		
2405	8"	Bigtooth Aspen	Populus grandidentata				X		
2406	6"	Bigtooth Aspen	Populus grandidentata				X		
2407	11"	Linden	Tilia americana				X		
2408	10"	Shagbark Hickory	Carya ovata				X		
2409	8"	Shagbark Hickory	Carya ovata				X		
2410	8"	Shagbark Hickory	Carya ovata				X		
2411	33"	Black Oak	Quercus velutina			X			CRZ
2412	25"	Black Oak	Quercus velutina			X			X
2413	7"	Black Cherry	Prunus serotina				X		
2414	28"	Black Oak	Quercus velutina		40%				X
2415	7"	Sweet Cherry	Prunus avuim				X		X
2416	21"	White Oak	Quercus alba			X			X
2417	9"	Norway Spruce	Picea abies				X		X
2418	13"	Tuliptree	Liriodendron tulipifera				X		X
2419	9"	Linden	Tilia americana				X		
2420	11"	Black Walnut	Juglans nigra				X		
2421	22"	Red Oak	Quercus rubra			X			X
2422	7"	American Elm	Ulmus americana				X		X
2423	28"	Red Oak	Quercus rubra			X			X
2424	27"	American Elm	Ulmus americana			X			X
2425	8"	American Elm	Ulmus americana				X		X
2426	6"	American Elm	Ulmus americana				X		X
2427	7"	Silver Maple	Acer saccharinum				X		X
2428	6"	American Elm	Ulmus americana				X		X
2429	7"	Black Cherry	Prunus serotina				X		
2430	7"	Silver Maple	Acer saccharinum				X		
2431	6"	Silver Maple	Acer saccharinum				X		X
2432	33"	White Oak	Quercus alba			X			X
2433	15"	Red Oak	Quercus rubra				X		
2434	8"	Black Cherry	Prunus serotina				X		
2435	9"	Sweet Cherry	Prunus avuim				X		
2436	19"	Red Oak	Quercus rubra		40%				
2437	11"	Black Oak	Quercus velutina				X		
2438	21"	Pignut Hickory	Carya glabra			X			
2439	7"	American Elm	Ulmus americana				X		
2440	6"	American Elm	Ulmus americana				X		
2441	18"	White Oak	Quercus alba			X			
2442	11"	Red Oak	Quercus rubra				X		
2443	27"	Red Oak	Quercus rubra			X			
2444	10"	Red Oak	Quercus rubra				X		
2445	9"	Black Cherry	Prunus serotina				X		
2446	6"	Pignut Hickory	Carya glabra				X		
2447	9"	Black Walnut	Juglans nigra				X		
2448	10"	American Elm	Ulmus americana				X		
2449	19"	Red Oak	Quercus rubra			X			
2450	7"	American Elm	Ulmus americana				X		
2451	12"	Black Cherry	Prunus serotina				X		
2452	42"	Red Oak	Quercus rubra			X			
2453	27"	Red Oak	Quercus rubra			X			
2454	6"	Silver Maple	Acer saccharinum				X		
2455	7"	Silver Maple	Acer saccharinum				X		
2456	20"	Red Oak	Quercus rubra			X			
2457	11"	Black Walnut	Juglans nigra				X		
2458	11"	White Oak	Quercus alba				X		
2459	14"	White Oak	Quercus alba				X		

