

CLIENT
**WAYNE COUNTY
PARKS**
33175 ANN ARBOR TRAIL
WESTLAND, MI

PROJECT TITLE
**VENOY DORSEY
KAYAK LAUNCHES**
WAYNE, MI

REVISIONS	
95% CD	10/08/2
MDNR REVIEW	02/04/2
MDNR REVISIONS	03/10/2
MDNR REVISIONS	04/25/2
WAYNE COUNTY	07/12/2
WAYNE CO. REVISIONS	10/25/2
BIDS	11/30/2
ADDENDUM #1	12/16/2
WAYNE CO. REVISIONS	01/30/2
REBID	06/05/2

ORIGINAL ISSUE DATE:
MARCH 2, 2021

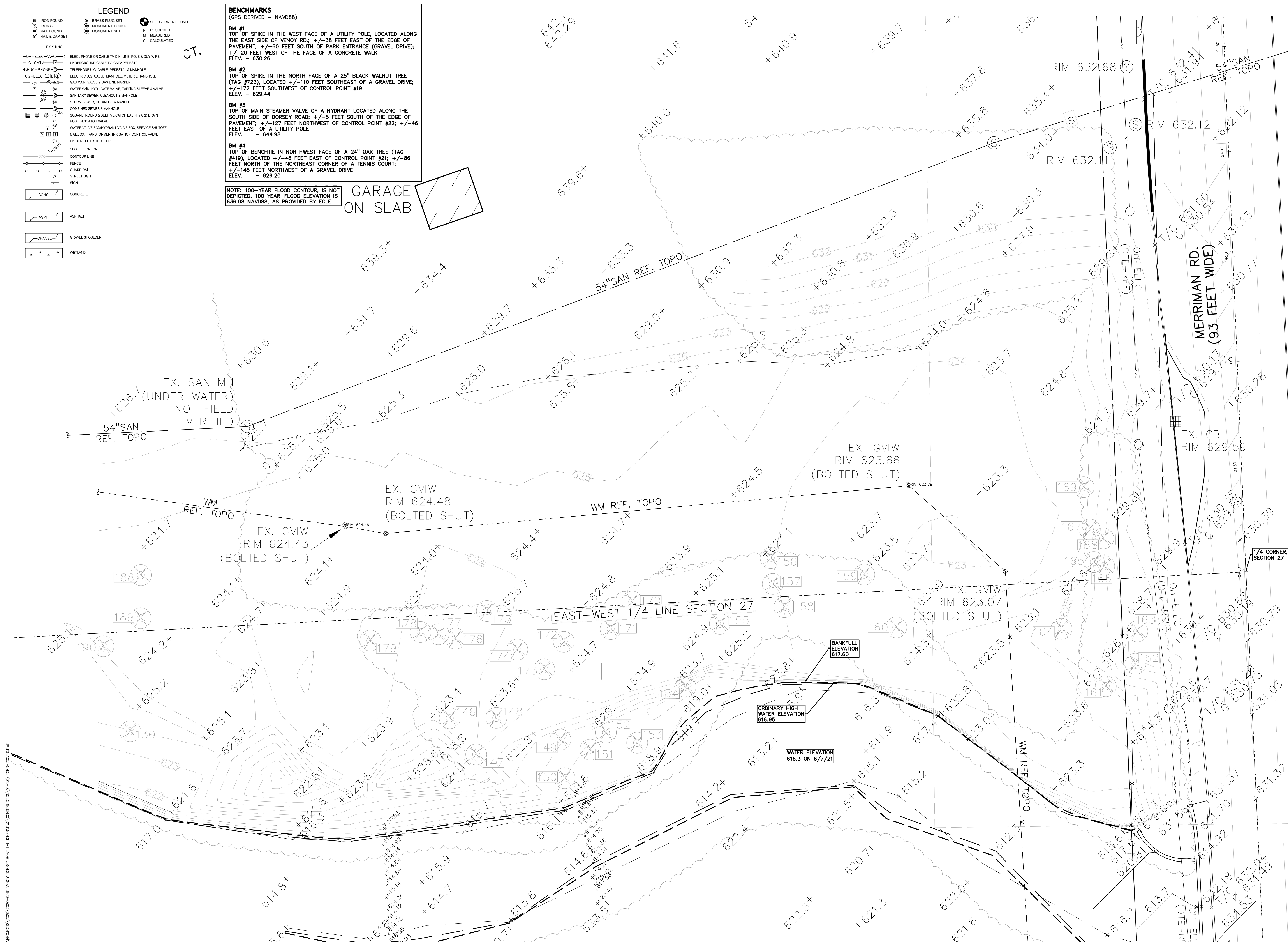
DRAWING TITLE

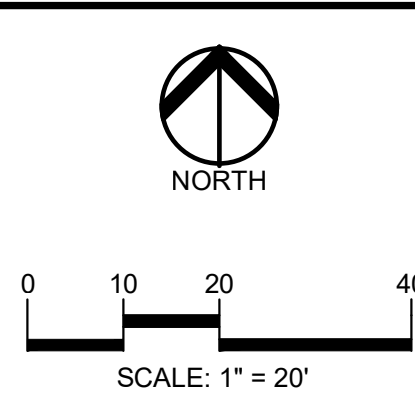
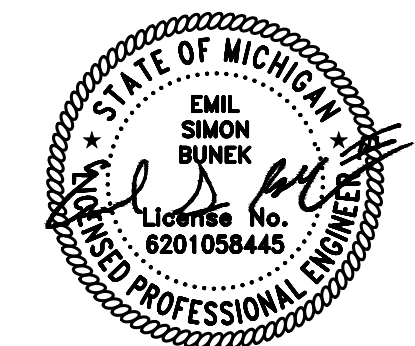
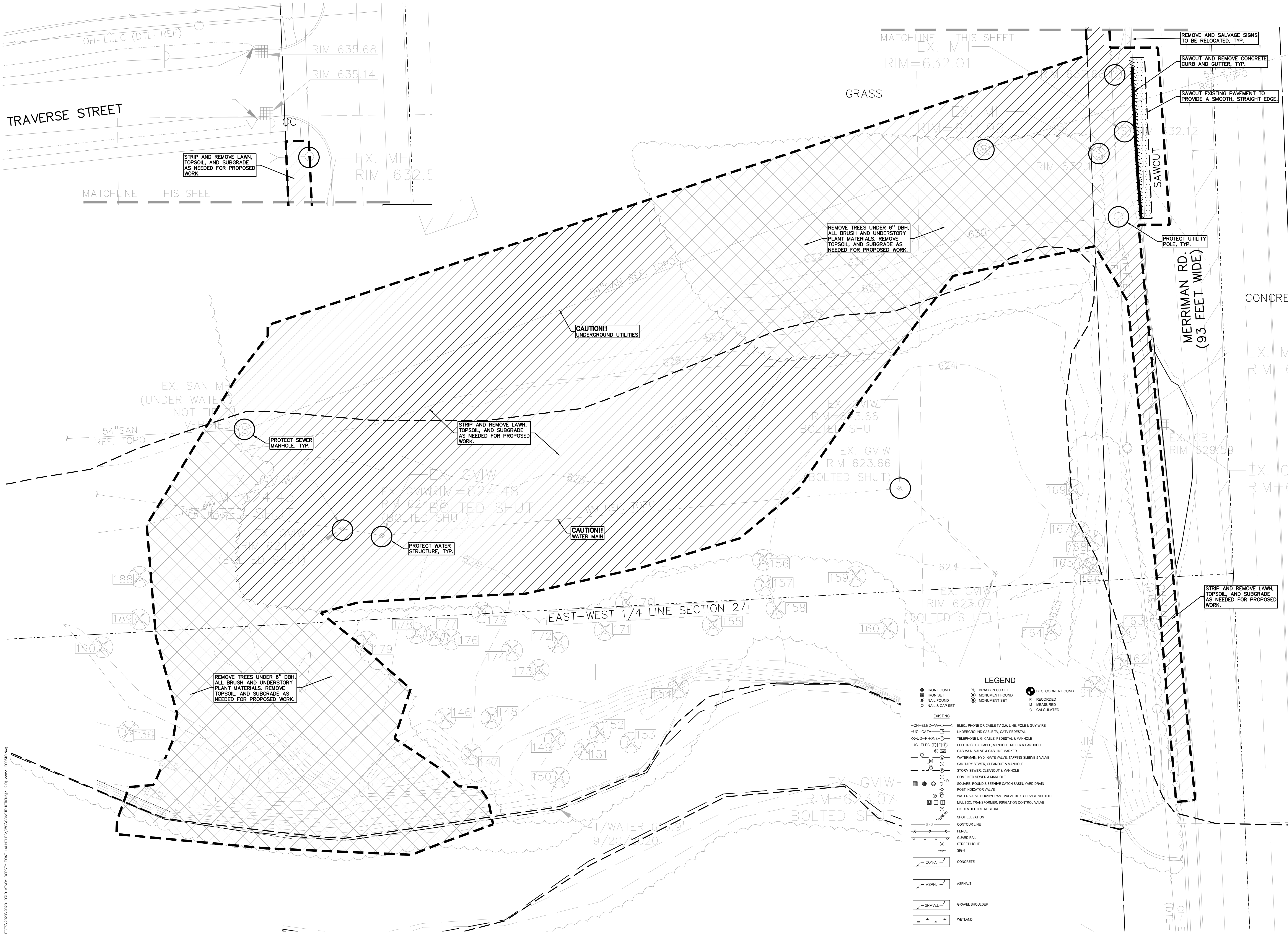
**MERRIMAN
TOPOGRAPHIC
SURVEY**

PEA JOB NO.	2020-0310
P.M.	BW
DN.	JRW
DES.	BWJ/JRW

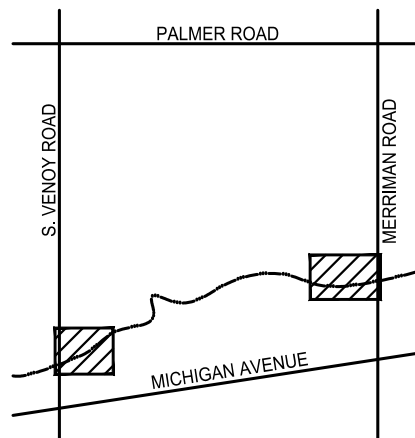
DRAWING NUMBER:

C-11.0





CAUTION!!
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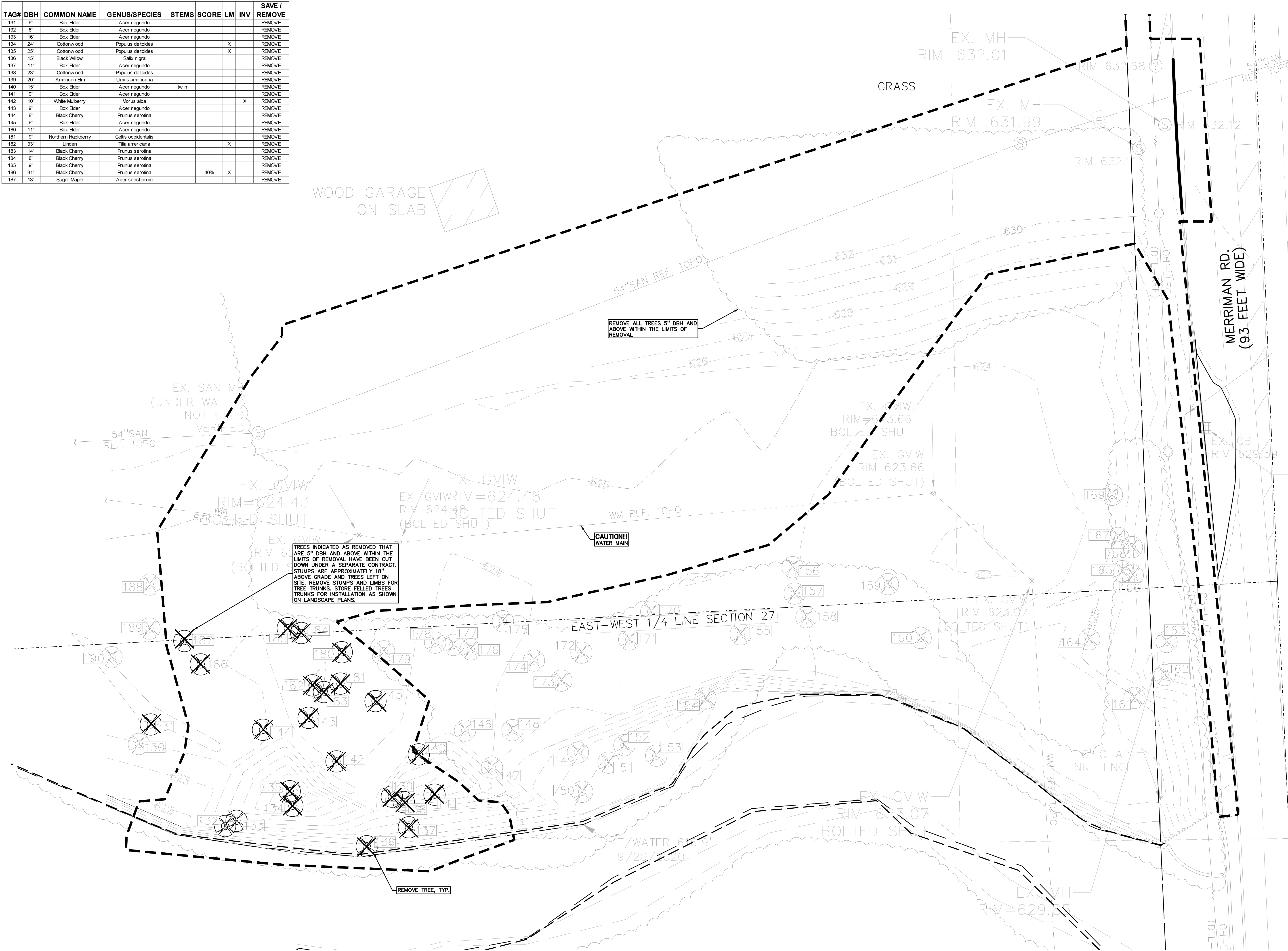
DRAWING TITLE
MERRIMAN DEMOLITION PLAN

PEA JOB NO.	2020-0310
P.M.	BWJ
DN.	JRW
DES.	BWJ/JRW

DRAWING NUMBER:

C-12.0

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	INV	SAVE / REMOVE
131	9"	Box Elder	Acer negundo					REMOVE
132	8"	Box Elder	Acer negundo					REMOVE
133	16"	Box Elder	Acer negundo					REMOVE
134	24"	Cottonw ood	Populus deltoides			X		REMOVE
135	25"	Cottonw ood	Populus deltoides			X		REMOVE
136	15"	Black Willow	Salix nigra					REMOVE
137	11"	Box Elder	Acer negundo					REMOVE
138	23"	Cottonw ood	Populus deltoides					REMOVE
139	20"	American Elm	Ulmus americana					REMOVE
140	15"	Box Elder	Acer negundo	tw in				REMOVE
141	9"	Box Elder	Acer negundo					REMOVE
142	10"	White Mulberry	Morus alba				X	REMOVE
143	9"	Box Elder	Acer negundo					REMOVE
144	8"	Black Cherry	Prunus serotina					REMOVE
145	9"	Box Elder	Acer negundo					REMOVE
180	11"	Box Elder	Acer negundo					REMOVE
181	9"	Northern Hackberry	Celtis occidentalis					REMOVE
182	33"	Linden	Tilia americana			X		REMOVE
183	14"	Black Cherry	Prunus serotina					REMOVE
184	8"	Black Cherry	Prunus serotina					REMOVE
185	9"	Black Cherry	Prunus serotina					REMOVE
186	31"	Black Cherry	Prunus serotina		40%	X		REMOVE
187	13"	Sugar Maple	Acer saccharum					REMOVE



PEA
GROUP

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STATE OF MICHIGAN
EMIL SIMON
BUREAU
Licenses No. 6201058445
Professional Engineer

NORTH

0102040

SCALE: 1" = 20'

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DRAWING TITLE
MERRIMAN
TREE REMOVAL
PLAN

PEA JOB NO. 2020-0310

P.M. BWJ

DN. JRW

DES. BWJ/JRW

DRAWING NUMBER:
C-12.1



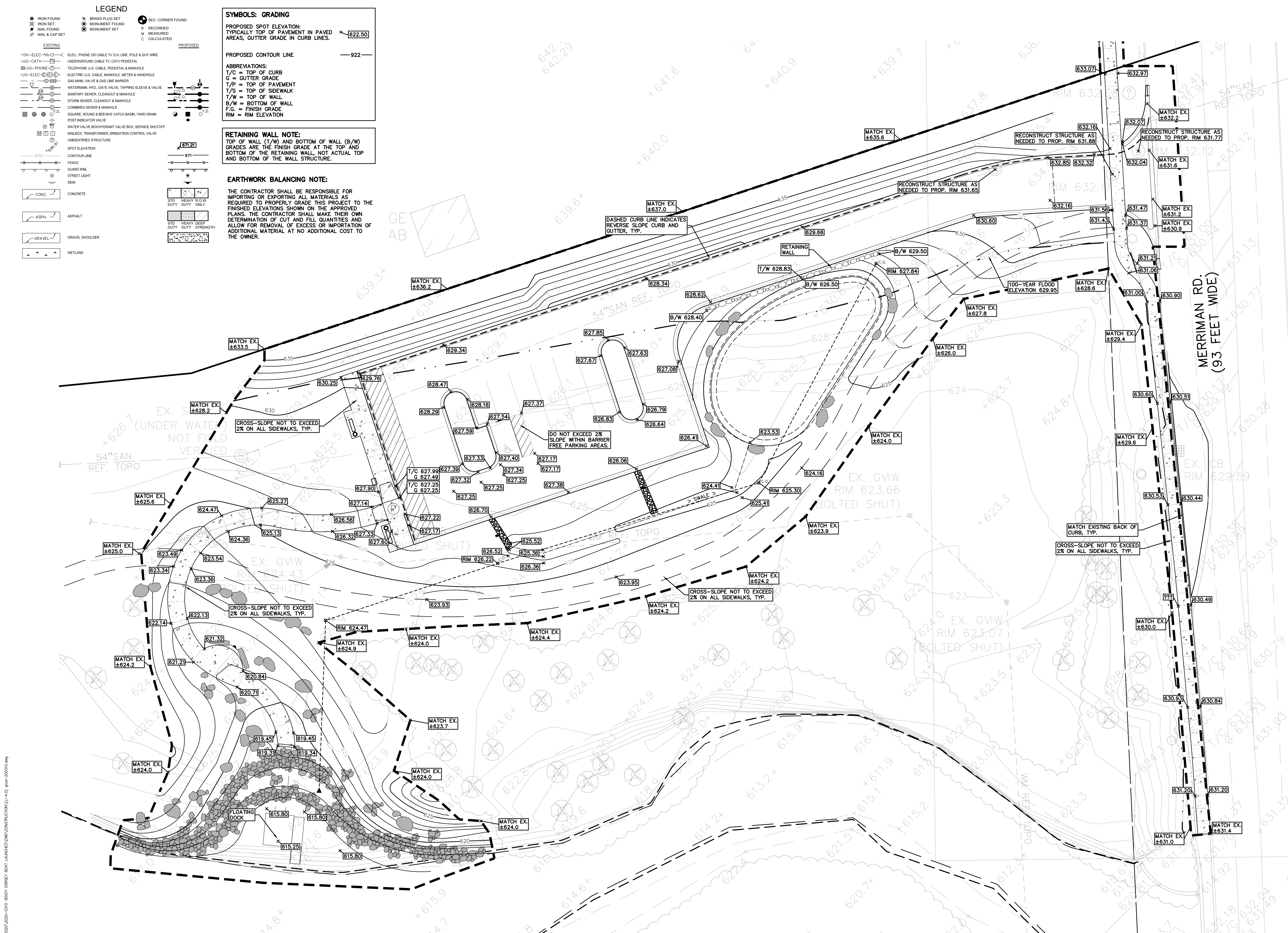
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KAYAK LAUNCHES**

