APPENDIX M (Cont'd)
Bid Package – Tamarack Creek

ROUGE RIVER AOC HABITAT PROJECT:
TAMARACK CREEK - STREAM AND WETLAND RESTORATION

Alliance of Rouge Communities
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SOUTHFIELD, MICHIGAN

GLRI EPA DESIGN AWARD NO. GL-00E02344
GLRI EPA IMPLEMENTATION AWARD NO. GL-00E02478
FOR BIDDING JANUARY 2021

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Great Lakes RESTORATION

PREPARED BY:

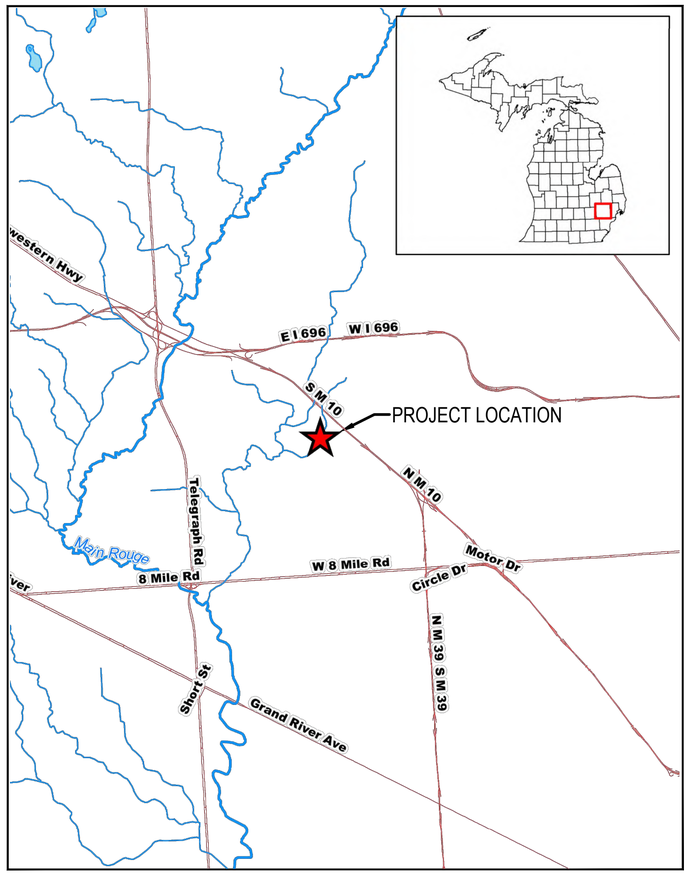
ECT Environmental Consulting & Technology, Inc.

Environmental Consulting & Technology, Inc.
2200 Commonwealth Boulevard, Suite 300
Ann Arbor, Michigan 48105
Phone: 734.769.3004
Fax: 734.769.31664

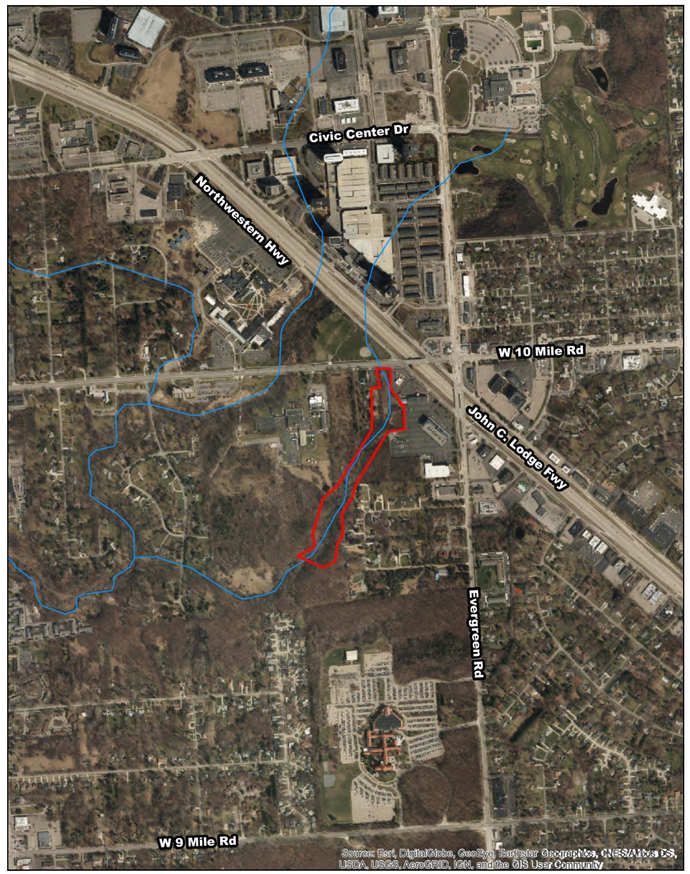
WITH:

Somat Engineering INCORPORATED

MIDWESTERN CONSULTING



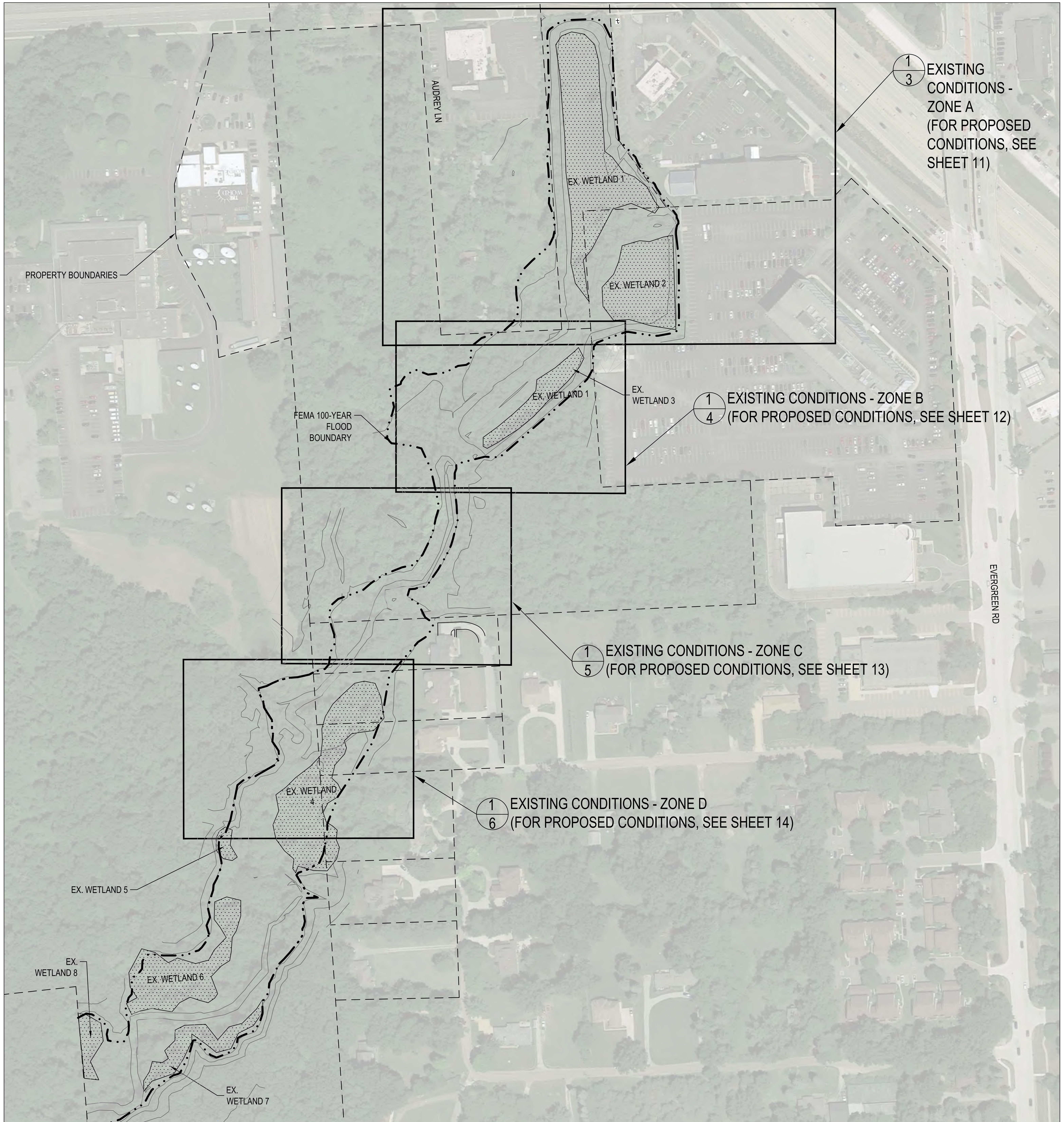
PROJECT LOCATION MAP
NOT TO SCALE



PROJECT VICINITY MAP
NOT TO SCALE

DRAWING INDEX

PROJECT DESIGN FUNDED BY THE ENVIRONMENTAL PROTECTION AGENCY THROUGH A GREAT LAKE RESTORATION INITIATIVE GRANT. GLRI EPA AWARD NO. GL-00E02344
PROJECT IMPLEMENTATION FUNDED BY THE ENVIRONMENTAL PROTECTION AGENCY THROUGH A GREAT LAKE RESTORATION INITIATIVE GRANT. GLRI EPA AWARD NO. GL-00E02478



BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING IN DECEMBER 2018

LEGEND

838	EXIST. CONTOUR
— — —	PROPERTY LINE
— · — · —	FEMA 100-YR FLOOD BOUNDARY
(stippled)	EXISTING WETLAND

EXISTING SITE CONDITIONS:

1. CONTRACTOR SHALL BECOME FAMILIAR WITH ALL EXISTING SITE CONDITIONS PRIOR TO STARTING WORK.

2. THE CONTRACTOR UNDERSTANDS AND ACKNOWLEDGES THAT THE PERFORMANCE OF THE WORK IS REQUIRED WITHIN THE ROUGE RIVER SYSTEM AND FLOODPLAIN AND THAT THE ROUGE RIVER WATER LEVEL FLUCTUATES.

3. THE CONTRACTOR UNDERSTANDS AND ACKNOWLEDGES THAT THEY HAVE TAKEN INTO ACCOUNT THE POTENTIAL FOR ANY WATER LEVEL CHANGES THAT MIGHT OCCUR IN COSTING, SCHEDULING, AND FEASIBILITY OF PERFORMING THE CONTRACT WORK UNDER THE PREVAILING ENVIRONMENTAL CONDITIONS. THEREFORE THE CONTRACTOR ACKNOWLEDGES THAT ANY FLUCTUATION IN WATER LEVELS, FLOODING, OR INUNDATION DURING/OVER THE COURSE OF THE PROJECT IS LIKELY AND DOES NOT CONSTITUTE A CHANGE IN CONDITIONS OR AN UNFORESEEN SITE CONDITION.

4. THE CONTRACTOR SHALL BE FULLY AWARE OF THE ROUGE RIVER HYDROLOGY AND CURRENT WEATHER CONDITIONS SO THAT WORK CAN BE SECURED AND PROTECTED AT ALL TIMES, SO THAT SAFE JOB SITE WORKING CONDITIONS ARE MAINTAINED, AND SO THAT SOIL EROSION IS CONTROLLED IN ACCORDANCE WITH ALL APPLICABLE PERMITS AND ENVIRONMENTAL LAWS.

5. THE CONTRACTOR ACKNOWLEDGES THAT DELAYS IN THE START OF, OR COMPLETION OF, WORK DUE TO FLUCTUATIONS IN WATER LEVEL THROUGHOUT THE DURATION OF THE PROJECT SHALL NOT CONSTITUTE A CHANGE IN CONDITIONS NOR SHALL BE A BASIS FOR ANY EXTENSION OF TIME OR DAMAGES. IF THE CONTRACTOR SHALL BE UNAVOIDABLE DELAYED IN BEGINNING OR FULFILLING THIS CONTRACT BY REASONS OF CHANGING WATER LEVELS, STORMS, INUNDATION OR FLOODS, THE CONTRACTOR SHALL HAVE NOT VALID CLAM FOR DAMAGES, BUT SHALL IN SUCH CASE BE ENTITLED TO AN EXTENSION OF TIME AS THE ENGINEER SHALL ADJUDGE TO BE JUST AND REASONABLE, PROVIDED THAT FORMAL CLAIM FOR AN EXTENSION OF TIME IS MADE IN WRITING BY THE CONTRACTOR WITHIN 14 DAYS OF THE ALLEGED DELAY.

6. THE ENGINEER RESERVES THE RIGHT TO SUSPEND WORK ACTIVITIES WHEN IT IS IN THE BEST INTEREST OF THE PROJECT TO DO SO DUE TO WEATHER, FLOW, OR WATER LEVEL CONDITIONS. THE DIRECTIVE TO SUSPEND WORK ACTIVITIES SHALL BE SUBMITTED TO THE CONTRACTOR, BY THE ENGINEER, IN WRITING. SUCH SUSPENSION SHALL NOT BE BASIS FOR CLAIM FOR ADDITIONAL COST BUT CAN BE BASIS FOR EXTENSION OF TIME.

7. THE CONTRACTOR SHALL RESEARCH AVAILABLE INFORMATION AND PERFORM ITS OWN INDEPENDENT INVESTIGATIONS AS NEEDED IN AN EFFORT TO FULLY UNDERSTAND ENVIRONMENTAL CONDITIONS ASSOCIATED WITH THE PROJECT SITE. THE CONTRACTOR SHALL UNDERSTAND THE SITE CONDITIONS THAT WILL AFFECT THE COST, SCHEDULE, OR PERFORMANCE OF WORK IN ADVANCE OF STARTING SUCH WORK.

8. TOPOGRAPHIC SURVEY INFORMATION PROVIDED BY MIDWESTERN CONSULTING, INC. SURVEY CONDUCTED IN DECEMBER, 2018.

9. ALL ELEVATIONS SHOWN ARE IN NAVD88 DATUM.

10. CONTRACTOR TO CONFIRM EXISTING CONDITIONS PRIOR TO CONSTRUCTION, AND REPORT ANY DISCREPANCIES TO PROJECT TEAM PRIOR TO COMMENCING WORK ACTIVITIES.

11. SEDIMENT SAMPLE LABORATORY DATA IS AVAILABLE UPON REQUEST

12. FULL TREE INVENTORY IS AVAILABLE UPON REQUEST

13. BENCHMARK INFORMATION SHOWN BELOW.

NOTES:
1. SURVEY INFORMATION PROVIDED BY MIDWESTERN CONSULTING, INC.
2. SURVEY WAS CONDUCTED IN DECEMBER, 2018
3. ALL ELEVATIONS SHOWN ARE IN NAVD88 DATUM
4. CONTRACTOR TO CONFIRM EXISTING CONDITIONS PRIOR TO CONSTRUCTION AS NEEDED

BENCHMARK #1
TOP OF CONCRETE HEADWALL OVER 72" CULVERT LOCATED +/-510' SOUTH OF THE C/L 10 MILE ROAD; +/- 55' SOUTH OF SOUTHEAST CORNER OF BUILDING; +/- 35' EAST OF TREE (TAG #1022, 15" BOX ELDER).
ELEVATION = 660.60 (NAVD 88 DATUM)

BENCHMARK #2
TOP OF SPIKE SET IN SOUTHEAST FACE OF TREE (TAG #1278, 18" RED OAK); +/-47' NORTHEAST OF C.P. #3096; +/-31' WEST OF THE CENTERLINE OF TAMARACK CREEK; +/-179' SOUTH-SOUTHWEST OF C.P. #11.
ELEVATION = 660.92 (NAVD 88 DATUM)

GENERAL NOTES:
1. UNDERGROUND UTILITIES: FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 53, 1974, THE CONTRACTOR SHALL DIAL 1-800-482-7171 A MINIMUM OF THREE FULL WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS PRIOR TO BEGINNING EACH EXCAVATION IN AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.
2. SURVEY DATA PRESENTED IN THESE DRAWINGS WAS PROVIDED BY:
MIDWESTERN CONSULTING
3815 PLAZA DRIVE
ANN ARBOR, MICHIGAN 48108
(734) 995-0200 (PH)
3. THE SOIL LOG INFORMATION (ATTACHED TO BID SPECIFICATIONS) REPRESENTS POINT INFORMATION. PRESENTATION OF THIS INFORMATION IN NO WAY INFERS THAT SUBSURFACE CONDITIONS ARE THE SAME OTHER THAN THE EXACT LOCATION OF THE BORINGS.
4. STORAGE OF EQUIPMENT AND CONSTRUCTION MATERIALS SHALL BE RESTRICTED TO DESIGNATED STAGING AREAS AS INDICATED ON THE PLANS, UNLESS OTHERWISE APPROVED BY ENGINEER.
5. ALL UTILITIES, CULVERTS AND BENCHMARKS SHALL BE PRESERVED DURING CONSTRUCTION ACTIVITIES UNLESS OTHERWISE SHOWN ON THE DRAWINGS. CONTRACTOR TO REPLACE DAMAGED UTILITIES, CULVERTS OR BENCHMARKS AT OWN EXPENSE.
6. ALL CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO 'LIMIT OF DISTURBANCE' LINE. WORK BEYOND THESE LIMITS SHALL BE AS DIRECTED BY ENGINEER.
7. TRANSPORTATION OF EQUIPMENT AND MATERIALS TO/FROM THE SITE ON STATE HIGHWAYS AND TRUNK LINES SHALL CONFORM TO ALL LOCAL AND STATE TRAFFIC LAWS. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PERTAINING TO DELIVERY OF EQUIPMENT AND MATERIALS TO/FROM THE SITE. COSTS OF OBTAINING NECESSARY PERMITS IS INCIDENTAL TO THE WORK.
8. ALL WORK SHALL BE COMPLETED BETWEEN THE HOURS OF 7:00AM AND 6:00PM. ALL WORK SHALL BE COMPLETED MONDAY THROUGH SATURDAY.
9. CONSTRUCTION ACCESS TO THE SITES FOR ALL ACTIVITIES WILL BE FROM AUDREY LANE (OFF OF 10 MILE) AS INDICATED ON THE SITE ACCESS PLAN. NO OTHER ACCESS IS ALLOWED WITHOUT WRITTEN PERMISSION FROM THE OWNER.
10. ALL MATERIALS REMOVED, EXCEPT WHERE OTHERWISE INDICATED ON THE PLANS, SHALL BE LEGALLY DISPOSED OF OFF SITE.
11. ALL EXCESS SOIL AND FILL GENERATED DURING REQUIRED EXCAVATION AS SHOWN ON DRAWINGS SHALL BE LEGALLY DISPOSED OF OFF-SITE.
12. THE CONTRACTOR SHALL OBTAIN PERMITS AS REQUIRED FOR THE PROJECT, INCLUDING THE SOIL EROSION AND SEDIMENT CONTROL PERMIT FROM THE CITY OF SOUTHFIELD.
13. THE EGLE/USACE PERMIT HAS BEEN ACQUIRED. ALL WORK SHALL BE DONE TO MEET THE REQUIREMENTS OF EGLE AND/OR USACE PERMITS ISSUED FOR THIS PROJECT. A COPY OF THE PERMIT IS INCLUDED IN THE CONTRACT DOCUMENTS.

3 WORKING DAYS
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SOUTHFIELD, MICHIGAN

FOR BIDDING	01-2021
EGLE/USACE JOINT PERMIT APP.	06-2020

180611-0300
ECT PROJECT NUMBER

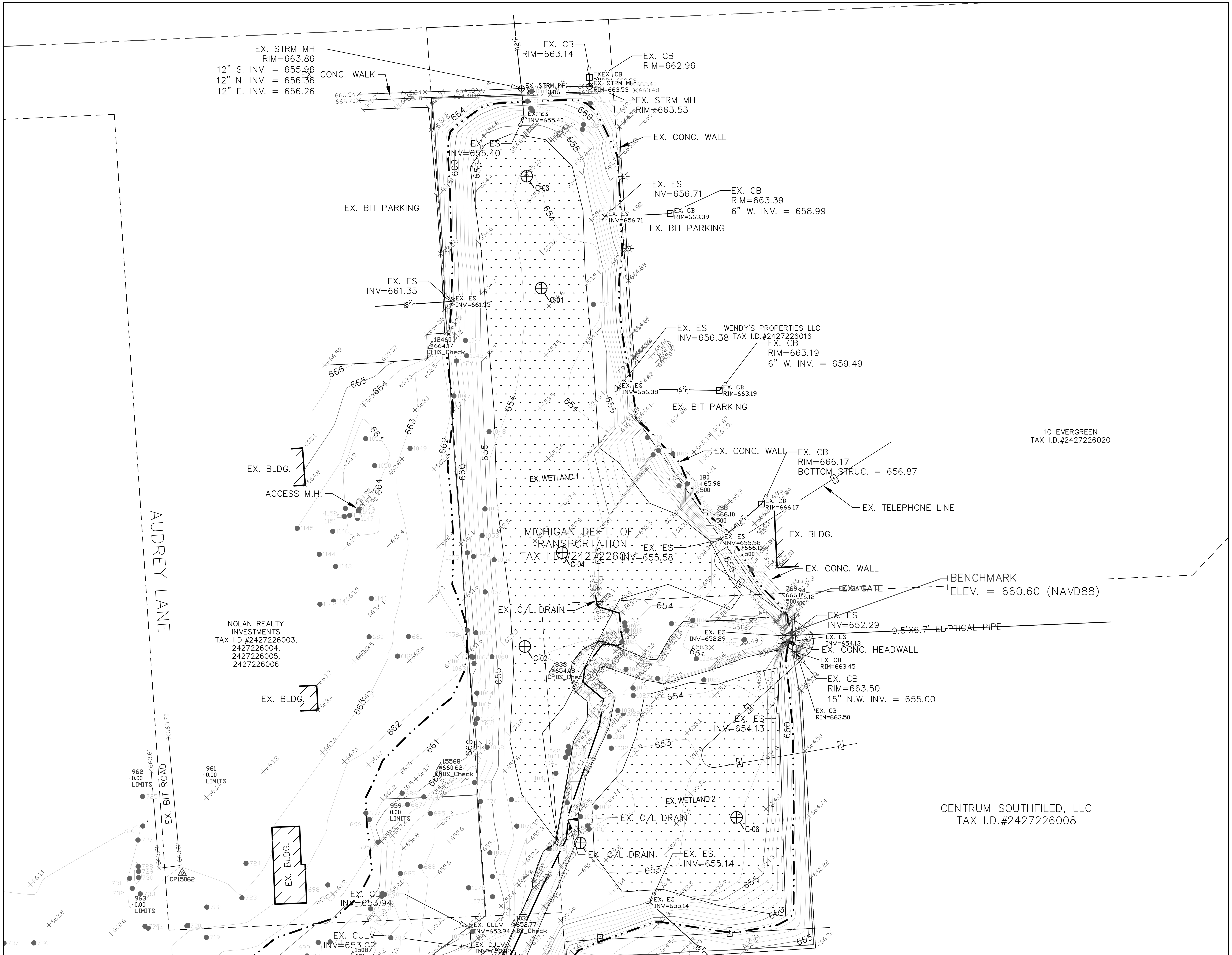
AB DESIGNED BY	MB CHECKED BY
AT DRAWN BY	JO APPROVED BY

EXISTING CONDITIONS - OVERVIEW

SCALE: 1" = 120' @ 22" x 34"
0 60' 120' 240'