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
2460	17"	Red Oak	Quercus rubra		40%				X
2461	29"	Red Oak	Quercus rubra			X			X
2462	16"	Silver Maple	Acer saccharinum	twin			X		X
2463	7"	American Elm	Ulmus americana				X		
2464	6"	Black Cherry	Prunus serotina				X		X
2465	6"	American Elm	Ulmus americana				X		X
2466	7"	American Elm	Ulmus americana				X		X
2467	20"	White Oak	Quercus alba			X			
2468	16"	Red Oak	Quercus rubra				X		
2469	20"	Black Oak	Quercus velutina			X			
2470	16"	Black Oak	Quercus velutina				X		
2471	8"	Norway Spruce	Picea abies				X		
2472	8"	Tuliptree	Liriodendron tulipifera				X		
2473	9"	Norway Spruce	Picea abies				X		
2475	8"	Tuliptree	Liriodendron tulipifera				X		
2476	14"	Tuliptree	Liriodendron tulipifera				X		
2477	13"	Shagbark Hickory	Carya ovata				X		
2478	28"	Black Oak	Quercus velutina		40%				
2479	27"	Black Oak	Quercus velutina			X			
2480	28"	White Oak	Quercus alba			X			
2481	7"	Silver Maple	Acer saccharinum				X		
2482	14"	White Oak	Quercus alba				X		
2483	21"	Red Oak	Quercus rubra			X			
2484	17"	White Oak	Quercus alba				X		
2485	9"	Red Oak	Quercus rubra				X		
2486	28"	White Oak	Quercus alba			X			
2487	8"	Red Oak	Quercus rubra				X		
2488	8"	Black Cherry	Prunus serotina				X		
2489	20"	White Oak	Quercus alba			X			
2490	8"	Red Oak	Quercus rubra				X		
2491	7"	Shagbark Hickory	Carya ovata				X		
2492	11"	Red Oak	Quercus rubra				X		
2493	6"	Red Oak	Quercus rubra				X		
2494	11"	Red Oak	Quercus rubra				X		
2495	12"	Black Cherry	Prunus serotina		40%				
2496	15"	Black Walnut	Juglans nigra				X		
2497	15"	Pignut Hickory	Carya glabra				X		
2498	7"	Pignut Hickory	Carya glabra				X		
2499	7"	Red Oak	Quercus rubra				X		
2500	20"	Red Elm	Ulmus rubra		40%				
2501	10"	Shagbark Hickory	Carya ovata				X		
2502	7"	Black Cherry	Prunus serotina				X		
2503	18"	Black Oak	Quercus velutina		40%				
2504	7"	Shagbark Hickory	Carya ovata				X		
2505	14"	Black Oak	Quercus velutina				X		
2506	13"	Red Oak	Quercus rubra				X		
2507	9"	Black Cherry	Prunus serotina		40%				
2508	26"	Red Oak	Quercus rubra		40%				
2509	20"	Shagbark Hickory	Carya ovata			X			
2510	8"	Shagbark Hickory	Carya ovata				X		
2511	8"	White Oak	Quercus alba				X		
2512	22"	Red Oak	Quercus rubra			X			
2513	26"	Red Oak	Quercus rubra			X			
2514	15"	White Oak	Quercus alba				X		
2515	8"	Black Cherry	Prunus serotina		40%				
2516	8"	American Elm	Ulmus americana	twin			X		
2517	8"	Black Cherry	Prunus serotina				X		
2518	22"	Black Oak	Quercus velutina			X			
2519	7"	Silver Maple	Acer saccharinum				X		
2520	24"	Red Oak	Quercus rubra			X			
2521	16"	Pignut Hickory	Carya glabra				X		
2522	12"	White Oak	Quercus alba		40%				
2523	19"	Red Oak	Quercus rubra			X			
2524	6"	Black Walnut	Juglans nigra				X		
2525	7"	Black Walnut	Juglans nigra				X		
2526	7"	Black Walnut	Juglans nigra				X		
2527	10"	Black Walnut	Juglans nigra				X		
2528	15"	Red Oak	Quercus rubra		40%				
2529	20"	Red Oak	Quercus rubra		40%				
2530	8"	Hop-Hornbeam	Ostrya virginia			X			
2531	19"	Red Oak	Quercus rubra		40%				

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	PROTECTED	INV	REMOVE
2532	20"	Red Oak	Quercus rubra			X			
2533	19"	Red Oak	Quercus rubra			X			
2534	20"	Red Oak	Quercus rubra			X			
2535	8"	Black Cherry	Prunus serotina				X		
2536	13"	Red Oak	Quercus rubra				X		
2537	22"	Red Oak	Quercus rubra			X			
2538	24"	Red Oak	Quercus rubra			X			
2539	27"	White Oak	Quercus alba			X			
2540	11"	Red Oak	Quercus rubra				X		
2541	8"	Shagbark Hickory	Carya ovata				X		
2542	17"	Red Oak	Quercus rubra				X		
2543	12"	Red Oak	Quercus rubra				X		
2544	9"	Red Oak	Quercus rubra				X		
2545	6"	Shagbark Hickory	Carya ovata				X		
2546	28"	Shagbark Hickory	Carya ovata			X			
2547	10"	Red Oak	Quercus rubra				X		
2548	6"	Red Oak	Quercus rubra				X		
2549	13"	Bitternut Hickory	Carya cordiformis				X		
2550	23"	Red Oak	Quercus rubra			X			
2551	13"	Shagbark Hickory	Carya ovata				X		
2552	6"	Silver Maple	Acer saccharinum				X		
2553	31"	Red Oak	Quercus rubra			X			
2554	18"	White Oak	Quercus alba			X			
2555	8"	Shagbark Hickory	Carya ovata				X		
2556	9"	American Elm	Ulmus americana				X		
2557	15"	Shagbark Hickory	Carya ovata				X		
2558	13"	Silver Maple	Acer saccharinum				X		
2559	11"	Red Oak	Quercus rubra				X		
2560	29"	White Oak	Quercus alba			X			
2561	11"	Red Oak	Quercus rubra				X		
2562	22"	Red Oak	Quercus rubra			X			
2563	21"	Red Oak	Quercus rubra			X			
2564	9"	Shagbark Hickory	Carya ovata				X		
2565	30"	Red Oak	Quercus rubra			X			
2566	6"	White Oak	Quercus alba				X		
2567	12"	Shagbark Hickory	Carya ovata				X		
2568	11"	Shagbark Hickory	Carya ovata				X		
2569	6"	American Elm	Ulmus americana				X		
2570	38"	Red Oak	Quercus rubra			X			
2571	7"	Hop-Hornbeam	Ostrya virginia				X		
2572	7"	Black Walnut	Juglans nigra				X		
2573	11"	Black Cherry	Prunus serotina		40%				
2574	17"	Red Oak	Quercus rubra				X		
2575	17"	Red Oak	Quercus rubra				X		
2576	7"	American Elm	Ulmus americana				X		

NOTE: REMOVALS NOTED AS CRZ ARE TREES TO REMAIN BUT ARE INCLUDED IN THE TREE IMPACT/MITIGATION CALCULATIONS DUE TO CRITICAL ROOT ZONE (CRZ) IMPACTS.