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PEA JOB NO.	2020-0310
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DRAWING NUMBER:	

C-14.0



SEQUENCE OF CONSTRUCTION:

- START DAY END DAY
1 90 INSTALL CRUSHED CONCRETE ACCESS APPROACH AT SITE ROAD APPROACH.
1 90 INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES, SILT FENCES, INLET PROTECTION, ETC. AS NECESSARY.
1 120 MAINTAIN A 25' BUFFER OF VEGETATION AROUND PERIMETER OF SITE WHERE POSSIBLE.
1 15 REMOVE ALL VEGETATION, TREES AND BRUSH FROM THE PROPOSED CONSTRUCTION AREA UNLESS MARKED TO REMAIN. STRIP AND STOCKPILE TOPSOIL AS REQUIRED RESTORATION. ALL STOCKPILES MUST BE GRADED AND SEEDDED.
5 14 REMOVE ALL PAVEMENT, CURB, UTILITIES, ETC. AS REQUIRED TO INSTALL THE PROPOSED WORK AS SHOWN ON THE TOPOGRAPHIC SURVEY AND DEMOLITION PLAN.
5 14 DISPOSE OF ALL EXCESS/UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO ON-SITE BURN OR BURY PITS ALLOWED.
14 28 ROUGH GRADE SITE. SEED AND MULCH BLANKETS MUST BE INSTALLED AS SHOWN WITHIN 5 DAYS OF FINAL GRADE. REPAIR AND/OR RE-INSTALL ANY TEMPORARY SOIL EROSION CONTROL MEASURES THAT WERE DAMAGED DURING GRADING OPERATIONS.
28 60 INSTALL SITE UTILITIES (STORM SEWER, SANITARY SEWER, WATER MAIN ETC.). INSTALL INLET PROTECTION AT ALL PROPOSED CATCH BASINS.
28 90 TEMPORARY SEEDING MUST BE PROVIDED IN AREAS NOT TO BE WORKED ON FOR 15 DAYS OR LONGER.
30 80 BEGIN CONSTRUCTION OF BUILDING.
70 80 FINE GRADE SITE AND PREPARE FOR SITE PAVING OPERATIONS.
80 110 INSTALL ALL PAVEMENT, SIDEWALKS, CURBING AS PROPOSED. IF PERMANENT LANDSCAPING IS NOT TO BE INSTALLED SOON AFTER PAVING IS COMPLETE, ALL AREAS WITHIN 20 FEET OF BACK OF CURB MUST BE TEMPORARILY SEEDDED. REPAIR INLET PROTECTION, SILT FENCE AND ANY OTHER DAMAGED SOIL EROSION CONTROL MEASURES AS NECESSARY.
90 119 FINAL GRADE, REDISTRIBUTE STOCKPILED TOPSOIL, ESTABLISH VEGETATION AND INSTALL ALL PERMANENT LANDSCAPING IN ALL DISTURBED AREAS NOT BUILT.
118 120 CLEAN PAVEMENT AND REMOVE ALL TEMPORARY SOIL EROSION CONTROL MEASURES. RE-ESTABLISH VEGETATION AS REQUIRED.
120 120 REMOVE SEDIMENTATION CONTROLS ONCE ENTIRE SITE HAS BEEN PERMANENTLY STABILIZED.

STREET CLEANING SCHEDULE

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SCRAPE STREETS		X	X	X	X	X	X
SWEEP STREETS				X			

FINAL INSPECTION AND CERTIFICATE OF COMPLETION REQUIREMENTS:

- ALL ITEMS ON APPROVED SESC PLAN AND PERMIT MUST BE COMPLETED.
- ALL DISTURBED EARTH MUST BE PERMANENTLY STABILIZED WITH VEGETATION OR HARD SURFACE.
- ACCUMULATED SEDIMENT MUST BE REMOVED FROM THE ENTIRE STORM SEWER SYSTEM.
- ACCUMULATED SEDIMENT MUST BE REMOVED FROM THE SEDIMENTATION BASIN.
- ALL TEMPORARY SESC DEVICES MAY BE REMOVED AFTER CERTIFICATE OF COMPLETION.

EROSION CONTROL QUANTITIES:

SILT FENCE 641 LF
TURBIDITY CURTAIN 200 LF
TEMPORARY CONSTRUCTION ACCESS DRIVE 1 EA.
EROSION CONTROL BLANKETS 479 S.Y.
TEMPORARY SEEDING 4,858 S.Y.