NORTH

SHEET NUMBER
2

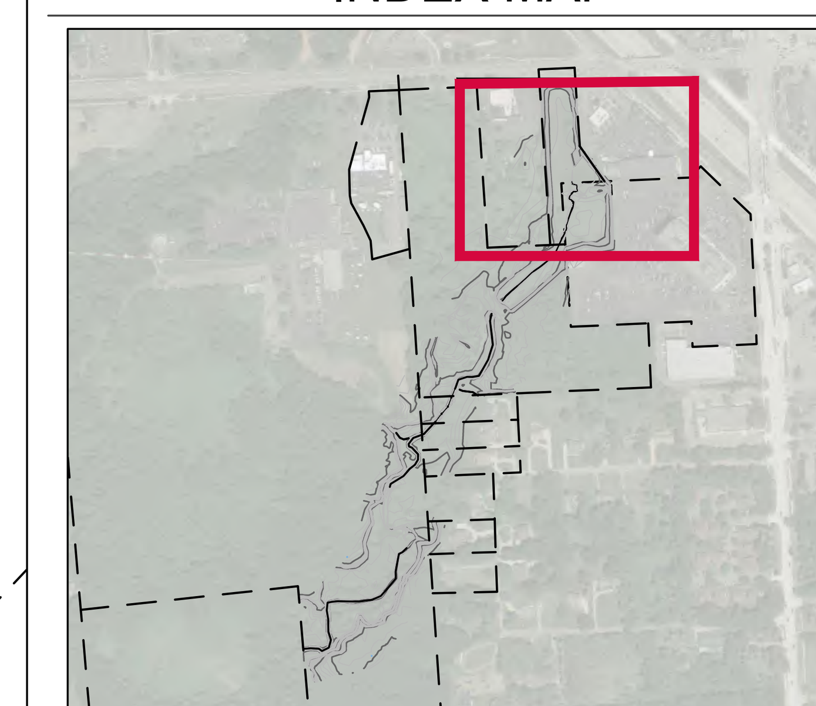


1/3 EXISTING CONDITIONS - ZONE A

LEGEND

Symbol	Description
838	EXIST. CONTOUR
U.P.	EXIST. UTILITY POLE
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
t	EXIST. TELEPHONE LINE
r	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	END SECTION
	CULVERT
	FENCE
	SINGLE TREE
	SECTION CORNER
	CONTROL PT.
C-0X	SOIL BORING LOCATION
	EXIST. BUILDING
	EXIST. STREAM CENTERLINE
	EXIST.PROPERTY LINE
	FEMA 100-YR FLOOD BOUNDARY
	EXIST. WETLAND

INDEX MAP



NOTES:

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3. ALL ELEVATIONS SHOWN ARE IN NAVD88 DATUM
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5. SEE EXISTING CONDITIONS NOTES ON SHEET 2

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EGLE/USACE JOINT PERMIT APP.	06-2020

180611-0300
ECT PROJECT NUMBER

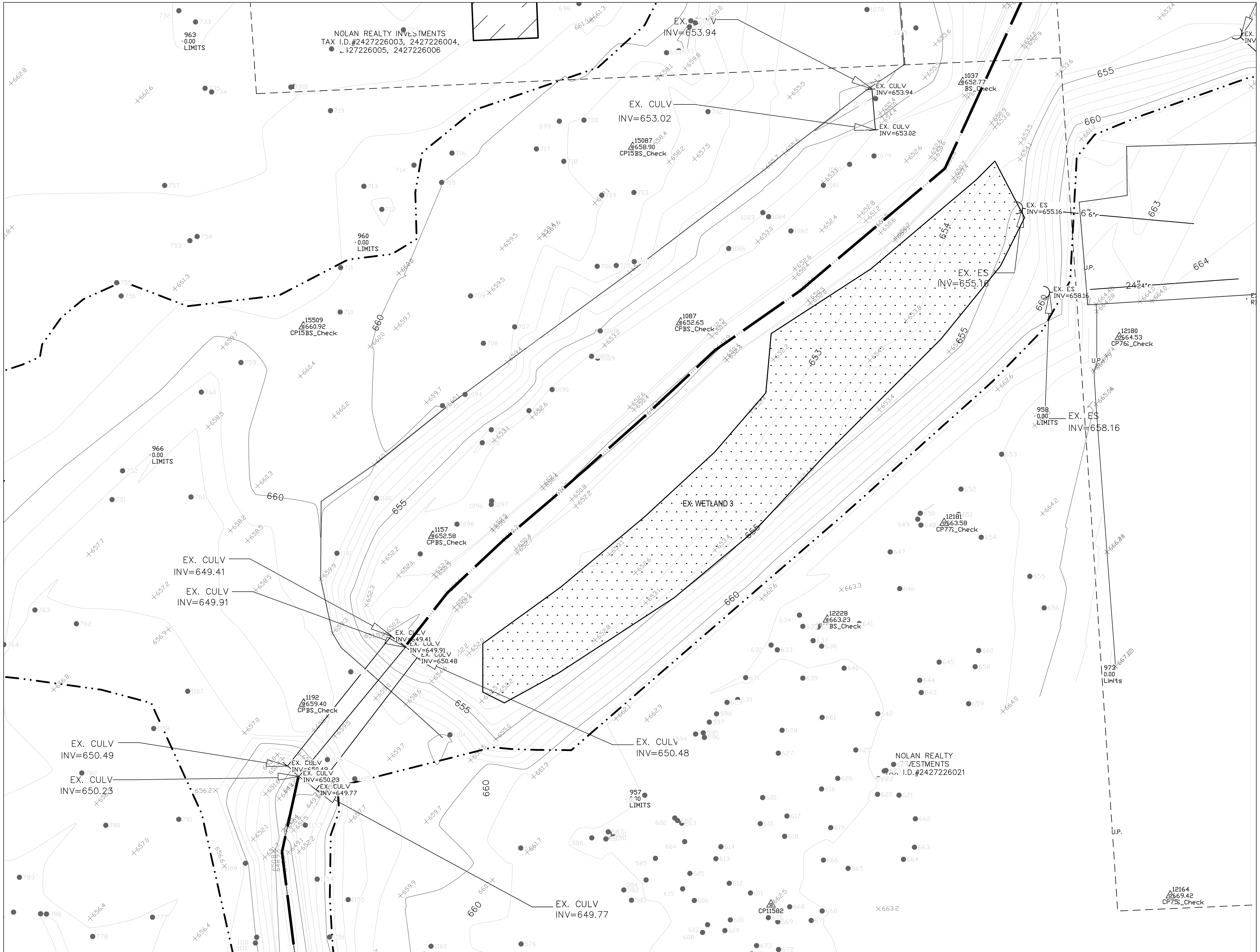
AB DESIGNED BY	MB CHECKED BY
AT DRAWN BY	JO APPROVED BY

EXISTING CONDITIONS - ZONE A

SCALE: 1" = 40' @ 22" x 34"
0 20' 40' 80'

NORTH

SHEET NUMBER
3

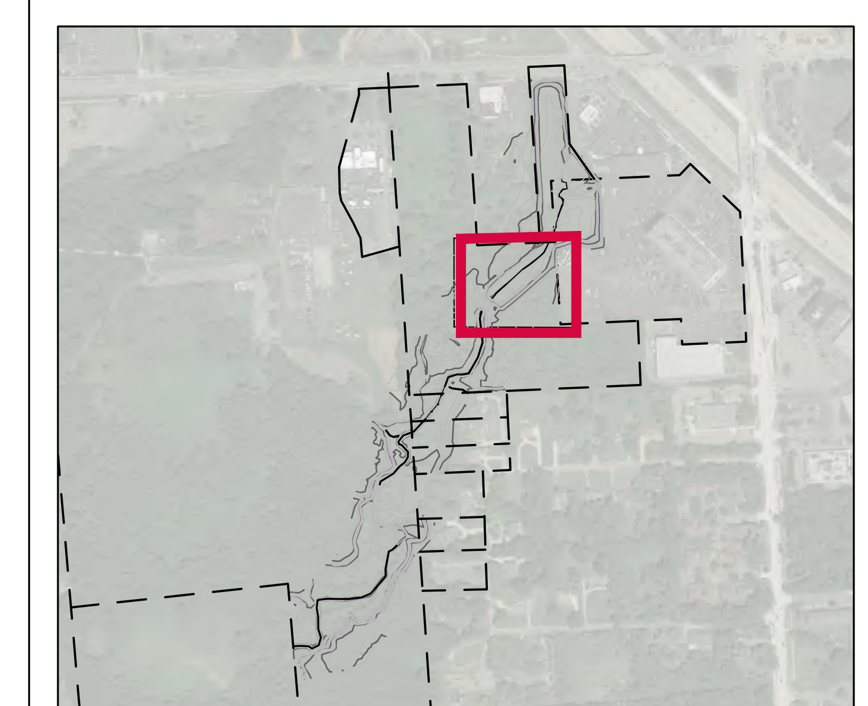


1/4 EXISTING CONDITIONS - ZONE B

LEGEND

838	EXIST. CONTOUR
U.P.	EXIST. UTILITY POLE
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
t	EXIST. TELEPHONE LINE
	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	END SECTION
	CULVERT
	FENCE
	SINGLE TREE
	SECTION CORNER
	CONTROL PT.
	FEMA 100-YR FLOOD BOUNDARY
	EXIST. BUILDING
	EXIST. STREAM CENTERLINE
	EXIST. PROPERTY LINE
	EXIST. WETLAND

INDEX MAP



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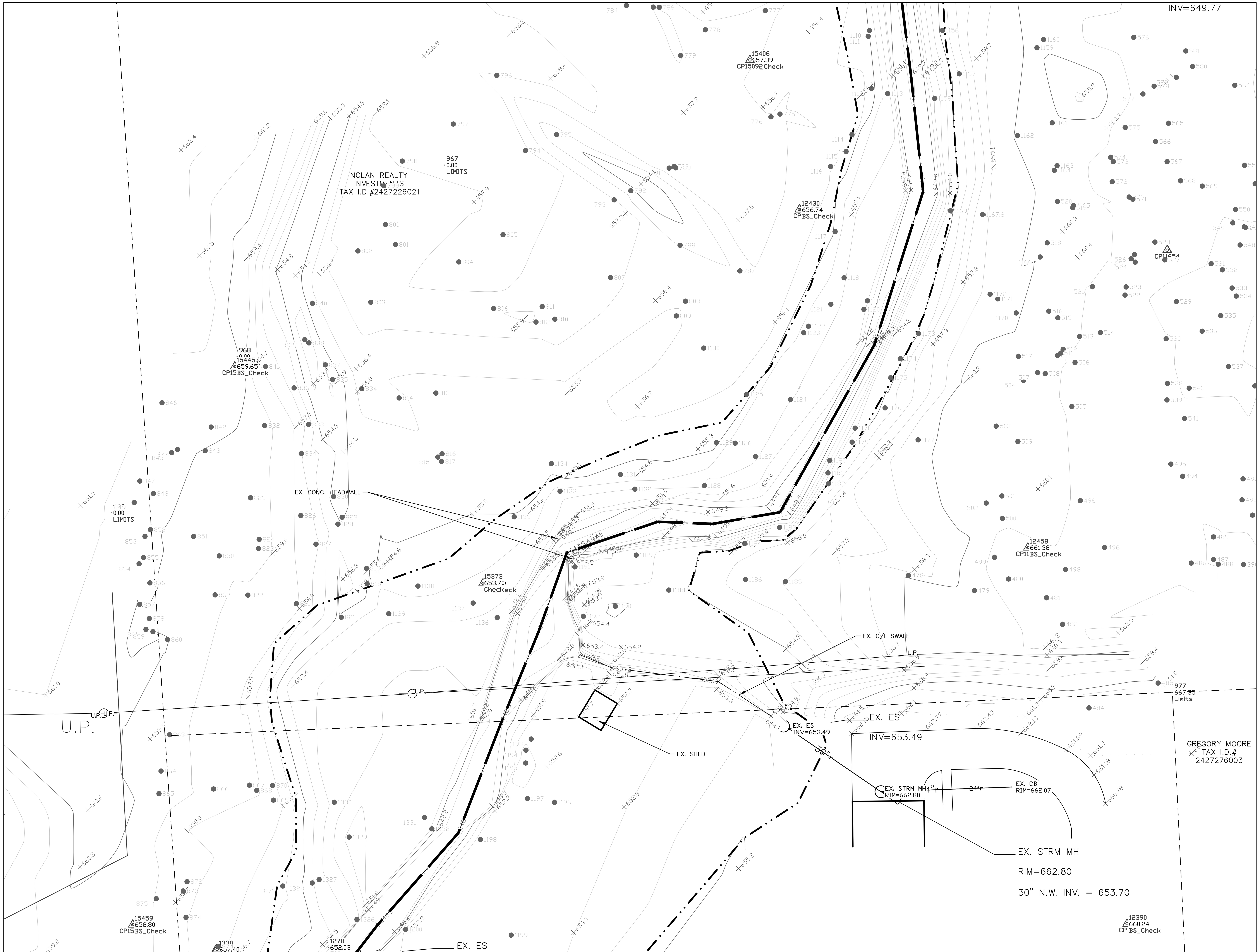
AB DESIGNED BY	MB CHECKED BY
AT DRAWN BY	JO APPROVED BY

EXISTING CONDITIONS - ZONE B

SCALE: 1" = 20' @ 22" x 34"
0 10' 20' 40'

NORTH

SHEET NUMBER
4



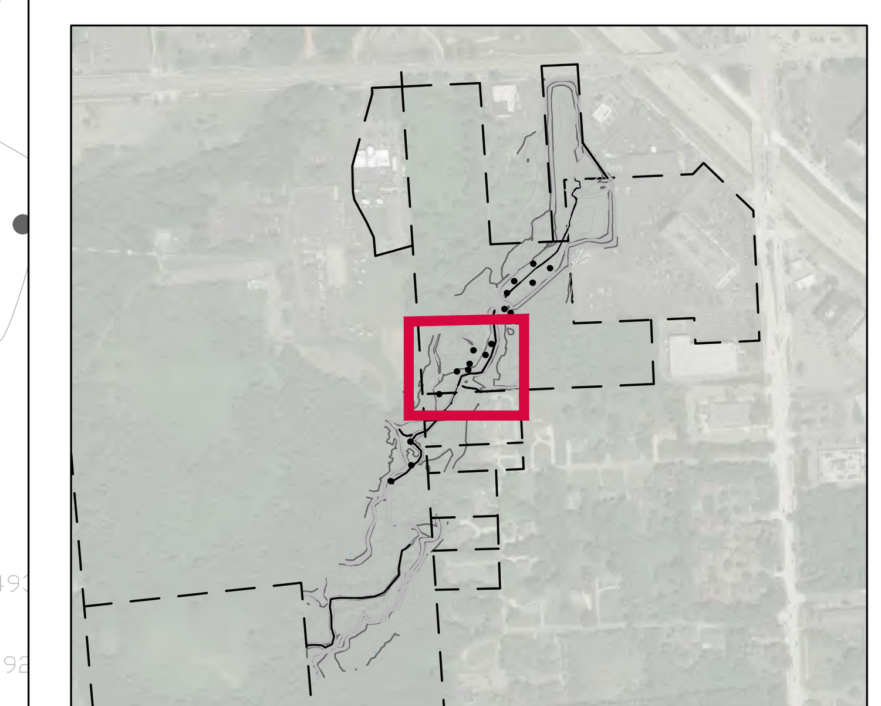
1/5 EXISTING CONDITIONS - ZONE C

BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING

LEGEND

838	EXIST. CONTOUR
U.P.	EXIST. UTILITY POLE
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
t	EXIST. TELEPHONE LINE
r	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	END SECTION
	CULVERT
	FENCE
	SINGLE TREE
	SECTION CORNER
	CONTROL PT.
	FEMA 100-YR FLOOD BOUNDARY
	EXIST. BUILDING
	EXIST. STREAM CENTERLINE
	EXIST. PROPERTY LINE

INDEX MAP



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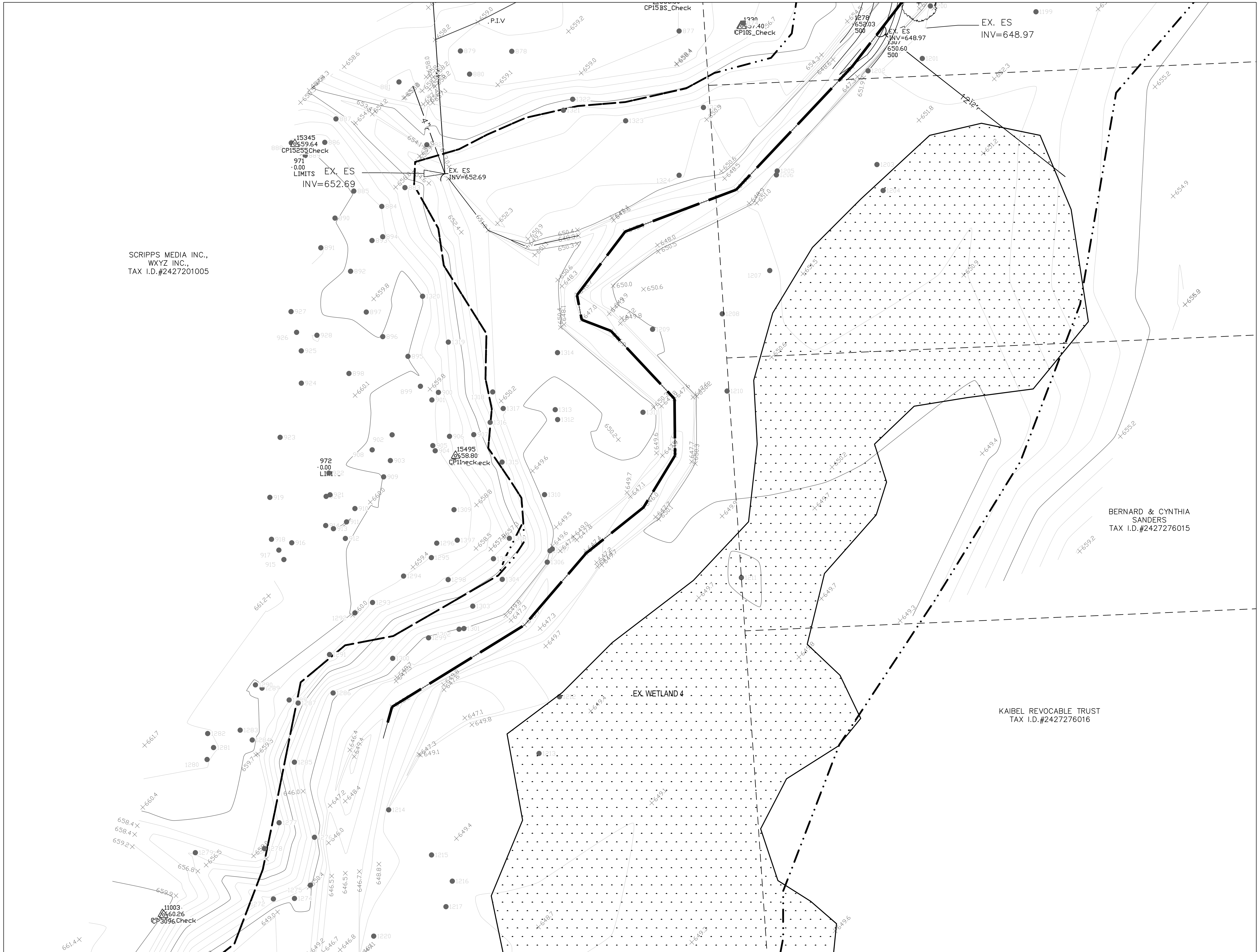
AT DRAWN BY	JO APPROVED BY

EXISTING CONDITIONS - ZONE C

SCALE: 1" = 20' @ 22" x 34"
0 10' 20' 40'

NORTH

SHEET NUMBER
5



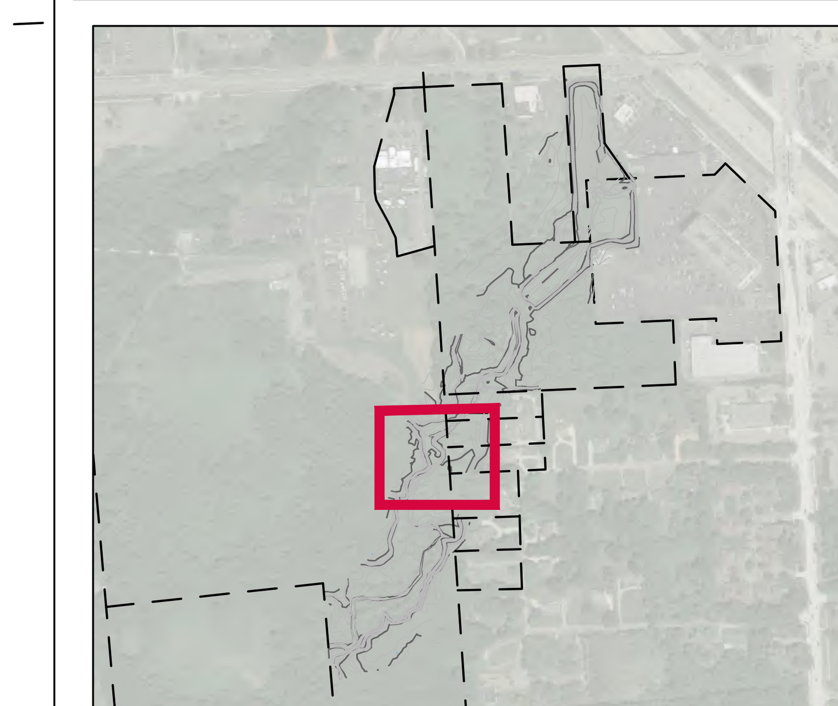
1/6 EXISTING CONDITIONS - ZONE D

BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING

LEGEND

838	EXIST. CONTOUR
U.P.	EXIST. UTILITY POLE
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
t	EXIST. TELEPHONE LINE
r	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	END SECTION
	CULVERT
	FENCE
	SINGLE TREE
	SECTION CORNER
	CONTROL PT.
	FEMA 100-YR FLOOD BOUNDARY
	EXIST. BUILDING
	EXIST. STREAM CENTERLINE
	EXIST. PROPERTY LINE
	EXIST. WETLAND

INDEX MAP



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ECT PROJECT NUMBER

AB — DESIGNED BY
MB — CHECKED BY
AB/ AK — DRAWN BY
JO — APPROVED BY

EXISTING CONDITIONS - ZONE D

SCALE: 1" = 20' @ 22" x 34"
0 10' 20' 40'