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.

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MORRISON HILLS

PRIVATE ROAD
TREE INVENTORY LIST 2 OF 2

15

DATE: 03/16/22
SHEET 15 OF 19

REVISIONS:	REV. DATE	
TOWNSHIP REVIEW	6/17/22	CADD: RMLII
TOWNSHIP REVIEW	07/25/22	ENG: HTH
TOWNSHIP REVIEW	8/12/22	PM: TJC
TOWNSHIP SUBMITTAL	12/21/22	TECH: RMLII
PER EGLE AND COUNTY SESC REVIEW	01/30/23	/21188EX01

JOB No. 21188A

LOG OF TEST PIT

Project No.: 211282 | **Test Pit No.:** TP-1 | **Sheet:** 1 of 1

Project: Bridgewood Hills II Infiltration Testing
Client: MAVD
Location: Scio Township, Michigan
Drill Type:
Crew Chief: Field Eng.: JS Rev. By: RW
Coordinates: N=300860.7 E=132617743 (MI South ift)
Elevation: 875.2 ft Datum: NAVD 88 (GPS Observation)
Notes:
Plugging Record: Backfilled test pit with excavated soil.

Date Begin: 07/29/2021 Date End: 07/29/2021

Excavator	Type: Bucket	Dia.: 2.0'	Groundwater, ft. During:	None
			End	NA
			Seepage	
			Date	Depth, ft.

Depth Excavated: 6.5 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100% — QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
874.7	0.5					12" Sandy Topsoil				
874.2	1.0					1.0				
873.7	1.5				SC	Brown clayey SAND; mostly coarse to fine sand, little clayey fines, moist with occasional coarse gravel / COBBLE				
873.2	2.0									
872.7	2.5									
872.2	3.0									
871.7	3.5									
871.2	4.0									
870.7	4.5									
870.2	5.0									
869.7	5.5									
869.2	6.0					6.2				
868.7	6.5				SP	Brown poorly graded SAND; mostly coarse to fine sand, few coarse to fine gravel, moist				
						End of Test Pit				

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.

LOG OF TEST PIT

Project No.: 211282 | **Test Pit No.:** TP-2 | **Sheet:** 1 of 1

Project: Bridgewood Hills II Infiltration Testing
Client: MAVD
Location: Scio Township, Michigan
Drill Type:
Crew Chief: Field Eng.: JS Rev. By: RW
Coordinates: N=300936.9 E=132617504 (MI South ift)
Elevation: 874.6 ft Datum: NAVD 88 (GPS Observation)
Notes:
Plugging Record: Backfilled test pit with excavated soil.

Date Begin: 07/29/2021 Date End: 07/29/2021

Excavator	Type: Bucket	Dia.: 2.0'	Groundwater, ft. During:	None
			End	NA
			Seepage	
			Date	Depth, ft.

Depth Excavated: 7.5 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100% — QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
874.1	0.5					16" Sandy Topsoil				
873.6	1.0					1.3				
873.1	1.5				SC	Brown clayey SAND; mostly coarse to fine sand, little clayey fines, moist with occasional coarse gravel / COBBLE				
872.6	2.0									
872.1	2.5									
871.6	3.0									
871.1	3.5									
870.6	4.0									
870.1	4.5									
869.6	5.0									
869.1	5.5									
868.6	6.0									
868.1	6.5									
867.6	7.0									
867.1	7.5					7.5				
						End of Test Pit				

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.

LOG OF TEST PIT

Project No.: 211282 | **Test Pit No.:** TP-3 | **Sheet:** 1 of 1

Project: Bridgewood Hills II Infiltration Testing
Client: MAVD
Location: Scio Township, Michigan
Drill Type:
Crew Chief: Field Eng.: JS Rev. By: RW
Coordinates: N=301169.3 E=132617486 (MI South ift)
Elevation: 864.7 ft Datum: NAVD 88 (GPS Observation)
Notes:
Plugging Record: Backfilled test pit with excavated soil.

Date Begin: 07/29/2021 Date End: 07/29/2021

Excavator	Type: Bucket	Dia.: 2.0'	Groundwater, ft. During:	None
			End	NA
			Seepage	
			Date	Depth, ft.

Depth Excavated: 8.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100% — QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
864.2	0.5					12" Sandy Topsoil				
863.7	1.0					1.0				
863.2	1.5				SC	Brown clayey SAND; mostly coarse to fine sand, little clayey fines, moist with occasional coarse gravel / COBBLE				
862.7	2.0									
862.2	2.5									
861.7	3.0									
861.2	3.5									
860.7	4.0									
860.2	4.5					4.7				
859.7	5.0					Brown poorly graded SAND; mostly coarse to fine sand, few coarse to fine gravel, moist				
859.2	5.5				SP					
858.7	6.0									
858.2	6.5									
857.7	7.0									
857.2	7.5									
856.7	8.0					8.0				
						End of Test Pit				

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.