GENERAL SITE CONDITIONS:

ACCORDING TO THE GEOTECHNICAL INVESTIGATION PERFORMED BY PEA GROUP DATED SEPTEMBER 23, 2021 THE SITE CONSISTS OF COHESIVE SOILS WITH LAYERS OF SAND.

- TOTAL DISTURBED AREA = ±1.92 ACRES

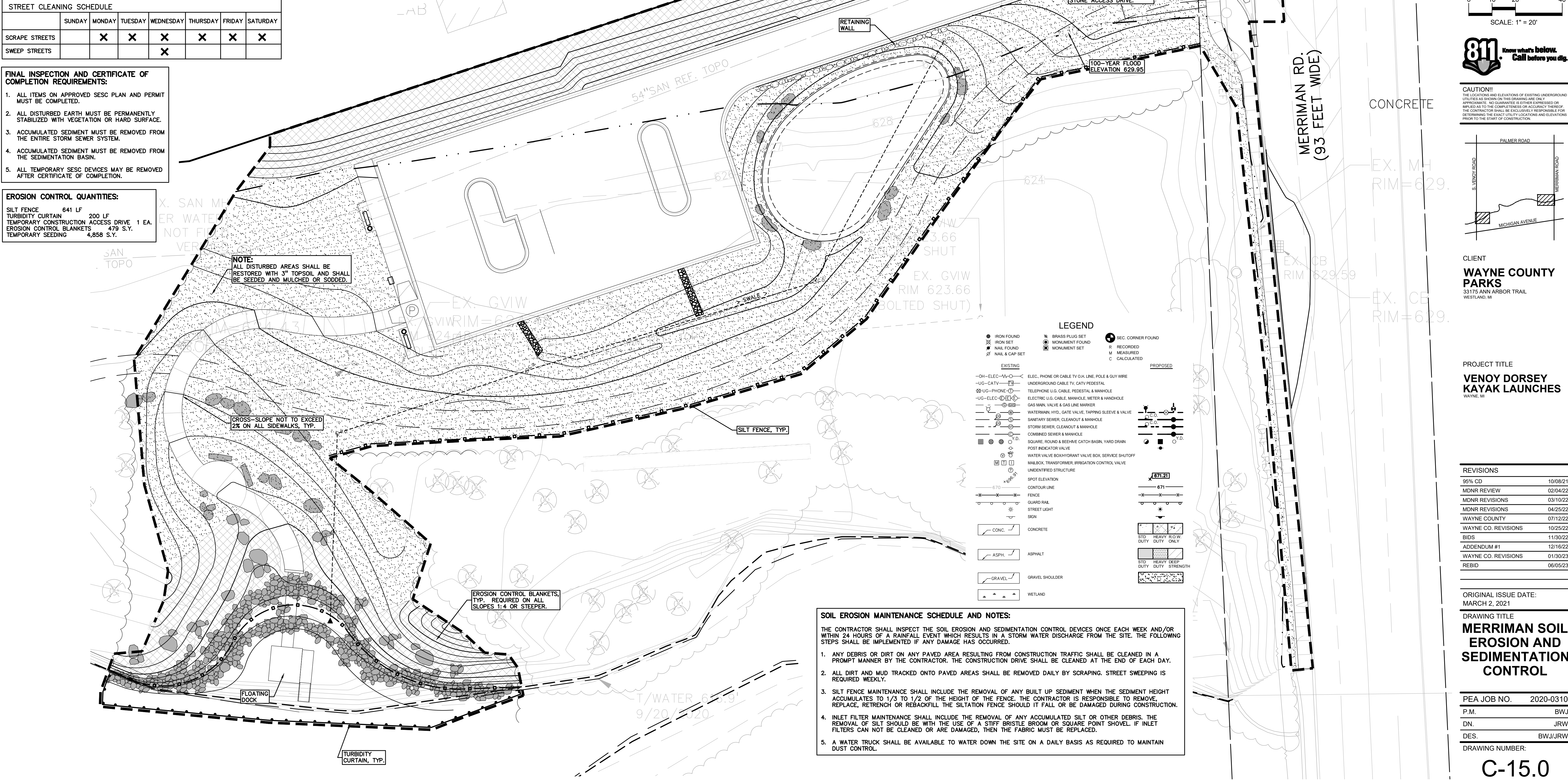
SOIL EROSION CONTROL NOTES:

- ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO STANDARDS AND SPECIFICATIONS OF THE CITY OF WESTLAND AND WAYNE COUNTY.
- DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR FOR EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES, AND ANY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
- EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
- CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES WHEN REQUIRED AND AS DIRECTED ON THESE PLANS. REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES, AND OTHER EARTH CHANGES HAVE BEEN ACCOMPLISHED AND A CERTIFICATE OF COMPLETION HAS BEEN ISSUED BY THE CITY OF WESTLAND AND WAYNE COUNTY FOR THE SESC PERMIT.
- STAGING THE WORK SHALL BE DONE BY THE CONTRACTOR AS DIRECTED IN THESE PLANS AND AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED EARTH.
- SOIL EROSION CONTROL PRACTICES SHALL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES SHALL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.

NOTE:
HEAVY DASHED LINE INDICATES
LIMITS OF EARTH DISRUPTION.
AREA = ±1.92 ACRES

SYMBOLS: EROSION CONTROL

- SILT FENCE
- TURBIDITY CURTAIN
- TEMPORARY CONSTRUCTION ACCESS DRIVE
- EROSION CONTROL BLANKETS
- APPROXIMATE TEMPORARY SEEDING LOCATIONS



SOIL EROSION MAINTENANCE SCHEDULE AND NOTES:

THE CONTRACTOR SHALL INSPECT THE SOIL EROSION AND SEDIMENTATION CONTROL DEVICES ONCE EACH WEEK AND/OR WITHIN 24 HOURS OF A RAINFALL EVENT WHICH RESULTS IN A STORM WATER DISCHARGE FROM THE SITE. THE FOLLOWING STEPS SHALL BE IMPLEMENTED IF ANY DAMAGE HAS OCCURRED.