NORTH

SHEET NUMBER
6

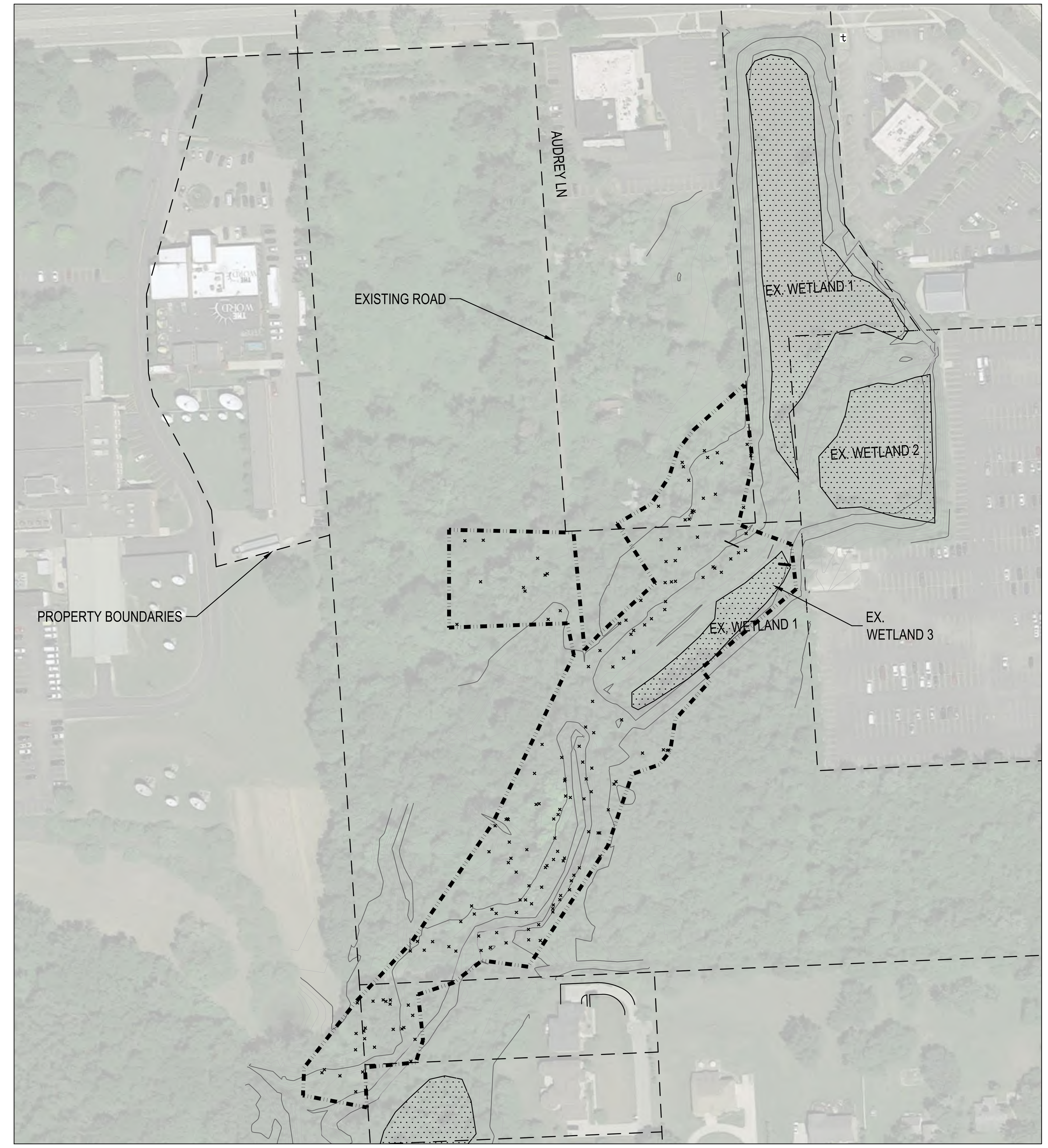
TREES TO BE REMOVED

TAG#	DBH	COMMON NAME	GENUS/SPECIES	LANDMARK
257	7	Box Elder	Acer negundo	
486	7	Black Walnut	Juglans nigra	
487	7	American Elm	Ulmus americana	
488	12	Box Elder	Acer negundo	
490	6	Black Willow	Salix nigra	
684	14	Black Walnut	Juglans nigra	
685	10	Black Walnut	Juglans nigra	
686	15	Black Walnut	Juglans nigra	
687	10	Black Walnut	Juglans nigra	
688	12	Black Walnut	Juglans nigra	
689	8	Black Walnut	Juglans nigra	
690	9	White Mulberry	Morus alba	
691	14	White Mulberry	Morus alba	
692	23	White Pine	Pinus strobus	X
693	11	American Elm	Ulmus americana	
694	9	Black Cherry	Prunus serotina	
695	27	White Pine	Pinus strobus	X
696	13	White Pine	Pinus strobus	
697	11	White Pine	Pinus strobus	
698	29	Linden	Tilia americana	X
700	12	Black Walnut	Juglans nigra	
701	16	Black Walnut	Juglans nigra	
702	9	Black Walnut	Juglans nigra	
703	6	White Ash	Fraxinus americana	
704	6	American Elm	Ulmus americana	
705	14	Black Willow	Salix nigra	
706	18	Black Willow	Salix nigra	
707	13	Black Willow	Salix nigra	
736	19	Black Walnut	Juglans nigra	
737	20	Black Walnut	Juglans nigra	X
745	18	Box Elder	Acer negundo	
753	10	Black Maple	Acer nigrum	
754	10	Black Maple	Acer nigrum	
755	8	American Elm	Ulmus americana	
756	25	Silver Maple	Acer saccharinum	X
757	26	Silver Maple	Acer saccharinum	X
758	10	Dogwood	Cornus florida	X
759	39	Cottonwood	Populus deltoides	X
760	11	Silver Maple	Acer saccharinum	
775	7	Black Maple	Acer nigrum	
776	8	Black Maple	Acer nigrum	
777	9	Black Walnut	Juglans nigra	
781	7	White Ash	Fraxinus americana	
787	7	American Elm	Ulmus americana	
788	8	Black Walnut	Juglans nigra	
789	10	Black Maple	Acer nigrum	
790	13	Black Maple	Acer nigrum	
791	8	Black Maple	Acer nigrum	
792	35	Cottonwood	Populus deltoides	X
807	7	Linden	Tilia americana	
808	8	American Elm	Ulmus americana	
809	7	American Elm	Ulmus americana	
818	11	Linden	Tilia americana	
821	33	Black Maple	Acer nigrum	X
865	11	Black Maple	Acer nigrum	
866	10	Red Oak	Quercus rubra	
867	17	Red Oak	Quercus rubra	
868	14	Red Oak	Quercus rubra	
869	10	Sugar Maple	Acer saccharum	
870	25	Cottonwood	Populus deltoides	X
871	7	Hop-Hornbeam	Ostrya virginia	
872	18	White Oak	Quercus alba	X
873	6	Hop-Hornbeam	Ostrya virginia	
874	6	Northern Hackberry	Celtis occidentalis	
875	13	Black Maple	Acer nigrum	
877	10	Black Maple	Acer nigrum	
904	21	Black Cherry	Prunus serotina	X
905	15	Red Oak	Quercus rubra	
906	9	White Pine	Pinus strobus	
1036	8	Silver Maple	Acer saccharinum	
1069	22	Black Walnut	Juglans nigra	X
1070	35	Black Willow	Salix nigra	X
1071	8	Box Elder	Acer negundo	
1072	10	Box Elder	Acer negundo	
1073	28	Black Willow	Salix nigra	X
1074	24	Black Willow	Salix nigra	X
1075	17	Black Willow	Salix nigra	
1076	8	Box Elder	Acer negundo	
1077	13	Black Willow	Salix nigra	
1079	10	Black Walnut	Juglans nigra	
1080	12	Black Willow	Salix nigra	
1081	12	Black Walnut	Juglans nigra	
1082	9	Box Elder	Acer negundo	
1083	12	Black Willow	Salix nigra	
1084	9	Black Willow	Salix nigra	
1086	15	Black Willow	Salix nigra	
1087	26	Black Willow	Salix nigra	X
1088	17	Black Willow	Salix nigra	
1089	11	Black Willow	Salix nigra	
1090	10	Black Willow	Salix nigra	
1091	13	Black Willow	Salix nigra	
1092	14	Black Willow	Salix nigra	
1093	15	Black Willow	Salix nigra	
1094	9	American Elm	Ulmus americana	
1095	20	American Elm	Ulmus americana	X
1096	16	Black Willow	Salix nigra	
1097	11	Wild Plum	Prunus americana	
1098	8	Silver Maple	Acer saccharinum	
1099	10	Silver Maple	Acer saccharinum	

TAG#	DBH	COMMON NAME	GENUS/SPECIES	LANDMARK
1100	11	American Elm	Ulmus americana	
1102	17	Black Willow	Salix nigra	
1103	18	Black Willow	Salix nigra	
1104	11	White Ash	Fraxinus americana	
1105	16	Sugar Maple	Acer saccharum	
1106	35	Cottonwood	Populus deltoides	X
1109	15	Black Willow	Salix nigra	
1110	10	Sugar Maple	Acer saccharum	
1111	12	Sugar Maple	Acer saccharum	
1112	10	Sugar Maple	Acer saccharum	
1113	9	Sugar Maple	Acer saccharum	
1114	12	Sugar Maple	Acer saccharum	
1115	8	Sugar Maple	Acer saccharum	
1116	9	Sugar Maple	Acer saccharum	
1117	13	Sugar Maple	Acer saccharum	
1118	9	Sugar Maple	Acer saccharum	
1119	26	Black Willow	Salix nigra	X
1120	19	Black Willow	Salix nigra	
1121	11	Sugar Maple	Acer saccharum	
1122	14	Sugar Maple	Acer saccharum	
1123	9	Sugar Maple	Acer saccharum	
1124	9	Sugar Maple	Acer saccharum	
1125	10	Sugar Maple	Acer saccharum	
1126	29	Black Willow	Salix nigra	X
1127	24	Black Willow	Salix nigra	X
1128	9	American Elm	Ulmus americana	
1129	8	Sugar Maple	Acer saccharum	
1130	8	American Elm	Ulmus americana	
1131	11	Sugar Maple	Acer saccharum	
1132	8	American Elm	Ulmus americana	
1133	8	Sugar Maple	Acer saccharum	
1134	16	Sugar Maple	Acer saccharum	
1135	8	Sugar Maple	Acer saccharum	
1136	13	Red Elm	Ulmus rubra	
1137	10	Linden	Tilia americana	
1138	19	Cottonwood	Populus deltoides	
1139	8	Linden	Tilia americana	
1153	15	Black Willow	Salix nigra	
1154	16	Black Willow	Salix nigra	
1155	20	Black Willow	Salix nigra	
1156	24	Black Willow	Salix nigra	X
1157	23	Black Willow	Salix nigra	
1158	8	American Elm	Ulmus americana	
1159	15	Box Elder	Acer negundo	
1160	18	Box Elder	Acer negundo	
1162	9	Black Walnut	Juglans nigra	
1167	14	Black Willow	Salix nigra	
1168	8	Silver Maple	Acer saccharinum	
1169	9	American Elm	Ulmus americana	
1172	17	Box Elder	Acer negundo	
1173	13	Black Willow	Salix nigra	
1174	11	Black Willow	Salix nigra	
1175	13	Black Willow	Salix nigra	
1176	14	Black Willow	Salix nigra	
1178	11	American Elm	Ulmus americana	
1179	10	Black Maple	Acer nigrum	
1180	10	American Elm	Ulmus americana	
1181	11	American Elm	Ulmus americana	
1182	18	American Elm	Ulmus americana	X
1183	10	American Elm	Ulmus americana	
1184	9	Black Walnut	Juglans nigra	
1185	20	Cottonwood	Populus deltoides	
1186	11	American Elm	Ulmus americana	
1188	21	Cottonwood	Populus deltoides	
1189	8	Black Maple	Acer nigrum	
1190	15	American Elm	Ulmus americana	
1191	8	American Elm	Ulmus americana	
1192	14	Black Maple	Acer nigrum	
1202	23	Cottonwood	Populus deltoides	
1323	13	Red Oak	Quercus rubra	
1324	14	American Elm	Ulmus americana	
1325	14	Sugar Maple	Acer saccharum	
1326	14	American Elm	Ulmus americana	
1327	25	American Elm	Ulmus americana	X
1328	17	Red Oak	Quercus rubra	
1329	26	Silver Maple	Acer saccharinum	X
1330	8	Black Maple	Acer nigrum	
1331	10	Black Maple	Acer nigrum	
1332	17	Red Oak	Quercus rubra	

NOTE: THE LIST ABOVE INCLUDES ONLY TREES TO BE REMOVED.
A FULL TREE INVENTORY IS AVAILABLE UPON REQUEST.

BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING IN DECEMBER 2018



1/7 TREE REMOVAL AND CLEARING LIMITS PLAN

LEGEND

- 838 EXIST. CONTOUR
- PROPERTY LINE
- EXISTING WETLAND
- CLEARING LIMITS

INDIANA BAT: ANY TREES 3 INCHES DBH OR LARGER IS TO BE CONSIDERED BAT HABITAT. NO TREES OF THIS SIZE ARE TO BE CUT BETWEEN APRIL 1 AND SEPTEMBER 30 IN ANY YEAR TO AVOID TAKE OF INDIANA BAT (*MYOTIS SODALIS*), A FEDERALLY LISTED ENDANGERED SPECIES, UNLESS THE TREE IS CERTIFIED BY A BIOLOGIST NOT TO BE APPLICABLE HABITAT.

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180611-0300
ECT PROJECT NUMBER

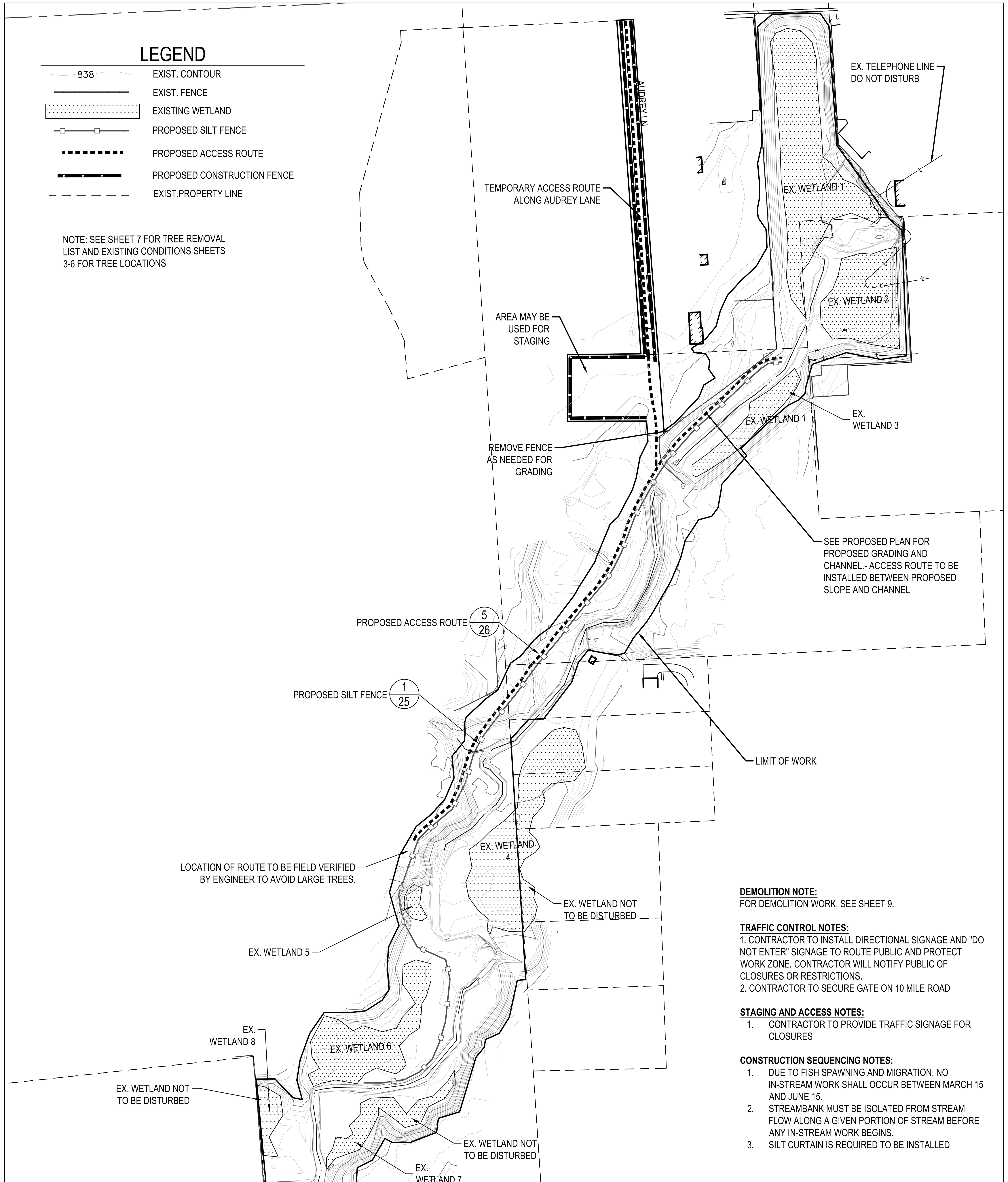
AB DESIGNED BY | MB CHECKED BY
AT DRAWN BY | JO APPROVED BY

TREE INVENTORY

SCALE: 1" = 120' @ 22" x 34"
0 60' 120' 240'

NORTH

SHEET NUMBER
7



1 8 SITE PREPARATION PLAN

DEMOLITION NOTE:
FOR DEMOLITION WORK, SEE SHEET 9.

TRAFFIC CONTROL NOTES:
1. CONTRACTOR TO INSTALL DIRECTIONAL SIGNAGE AND "DO NOT ENTER" SIGNAGE TO ROUTE PUBLIC AND PROTECT WORK ZONE. CONTRACTOR WILL NOTIFY PUBLIC OF CLOSURES OR RESTRICTIONS.
2. CONTRACTOR TO SECURE GATE ON 10 MILE ROAD

STAGING AND ACCESS NOTES:
1. CONTRACTOR TO PROVIDE TRAFFIC SIGNAGE FOR CLOSURES

CONSTRUCTION SEQUENCING NOTES:
1. DUE TO FISH SPAWNING AND MIGRATION, NO IN-STREAM WORK SHALL OCCUR BETWEEN MARCH 15 AND JUNE 15.
2. STREAMBANK MUST BE ISOLATED FROM STREAM FLOW ALONG A GIVEN PORTION OF STREAM BEFORE ANY IN-STREAM WORK BEGINS.
3. SILT CURTAIN IS REQUIRED TO BE INSTALLED

TEMPORARY CONSTRUCTION SIGN

WHITE BACKGROUND

BLACK LETTERING

Tamarack Creek – Stream and Wetland Restoration
Rouge River AOC Habitat Design

Alliance of Rouge Communities

This project is funded by the U.S. Environmental Protection Agency Great Lakes National Program Office. A $583,220 Great Lakes Restoration Initiative Grant (Grant No. 00E02344) funded project design; a portion of a $3,308,139 Great Lakes Restoration Initiative Grant (Grant No. 00E02478) funds project implementation. Both grants were received by Alliance of Rouge Communities.

Alliance of Rouge Communities OURS TO PROTECT — Southfield the center of it all — Great Lakes RESTORATION

Engineer: ECT Environmental Consulting & Technology, Inc. **Contractor:** (Insert Logo Here)

SIGN DIMENSIONS: 1200 mm x 2400 mm x 19 mm (approx. 4' x 8' x ¾")
PLYWOOD PANEL (APA RATED A-B GRADE–EXTERIOR)
SIGN LOCATION TO BE DETERMINED IN FIELD WITH OWNER PRIOR TO COMSTRUCTION

SOIL EROSION CONTROL NOTES:
IN ACCORDANCE WITH RULE 1709 PROMULGATED UNDER THE AUTHORITY OF PART 91, SOIL EROSION AND SEDIMENT CONTROL, OF THE NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, 1994 PA 451, AS AMENDED, AND IN ADDITION TO THE INFORMATION IN THE PROJECT PLANS AND SPECIFICATIONS, THE FOLLOWING GENERAL CONDITIONS APPLY TO THE EARTH CHANGE AUTHORIZED BY THIS DOCUMENT.

1. PROPOSED SECTIONS OF CHANNEL SHOULD NOT BE CONNECTED TO EXISTING CHANNEL UNTIL ALL PROPOSED SECTIONS ARE COMPLETE. CONNECTION OF PROPOSED SECTIONS TO EXISTING SECTIONS SHOULD BE DONE FROM DOWNSTREAM TO UPSTREAM, WHILE PLUGGING EXISTING CHANNEL.
2. CONSTRUCT AND COMPLETE THE EARTH CHANGE IN ACCORDANCE WITH THE SOIL EROSION AND SEDIMENT CONTROL PERMIT AND IN A MANNER THAT LIMITS THE EXPOSED AREA OF DISTURBED LAND FOR THE SHORTEST PERIOD OF TIME.
3. TEMPORARY OR PERMANENT CONTROL MEASURES SHALL BE INSTALLED TO CONVEY WATER AROUND, THROUGH OR FROM THE EARTH CHANGE AT A NON-EROSIVE VELOCITY.
4. REMOVE SEDIMENT CAUSED BY ACCELERATED SOIL EROSION FROM RUNOFF WATER BEFORE IT LEAVES THE SITE OF THE EARTH CHANGE.
5. INSTALL TEMPORARY SOIL EROSION AND SEDIMENTATION MEASURES BEFORE OR UPON COMMENCEMENT OF THE EARTH CHANGE ACTIVITY AND MAINTAIN THE MEASURES ON A DAILY BASIS. REMOVE TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES AFTER PERMANENT SOIL EROSION MEASURES ARE IN PLACE AND THE AREA IS STABILIZED. ("STABILIZED" MEANS THE ESTABLISHMENT OF VEGETATION OR THE PROPER PLACEMENT, GRADING OR COVERING OF SOIL TO ENSURE ITS RESISTANCE TO SOIL EROSION, SLIDING, OR OTHER EARTH MOVEMENT.)
6. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SITE DRAINAGE.
7. CONTRACTOR IS RESPONSIBLE TO PROTECT ADJACENT WATER COURSES FROM THE DISCHARGE OF SEDIMENT DURING CONSTRUCTION.
8. INSTALL PERMANENT EROSION CONTROL MEASURES WITHIN 5 DAYS OF COMPLETING FINAL GRADING OR MAINTAIN TEMPORARY MEASURES UNTIL PERMANENT MEASURES ARE INSTALLED.
9. SILT FENCE TO BE INSTALLED AROUND OFF-SITE STOCKPILE AREAS.
10. APPLY TEMPORARY EROSION CONTROL ON OVER EXPOSED SOILS DURING WET WEATHER AND WHEN SITE IS INACTIVE FOR MORE THAN 24 HOURS.
11. DO NOT CONSTRUCT DURING HIGH FLOW OR WET WEATHER.
12. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING LANDSCAPING DURING THE WARRANTY PERIOD.
13. PROTECT ALL DRAIN INLETS WITH SEDIMENT FILTERS.
14. EXISTING LOW AREAS TO BE USED FOR STORMWATER DETENTION AND SETTLING DURING CONSTRUCTION.