LOG OF TEST PIT

Project No.: 211282 | **Test Pit No.:** TP-4 | **Sheet:** 1 of 1

Project: Bridgewood Hills II Infiltration Testing
Client: MAVD
Location: Scio Township, Michigan
Drill Type:
Crew Chief: Field Eng.: JS Rev. By: RW
Coordinates: N=301281.3 E=132618234 (MI South ift)
Elevation: 856.9 ft Datum: NAVD 88 (GPS Observation)
Notes:
Plugging Record: Backfilled test pit with excavated soil.

Date Begin: 07/29/2021 Date End: 07/29/2021

Excavator	Type: Bucket	Dia.: 2.0'	Groundwater, ft. During:	None
			End	NA
			Seepage	
			Date	Depth, ft.

Depth Excavated: 6.2 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100% — QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
856.4	0.5					12" Sandy Topsoil				
855.9	1.0					1.0				
855.4	1.5				SP-SM	Brown poorly graded SAND with silt and gravel; mostly coarse to fine sand, little coarse to fine gravel, few silty fines, moist				
854.9	2.0									
854.4	2.5									
853.9	3.0									
853.4	3.5									
852.9	4.0									
852.4	4.5					Grades wet				
851.9	5.0									
851.4	5.5									
850.9	6.0					6.2				
						End of Test Pit				

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.

LOG OF TEST PIT

Project No.: 221067 | **Test Pit No.:** TP-5 | **Sheet:** 1 of 1

Project: Morrison Hills Infiltration Testing
Client: Midwestern Consulting
Location: Dexter, Michigan
Drill Type: Excavator
Crew Chief: Field Eng.: RS Rev. By: RW
Coordinates:
Elevation: 864 ft Datum: Elevations provided by Midwestern Consulting
Notes:
Plugging Record: Backfilled test pit with excavated soil.

Date Begin: 04/27/2022 Date End: 04/27/2022

Excavator	Type: Bucket	Dia.: 2.0'	Groundwater, ft. During:	None
			End	NA
			Seepage	
			Date	Depth, ft.

Depth Excavated: 5.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100% — QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
863.5	0.5					14" Sandy Topsoil				Heavy roots noted
863.0	1.0					1.2				
862.5	1.5				SC	Brown clayey SAND; mostly coarse to fine sand, little clayey fines, moist				
862.0	2.0									
861.5	2.5									
861.0	3.0									
860.5	3.5					3.5				
860.0	4.0				SP-SM	Brown poorly graded SAND with silt; mostly coarse to fine sand, few silty fines, moist				
859.5	4.5									
859.0	5.0					5.0				
						End of Boring				

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.

LOG OF TEST PIT

Project No.: 221067 | **Test Pit No.:** TP-6 | **Sheet:** 1 of 1

Project: Morrison Hills Infiltration Testing
Client: Midwestern Consulting
Location: Dexter, Michigan
Drill Type: Excavator
Crew Chief: Field Eng.: RS Rev. By: RW
Coordinates:
Elevation: 870 ft Datum: Elevations provided by Midwestern Consulting
Notes:
Plugging Record: Backfilled test pit with excavated soil.

Date Begin: 04/27/2022 Date End: 04/27/2022

Excavator	Type: Bucket	Dia.: 2.0'	Groundwater, ft. During:	None
			End	NA
			Seepage	
			Date	Depth, ft.

Depth Excavated: 5.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100% — QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
869.5	0.5					12" Sandy Topsoil				
869.0	1.0					1.0				
868.5	1.5				SP	Brown poorly graded SAND; mostly coarse to fine sand, trace clayey fines, moist				
868.0	2.0									
867.5	2.5									
867.0	3.0									
866.5	3.5									
866.0	4.0									
865.5	4.5									
865.0	5.0					5.0				
						End of Boring				

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.

LOG OF TEST PIT

Project No.: 221067 | **Test Pit No.:** TP-7 | **Sheet:** 1 of 1

Project: Morrison Hills Infiltration Testing
Client: Midwestern Consulting
Location: Dexter, Michigan
Drill Type: Excavator
Crew Chief: Field Eng.: RS Rev. By: RW
Coordinates:
Elevation: 862 ft Datum: Elevations provided by Midwestern Consulting
Notes:
Plugging Record: Backfilled test pit with excavated soil.

Date Begin: 04/27/2022 Date End: 04/27/2022

Excavator	Type: Bucket	Dia.: 2.0'	Groundwater, ft. During:	None
			End	NA
			Seepage	
			Date	Depth, ft.

Depth Excavated: 5.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100% — QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
861.5	0.5					12" Sandy Topsoil				
861.0	1.0					1.0				
860.5	1.5				SP-SM	Brown poorly graded SAND with silt; mostly coarse to fine sand, few silty fines, moist				
860.0	2.0									
859.5	2.5					2.5				
859.0	3.0					Brown poorly graded SAND; mostly coarse to fine sand, moist				
858.5	3.5									
858.0	4.0				SP					
857.5	4.5									
857.0	5.0					5.0				
						End of Boring				

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.