- ANY DEBRIS OR DIRT ON ANY PAVED AREA RESULTING FROM CONSTRUCTION TRAFFIC SHALL BE CLEANED IN A PROMPT MANNER BY THE CONTRACTOR. THE CONSTRUCTION DRIVE SHALL BE CLEANED AT THE END OF EACH DAY.
- ALL DIRT AND MUD TRACKED ONTO PAVED AREAS SHALL BE REMOVED DAILY BY SCRAPING. STREET SWEEPING IS REQUIRED WEEKLY.
- SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT UP SEDIMENT WHEN THE SEDIMENT HEIGHT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR RESACKFILL. THE SILTATION FENCE SHOULD IT FALL OR BE DAMAGED DURING CONSTRUCTION.
- INLET FILTER MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY ACCUMULATED SILT OR OTHER DEBRIS. THE REMOVAL OF SILT SHOULD BE WITH THE USE OF A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTERS CAN NOT BE CLEANED OR ARE DAMAGED, THEN THE FABRIC MUST BE REPLACED.
- A WATER TRUCK SHALL BE AVAILABLE TO WATER DOWN THE SITE ON A DAILY BASIS AS REQUIRED TO MAINTAIN DUST CONTROL.

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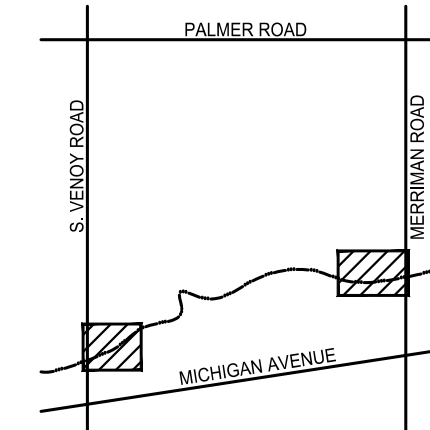
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0 10 20 40
SCALE: 1" = 20'



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DRAWING TITLE
MERRIMAN SOIL EROSION AND SEDIMENTATION CONTROL

PEA JOB NO. 2020-0310
P.M. BWJ
DN. JRW
DES. BWJ/JRW
DRAWING NUMBER:

C-15.0

ORIFICE CALCULATIONS WITH WAYNE COUNTY MINIMUM 1" ORIFICE

Detention Basin Outlet Control Structure		
CPRC Volume		3,381 cf
Q _{VED} Release Rate:		0.02 cfs
Detention Outlet Elevation:		619.75
V _{ED} Storage Elevation:		622.86
Avg. Head over Orifice (Hw):	h=0.5y	1.56 ft
Area of Orifice (A):		0.0032 sf
$A = Q_{VR} / (0.62 \sqrt{2g} Hw)$		
Outlet Hole Diameter:		1 in
Restriction Hole Area:		0.0055 sft
Number of Restriction Holes:		1
Total Restriction Hole Area:		0.0055 sft
Actual Discharge (Q):		0.034 cfs
$Q = 0.62 \cdot A \cdot (2 \cdot G \cdot Hw)^{0.5}$		
Drain Time:		27.76 hrs
Allowable Pump Flow Rate:		0.02 cfs
100-year Volume		2,140 cf
Q _{VR} Release Rate:		0.86 cfs
V ₁₀₀ Storage Elevation:	Q _{ved} >Q100	622.86 (Q _{ved})

ORIFICE CALCULATIONS TO ACHIEVE MINIMUM 48 HOUR DRAIN TIME

Detention Basin Outlet Control Structure		
CPRC Volume		3,381 cf
Q _{VED} Release Rate:		0.02 cfs
Detention Outlet Elevation:		619.75
V _{ED} Storage Elevation:		622.86
Avg. Head over Orifice (Hw):	h=0.5y	1.56 ft
Area of Orifice (A):		0.0032 sf
$A = Q_{VR} / (0.62 \sqrt{2g} Hw)$		
Outlet Hole Diameter:		0.75 in
Restriction Hole Area:		0.0031 sft
Number of Restriction Holes:		1
Total Restriction Hole Area:		0.0031 sft
Actual Discharge (Q):		0.019 cfs
$Q = 0.62 \cdot A \cdot (2 \cdot G \cdot Hw)^{0.5}$		
Drain Time:		49.35 hrs
Allowable Pump Flow Rate:		0.02 cfs
100-year Volume		2,140 cf
Q _{VR} Release Rate:		0.86 cfs
V ₁₀₀ Storage Elevation:	Q _{ved} >Q100	622.86 (Q _{ved})

BIOSWALE VOLUME CALCULATION - MERRIMAN BASIN	
VOLUME IN SAND (PorosityxArea of Sand)	733.2 CF
Porosity	0.2
Depth	1 ft
Area	3666 ft
VOLUME IN STONE (PorosityxLxWxD)	2199.6 CF
Porosity	0.3
Depth	2 ft
Area	3666 sft
VOLUME BELOW RIM ((Sum of Contour Areas)/2)*0.5	2016.3 CF
AREA OF 623.25 CONTOUR	4399 s.f.
AREA OF 622.75 CONTOUR	3666 s.f.
VOLUME GRAND TOTAL	4,949 CF

LEGEND	
● IRON FOUND	● BRASS PLUG SET
⊗ IRON SET	⊗ MONUMENT FOUND
⊗ NAIL FOUND	⊗ MONUMENT SET
⊗ NAIL & CAP SET	
⊗ SEC. CORNER FOUND	
R RECORDED	
M MEASURED	
C CALCULATED	
EXISTING	PROPOSED
—OH—ELEC—W—O—	ELEC. PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
—UG—CABLE—W—O—	UNDERGROUND CABLE TV, GUY PEDESTAL
—UG—PHONE—O—	TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
—UG—ELEC—O—	ELECTRIC U.G. CABLE, MANHOLE, METER & MANHOLE
—GAS—O—	GAS MAIN, VALVE & GAS LINE MARKER
—WATER—O—	WATER MAIN, VALVE, GATE VALVE, TAPPING GLEEVE & VALVE
—SEWER—O—	SANITARY SEWER, CLEANOUT & MANHOLE
—STORM—O—	STORM SEWER, CLEANOUT & MANHOLE
—COMBINED—O—	COMBINED SEWER & MANHOLE
—SQUARE, ROUND & BEEHIVE CATCH BASIN, YARD DRAIN	
—POST INDICATOR VALVE	
—WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF	
—MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE	
—UNIDENTIFIED STRUCTURE	
—SPOT ELEVATION	
—CONTOUR LINE	
—FENCE	
—GUARD RAIL	
—STREET LIGHT	
—SIGN	
—CONC.	CONCRETE
—ASPH.	ASPHALT
—GRAVEL	GRAVEL SHOULDER
—WETLAND	
—STD. HEAVY R.O.W. DUTY ONLY	
—STD. HEAVY DEEP DUTY, DUTY STRENGTH	