CLEARING AND GRUBBING NOTES
1. REVIEW CLEARING LIMITS AND TREE REMOVALS WITH PROJECT ENGINEER PRIOR TO BEGINNING WORK.
2. ALL SILT FENCE AND PROTECTIVE FENCE SHALL BE INSTALLED PRIOR TO CLEARING OPERATIONS. ALL FENCING SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT. FENCING SHALL BE REMOVED ONLY UPON APPROVAL BY ENGINEER.
3. ALL PLANT MATERIAL NOT MARKED FOR REMOVAL SHALL BE DISTURBED AS LITTLE AS POSSIBLE DURING THE CLEARING AND CONSTRUCTION OPERATIONS. NO EXCAVATION SHALL BE DONE WITHIN THE DRIP LINE (LIMIT OF OVERHANGING BRANCHES) OF TREES TO BE SAVED, UNLESS SPECIFICALLY APPROVED BY THE ENGINEER.THE LOWER BRANCHES OF ALL TREES TO REMAIN SHALL NOT BE REMOVED, OR DAMAGED BY CONSTRUCTION EQUIPMENT. AVOID COMPACTION OF ROOTS.
4. HYDRO AXE AND/OR SIMILAR CLEARING EQUIPMENT SHALL NOT BE PERMITTED ON SITE.

STAGING/ ACCESS NOTES:
1. EQUIPMENT ACCESS AND STAGING AND MATERIALS STORAGE CAN OCCUR WITHIN THE LIMITS OF DISTURBANCE IN ADDITION TO DESIGNATED STAGING AREAS. NO ADDITIONAL VEGETATION CLEARING FOR ACESS OR STAGING IS PERMITTED WITHOUT APPROVAL OF THE ENGINEER AND OWNER.
2. NO MATERIAL STORAGE OR EQUIPMENT STAGING IS PERMITTED ON ANY PORTION OF 10 MILE ROAD INCLUDING AREAS CLOSED TO TRAFFIC.
3. CONTRACTOR SHALL PROVIDE ADEQUATE PROTECTION OVER EXISTING ASPHALT ON AUDREY LANE TO PREVENT PHYSICAL DAMAGE OR CHEMICAL DAMAGE FROM LEAKING PETROLEUM PRODUCTS. REPAIR OF DAMAGED ROAD SHALL BE AT CONTRACTOR'S EXPENSE UNLESS SPECIFICALLY ACCOUNTED FOR UNDER CONTRACTOR'S SITE RESTORATION LINE ITEM.

15. INSTALL TEMPORARY INLET FILTERS AT ALL ADJACENT AND DOWN-GRADIENT STORM WATER INLETS, CATCH BASINS AND MANHOLES THAT MAY BE IMPACTED. CATCH BASIN INLET FILTERS SHALL BE MAINTAINED CLEAN AT ALL TIMES THROUGHOUT THE CONSTRUCTION PERIOD. IF A FILTER HAS HOLES OR IS INUNDATED WITH SEDIMENT, THE FILTER WILL REQUIRE REPLACEMENT.
16. INSTALL AN ANTI-TRACKING PAD AT THE SITE ENTRY AND EXIT(S). THE ANTI-TRACKING PAD SHOULD BE CONSTRUCTED OF GEOTEXTILE FABRIC WITH LIMESTONE OVER IT.
17. SILT FENCE AND/OR TURBIDITY BARRIER SHALL BE MAINTAINED AT ALL TIMES THROUGHOUT THE CONSTRUCTION PERIOD. IF REPAIR OR REPLACEMENT IS NECESSARY, IT SHALL BE PERFORMED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS. MAINTENANCE INCLUDES THE REMOVING OF BUILT-UP SEDIMENT CONTRACTOR SHALL REMOVE, REPLACE IF IT FAILS. ADDITIONALLY, THE CONTRACTOR SHALL REINSTALL ANY PORTION OF THE FENCING/ BARRIER DAMAGED BY CONSTRUCTION MACHINERY.
18. PLACE STOCKPILES AND OTHER SPOIL PILES AWAY FROM THE DRAINAGE SYSTEM TO MINIMIZE SEDIMENT TRANSPORT. IF THE STOCKPILE AND/OR SPOIL PILE MUST REMAIN ON-SITE OVERNIGHT, OR IF THE WEATHER CONDITIONS INDICATE THE CHANCE FOR PRECIPITATION, A.) COVER THE PILE WITH WATER REPELLENT MATERIAL TO PREVENT EROSION AND/OR B.) INSTALL SILT FENCING AROUND THE BASE OF THE PILE TO PREVENT TRANSPORT OF SEDIMENT TO THE STORM WATER SYSTEM, OR APPLY OTHER CONTROL METHODS APPROPRIATE TO THE SITE. CONTROL MEASURES TO GUARD AGAINST WIND EROSION MUST ALSO BE EMPLOYED , SUCH AS WETTING OR COVERING THE STOCKPILES. KEEP AS FEW STOCKPILES AS POSSIBLE DURING THE COURSE OF THE PROJECT.
19. THROUGHOUT THE CONSTRUCTION PERIOD, ALL MUD/SILT TRACKED ONTO EXISTING ROADS FROM THE SITE DUE TO CONSTRUCTION SHALL BE IMMEDIATELY REMOVED BY THE CONTRACTOR.
20. SEEDING OR OTHER STABILIZATION SHALL BE REQUIRED IMMEDIATELY TO AREAS WHICH HAVE BEEN DAMAGED BY RUNOFF.
21. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL ON THE SITE THROUGHOUT THE DURATION OF THE CONSTRUCTION PROCESS.
22. SILT CURTAINS SHALL BE INSTALLED DOWNSTREAM OF HABITAT STRUCTURE CONSTRUCTION IN EXISTING STREAM

MISCELLANEOUS NOTES:
1. CONSTRUCTION MUST BE UNDERTAKEN AND COMPLETED DURING THE DRY PERIOD OF THE WETLAND. IF THE AREA DOES NOT DRY OUT, THE CONSTRUCTION SHALL BE DONE ON EQUIPMENT MATS TO PREVENT COMPACTION OF THE SOIL.
2. DURING REMOVAL OR REPAIR OR REPAIR OF EXISTING STRUCTURES, EVERY PRECAUTION SHALL BE TAKEN TO PREVENT DEBRIS FROM ENTERING ANY WATERCOURSE. ANY DEBRIS REACHING THE WATERCOURSE DURING THE REMOVAL AND/OR RECONSTRUCTION OF THE STRUCTURE SHALL BE IMMEDIATELY RETRIEVED FROM THE WATER. ALL MATERIAL SHALL BE DISPOSED OF IN AN ACCEPTABLE MANNER CONSISTENT WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
3. NO WORK SHALL BE DONE IN THE STREAM DURING PERIODS OF ABOVE-NORMAL FLOWS EXCEPT AS NECESSARY TO PREVENT EROSION.
4. IF THE PROJECT, OR ANY PORTION OF THE PROJECT, IS STOPPED AND LIES INCOMPLETE FOR ANY LENGTH OF TIME (OTHER THAN THAT ENCOUNTERED IN A NORMAL WORK WEEK) EVERY PRECAUTION SHALL BE TAKEN TO PROTECT THE INCOMPLETE WORK FROM EROSION, INCLUDING THE PLACEMENT OF TEMPORARY GRAVEL BAG RIPRAP, TEMPORARY SEED AND MULCH, OR OTHER ACCEPTABLE TEMPORARY PROTECTION.
5. PRIOR TO THE INITIATION OF ANY PERMITTED CONSTRUCTION ACTIVITIES, A SEDIMENTATION BARRIER SHALL BE CONSTRUCTED IMMEDIATELY DOWN GRADIENT OF THE CONSTRUCTION SITE. SEDIMENTATION BARRIERS SHALL BE SPECIFICALLY DESIGNED TO HANDLE THE SEDIMENT TYPE, LOAD, WATER DEPTH, AND FLOW CONDITIONS OF EACH CONSTRUCTION SITE THROUGHOUT THE ANTICIPATED TIME OF CONSTRUCTION AND UNSTABLE SITE CONDITIONS. THE SEDIMENTATION BARRIER SHALL BE MAINTAINED IN GOOD WORKING ORDER THROUGHOUT THE DURATION OF THE PROJECT. UPON PROJECT COMPLETION, THE ACCUMULATED MATERIALS SHALL BE REMOVED AND DISPOSED OF AT AN UPLAND (NON-WETLAND, NON-FLOODPLAIN) SITE AND STABILIZED WITH SEED AND MULCH. THE SEDIMENTATION BARRIER SHALL THEN BE REMOVED IN ITS ENTIRETY AND THE AREA RESTORED TO ITS ORIGINAL CONFIGURATION AND COVER.
6. NO IN-STREAM WORK MAY OCCUR BETWEEN APRIL 15 AND JUNE 15 OF ANY CALENDAR YEAR THAT THIS PERMIT IS ACTIVE WITHOUT THE USE OF SILT CURTAINS TO SEGREGATE DEFINED WORK ZONES, WITH PROGRESSION OF WORK WITHIN ONE ZONE AT A TIME. IF SUCH WORK OCCURS THE PERMITTEE SHALL CONTACT EGLE 48 HOURS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES AND SUBMIT A PLAN DRAWING INDICATING SILT CURTAIN LAYOUT AND THE SEGREGATION OF WORK AREAS.

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Ann Arbor, Michigan 48105
734.769.3004
734.769.3164 fax
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FOR BIDDING	01-2021
EGLE/USACE JOINT PERMIT APP.	06-2020

180611-0300 ECT PROJECT NUMBER

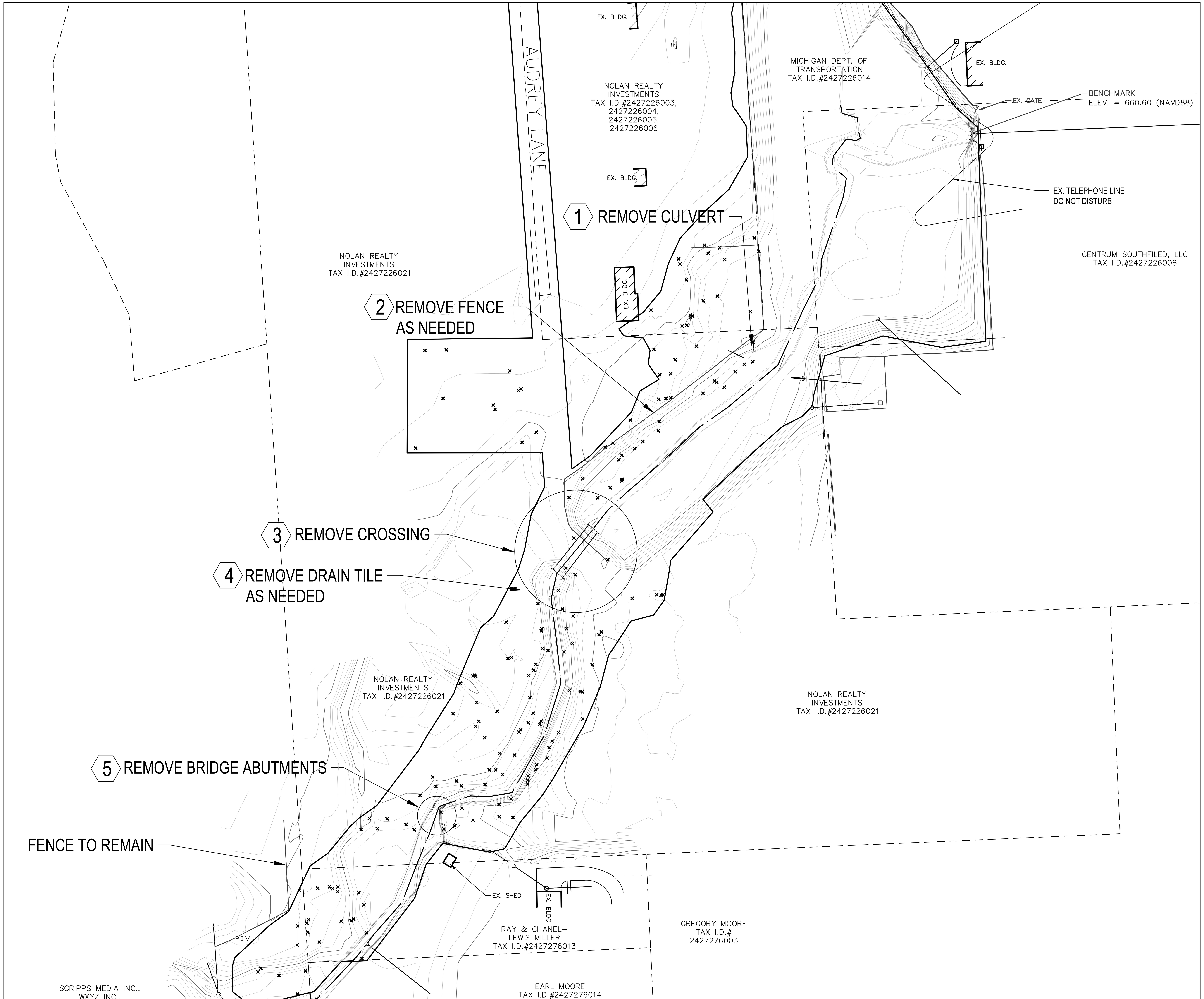
AB DESIGNED BY	MB CHECKED BY
AT DRAWN BY	JO APPROVED BY

SITE PREPARATION PLAN

SCALE: 1" = 120' @ 22" x 34"
0 60' 120' 240'

NORTH

SHEET NUMBER **8**



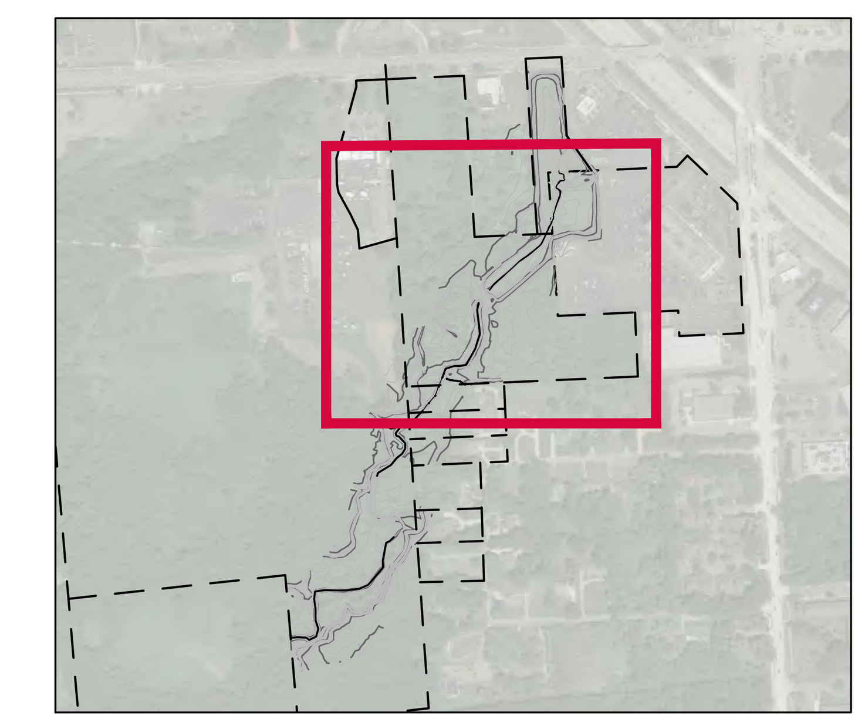
1/9 DEMOLITION PLAN

LEGEND

- 838 — EXIST. CONTOUR
- EXIST. BUILDING
- EXIST. STREAM CENTERLINE
- EXIST. PROPERTY LINE
- EXIST. FENCE
- × — PR. TREE REMOVAL (FOR LIST OF TREES TO BE REMOVED, SEE SHEET 7)

1. REMOVE CULVERT
   1. REMOVE 16 LF OF EXISTING CULVERT
2. REMOVE FENCE
   1. REMOVE 800 LF OF EXISTING FENCE AS NECESSARY FOR GRADING
3. REMOVE CROSSING
   1. 3 CMP CULVERTS 70 LF TO BE REMOVED INCLUDING BEDDING MATERIALS IF PRESENT
   2. 450 TONS OF CONCRETE RUBBLE
   3. 2000 CYDS FILL
4. REMOVE DRAIN TILE AS NEEDED
   1. DRAIN TILE TO BE FIELD LOCATED AND REMOVED ONLY TO THE EXTENT AS NEEDED FOR PROPOSED EXCAVATION AND GRADING
5. REMOVE BRIDGE ABUTMENTS
   1. 50 TONS REINFORCED CONCRETE ABUTMENTS AND FOOTINGS (~2 ton/cy)

INDEX MAP



NOTE: NO DEMOLITION NEEDED OUTSIDE OF THESE LIMITS, WITH THE EXCEPTION OF SOME TREE AND BRUSH CLEARING FOR THE ACCESS ROUTE. FOR TREE REMOVAL LIST, SEE SHEET 9.

SITE CLEARING NOTES:
1. TOTAL SITE CLEARING AREA: 8.0 ACRES

SCHEDULING NOTES:
1. DUE TO FISH SPAWNING AND MIGRATION, NO IN-STREAM WORK SHALL OCCUR BETWEEN MARCH 15 AND JUNE 15.

TREE REMOVAL NOTES
1. TREES AS DESIGNATED ON THE LIST ON SHEET 7 TO BE REMOVED AS PART OF THIS PROJECT.
2. ALL TREES TO BE REMOVED AND ALL CLEARING TO BE FIELD VERIFIED BY ENGINEER PRIOR TO WORK ACTIVITIES.
3. SOME TREES MAY BE SALVAGED FOR USE IN HABITAT STRUCTURES AS SHOWN ON SHEET 24. TREES TO BE FIELD VERIFIED BY ENGINEER PRIOR TO INSTALLATION.
4. ALL EXCESS WOODY DEBRIS TO BE DISPOSED OF LEGALLY OFFSITE.
5. FOR AREAS TO BE GRADED, TREES, STUMPS AND ROOTS TO BE REMOVED TO A DEPTH OF 12 INCHES (MIN) BELOW FINAL GRADE.
6. HOLES AND TRENCHES REMAINING AFTER GRUBBING TO BE GRADED OR FILLED IN.
7. ANY MERCHANTABLE TIMBER MAY BE CONSIDERED PROPERTY OF THE CONTRACTOR.
8. ECT RECOMMENDS THAT TREE REMOVALS OCCUR OCTOBER 1 THROUGH MARCH 31 WHEN BATS ARE NOT PRESENT. IF THESE CUTTING RESTRICTION DATES CANNOT ME BE, POTENTIAL BAT ROOST TREE SURVEYS MAY BE CONDUCTED AND EQUIPMENT ACCESS ROUTES SELECTED TO AVOID THE IDENTIFIED POTENTIAL ROOSTS

EASTERN MASSASAUGA RATTLESNAKE (EMR) NOTES:
1. CONTRACTOR TO USE WILDLIFE-SAFE MATERIALS FOR EROSION CONTROL AND SITE RESTORATION (MATERIALS THAT DO NOT INCORPORATE PLASTIC-MESH OR OTHER SIMILAR MATERIAL THAT COULD ENSNARE EMR).
2. CONTRACTOR AND SUBCONTRACTORS ON SITE SHOULD WATCH MDNR'S "60-SECOND SNAKES: THE EASTERN MASSASAUGA RATTLESNAKE" VIDEO OR REVIEW THE USFWS EMR FACTSHEET.
3. CONTRACTOR MUST REPORT ANY EMR OBSERVATIONS, OR OBSERVATION OF ANY OTHER LISTED THREATENED OR ENDANGERED SPECIES, DURING PROJECT IMPLEMENTATION TO ENGINEER WITHIN 2 HOURS.

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DEMOLITION PLAN

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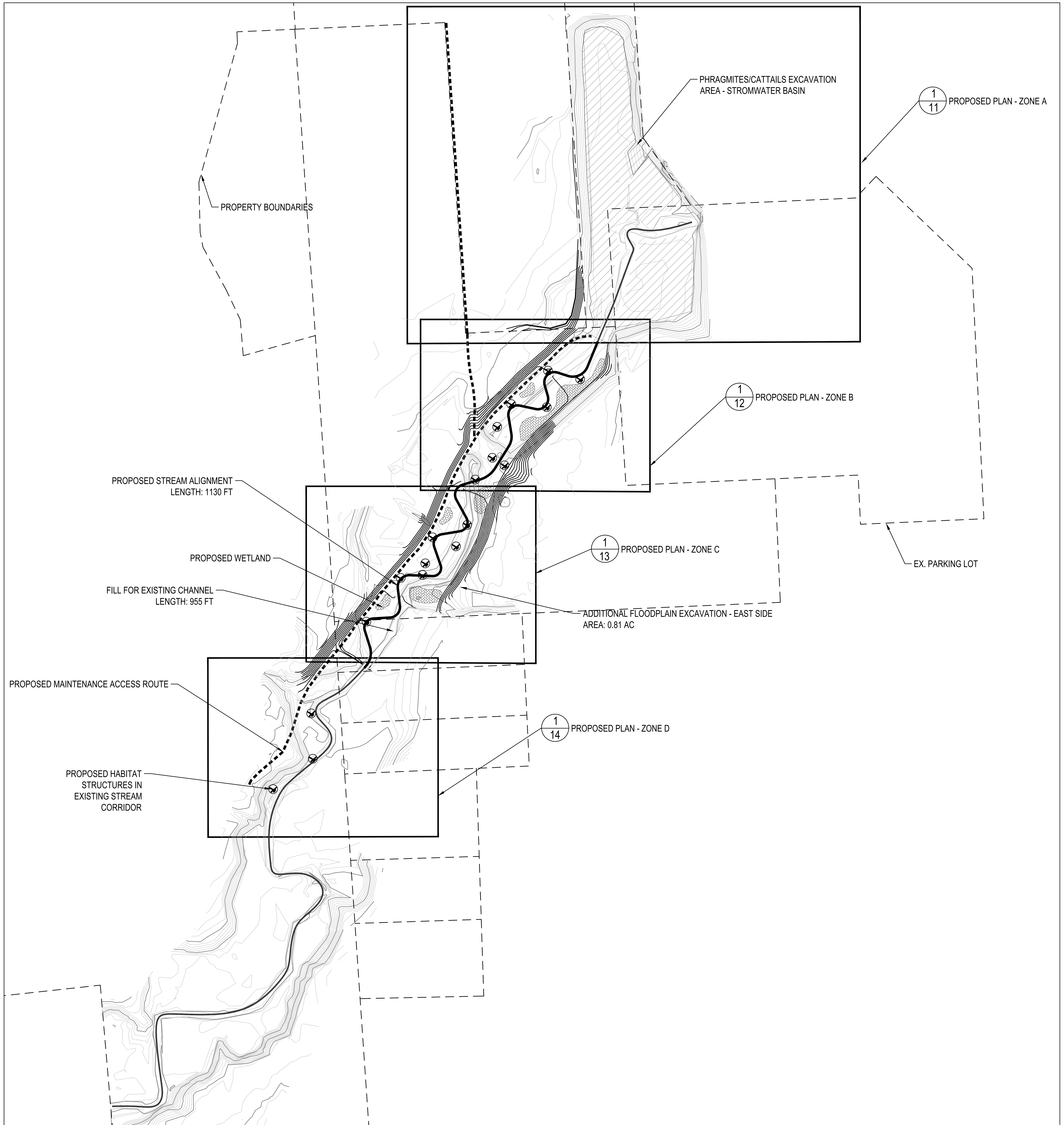
SHEET NUMBER
9



BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING IN DECEMBER 2018

LEGEND

838	EXIST. CONTOUR
	EXIST. STREAM CENTERLINE
	EXIST.PROPERTY LINE
	FEMA 100-YR FLOOD BOUNDARY
	PR. STREAM CENTERLINE
	PR. GRADING
	PR. ACCESS ROUTE
	PR. WETLAND
	PR. ENHANCED STORMWATER BASIN
	PR. HABITAT STRUCTURE

HABITAT STRUCTURES SCHEDULE

STA.	DETAIL	DESCRIPTION
4+90 TO 5+30	2/27	WHOLE TREE REVETMENT - LEFT BANK
5+60 TO 6+05	2/27	WHOLE TREE REVETMENT - RIGHT BANK
6+50	10/27	SCOUR POOL LOG
7+30	9/27	SCOUR POOL LOG
7+70	13/27	WOODY HABITAT
8+45 TO 8+85	2/27	WHOLE TREE REVETMENT - LEFT BANK
8+45 TO 8+85	2/27	WHOLE TREE REVETMENT - RIGHT BANK
9+30	11/27	STAGGERED WING LOGS
10+60	9/27	SCOUR POOL LOG
10+90	13/27	WOODY HABITAT
11+35	10/27	SCOUR POOL LOG
11+80	13/27	WOODY HABITAT
12+50	12/27	HORIZONTAL LOG SILL
12+85 TO 13+25	2/27	WHOLE TREE REVETMENT - RIGHT BANK
14+35 TO 14+75	2/27	WHOLE TREE REVETMENT - RIGHT BANK
15+40	6/27	AT-GRADE RIFFLE
17+10	8/27	ROOTWAD REVETMENT - RIGHT BANK
17+50	7/27	AT-GRADE RIFFLE
18+40 TO 18+60	2/27	WHOLE TREE REVETMENT - RIGHT BANK
19+50	10/27	SCOUR POOL LOG

GENERAL EARTHWORK NOTES:
1. DO NOT PLACE OR COMPACT FILL MATERIAL DURING WET OR FREEZING WEATHER THAT PREVENTS ACHIEVEMENT OF SPECIFIED COMPACTION REQUIREMENTS.