LOG OF TEST PIT

Project No.: 221067 | **Test Pit No.:** TP-8 | **Sheet:** 1 of 1

Project: Morrison Hills Infiltration Testing
Client: Midwestern Consulting
Location: Dexter, Michigan
Drill Type: Excavator
Crew Chief: Field Eng.: RS Rev. By: RW
Coordinates:
Elevation: 873 ft Datum: Elevations provided by Midwestern Consulting
Notes:
Plugging Record: Backfilled test pit with excavated soil.

Date Begin: 04/27/2022 Date End: 04/27/2022

Excavator	Type: Bucket	Dia.: 2.0'	Groundwater, ft. During:	None
			End	NA
			Seepage	
			Date	Depth, ft.

Depth Excavated: 5.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100% — QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
872.5	0.5					12" Sandy Topsoil				
872.0	1.0					1.0				
871.5	1.5				SP-SC	Brown poorly graded SAND with clay; mostly coarse to fine sand, few clayey fines, moist				
871.0	2.0									
870.5	2.5									
870.0	3.0									
869.5	3.5									
869.0	4.0									
868.5	4.5									
868.0	5.0					5.0				
						End of Boring				

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.

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MORRISON HILLS
PRIVATE ROAD
INFILTRATION TEST PITS

16

JOB No. 21188A
REVISIONS:
TOWNSHIP REVIEW — REV. DATE 6/17/22

DATE: 03/16/22
SHEET 16 OF 19
CADD: RMLII
ENG: HTH
PM: TJC
TECH: RMLII
/21188DA01

SOIL EVALUATION NOTES

SEV2021-
SEW2021-
Date: 1 /2021

Address: Lot "A" Parcel: Twp.:

For: New Const. Replacement DF Sanitarian: JXG Excavator: Bollinger

Additional people onsite:

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES ___% NO Mottling observed: YES @ ___ft. NO

Approvable soils found from: 3 ft. to 4 ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone At grade" ABOVE / BELOW grade Basement plumbing by gravity? YES NO

COMMENTS:

TEST PIT DESCRIPTIONS:

TP1 0-12" Ts/Loam
12"-3' Loamy Sand, brn
3'-7' med. Sand, brn/gry
7'-9' Coarse gravy Sand
Mottling 3', H2O 7'

TP2 0-12" Ts/Loam
12"-4' Loamy Sand, brn
4'-8' med. Sand, brn/gry
Mottling 4', H2O 7'

TP3 0-12" Ts/Loam
12"-3' Loamy Sand/brn
3'-8' med. Sand, brn/gry
mottling 4', H2O 7'

SOIL EVALUATION NOTES

SEV2021-
SEW2021-
Date: 1 /2021

Address: Lot "B" Parcel: Twp.:

For: New Const. Replacement DF Sanitarian: JXG Excavator: Bollinger

Additional people onsite:

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES ___% NO Mottling observed: YES @ see notes ft. NO

Approvable soils found from: 6 ft. to 6 ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone 30 " ABOVE / BELOW grade Basement plumbing by gravity? YES NO

COMMENTS:

TEST PIT DESCRIPTIONS:

TP4 0-6" Ts/Loam
6"-4' clay Loam, brn
4'-6' Fine Sand, brn
6'-9' med. Sand, brn
NO H2O/ mottling

TP5 - Same TP4

TP6 - Same TP4

TP7 - did not witness

TP8 0-12" Ts/Loam
12"-3' Clay Loam/brn
3'-8' Sandy clay loam, brn/gry
mottling 2', H2O 5'

TP9 - Same as TP4

SOIL EVALUATION NOTES

SEV2021-
SEW2021-
Date: 1 /2021

Address: Lot "C" Parcel: Twp.:

For: New Const. Replacement DF Sanitarian: JXG Excavator: Bollinger

Additional people onsite:

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES ___% NO Mottling observed: YES @ ___ft. NO

Approvable soils found from: 4 ft. to 6 ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone 30 " ABOVE / BELOW grade Basement plumbing by gravity? YES NO

COMMENTS: Primary over TP11 + TP12

TEST PIT DESCRIPTIONS:

TP10 0-6" Ts/Loam
6"-4' Sandy Clay Loam, brn
4'-10' Fine Sand/brn
NO H2O/mottling

☆ TP11 0-6" Ts/Loam
6"-4' Clay Loam/brn
4'-6' Loamy Sand/brn
6'-9' med. Sand/brn
NO H2O/mottling

☆ TP12 - Same as TP11

TP13 0-12" Ts/Loam
12"-3' Clay Loam/brn
3'-11' Loamy Sand/brn
NO H2O/mottling

SOIL EVALUATION NOTES

SEV2021-
SEW2021-
Date: 1 /2021

Address: LOT "D" Parcel: Twp.:

For: New Const. Replacement DF Sanitarian: JXG Excavator: Bollinger

Additional people onsite:

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES ___%. NO Mottling observed: YES @ ___ft. NO

Approvable soils found from: ___ft. to ___ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone ___" ABOVE / BELOW grade Basement plumbing by gravity? YES NO

COMMENTS:

TEST PIT DESCRIPTIONS:

TP14 0-12" Ts/Loam
12"-4' Sandy Clay Loam, brn
4'-6' Fine Sand, brn
6'-8' Coarse Sand, brn
8'-10" med. Sand, brn
NO H2O, mottling 7'

TP15 - Same as TP14

TP16 - Same as TP14

TP17 - Same as TP14

SOIL EVALUATION NOTES

SEV2021-
SEW2021-
Date: 1 /2021

Address: Lot "E" Parcel: Twp.:

For: New Const. Replacement DF Sanitarian: JXG Excavator: Bollinger

Additional people onsite:

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES ___% NO Mottling observed: YES @ ___ft. NO

Approvable soils found from: 7 ft. to 9 ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone 30 " ABOVE / BELOW grade Basement plumbing by gravity? YES NO

COMMENTS: Proposed to demo home. Well less than 50' to test pits, will need abandoned to use approval area.

TEST PIT DESCRIPTIONS:

TP31 0-12" Ts/Loam
12"-7' Sandy Clay Loam, brn
7'-10' Med. Sand, brn
NO H2O/mottling

TP32 - Same as TP31

TP33 - 0-12" Ts/Loam
12"-9' Sandy Clay Loam/brn
9"-12' Med. Sand, brn
NO H2O/mottling

SOIL EVALUATION NOTES

SEV2021-
SEW2021-
Date: 1 /2021

Address: LOT "F" Parcel: Twp.:

For: New Const. Replacement DF Sanitarian: JXG Excavator: Bollinger

Additional people onsite:

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES ___% NO Mottling observed: YES @ ___ft. NO

Approvable soils found from: 3 ft. to 3 ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone 30 " ABOVE BELOW grade Basement plumbing by gravity? YES NO

COMMENTS:

TEST PIT DESCRIPTIONS:

☆ TP23 0-6" Ts/Loam
6"-3' Sandy Clay Loam, brn
3'-8' Med Sand, brn
NO mottling / H2O

☆ TP24 - Same TP23

☆ TP25 - Same as TP23

NG TP26 0-12" Ts/Loam
12"-6' Clay Loam
6'-12 Sandy Clay Loam/ Fine Sand, brn
NO H2O/mottling

NG TP27 - Same as TP26

~~TP28~~

NG TP30 0-12" Ts/Loam
12"-6' Sandy Clay Loam/brn
6'-12' Clay Loam, brn
NO H2O / mottling

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ANN ARBOR, MICHIGAN 48104
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734-930-6700

MORRISON HILLS
PRIVATE ROAD
TEST PITS SOIL LOGS 1 OF 2

17

JOB No. 21188A
REVISIONS:
TOWNSHIP REVIEW
REV. DATE
6/17/22
DATE: 03/16/22
SHEET 17 OF 19
CADD: RMLII
ENG: HTH
PM: TJC
TECH: RMLII
/21188DA01

SOIL EVALUATION NOTES

SEV2021-_____
SEW2021-_____ Date: ___/___/2021

Address: Lot "F" Parcel "1" Parcel: _____ Twp.: _____

For: New Const. Replacement DF Sanitarian: JX6 Excavator: Bollinger

Additional people onsite: _____

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES 20 % NO Mottling observed: YES @ ___ ft. NO

Approvable soils found from: 3 ft. to 4 ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone 30 " ABOVE / BELOW grade Basement plumbing by gravity? YES NO

COMMENTS:

TEST PIT DESCRIPTIONS:

TP23 0-6" Ts/Loam
6"-3' Sandy Clay Loam/brn
3'-8' med. Sand/brn
NO mottling / H2O

TP24 - Same TP23

TP25 - Same as TP23

TP26 0-12" Ts/Loam
12"-6' Clay Loam
6'-12 Sandy Clay Loam/ Fine Sand/brn
NO H2O/mottling

TP27 - Same as TP26

~~TP28~~

TP30 0-12" Ts/Loam
12"-6' Sandy Clay Loam/brn
6'-12' Clay Loam/brn
NO H2O / mottling

TP50 0-12" Ts/Loam
12"-4' SCL/brn
4'-12' Fine/loamy sand/brn
NO H2O/mottling

TP51 0-12" Ts/Loam
12"-4' SCL/brn
4'-12" Fine/loamy sand/brn
NO H2O/mottling

SOIL EVALUATION NOTES

SEV2022-_____
SEW2022-_____ Date: ___/___/2022

Address: Parcel "2" Parcel: _____ Twp.: SC10

For: New Const. Replacement DF Sanitarian: JX6 Excavator: Bollinger

Additional people onsite: _____

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES ___ % NO Mottling observed: YES @ ___ ft. NO

Approvable soils found from: 8 ft. to 10 ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone 30 " ABOVE / BELOW grade Basement plumbing by gravity? YES NO

COMMENTS: Primary TP52/TP53, reserve TP54

TEST PIT DESCRIPTIONS:

TP52 0-12" Ts/Loam
12"-8' SCL/brn
8'-12" Med. Sand/brn
NO H2O/mottling

TP53 - Same as TP52

TP54 0-12" Ts/Loam
12"-10' SCL/brn
10'-14' Fine Sand/brn
NO H2O/mottling

SOIL EVALUATION NOTES

SEV2021-_____
SEW2021-_____ Date: ___/___/2021

Address: Lot "A" Parcel "3" Parcel: _____ Twp.: _____

For: New Const. Replacement DF Sanitarian: JX6 Excavator: Bollinger

Additional people onsite: _____

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES ___ % NO Mottling observed: YES @ ___ ft. NO

Approvable soils found from: 3 ft. to 4 ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone At grade " ABOVE / BELOW grade Basement plumbing by gravity? YES NO

COMMENTS:

TEST PIT DESCRIPTIONS:

TP1 0-12" Ts/Loam
12"-3' Loamy Sand/brn
3'-7' med. Sand, brn/gry
7'-9' Coarse gray Sand
Mottling 3', H2O 7'

TP2 0-12" Ts/Loam
12"-4' Loamy Sand/brn
4'-8' med. Sand, brn/gry
Mottling 4', H2O 7'

TP3 0-12" Ts/Loam
12"-3' Loamy Sand/brn
3'-8' med. Sand, brn/gry
mottling 4', H2O 7'

TP55 0-12" Ts/Loam
12"-4' SCL/brn
4'-11' Fine Loamy brn
11'-14' coarse Sand/brn
NO H2O, mottling 7'

TP56 0-12" Ts/Loam
12"-3' SCL/brn
3'-10' med Sand
NO H2O, mottling 8'

SOIL EVALUATION NOTES

SEV2022-_____
SEW2022-_____ Date: ___/___/2022

Address: Parcel "4" Parcel: _____ Twp.: SC10

For: New Const. Replacement DF Sanitarian: JX6 Excavator: Bollinger

Additional people onsite: _____

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES ___ % NO Mottling observed: YES @ ___ ft. NO

Approvable soils found from: 6 ft. to 7 ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone 24 " ABOVE / BELOW grade Basement plumbing by gravity? YES NO

COMMENTS:

TEST PIT DESCRIPTIONS:

TP57 0-12" Ts/Loam
12"-7' Fine/med. Sand, brn
7'-11' Coarse Sand, brn
Mottling 6', NO H2O

TP58 0-12" Ts/Loam
12"-3' SCL, brn
3'-6' Loamy sand, brn
6'-9' Fine Sand, brn
9'-11 gray clay
Mottling 8', NO H2O

TP59 0-12" Ts/Loam
12"-4" Clay Loam, brn
4'-6' Fine Sand, brn
6'-11' med Sand, brn
Mottling 6', NO H2O

SOIL EVALUATION NOTES

SEV2022-_____
SEW2022-_____ Date: ___/___/2022

Address: Parcel "5" Parcel: _____ Twp.: SC10

For: New Const. Replacement DF Sanitarian: JX6 Excavator: Bollinger

Additional people onsite: _____

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES ___ % NO Mottling observed: YES @ ___ ft. NO

Approvable soils found from: 9 ft. to 10 ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone 30 " ABOVE / BELOW grade Basement plumbing by gravity? YES NO

COMMENTS:

TEST PIT DESCRIPTIONS:

TP60 0-12" Ts/Loam
12"-7' SCL, brn
7'-9' Fine Sand, brn
9'-11' med. Sand, brn
11'-13'+ coarse Sand, brn
NO H2O, mottling

TP61 0-12" Ts/Loam
12"-4' SCL, brn
4'-10' Fine Sand, brn
10'-13' med. Sand, brn
13'-14'+ coarse Sand, brn
NO H2O, Mottling

SOIL EVALUATION NOTES

SEV2021-_____
SEW2021-_____ Date: ___/___/2021

Address: Lot "E" Parcel "6" Parcel: _____ Twp.: _____

For: New Const. Replacement DF Sanitarian: JX6 Excavator: Bollinger

Additional people onsite: _____

RESULT: APPROVED DENIED Well First Area: YES NO Tank first: YES NO

Oversized field required: YES ___ % NO Mottling observed: YES @ ___ ft. NO

Approvable soils found from: 7 ft. to 9 ft. Approval letter issued in field: YES NO

Top Sand / Bottom of Stone 30 " ABOVE / BELOW grade Basement plumbing by gravity? YES NO

COMMENTS: Proposed to demo home. Well less than 50' to test pits, will need abandoned to use approval area.

TEST PIT DESCRIPTIONS:

TP 31 0-12" Ts/Loam
12"-7" Sandy Clay Loam, brn
7'-10' Med. Sand, brn
NO H2O / mottling

TP 32 - Same as TP 31

TP 33 - 0-12" Ts/Loam
12"-9' Sandy Clay Loam/brn
9'-12' Med. Sand, brn
NO H2O/mottling

TP62 0-12" Ts/Loam
12"-8' SCL, brn
8'-12' med. Sand, brn
No H2O / mottling

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BRIDGEWOOD HILLS II, LLC
2723 SOUTH STATE STREET, SUITE250
ANN ARBOR, MICHIGAN 48104
GREG COPP
734-930-6700

MORRISON HILLS
PRIVATE ROAD
TEST PITS SOIL LOGS 2 OF 2

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JOB No. 21188A
REVISIONS:
TOWNSHIP REVIEW