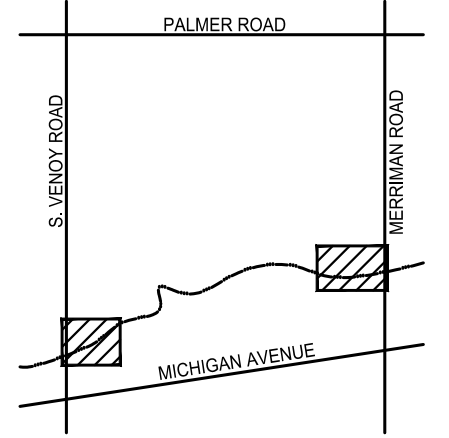
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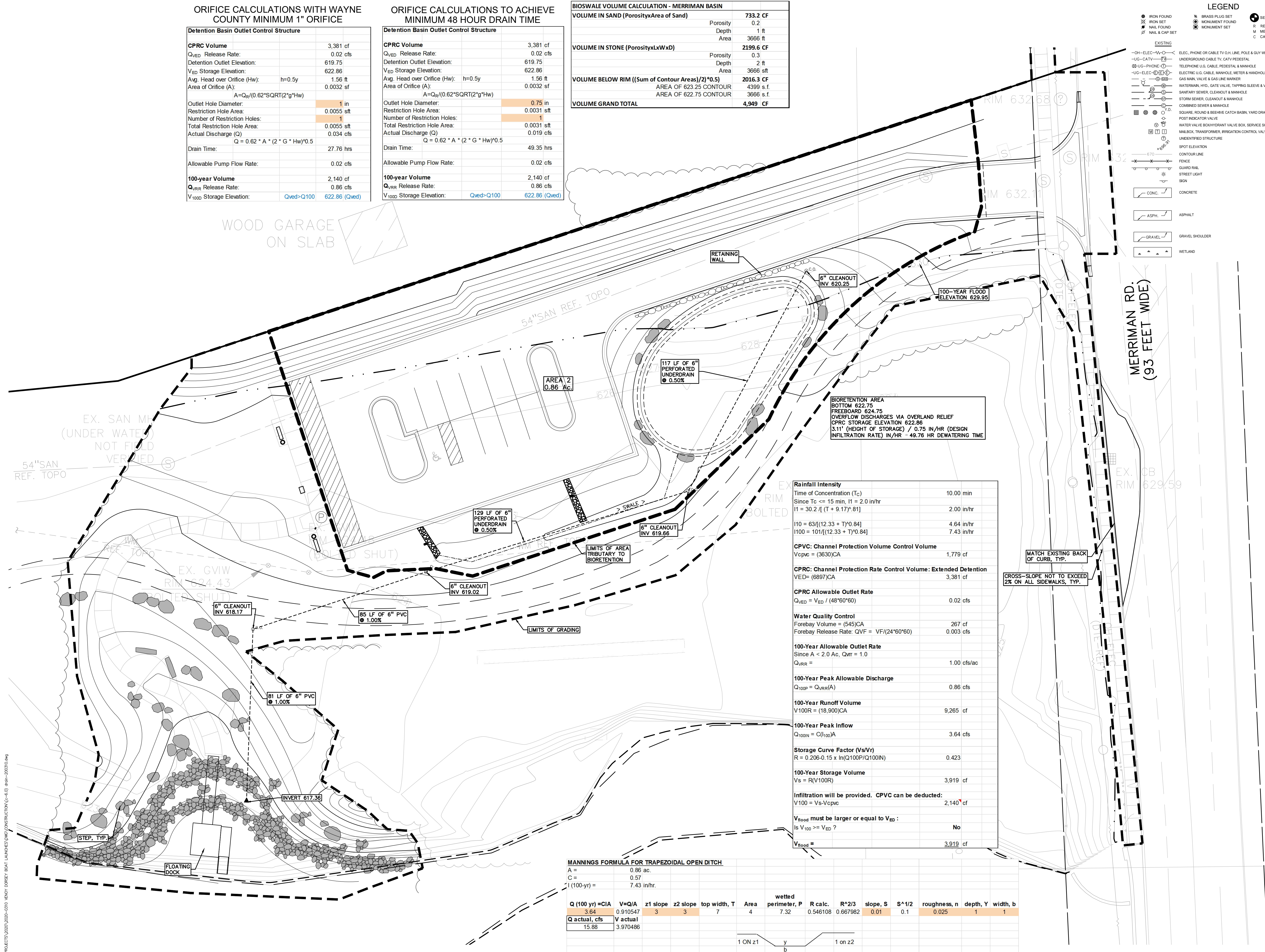
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MERRIMAN DRAINAGE PLAN

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DRAWING NUMBER:	