MAINTENANCE AND GUARANTEE PERIOD:
1. CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FOLLOWING THE APPROVAL OF CONSTRUCTION INSPECTION AT SUBSTANTIAL COMPLETION. THE CONTRACTOR SHALL RESPOND WITHIN TWO WEEKS OF WRITTEN REQUESTS BY THE OWNER FOR REPLACEMENT/REPAIR. IF THE CONTRACTOR FAILS TO RESPOND WITHIN THIS TIME, THE OWNER MAY PROCEED WITH REPLACEMENT WORK AND BILL THE CONTRACTOR.
2. NOTIFY THE OWNER PRIOR TO AND FOLLOWING ANY MAINTENANCE ACTIVITY.
3. FINAL ACCEPTANCE OF WORK WILL BE SUBJECT TO ACCEPTANCE BY PROJECT MANAGER AND OWNER AT THE END OF GUARANTEE PERIOD.

MATERIAL NOTES:
1. ALL MATERIALS SHALL CONFORM TO DETAILS AND SPECIFICATIONS IN THE DRAWINGS.

SUBMITTALS
1. SUBMITTALS FOR APPROVAL BY ENGINEER ARE REQUIRED FOR ALL MATERIALS PRIOR TO MOBILIZATION. ALL EXPENSES INCURRED BY CONTRACTOR PRIOR TO ENGINEER'S APPROVAL SHALL NOT BE PAID BY OWNER.

SITE RESTORATION AND CLEAN-UP:
1. IMMEDIATELY CLEAN UP EXCESS SOIL, MULCH, OR OTHER DEBRIS AND PROPERLY DISPOSE OF DELETERIOUS MATERIALS LEGALLY OFF-SITE IN A MANNER CONSISTENT WITH LOCAL LAWS. TAKE NECESSARY PRECAUTIONS TO PREVENT CONTAMINATION OF CLEAN AREAS AS A RESULT OF CLEANING OPERATIONS.
2. PROMPTLY REMOVE EQUIPMENT AND UNUSED MATERIALS AT COMPLETION OF ACTIVITIES.
3. RETURN STOCKPILE AND STORAGE AREAS TO THEIR ORIGINAL GRADE AND RESTORE GROUND SURFACES AFTER STORED MATERIAL HAS BEEN REMOVED.
4. CONTRACTOR SHALL REPAIR DAMAGED VEGETATION AND AERATE SOIL OVER ROOT ZONE OF NEGATIVELY IMPACTED VEGETATION. RE-SEED ALL DISTURBED AREAS TO PRE-EXISTING CONDITIONS OR AS SPECIFIED.

SITE RESTORATION AND CLEAN-UP:
1. CONTRACTOR IS RESPONSIBLE FOR PROVIDING AS BUILT DOCUMENTS AT THE COMPLETION OF THE WORK. AS-BUILT DRAWINGS SHALL INCLUDE 1 COPY OF MARKED UP FIELD PLANS AND 3 COPIES OF CERTIFIED AS-BUILT DRAWINGS AND 1 DIGITAL FILE CONTAINING AUTOCAD AS-BUILT INFORMATION. THE BASE SURVEY DRAWING WILL BE PROVIDED TO THE CONTRACTOR.

GRADING AND LAYOUT NOTES
1. ALL PROPOSED ELEVATIONS SHOWN ARE FINISHED GRADE. FINAL DESIGN GRADES MAY BE ADJUSTED TO MINIMIZE GRADING ACCORDINGLY.
2. CONTRACTOR SHALL PROVIDE GRADE VERIFICATION STAKES AT ALL PROPOSED SPOT ELEVATIONS SHOWN ON THE PLANS AND EVERY 50 FEET ALONG PROPOSED CONTOURS AS DIRECTED BY THE ENGINEER.
3. THE CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING VEGETATION IN AREAS ADJACENT TO WORK AREAS. ALL DISTURBED AREAS SHALL BE REVEGETATED AND RESTORED TO EXISTING CONDITIONS.
4. ALL FILL SHALL BE AS SPECIFIED. ALL IMPORTED FILL SOIL SOURCES SHALL BE APPROVED BY THE ENGINEER IN WRITING PRIOR TO DELIVERY TO THE PROJECT SITE.

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SOUTHFIELD, MICHIGAN

FOR BIDDING	01-2021
EGLE/USACE JOINT PERMIT APP.	06-2020

180611-0300
ECT PROJECT NUMBER

AB DESIGNED BY	MB CHECKED BY
AB/ AK DRAWN BY	JO APPROVED BY

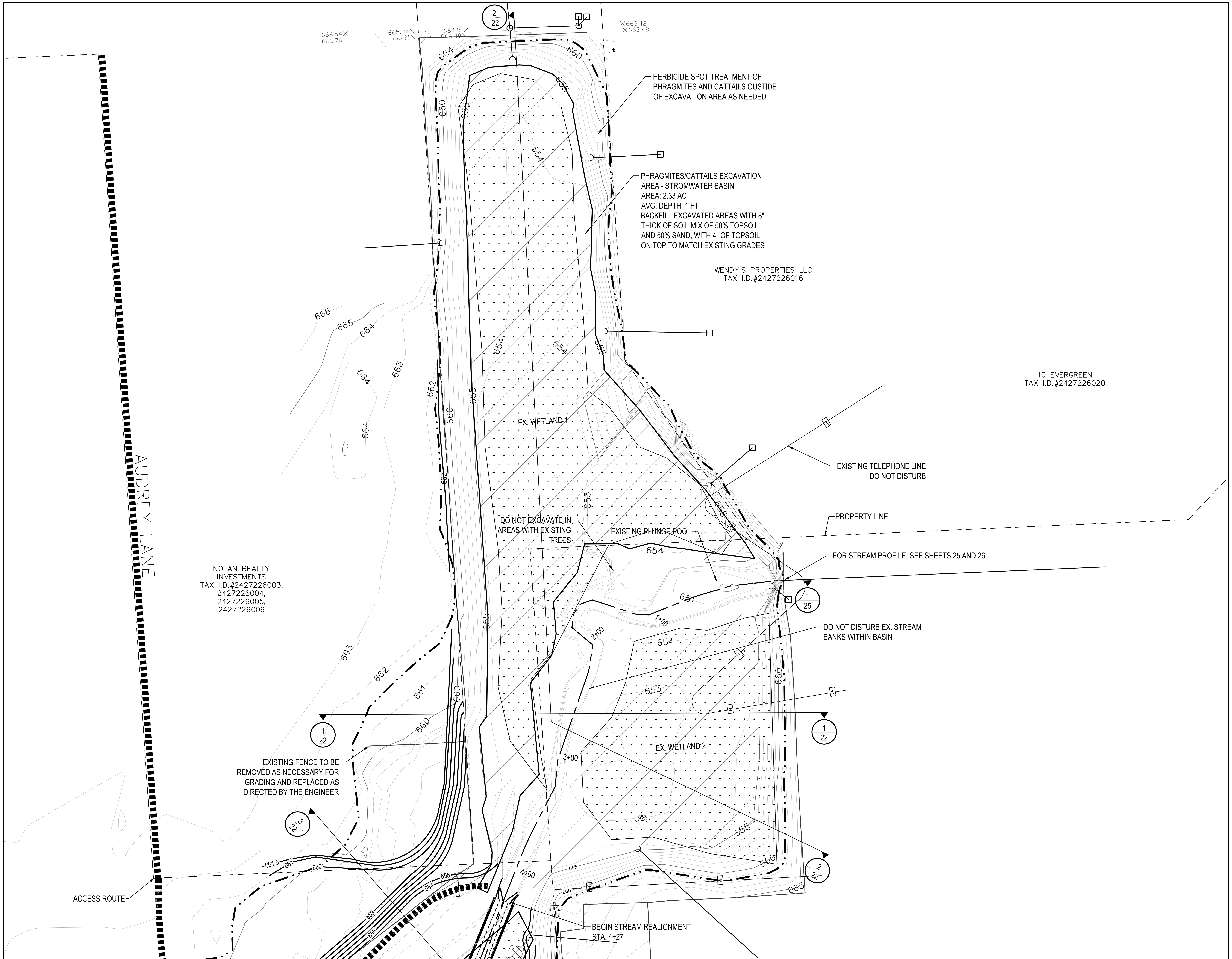
PROPOSED PLAN - OVERVIEW

SCALE: 1" = 120' @ 22" x 34"
0 60' 120' 240'

NORTH

SHEET NUMBER
10

P:\Alliance of Rouge Communities\Grant Projects\2018 EPA3 Rouge Habitat\Tamarack - Southfield\3_Data-Dwgs-Maps\CAD\Tamarack For Bidding 01.11.2020.dwg

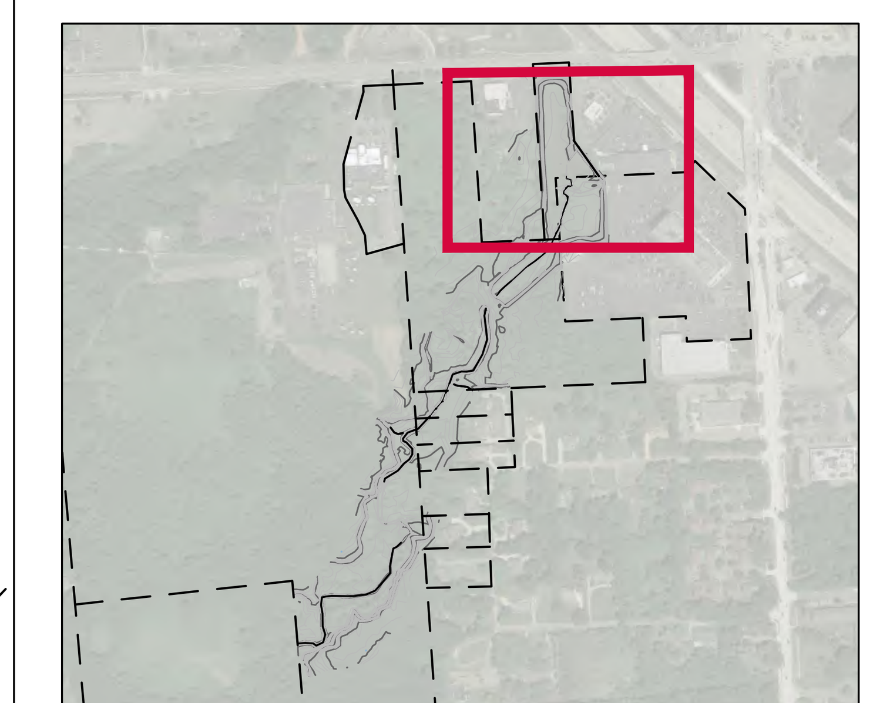


1/11 PROPOSED PLAN - ZONE A

LEGEND

838	EXIST. CONTOUR
	EXIST. STREAM CENTERLINE
	EXIST.PROPERTY LINE
	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	END SECTION
	CULVERT
	EXIST. FENCE
	EXIST. WETLAND
	FEMA 100-YR FLOOD BOUNDARY
	PR. STREAM CENTERLINE
	PR. THALWEG
	PR. BOTTOM OF BANK
	PR. TOP OF BANK
	PR. CONTOUR
	PR. BASIN EXCAVATION AREA
	PR. ACCESS ROUTE
	PR. WETLAND

INDEX MAP



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PROPOSED PLAN - ZONE A

SCALE: 1" = 40' @ 22" x 34"
0 20' 40' 80'

NORTH

SHEET NUMBER
11

NOLAN REALTY INVESTMENTS
TAX I.D.#2427226003, 2427226004, 2427226005, 2427226006

ACCESS ROUTE

PROPOSED WETLAND B
(SEE PROPOSED WETLAND NOTES ON SHEET 24)

SCOUR POOL WITH LOG 10/27

TEMPORARY AT-GRADE STREAM CROSSING - WEST SLOPE 3/28

REMOVE EX. PIPE

BEGIN STREAM REALIGNMENT STA. 4+27

4+00

5+00

6+00

7+00

8+00

PROPOSED ENHANCED STORMWATER BASIN

5/28 PR. ACCESS ROUTE

EX. WETLAND 1

PROPOSED WETLAND A
(SEE PROPOSED WETLAND NOTES ON SHEET 24)

2/27 WHOLE TREE REVETMENT

2/27 WHOLE TREE REVETMENT

10/27 SCOUR POOL WITH LOG

13/27 WOODY HABITAT

2/27 WHOLE TREE REVETMENT

MID-CHANNEL SCOUR POOL WITH STAGGERED WING LOGS 11/27

3/28 TEMPORARY AT-GRADE STREAM CROSSING - EAST SLOPE

NOLAN REALTY INVESTMENTS
TAX I.D.#2427226021

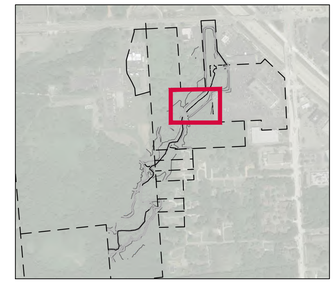
1/12 PROPOSED PLAN - ZONE B

BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING IN DECEMBER 2018

LEGEND

- 838 EXIST. CONTOUR
- EXIST. STREAM CENTERLINE
- EXIST.PROPERTY LINE
- EXIST. STORM SEWER
- END SECTION
- CULVERT
- EXIST. FENCE
- EXIST. WETLAND
- FEMA 100-YR FLOOD BOUNDARY
- PR. STREAM CENTERLINE
- PR. THALWEG
- PR. BOTTOM OF BANK
- PR. TOP OF BANK
- PR. CONTOUR
- PR. ENHANCED STORMWATER BASIN
- PR. ACCESS ROUTE
- PR. WETLAND
- PR. TEMPORARY AT-GRADE CROSSING
- PR. HABITAT STRUCTURE SEE HABITAT SCHEDULE ON SHEET 10

INDEX MAP



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AT	JD
DRAWN BY	APPROVED BY

PROPOSED PLAN - ZONE B

SCALE: 1" = 20' @ 22" x 34"
0 10' 20' 40'

NORTH

SHEET NUMBER 12

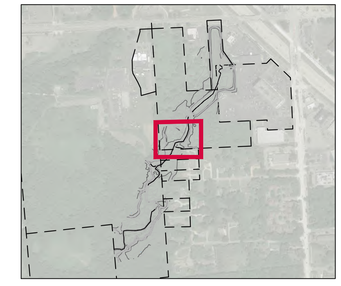
1/13 PROPOSED PLAN - ZONE C

BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING IN DECEMBER 2018

LEGEND

- EXIST. CONTOUR
- EXIST. STREAM CENTERLINE
- EXIST.PROPERTY LINE
- EXIST. FENCE
- FEMA 100-YR FLOOD BOUNDARY
- PR. STREAM CENTERLINE
- PR. THALWEG
- PR. BOTTOM OF BANK
- PR. TOP OF BANK
- PR. CONTOUR
- PR. ACCESS ROUTE
- PR. WETLAND
- PR. HABITAT STRUCTURE

INDEX MAP



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180611-0300
ECT PROJECT NUMBER

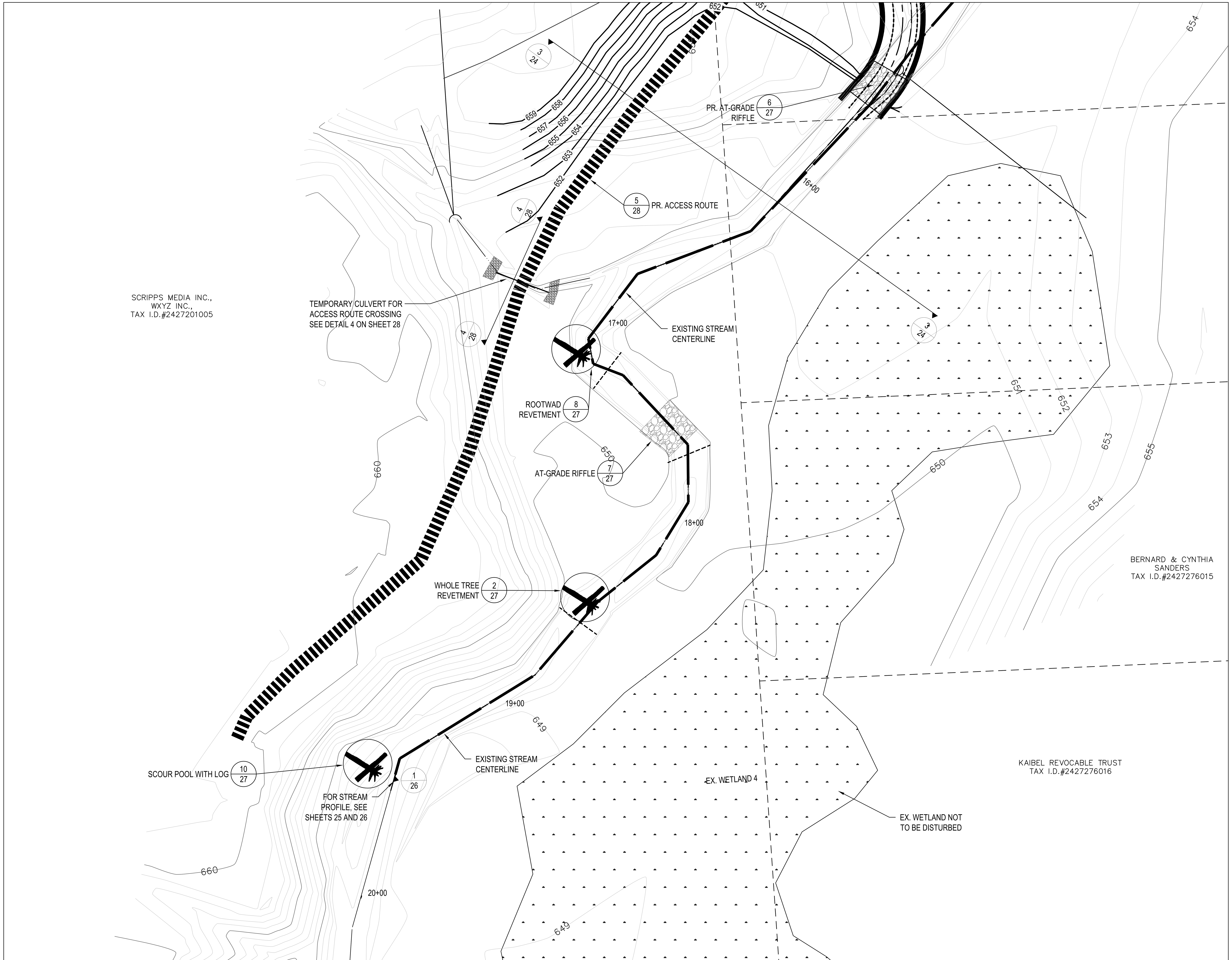
AB	MB
DESIGNED BY	CHECKED BY
AT	JO
DRAWN BY	APPROVED BY

PROPOSED PLAN - ZONE C

SCALE: 1" = 20' @ 22" x 34"
0 10' 20' 40'

NORTH

SHEET NUMBER 13



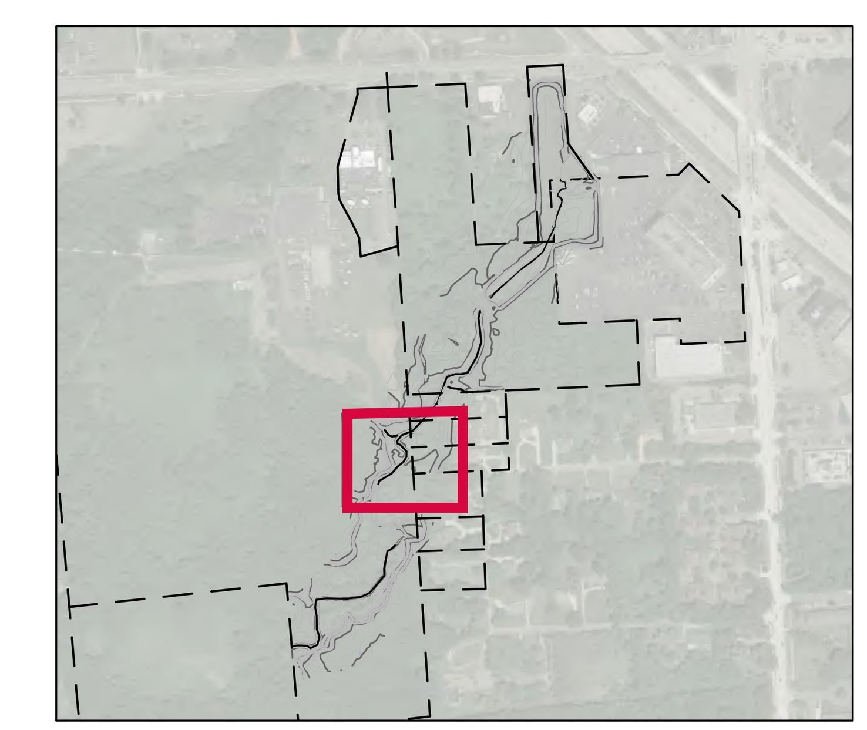
1
14
PROPOSED PLAN - ZONE D

BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING IN DECEMBER 2018

LEGEND

- 838 EXIST. CONTOUR
- EXIST. STREAM CENTERLINE
- EXIST.PROPERTY LINE
- EXIST. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- END SECTION
- CULVERT
- EXIST. FENCE
- FEMA 100-YR FLOOD BOUNDARY
- PR. STREAM CENTERLINE
- PR. THALWEG
- PR. BOTTOM OF BANK
- PR. TOP OF BANK
- PR. CONTOUR
- PR. ACCESS ROUTE
- PR. WETLAND
- PR. AT-GRADE RIFFLE
- PR. RIP RAP AT CULVERT ENDS
- PR. SILT CURTAIN
- PR. HABITAT STRUCTURE