REV.	DATE
	6/17/22

DATE: 03/16/22
SHEET 18 OF 19
CADD: RMLII
ENG: HTH
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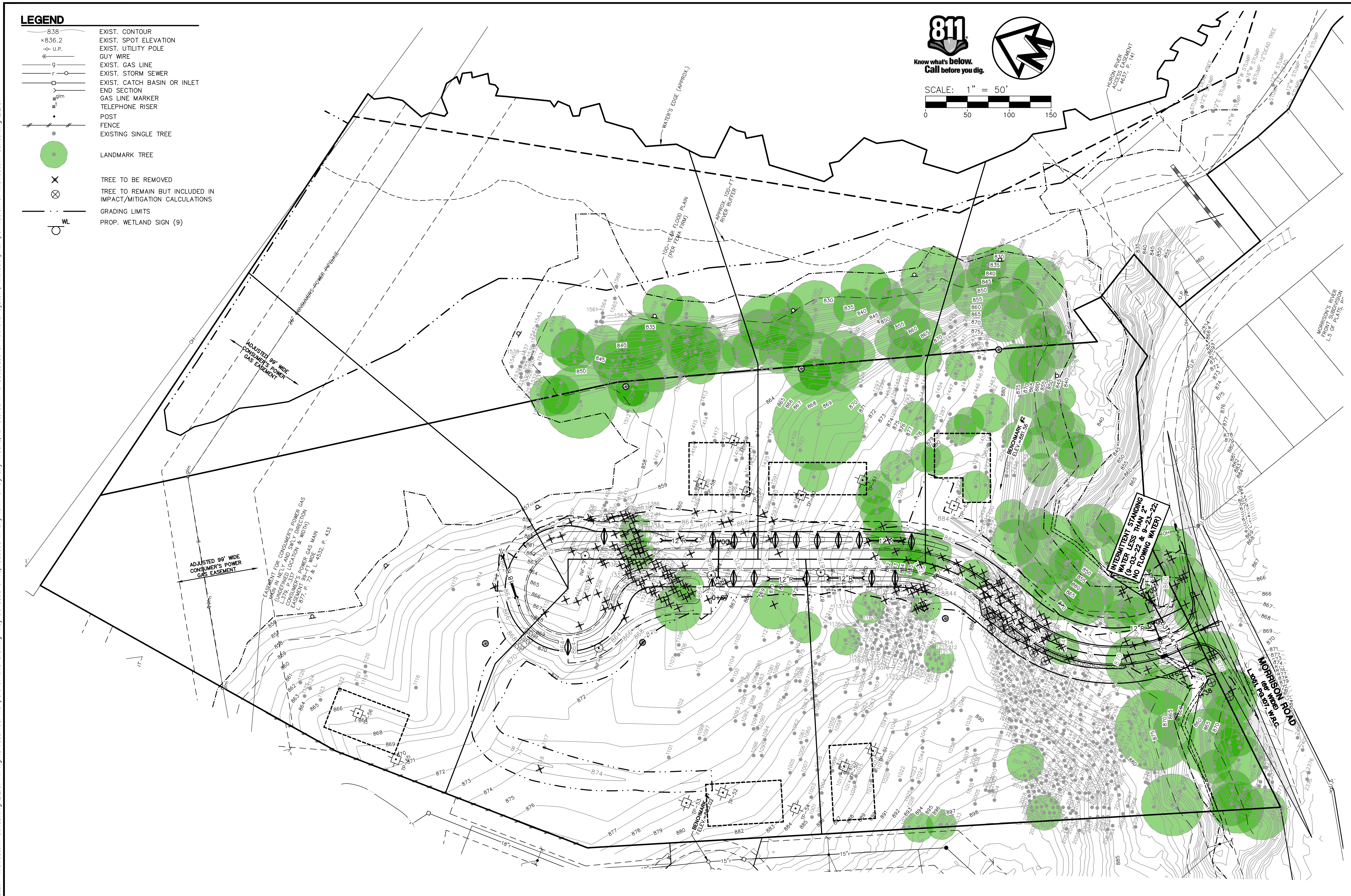
/21188DA01

LEGEND

838	EXIST. CONTOUR
×836.2	EXIST. SPOT ELEVATION
U.P.	EXIST. UTILITY POLE
	GUY WIRE
g	EXIST. GAS LINE
r	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	END SECTION
glm	GAS LINE MARKER
	TELEPHONE RISER
•	POST
	FENCE
	EXISTING SINGLE TREE
	LANDMARK TREE
×	TREE TO BE REMOVED
⊗	TREE TO REMAIN BUT INCLUDED IN IMPACT/MITIGATION CALCULATIONS
	GRADING LIMITS
WL	PROP. WETLAND SIGN (9)



The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.

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MORRISON HILLS
PRIVATE ROAD
NATURAL FEATURES OVERLAY PLAN

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REVISIONS:	REV. DATE	
PER MUNICIPAL COMMENTS	08/25/22	DATE: 03/16/22
		SHEET 19 OF 19
		CADD: RMJI
		ENG: HTH
		PM: IJC
		TECH: RMJI
		21188NF01

JOB No. 21188A