C-16.0



S:\PROJECTS\2020\2020-0310 VENJOY DORSEY BOAT LAUNCHES\DWG CONSTRUCTION (C-16.0) 03-01-2021.dwg

= ORNAMENTAL TREES

= LANDSCAPING ADJ. TO ROAD

= SHRUBS

= PERENNIALS

= NON-IRRIGATED SEED LAWN

= STORMWATER SEED MIX

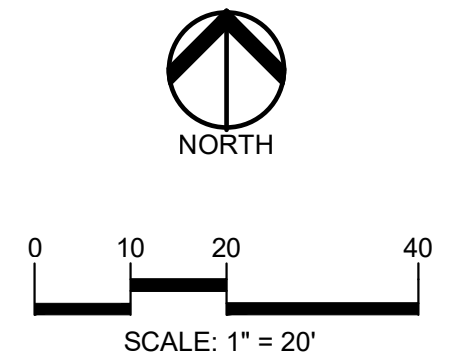
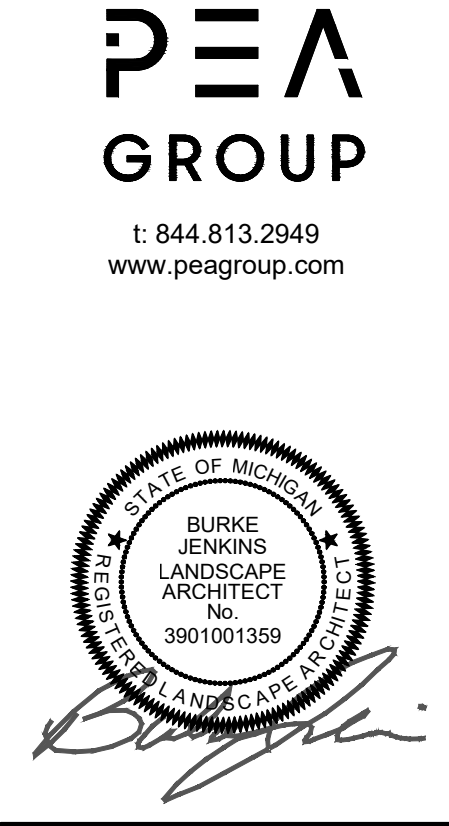
= ECONOMY PRAIRIE SEED MIX

= EXISTING TREES TO REMAIN
WITH TREE PROTECTION FENCE

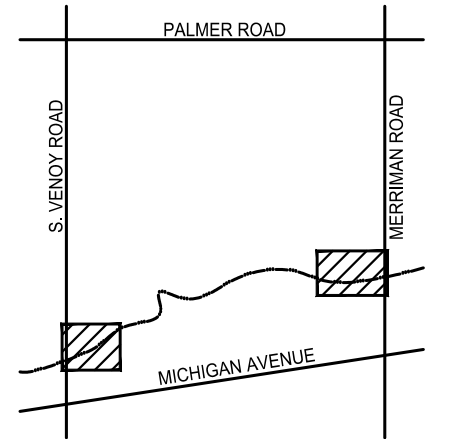
DECIDUOUS TREE PLANT LIST:					
QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC
2	AL2.5	Serviceberry	<i>Amelanchier laevis</i>	2.5" Cal.	B&B
5	BN8	River Birch	<i>Betula nigra</i>	8' Ht.	B&B
4	LT2.5	Tulip Tree	<i>Liriodendron tulipifera</i>	2.5" Cal.	B&B
1	NS2.5	Black Gum	<i>Nyssa sylvatica</i>	2.5" Cal.	B&B
1	QB2.5	Swamp White Oak	<i>Quercus bicolor</i>	2.5" Cal.	B&B
13	TOTAL DEC.				
EVERGREEN TREE PLANT LIST:					
QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC
7	AC8	Concolor Fir	<i>Abies concolor</i>	8' Ht.	B&B
5	PA8	Norway Spruce	<i>Picea abies</i>	8' Ht.	B&B
5	PG8	Black Hills Spruce	<i>Picea glauca 'Densata'</i>	8' Ht.	B&B
6	PO8	Serbian Spruce	<i>Picea omorika</i>	8' Ht.	B&B
23	TOTAL EVG.				

SHRUB PLANT LIST:				
QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE SPEC
36	AB24	Red Chokeberry	<i>Aronia arbutifolia</i> 'Brilliantissima'	24" Ht. Cont.
99	CS24	Red Twig Dogwood	<i>Cornus sericea</i> 'Kelsey'	24" Ht. Cont.
1	HA6	Arnold Promise Witchhazel	<i>Hamamelis x intermedia</i> 'Arnold Promise'	6' Ht. Cont.
25	IV36	Winter Red Winterberry	<i>Ilex verticillata</i> 'Winter Red'	36" Ht. Cont.
50	PO30	Tiny Wine Ninebark	<i>Physocarpus opulifolius</i> 'Tiny wine'	30" Ht. Cont.
41	RA24	Gro Low Sumac	<i>Rhus aromatica</i> 'Gro-Low'	24" Ht. Cont.
46	VR36	Leatherleaf Viburnum	<i>Viburnum rhytidophyllum</i>	36" Ht. Cont.
298	TOTAL SHRUBS			

PERENNIAL PLANT LIST:					
QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC
47	CS	Common Tussock Sedge	<i>Carex stricta</i>	1 Gal.	Cont.
32	CV	Brown Fox Sedge	<i>Carex vulpinoidea</i>	1 Gal.	Cont.
30	EP	Pale Purple Coneflower	<i>Echinacea pallida</i>	1 Gal.	Cont.
34	LS	Marsh Blazing Star	<i>Liatris spicata</i>	1 Gal.	Cont.
80	PV	Obedient Plant	<i>Physostegia virginiana</i>	1 Gal.	Cont.
37	RF	Black-Eyed Susan	<i>Rudbeckia fulgida</i> var. <i>sulivantii</i> 'Goldsturm'	1 Gal.	Cont.
51	SC	Wool Grass	<i>Scirpus cyperinus</i>	2 Gal.	Cont.
41	SN	New England Aster	<i>Symphyotrichum novae-angliae</i>	2 Gal.	Cont.
352	TOTAL PER.				



CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT

**WAYNE COUNTY
PARKS**

33175 ANN ARBOR TRAIL
WESTLAND, MI

PROJECT TITLE
**VENOY DORSEY
KAYAK LAUNCHES**
WAYNE, MI

REVISIONS	
95% CD	10/08/21
MDNR REVIEW	02/04/22
MDNR REVISIONS	03/10/22
MDNR REVISIONS	04/25/22
WAYNE COUNTY	07/12/22
WAYNE CO. REVISIONS	10/25/22
BIDS	11/30/22
ADDENDUM #1	12/16/22
WAYNE CO. REVISIONS	01/30/23
REBID	06/05/23

ORIGINAL ISSUE DATE:
MARCH 2, 2021

DRAWING TITLE

**MERRIMAN
LANDSCAPE
PLAN**

PEA JOB NO.	2020-0310
P.M.	BWJ
DN.	JRW
DES.	BWJ/JRW
DRAWING NUMBER:	

C-17.0