INDEX MAP



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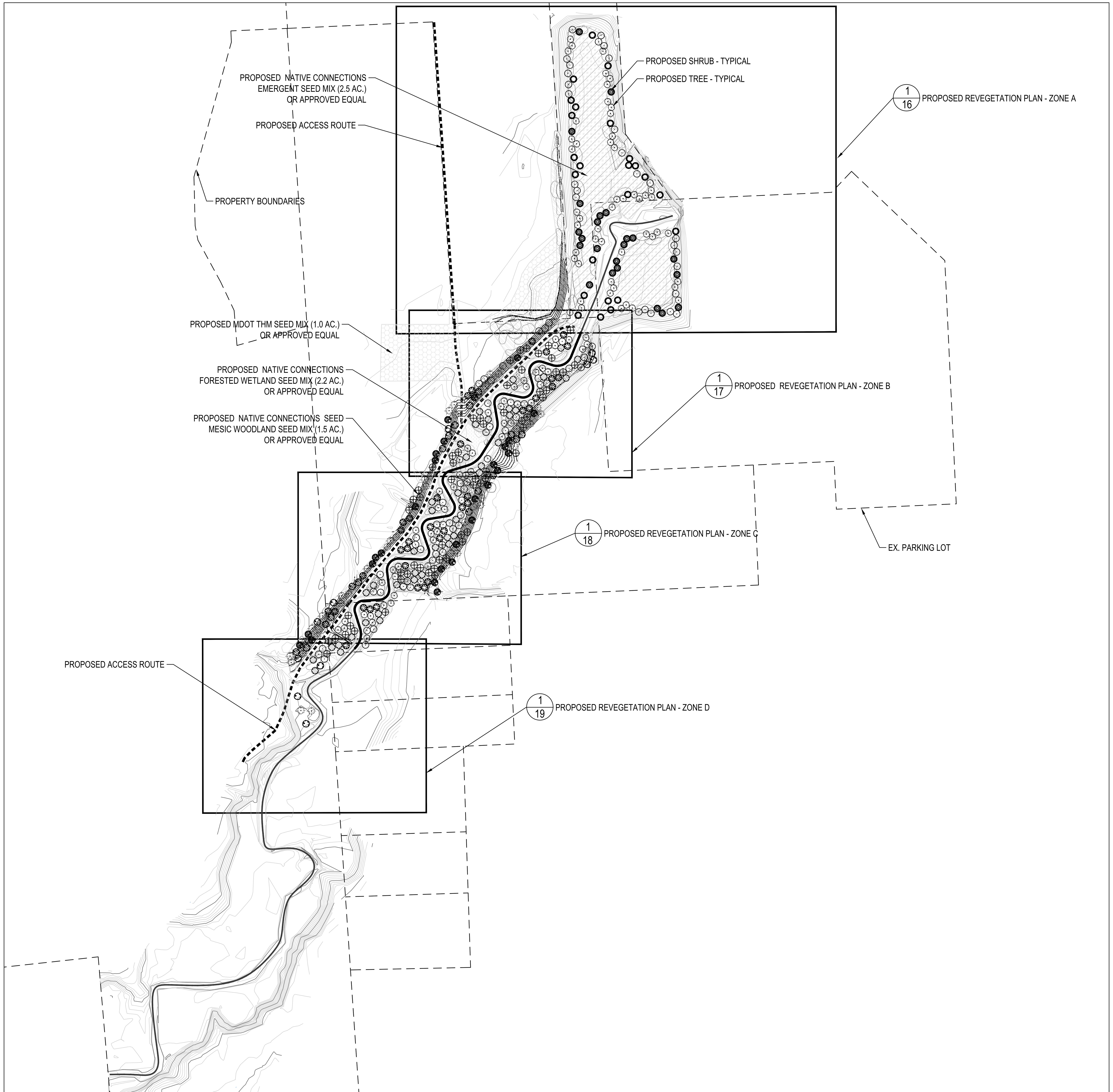
PROPOSED PLAN - ZONE D

SCALE: 1" = 20' @ 22" x 34"
0 10' 20' 40'

NORTH

SHEET NUMBER
14



BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING IN DECEMBER 2018

LEGEND

- 838 EXIST. CONTOUR
- EXIST. STREAM CENTERLINE
- EXIST.PROPERTY LINE
- FEMA 100-YR FLOOD BOUNDARY
- PR. STREAM CENTERLINE
- PR. GRADING
- PR. MAINTENANCE ACCESS ROUTE
- PR. WETLAND

REVEGETATION LEGEND

STORMWATER BASIN:
- STRAW MULCH BLANKET (S75BN, SEE STRAW MULCH BLANKET INSTALLATION NOTES)
- B&B TREES
- 3-5 GAL. CONTAINERIZED SHRUBS
- 4 IN. TOPSOIL
- NATIVE CONNECTION EMERGENT SEED MIX

FLOODPLAIN BENCH:
- ECB (C700BN, SEE ECB INSTALLATION NOTES)
- ECB TO BE INSTALLED PERPENDICULAR TO THE STREAM CHANNEL AND STAPLED PER THE MANUFACTURER'S RECOMMENDATIONS WITH STAPLE PATTERN "D"
- LIVE STAKES
- 4 IN. TOPSOIL
- NATIVE CONNECTIONS FORESTED WETLAND SEED MIX

FLOODPLAIN SLOPES:
- ECB (NAG C700BN, SEE ECB INSTALLATION NOTES)
- ECB TO BE INSTALLED PERPENDICULAR TO THE STREAM CHANNEL AND STAPLED PER THE MANUFACTURER'S RECOMMENDATIONS WITH STAPLE PATTERN "D"
- 6 IN. TOPSOIL
- NATIVE CONNECTIONS MESIC WOODLAND SEED MIX

DISTURBED UPLAND:
- ECB (S75BN, SEE ECB INSTALLATION NOTES)
- 6 IN. TOPSOIL
- MDOT THM SEED MIX

LIVE STAKES:
- SEE SHEET 20 FOR DETAILS

SEE SHEET 20 FOR DETAILS.

EROSION CONTROL BLANKET (ECB) INSTALLATION FOR SLOPE OF FLOODPLAIN BENCH:

INSTALLATION OF ECB TO MATCH MANUFACTURERS INSTRUCTIONS (SHORELINE/ STREAM BANK APPLICATIONS) AND THE FOLLOWING REQUIREMENTS:
- INSTALL ECB AFTER SEEDING, BUT PRIOR TO PLANTING
- INSTALL ECB PERPENDICULAR TO STREAM CHANNEL. ECB TO BE ROLLED FROM TOP OF SLOPE TO BOTTOM OF SLOPE.
- ANCHOR ECB USING A 6 IN. DEEP X 6 IN. WIDE TRENCH WITH APPROX. 12 IN. OF ECB EXTENDED BEYOND THE UPSLOPE PORTION OF THE TRENCH. ANCHOR ECB WITH A ROW OF STAPLES APPROX. 12 IN. 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 IN. PORTION OF ECB BACK OVER THE SEED AND COMPACTED SOIL. SECURE ECB OVER COMPACTED SOIL WITH A ROW OF STAPLES SPACED APPROX.12 IN. APART ACROSS THE WIDTH OF THE ECB
- THE EDGES OF ALL HORIZONTAL AND VERTICAL SEAMS MUST BE STAPLED WITH A 2 IN. TO 5 IN. OVERLAP. SEAM OVERLAPS SHOULD BE SHINGLED IN THE STREAM FLOW DIRECTION.
- AN ADEQUATE NUMBER OF STAPLES MUST BE USED TO SECURE ECB. STAPLE PATTERN MUST MATCH "STAPLE PATTERN D" WITH MIN. STAPLE DENSITY OF 3.4 STAPLES PER SQUARE YARD.

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PROPOSED REVEGETATION PLAN - OVERVIEW

SCALE: 1" = 120' @ 22" x 34"
0 60' 120' 240'

NORTH

SHEET NUMBER
15

1/16 PROPOSED REVEGETATION PLAN - ZONE A
SCALE: 1" = 40' @ 22" x 34"

REVEGETATION LEGEND

STORMWATER BASIN:
- STRAW MULCH BLANKET (S75BN, SEE STRAW MULCH BLANKET INSTALLATION NOTES)
- B&B TREES
- 3-5 GAL. CONTAINERIZED SHRUBS
- 4 IN. TOPSOIL
- NATIVE CONNECTION EMERGENT SEED MIX

FLOODPLAIN BENCH:
- ECB (C700BN, SEE ECB INSTALLATION NOTES)
- ECB TO BE INSTALLED PERPENDICULAR TO THE STREAM CHANNEL AND STAPLED PER THE MANUFACTURER'S RECOMMENDATIONS WITH STAPLE PATTERN "D"
- LIVE STAKES
- 4 IN. TOPSOIL
- NATIVE CONNECTIONS FORESTED WETLAND SEED MIX

FLOODPLAIN SLOPES:
- ECB (NAG C700BN, SEE ECB INSTALLATION NOTES)
- ECB TO BE INSTALLED PERPENDICULAR TO THE STREAM CHANNEL AND STAPLED PER THE MANUFACTURER'S RECOMMENDATIONS WITH STAPLE PATTERN "D"
- 6 IN. TOPSOIL
- NATIVE CONNECTIONS MESIC WOODLAND SEED MIX

DISTURBED UPLAND:
- ECB (S75BN, SEE ECB INSTALLATION NOTES)
- 6 IN. TOPSOIL
- MDOT THM SEED MIX

LIVE STAKES:
- SEE SHEET 20 FOR DETAILS

LEGEND

838 EXIST. CONTOUR
EXIST. STREAM CENTERLINE
EXIST. PROPERTY LINE
EXIST. STORM SEWER
EXIST. CATCH BASIN OR INLET
END SECTION
CULVERT
EXIST. FENCE
EXIST. WETLAND
FEMA 100-YR FLOOD BOUNDARY
PR. STREAM CENTERLINE
PR. THALWEG
PR. BOTTOM OF BANK
PR. TOP OF BANK
PR. CONTOUR
PR. ACCESS ROUTE
PR. WETLAND

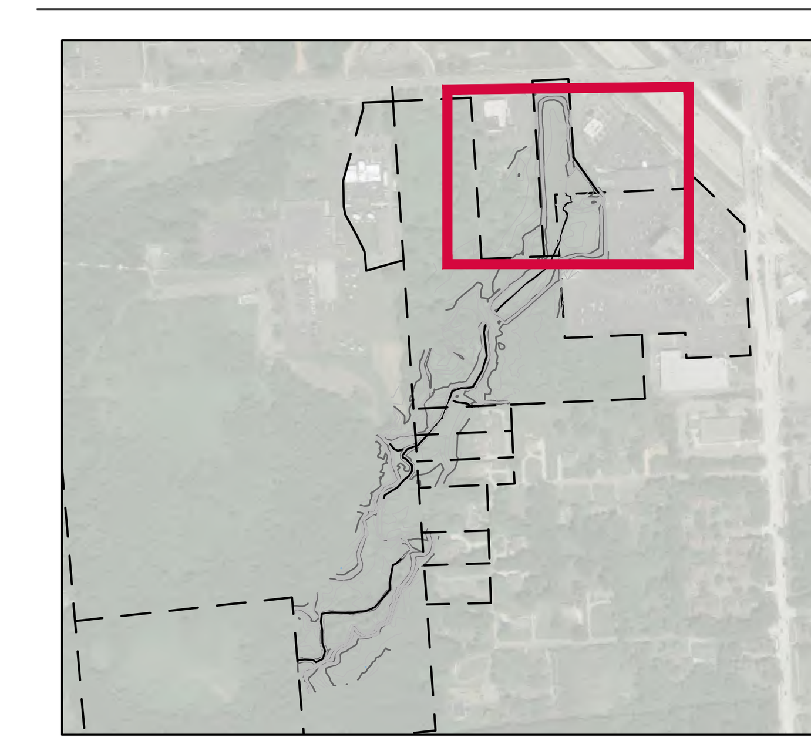
PLANT LIST: THIS SHEET
SEE SHEET 20 FOR DETAILS
TREES

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
	32	*ACER RUBRUM*	RED MAPLE	2.5 - 3" CAL.	B&B	15' O.C.
	57	*ACER SACCHARINUM*	SILVER MAPLE	2.5 - 3" CAL.	B&B	15' O.C.
	4	*CARPINUS CAROLINIANA*	MUSCLEWOOD	5-7' HT.	B&B	15' O.C.
	5	*CELTIS OCCIDENTALIS*	HACKBERRY	2.5 - 3" CAL.	B&B	15' O.C.
	1	*PLATANUS OCCIDENTALIS*	SYCAMORE	2.5 - 3" CAL.	B&B	15' O.C.
	24	*QUERCUS BICOLOR*	SWAMP WHITE OAK	2.5 - 3" CAL.	B&B	15' O.C.
	1	*QUERCUS MACROCARPA*	BUR OAK	2.5 - 3" CAL.	B&B	15' O.C.
	23	*QUERCUS PALUSTRIS*	PIN OAK	2.5 - 3" CAL.	B&B	15' O.C.

SHRUBS: PLANTED IN 12- PLANT CLUSTERS AS SHOWN

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
Co	84	*CEPHALANTHUS OCCIDENTALIS*	BUTTONBUSH	36" HT.	3-5 GAL.	6' O.C.
Ca	60	*CORNUS AMOMUM*	SILKY DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Cf	120	*CORNUS FOEMINA*	GRAY DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Cs	144	*CORNUS SERICEA*	RED-OSIER DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Hv	84	*HAMAMELIS VIRGINIANA*	WITCH-HAZEL	36" HT.	3-5 GAL.	6' O.C.
Iv	72	*ILEX VERTICILLATA*	WINTERBERRY	36" HT.	3-5 GAL.	6' O.C.
Lb	96	*LINDERA BENZOIN*	SPICEBUSH	36" HT.	3-5 GAL.	6' O.C.
Po	12	*PHYSOCARPUS OPULIFOLIUS*	NINEBARK	36" HT.	3-5 GAL.	6' O.C.
Sc	60	*SAMBUCUS CANADENSIS*	COMMON ELDERBERRY	36" HT.	3-5 GAL.	6' O.C.
Va	60	*VIBURNUM ACERIFOLIUM*	MAPLE LEAVED VIBURNUM	36" HT.	3-5 GAL.	6' O.C.
Vd	60	*VIBURNUM DENTATUM*	ARROW WOOD	36" HT.	3-5 GAL.	6' O.C.
Vt	48	*VIBURNUM TRILOBUM*	AMERICAN HIGHBUSH CRANBERRY	36" HT.	3-5 GAL.	6' O.C.

INDEX MAP



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ROUGE RIVER AOC HABITAT PROJECT: TAMARACK CREEK - STREAM AND WETLAND RESTORATION PROJECT

SOUTHFIELD, MICHIGAN

FOR BIDDING	01-2021
EGLE/USACE JOINT PERMIT APP.	06-2020

180611-0300
ECT PROJECT NUMBER

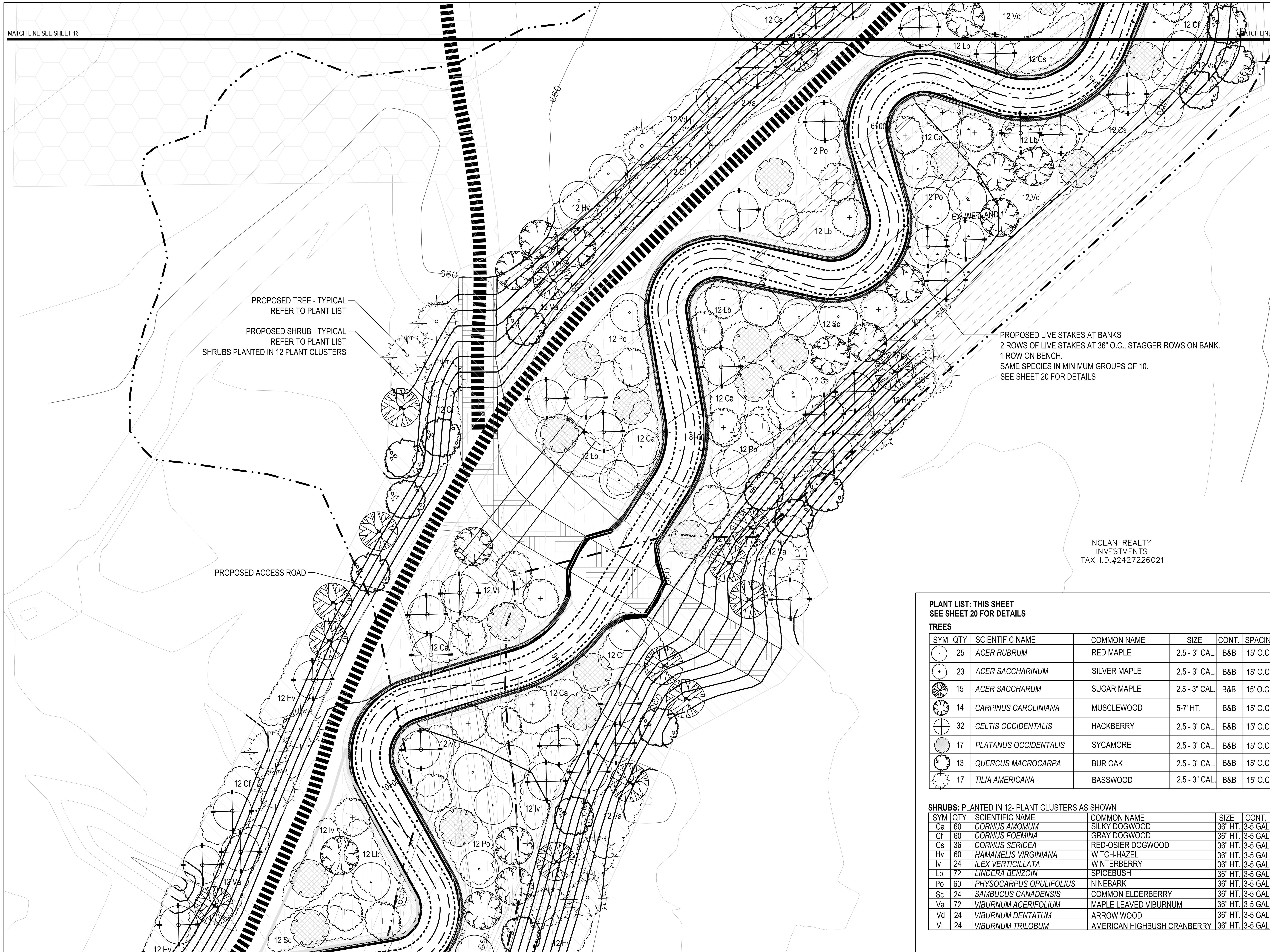
AB DESIGNED BY | MB CHECKED BY
AT DRAWN BY | JO APPROVED BY

PROPOSED REVEGETATION PLAN - ZONE A

SCALE: 1" = 40' @ 22" x 34"
0 20' 40' 80'

NORTH

SHEET NUMBER 16



PLANT LIST: THIS SHEET
SEE SHEET 20 FOR DETAILS

TREES

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
	25	*ACER RUBRUM*	RED MAPLE	2.5 - 3" CAL.	B&B	15' O.C.
	23	*ACER SACCHARINUM*	SILVER MAPLE	2.5 - 3" CAL.	B&B	15' O.C.
	15	*ACER SACCHARUM*	SUGAR MAPLE	2.5 - 3" CAL.	B&B	15' O.C.
	14	*CARPINUS CAROLINIANA*	MUSCLEWOOD	5-7' HT.	B&B	15' O.C.
	32	*CELTIS OCCIDENTALIS*	HACKBERRY	2.5 - 3" CAL.	B&B	15' O.C.
	17	*PLATANUS OCCIDENTALIS*	SYCAMORE	2.5 - 3" CAL.	B&B	15' O.C.
	13	*QUERCUS MACROCARPA*	BUR OAK	2.5 - 3" CAL.	B&B	15' O.C.
	17	*TILIA AMERICANA*	BASSWOOD	2.5 - 3" CAL.	B&B	15' O.C.

SHRUBS: PLANTED IN 12- PLANT CLUSTERS AS SHOWN

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
Ca	60	*CORNUS AMOMUM*	SILKY DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Cf	60	*CORNUS FOEMINA*	GRAY DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Cs	36	*CORNUS SERICEA*	RED-OSIER DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Hv	60	*HAMAMELIS VIRGINIANA*	WITCH-HAZEL	36" HT.	3-5 GAL.	6' O.C.
Iv	24	*ILEX VERTICILLATA*	WINTERBERRY	36" HT.	3-5 GAL.	6' O.C.
Lb	72	*LINDERA BENZOIN*	SPICEBUSH	36" HT.	3-5 GAL.	6' O.C.
Po	60	*PHYSOCARPUS OPULIFOLIUS*	NINEBARK	36" HT.	3-5 GAL.	6' O.C.
Sc	24	*SAMBUCUS CANADENSIS*	COMMON ELDERBERRY	36" HT.	3-5 GAL.	6' O.C.
Va	72	*VIBURNUM ACERIFOLIUM*	MAPLE LEAVED VIBURNUM	36" HT.	3-5 GAL.	6' O.C.
Vd	24	*VIBURNUM DENTATUM*	ARROW WOOD	36" HT.	3-5 GAL.	6' O.C.
Vt	24	*VIBURNUM TRILOBUM*	AMERICAN HIGHBUSH CRANBERRY	36" HT.	3-5 GAL.	6' O.C.

1 / 17 PROPOSED REVEGETATION PLAN - ZONE B
SCALE: 1" = 20' @ 22" x 34"

BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING IN DECEMBER 2018

LEGEND

- 838 EXIST. CONTOUR
- EXIST. STREAM CENTERLINE
- EXIST.PROPERTY LINE
- EXIST. STORM SEWER
- END SECTION
- CULVERT
- EXIST. FENCE
- EXIST. WETLAND
- FEMA 100-YR FLOOD BOUNDARY
- PR. STREAM CENTERLINE
- PR. THALWEG
- PR. BOTTOM OF BANK
- PR. TOP OF BANK
- PR. CONTOUR
- PR. ENHANCED STORMWATER BASIN
- PR. ACCESS ROUTE
- PR. WETLAND

REVEGETATION LEGEND

STORMWATER BASIN:
- STRAW MULCH BLANKET (S75BN, SEE STRAW MULCH BLANKET INSTALLATION NOTES)
- B&B TREES
- 3-5 GAL. CONTAINERIZED SHRUBS
- 4 IN. TOPSOIL
- NATIVE CONNECTION EMERGENT SEED MIX

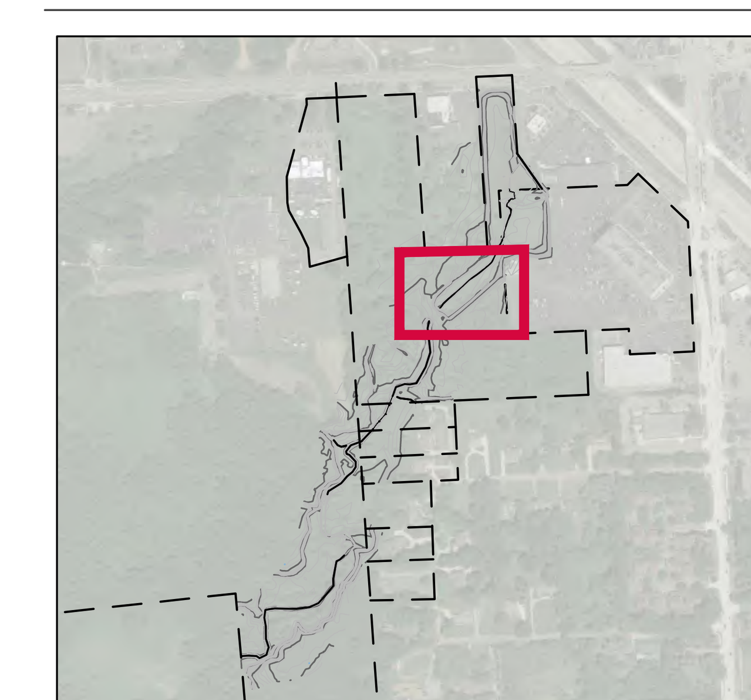
FLOODPLAIN BENCH:
- ECB (C700BN, SEE ECB INSTALLATION NOTES)
- ECB TO BE INSTALLED PERPENDICULAR TO THE STREAM CHANNEL AND STAPLED PER THE MANUFACTURER'S RECOMMENDATIONS WITH STAPLE PATTERN "D"
- LIVE STAKES
- 4 IN. TOPSOIL
- NATIVE CONNECTIONS FORESTED WETLAND SEED MIX

FLOODPLAIN SLOPES:
- ECB (NAG C700BN, SEE ECB INSTALLATION NOTES)
- ECB TO BE INSTALLED PERPENDICULAR TO THE STREAM CHANNEL AND STAPLED PER THE MANUFACTURER'S RECOMMENDATIONS WITH STAPLE PATTERN "D"
- 6 IN. TOPSOIL
- NATIVE CONNECTIONS MESIC WOODLAND SEED MIX

DISTURBED UPLAND:
- ECB (S75BN, SEE ECB INSTALLATION NOTES)
- 6 IN. TOPSOIL
- MDOT THM SEED MIX

LIVE STAKES:
- SEE SHEET 20 FOR DETAILS

INDEX MAP



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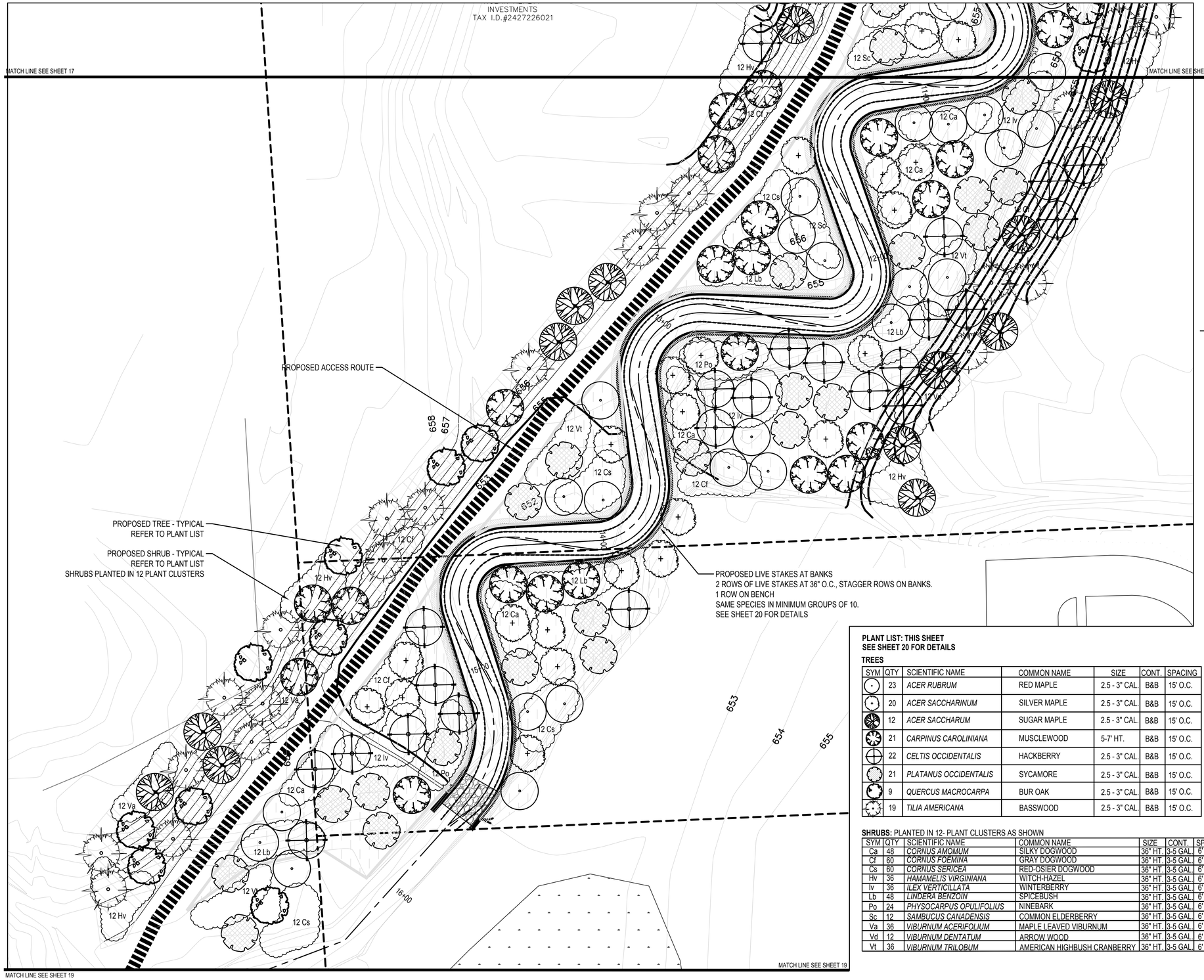
PROPOSED REVEGETATION PLAN - ZONE B

SCALE: 1" = 20' @ 22" x 34"
0 10' 20' 40'

NORTH

SHEET NUMBER
17



1/18 PROPOSED REVEGETATION PLAN - ZONE C
SCALE: 1" = 20' @ 22" x 34"

BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING IN DECEMBER 2018

LEGEND

- 838 — EXIST. CONTOUR
- EXIST. STREAM CENTERLINE
- EXIST.PROPERTY LINE
- EXIST. FENCE
- FEMA 100-YR FLOOD BOUNDARY
- PR. STREAM CENTERLINE
- PR. THALWEG
- PR. BOTTOM OF BANK
- PR. TOP OF BANK
- PR. CONTOUR
- PR. MAINTENANCE ACCESS ROUTE
- PR. WETLAND
- PR. AT-GRADE RIFFLE

REVEGETATION LEGEND

STORMWATER BASIN:
- STRAW MULCH BLANKET (S75BN, SEE STRAW MULCH BLANKET INSTALLATION NOTES)
- B&B TREES
- 3-5 GAL. CONTAINERIZED SHRUBS
- 4 IN. TOPSOIL
- NATIVE CONNECTION EMERGENT SEED MIX

FLOODPLAIN BENCH:
- ECB (C700BN, SEE ECB INSTALLATION NOTES)
- ECB TO BE INSTALLED PERPENDICULAR TO THE STREAM CHANNEL AND STAPLED PER THE MANUFACTURER'S RECOMMENDATIONS WITH STAPLE PATTERN "D"
- LIVE STAKES
- 4 IN. TOPSOIL
- NATIVE CONNECTIONS FORESTED WETLAND SEED MIX

FLOODPLAIN SLOPES:
- ECB (NAG C700BN, SEE ECB INSTALLATION NOTES)
- ECB TO BE INSTALLED PERPENDICULAR TO THE STREAM CHANNEL AND STAPLED PER THE MANUFACTURER'S RECOMMENDATIONS WITH STAPLE PATTERN "D"
- 6 IN. TOPSOIL
- NATIVE CONNECTIONS MESIC WOODLAND SEED MIX

DISTURBED UPLAND:
- ECB (S75BN, SEE ECB INSTALLATION NOTES)
- 6 IN. TOPSOIL
- MDOT THM SEED MIX

LIVE STAKES:
- SEE SHEET 20 FOR DETAILS

PLANT LIST: THIS SHEET
SEE SHEET 20 FOR DETAILS

TREES

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
	23	*ACER RUBRUM*	RED MAPLE	2.5 - 3" CAL.	B&B	15' O.C.
	20	*ACER SACCHARINUM*	SILVER MAPLE	2.5 - 3" CAL.	B&B	15' O.C.
	12	*ACER SACCHARUM*	SUGAR MAPLE	2.5 - 3" CAL.	B&B	15' O.C.
	21	*CARPINUS CAROLINIANA*	MUSCLEWOOD	5-7' HT.	B&B	15' O.C.
	22	*CELTIS OCCIDENTALIS*	HACKBERRY	2.5 - 3" CAL.	B&B	15' O.C.
	21	*PLATANUS OCCIDENTALIS*	SYCAMORE	2.5 - 3" CAL.	B&B	15' O.C.
	9	*QUERCUS MACROCARPA*	BUR OAK	2.5 - 3" CAL.	B&B	15' O.C.
	19	*TILIA AMERICANA*	BASSWOOD	2.5 - 3" CAL.	B&B	15' O.C.

SHRUBS: PLANTED IN 12- PLANT CLUSTERS AS SHOWN

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
Ca	48	*CORNUS AMOMUM*	SILKY DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Cf	60	*CORNUS FOEMINA*	GRAY DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Cs	60	*CORNUS SERICEA*	RED-OSIER DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Hv	36	*HAMAMELIS VIRGINIANA*	WITCH-HAZEL	36" HT.	3-5 GAL.	6' O.C.
Iv	36	*ILEX VERTICILLATA*	WINTERBERRY	36" HT.	3-5 GAL.	6' O.C.
Lb	48	*LINDERA BENZOIN*	SPICEBUSH	36" HT.	3-5 GAL.	6' O.C.
Po	24	*PHYSOCARPUS OPULIFOLIUS*	NINEBARK	36" HT.	3-5 GAL.	6' O.C.
Sc	12	*SAMBUCUS CANADENSIS*	COMMON ELDERBERRY	36" HT.	3-5 GAL.	6' O.C.
Va	36	*VIBURNUM ACERIFOLIUM*	MAPLE LEAVED VIBURNUM	36" HT.	3-5 GAL.	6' O.C.
Vd	12	*VIBURNUM DENTATUM*	ARROW WOOD	36" HT.	3-5 GAL.	6' O.C.
Vt	36	*VIBURNUM TRILOBUM*	AMERICAN HIGHBUSH CRANBERRY	36" HT.	3-5 GAL.	6' O.C.

INDEX MAP

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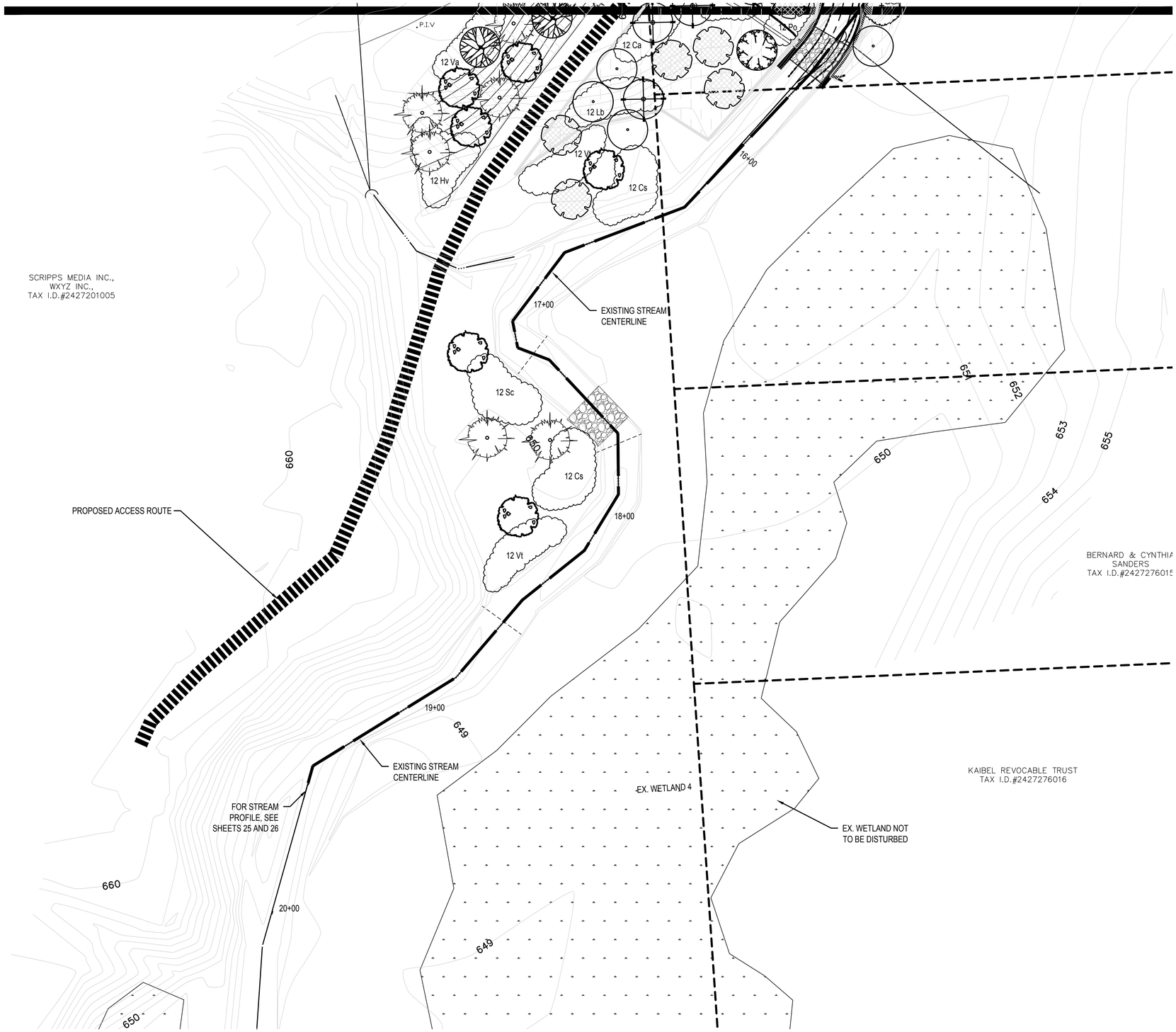
PROPOSED REVEGETATION PLAN - ZONE C

SCALE: 1" = 20' @ 22" x 34"
0 10' 20' 40'

NORTH

SHEET NUMBER
18



1/19 PROPOSED REVEGETATION PLAN - ZONE D

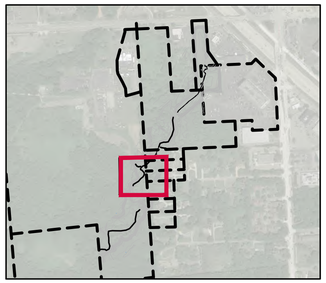
SCALE: 1" = 20' @ 22" x 34"

BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING IN DECEMBER 2018

LEGEND

- 838 — EXIST. CONTOUR
- EXIST. STREAM CENTERLINE
- EXIST.PROPERTY LINE
- EXIST. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- END SECTION
- CULVERT
- EXIST. FENCE
- FEMA 100-YR FLOOD BOUNDARY
- PR. STREAM CENTERLINE
- PR. THALWEG
- PR. BOTTOM OF BANK
- PR. TOP OF BANK
- PR. CONTOUR
- PR. ACCESS ROUTE
- PR. WETLAND
- PR. AT-GRADE RIFFLE
- PR. RIP RAP AT CULVERT ENDS
- PR. SILT CURTAIN

INDEX MAP



PLANT LIST: THIS SHEET
SEE SHEET 20 FOR DETAILS

TREES

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
	2	*QUERCUS MACROCARPA*	BUR OAK	2.5 - 3" CAL.	B&B	15' O.C.
	2	*TILIA AMERICANA*	BASSWOOD	2.5 - 3" CAL.	B&B	15' O.C.

SHRUBS: PLANTED IN 12- PLANT CLUSTERS AS SHOWN

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
Cs	12	*CORNUS SERICEA*	RED-OSIER DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Sc	12	*SAMBUCUS CANADENSIS*	COMMON ELDERBERRY	36" HT.	3-5 GAL.	6' O.C.
Vt	12	*VIBURNUM TRILOBUM*	AMERICAN HIGHBUSH CRANBERRY	36" HT.	3-5 GAL.	6' O.C.

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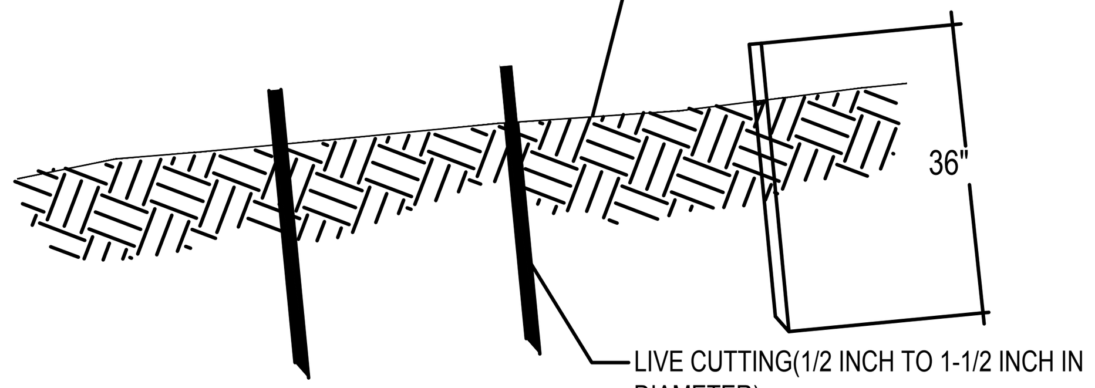
PROPOSED REVEGETATION PLAN - ZONE D

SCALE: 1" = 20' @ 22" x 34"
0 10' 20' 40'

NORTH

SHEET NUMBER 19



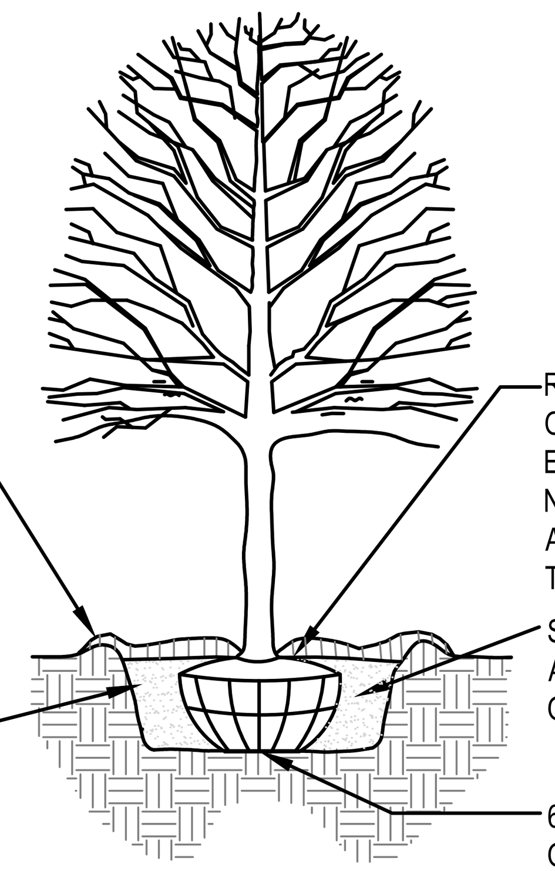
NOTES:

1. INSTALL IN MUDFLAT/TILL ZONE AS DIRECTED BY LANDSCAPE ECOLOGIST, DURING FIRST DORMANT SEASON FOLLOWING SEEDING
2. INSTALL LIVE STAKES AT RIGHT ANGLES PUSH INTO THE GROUND BY HAND. DEAD BLOW HAMMER AND PILOT HOLES AS NECESSARY.
3. BURY FOUR-FIFTHS OF THE STAKE IN THE GROUND, AND FIRMLY PACK SOIL AROUND IT. ORIENT THE BUDS UP.
4. INSTALL STAKES 3 FEET APART IN TRIANGULAR SPACING PATTERN. SEE DETAIL 6 ON SHEETS 28 FOR INSTALLATION LOCATION ON BANKS.

1/20 LIVE STAKE INSTALLATION
NO SCALE

NOTES:
TREE SHALL BE PLANTED WITH TOP OF ROOT BALL AT OR SLIGHTLY ABOVE FINISH GRADE - NEVER LOWER.

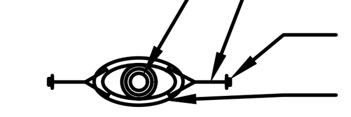
PRUNE ONLY AS DIRECTED EXCEPT FOR REMOVING DEAD OR BROKEN BRANCHES; RETAIN NATURAL FORM; DO NOT CUT LEADER.

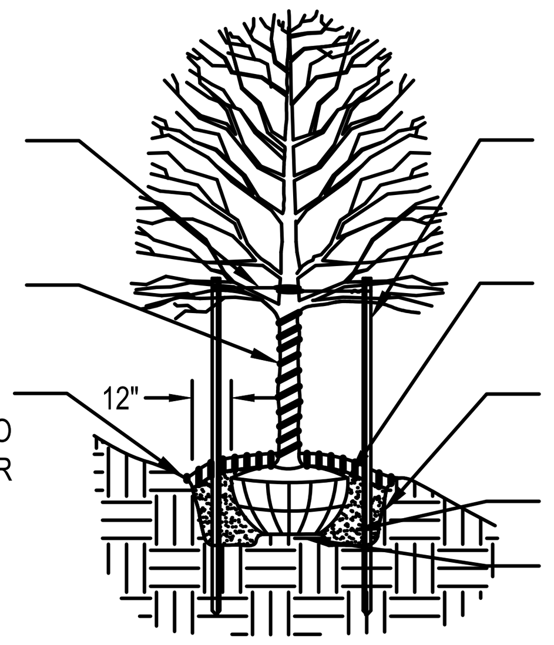


2/20 DECIDUOUS TREE PLANTING
NOT TO SCALE

NOTES:

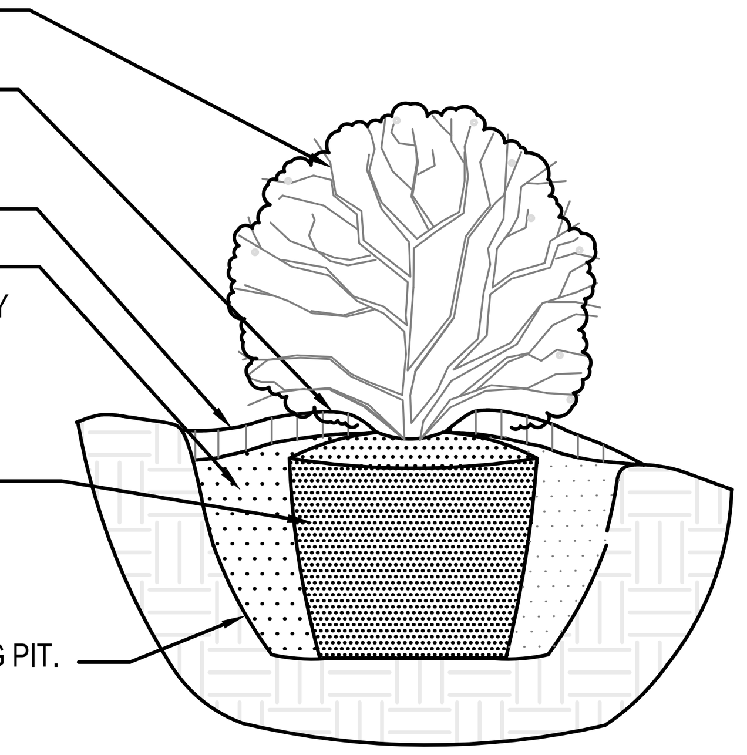
1. TREE SHALL BEAR SAME OR SLIGHTLY HIGHER RELATION TO FINISH GRADE AS TO PRIOR GRADE - NEVER LOWER.
2. CREATE HORIZONTAL SHELF FOR TREE WHEN PLANTING ON A SLOPE. DO NOT FILL OVER ROOT BALL ON UPSLOPE.
3. PRUNE ONLY AS DIRECTED EXCEPT FOR REMOVING DEAD OR BROKEN BRANCHES; RETAIN NATURAL FORM; DO NOT CUT LEADER.
4. BRACE ALL DECIDUOUS TREES UP TO 4" WITH TWO STAKES.





3/20 SLOPE TREE PLANTING
NOT TO SCALE

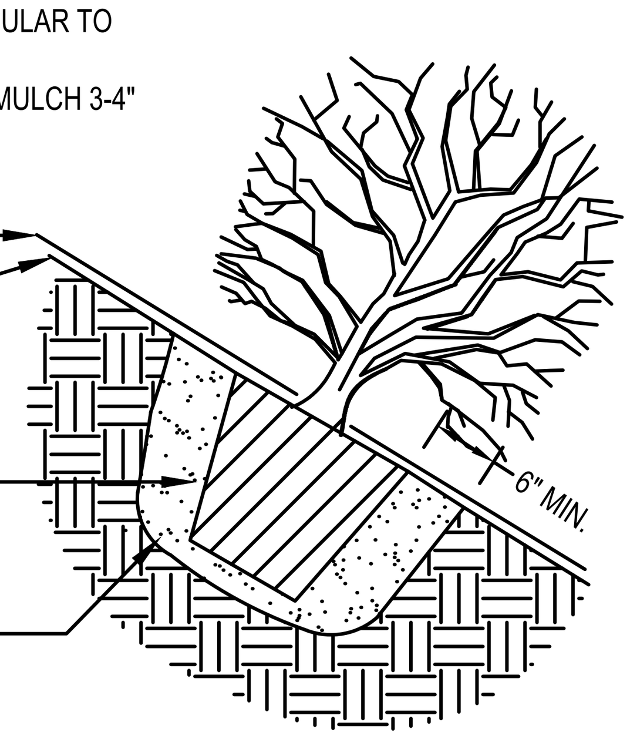
PLANT ALL SHRUBS VERTICAL.



4/20 SHRUB PLANTING DETAIL
NOT TO SCALE

NOTES:

1. SHRUB SHALL BEAR SAME OR SLIGHTLY HIGHER RELATION TO FINISH GRADE AS TO PRIOR GRADE - NEVER LOWER.
2. PRUNE ONLY AS DIRECTED EXCEPT FOR REMOVING DEAD OR BROKEN BRANCHES; RETAIN NATURAL FORM.
3. PLANT SHRUBS WITH MAIN LEADER PERPENDICULAR TO THE GROUND SURFACE.
4. IF NO EROSION CONTROL FIBER IS REQUIRED, MULCH 3-4" AROUND BASE OF SHRUB.



5/20 SLOPE SHRUB PLANTING
NOT TO SCALE

OVERALL PLANT LIST
REPRESENTING PLANT TOTALS FROM SHEETS 16-19

TREES

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
	80	*ACER RUBRUM*	RED MAPLE	2.5 - 3" CAL.	B&B	15' O.C.
	100	*ACER SACCHARINUM*	SILVER MAPLE	2.5 - 3" CAL.	B&B	15' O.C.
	27	*ACER SACCHARUM*	SUGAR MAPLE	2.5 - 3" CAL.	B&B	15' O.C.
	39	*CARPINUS CAROLINIANA*	MUSCLEWOOD	5-7' HT.	B&B	15' O.C.
	59	*CELTIS OCCIDENTALIS*	HACKBERRY	2.5 - 3" CAL.	B&B	15' O.C.
	39	*PLATANUS OCCIDENTALIS*	SYCAMORE	2.5 - 3" CAL.	B&B	15' O.C.
	24	*QUERCUS BICOLOR*	SWAMP WHITE OAK	2.5 - 3" CAL.	B&B	15' O.C.
	25	*QUERCUS MACROCARPA*	BUR OAK	2.5 - 3" CAL.	B&B	15' O.C.
	23	*QUERCUS PALUSTRIS*	PIN OAK	2.5 - 3" CAL.	B&B	15' O.C.
	38	*TILIA AMERICANA*	BASSWOOD	2.5 - 3" CAL.	B&B	15' O.C.

SHRUBS: PLANTED IN 12- PLANT CLUSTERS AS SHOWN

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
Co	84	*CEPHALANTHUS OCCIDENTALIS*	BUTTONBUSH	36" HT.	3-5 GAL.	6' O.C.
Ca	168	*CORNUS AMOMUM*	SILKY DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Cf	240	*CORNUS FOEMINA*	GRAY DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Cs	252	*CORNUS SERICEA*	RED-OSIER DOGWOOD	36" HT.	3-5 GAL.	6' O.C.
Hv	180	*HAMAMELIS VIRGINIANA*	WITCH-HAZEL	36" HT.	3-5 GAL.	6' O.C.
Iv	132	*ILEX VERTICILLATA*	WINTERBERRY	36" HT.	3-5 GAL.	6' O.C.
Lb	216	*LINDERA BENZOIN*	SPICEBUSH	36" HT.	3-5 GAL.	6' O.C.
Po	72	*PHYSOCARPUS OPULIFOLIUS*	NINEBARK	36" HT.	3-5 GAL.	6' O.C.
Sc	108	*SAMBUCUS CANADENSIS*	COMMON ELDERBERRY	36" HT.	3-5 GAL.	6' O.C.
Va	168	*VIBURNUM ACERIFOLIUM*	MAPLE LEAVED VIBURNUM	36" HT.	3-5 GAL.	6' O.C.
Vd	96	*VIBURNUM DENTATUM*	ARROW WOOD	36" HT.	3-5 GAL.	6' O.C.
Vt	120	*VIBURNUM TRILOBUM*	AMERICAN HIGHBUSH CRANBERRY	36" HT.	3-5 GAL.	6' O.C.

Native Connections | 17080 Hoshel Rd, Three Rivers, MI 49093 | www.nativeconnections.net
EMERGENT WETLAND SEED MIX
Total Seeding Rate: 31.25 lbs per acre

GRASSES, SEDGES & RUSHES		PLS OZ/ACRE	SEEDS/SQ FT
Carex comosa	Bristly Sedge	5.00	3.44
Carex crinita	Fringed Sedge	1.00	0.53
Carex hystericina	Porcupine Sedge	4.00	2.75
Carex stipata	Awl-fruited Sedge	2.00	1.56
Carex vulpinoidea	Fox Sedge	4.00	9.18
Eleocharis palustris	Great Spike Rush	0.25	0.29
Glyceria canadensis	Canada Manna Grass	2.00	3.40
Glyceria grandis	Reed Manna Grass	4.00	7.35
Juncus effusus	Soft Rush	0.25	5.74
Juncus torreyi	Torrey's Rush	0.25	9.18
Leersia oryzoides	Rice Cut Grass	2.00	1.56
Scirpus acutus	Hard-stem Bulrush	1.00	0.46
Scirpus atrovirens	Dark Green Bulrush	1.00	10.56
Scirpus cyperinus	Wool Grass	0.25	9.76
Scirpus fluviatilis	River Bulrush	7.00	0.69
Scirpus validus	Soft-stem Bulrush	2.00	1.42
Total Grasses		36.00	67.88
FORBS		PLS OZ/ACRE	SEEDS/SQ FT
Acorus americanus	Sweet Flag	5.00	0.76
Alisma subcordatum	Common Water Plantain	3.50	4.82
Asclepias incarnata	Swamp Milkweed	2.00	0.22
Aster puniceus	Swamp Aster	0.50	0.92
Bidens cernua	Nodding Bur Marigold	1.00	0.48
Cicuta maculata	Water Hemlock	0.75	0.21
Eupatorium maculatum	Joe Pye Weed	0.25	0.55
Eupatorium perfoliatum	Boneset	0.50	1.84
Iris virginica Southern	Blue Flag Iris	2.00	0.05
Lobelia cardinalis	Cardinal Flower	0.25	2.30
Lobelia siphilitica	Great Blue Lobelia	0.25	2.87
Mimulus ringens	Monkey Flower	0.25	13.20
Peltandra virginica	Arrow Arum	8.00	0.01
Penthorum sedoides	Ditch Stonecrop	0.50	14.92
Polygonum pensylvanicum	Pennsylvania Smartweed	3.00	0.90
Pontederia cordata	Pickerel Weed	6.00	0.17
Rumex orbiculatus	Great Water Dock	0.25	0.05
Sagittaria latifolia	Common Arrowhead	0.25	0.35
Sparganium eurycarpum	Common Bur Reed	7.75	0.09
Verbena hastata	Blue Vervain	2.00	4.27
Total Forbs		44.00	48.95
TEMPORARY GRASS COVER		OZ/ACRE	SEEDS/SQ FT
Lolium multiflorum	Annual Ryegrass	100.00	30.99
Avena sativa	Seed Oats	320.00	7.35
Total Temp Grasses		420.00	38.34

Native Connections | 17080 Hoshel Rd, Three Rivers, MI 49093 | www.nativeconnections.net
FORESTED WETLAND ESTABLISHMENT SEED MIX
Total Seeding Rate: 31 lbs per acre

GRASSES, SEDGES & RUSHES		PLS OZ/ACRE	SEEDS/SQ FT
Bromus ciliatus	Fringed Brome	8.00	1.84
Calamagrostis canadensis	Bluejoint Grass	0.50	3.21
Carex comosa	Bristly Sedge	2.00	1.38
Carex frankii	Frank's Sedge	2.00	0.78
Carex stipata	Awl-fruited Sedge	2.00	1.56
Carex vulpinoidea	Fox Sedge	2.00	4.59
Elymus riparius	Riverbank Wild Rye	4.00	0.64
Elymus virginicus	Virginia Wild Rye	50.00	4.82
Glyceria striata	Fowl Manna Grass	1.00	3.67
Juncus effusus	Soft Rush	0.30	6.89
Scirpus cyperinus	Wool Grass	0.20	7.81
Total Grasses		72.00	37.19
FORBS		PLS OZ/ACRE	SEEDS/SQ FT
Actinomeris alternifolia	Wingstem	1.75	0.36
Angelica atropurpurea	Angelica	2.25	0.28
Aster novae-angliae	New England Aster	0.25	0.38
Aster puniceus	Swamp Aster	0.25	0.46
Bidens frondosa	Devil's Beggarticks	0.25	0.03
Boltonia asteroides	False Aster	0.50	1.84
Cassia hebecarpa	Wild Senna	3.75	0.12
Cephalanthus occidentalis	Buttonbush	1.30	0.37
Eupatorium perfoliatum	Boneset	0.50	1.84
Helenium autumnale	Sneezeweed	3.00	8.95
Iris virginica	Southern Blue Flag Iris	0.75	0.02
Lobelia siphilitica	Great Blue Lobelia	0.25	2.87
Ludwigia alternifolia	Seedbox	0.25	1.61
Mimulus ringens	Monkey Flower	0.25	13.20
Monarda fistulosa	Wild Bergamot	1.50	2.41
Penstemon digitalis	Foxglove Beardtongue	1.20	3.58
Physostegia virginiana	Obedient Plant	1.00	0.25
Rudbeckia laciniata	Golden Glow	1.50	0.48
Solidago ohioensis	Ohio Goldenrod	1.00	2.53
Zizia aurea	Golden Alexander	2.50	0.63
Total Forbs		24.00	42.21
TEMPORARY GRASS COVER		OZ/ACRE	SEEDS/SQ FT
Lolium multiflorum	Annual Ryegrass	80.00	24.79
Avena sativa	Seed Oats	320.00	7.35
Total Temp Grasses		400.00	32.14

Native Connections | 17080 Hoshel Rd, Three Rivers, MI 49093 | www.nativeconnections.net
MESIC WOODLAND SEED MIX
Total Seeding Rate: 31 lbs per acre

GRASSES, SEDGES & RUSHES		PLS OZ/ACRE	SEEDS/SQ FT
Bromus purgans	Hairy Wood Chess	3.00	0.52
Carex cristatella	Crested Sedge	0.50	0.68
Carex grayi	Common Bur Sedge	1.75	0.05
Carex sprengelii	Long-beaked Sedge	0.50	0.11
Elymus villosus	Silky Wild Rye	6.00	0.76
Elymus virginicus	Virginia Wild Rye	40.00	3.86
Glyceria striata	Fowl Manna Grass	2.00	7.35
Hystrix patula	Bottlebrush Grass	6.00	1.05
Juncus tenuis	Path Rush	0.25	5.74
Total Grasses		60.00	20.11
FORBS PLS OZ/ACRE SEEDS/SQ FT			
Allium tricoccum	Wild Leek	2.00	0.06
Anemone canadensis	Canada Thimbleweed	1.00	0.18
Aquilegia canadensis	Wild Columbine	0.50	0.44
Arisaema triphyllum	Jack-in-the-Pulpit	1.00	0.01
Blephilia hirsuta	Hairy wood mint	0.25	1.38
Campanula americana	Tall Bellflower	0.25	0.98
Caulophyllum thalictroides	Blue Cohosh	4.00	0.01
Eupatorium purpureum	Sweet Joe Pye Weed	2.00	1.93
Eupatorium rugosum	White Snakeroot	0.50	1.72
Geranium maculatum	Wild Geranium	0.25	0.03
Helianthus grosseserratus	Saw-toothed Sunflower	1.00	0.34
Impatiens capensis	Spotted Touch-me-not	0.25	0.02
Lobelia siphilitica	Great Blue Lobelia	0.25	2.87
Penstemon digitalis	Foxglove Beardtongue	2.00	5.97
Polygonatum canaliculatum	Great Solomon's Seal	1.00	0.02
Rudbeckia laciniata	Golden Glow	5.00	1.61
Rudbeckia triloba	Brown-eyed Susan	5.00	3.90
Smilacina racemosa	False Solomon's Seal	4.00	0.04
Solidago caesia	Blue-stemmed Goldenrod	0.25	3.14
Solidago flexicaulis	Zigzag Goldenrod	0.10	0.19
Solidago rugosa	Rough Goldenrod	0.30	0.64
Thalictrum dioicum	Early Meadow Rue	0.10	0.02
Zizia aurea	Golden Alexander	5.00	1.26
Total Forbs		36.00	26.75
TEMPORARY GRASS COVER		OZ/ACRE	SEEDS/SQ FT
Lolium multiflorum	Annual Ryegrass	80.00	24.79
Avena sativa	Seed Oats	320.00	7.35
Total Temp Grasses		400.00	32.14

MDOT THM SEED MIX
Total Seeding Rate: 5 LBS. per 1000 SFT – 220 LBS. per ACRE

QUANTITY	VARIETY	PURITY	MIN. GERM
50%	Creeping Red Fescue	98.5%	85%
30%	Kentucky Bluegrass	98.5%	85%
20%	Perennial Ryegrass	99.5%	90%

LIVE STAKE SPECIES LIST (2250 TOTAL):

SCIENTIFIC NAME	COMMON NAME
CORNUS SERICEA	RED-OSIER DOGWOOD
CORNUS AMOMUM	SILKY DOGWOOD
SALIX EXIGUA	SANDBAR WILLOW
SALIX DISCOLOR	PUSSY WILLOW
SALIX SERICEA	SILKY WILLOW
SALIX NIGRA	BLACK WILLOW
SALIX AMYGDALOIDES	PEACH-LEAF WILLOW

LISTED SPECIES ARE TO BE EQUALLY REPRESENTED.
PLANT LIVE STAKES IN 2 ROWS OF LIVE STAKES AT 36" O.C., STAGGER ROWS. SAME SPECIES IN MINIMUM GROUPS OF 10.

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SOUTHFIELD, MICHIGAN

FOR BIDDING	01-2021
EGLE/USACE JOINT PERMIT APP.	06-2020

180611-0300
ECT PROJECT NUMBER

AB — DESIGNED BY; MB — CHECKED BY
AT — DRAWN BY; JO — APPROVED BY

PROPOSED REVEGETATION DETAILS

SCALE: AS SHOWN @ 22" x 34"

NORTH

SHEET NUMBER 20

REVEGETATION NOTES:

MAINTENANCE AND WARRANTY PERIOD:

1. WARRANTY PERIOD: WARRANT THAT ALL TREES, SEEDING, AND LIVE STAKES INSTALLED UNDER THIS CONTRACT WILL BE HEALTHY AND IN FLOURISHING CONDITION OF ACTIVE GROWTH FOR ONE (1) FULL GROWING SEASON (APRIL THROUGH NOVEMBER) FROM DATE OF FINAL ACCEPTANCE. THE CONTRACTOR SHALL RESPOND WITHIN TWO (2) WEEKS OF WRITTEN REQUESTS BY THE OWNER FOR REPLACEMENT OR REPAIR. IF THE CONTRACTOR FAILS TO RESPOND WITHIN THIS TIME, THE OWNER MAY PROCEED WITH REPLACEMENT WORK AND BILL THE CONTRACTOR.
2. ALL DELAYS IN COMPLETION OF PLANTING OPERATIONS WHICH EXTEND THE PLANTING INTO MORE THAN ONE PLANTING SEASON SHALL EXTEND THE WARRANTY PERIOD CORRESPONDINGLY.
3. REPLACEMENTS: AS SOON AS WEATHER CONDITIONS PERMIT, REPLACE, WITHOUT COST TO OWNER, ALL DEAD PLANTS AND ALL PLANTS NOT IN A VIGOROUS, THRIVING CONDITION, AS DETERMINED BY THE CONSULTANT DURING AND AT THE END OF THE WARRANTY PERIOD.
4. PATCHY OR BARE AREAS (IN EXCESS OF 8 SQUARE FEET) WHERE SEED MIX FAILED TO CREATE SUFFICIENT DENSITY OF COVER SHALL BE RESEEDED BY HAND AT THE RECOMMENDED APPLICATION RATE AT NO ADDITIONAL COST TO OWNER.
5. INCORRECT MATERIALS: DURING WARRANTY PERIOD, REPLACE AT NO COST TO OWNER ALL PLANTS REVEALED AS BEING UNTRUE TO NAME. PROVIDE REPLACEMENTS OF A SIZE AND QUALITY TO MATCH THE PLANTED MATERIALS AT THE TIME THE MISTAKE IS DISCOVERED.
6. ALL PLANT STOCK SHALL BE WATERED BY THE CONTRACTOR TO ENSURE THE HEALTH AND VIGOR OF THE PLANTED MATERIALS. THE CONTRACTOR SHALL WATER AS NEEDED BASED ON NATURAL RAINFALL DURING THE WARRANTY PERIOD. WATERING SHALL CONTINUE SO SEEDLINGS DO NOT DRY OUT ONCE WATERING HAS BEGUN. THE WATERING SHALL BE DONE FROM SURFACE METHODS AT A PRESSURE NOT TO EXCEED THE INFILTRATION RATE OF THE SOIL, LIMITING RUNOFF DURING THE WATERING PERIOD. EACH AREA WILL BE WATERED WITH SUFFICIENT WATER TO COMPLETELY SATURATE THE ROOT ZONE. THE CONTRACTOR SHALL INSPECT ALL PLANTS FOR INSECT INFESTATION AND DAMAGE.
7. EROSION SHALL BE REPAIRED BY THE CONTRACTOR.
8. PROTECTION FROM TRAFFIC AND EROSION IN NEWLY SEEDED AREAS AND THE MITIGATION AREAS IS THE RESPONSIBILITY OF THE CONTRACTOR. SAFETY FENCES AND/OR OTHER BARRIER METHODS WITH APPROPRIATE SIGNAGE MAY BE USED FOR ONE YEAR FROM COMPLETION OF CONSTRUCTION ACTIVITIES. ALL COSTS ASSOCIATED WITH THIS IS INCLUSIVE OF CONTRACTOR'S PRICING.
9. NOTIFY THE OWNER PRIOR TO AND FOLLOWING ANY MAINTENANCE ACTIVITY.
10. FINAL ACCEPTANCE OF WORK WILL BE SUBJECT TO ACCEPTANCE BY PROJECT MANAGER AND OWNER AT THE END OF GUARANTEE PERIOD.

NATIVE PLANTINGS:

1. TREES AND LIVE STAKES SHALL BE OF NATIVE PLANT MATERIAL OF GENOTYPES FROM THE NORTH CENTRAL STATES ONLY (IL, IN, IA, MI, OH), AND FROM A RECOGNIZED NURSERY OF THIS REGION. MICHIGAN SOURCES FOR TREE, SHRUBS, AND PLUGS SHALL BE LOCATED BEFORE BRANCHING OUT TO OTHER NORTH CENTRAL STATES. NATIVE PLANTINGS INCLUDE ALL TREES AND LIVE STAKES INSTALLED AS PART PF THIS PROJECT.
2. PLANTS SHALL BE NURSERY GROWN IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICES AND MUST MEET APPLICABLE REQUIREMENTS OF ICBN AND ICNCP. PLANTS SHALL BE SOUND, HEALTHY AND VIGOROUS, WELL BRANCHED AND DENSELY FOLIATED WHEN IN LEAF. PLANTS SHALL BE FREE OF DISEASE, INSECT PESTS, EGGS, OR LARVAE. PLANTS SHALL BE FREE OF KINKED, CIRCLING OR GIRDLING TRUNK SURFACE AND CENTER ROOTS, AND SHALL NOT BE ROOT-BOUND. RESPECT MAXIMUM STORAGE TIMES FOR PLANT STOCK.
3. NATIVE PLANTING AREAS SHALL BE INSTALLED AFTER MAY 15 (WHEN SOIL IS FREE OF FROST AND IN WORKABLE CONDITION), BUT BEFORE JUNE 30 OR AFTER SEPT. 1 BUT BEFORE OCTOBER 30 OR AS APPROVED BY THE ENGINEER.
4. FURNISH PLANT SPECIES AND SIZES AS INDICATED ON THE PLANS. PLANT STOCK SHALL BE TRUE TO THEIR NAME (GENUS AND SPECIES), AS SPECIFIED. CULTIVARS AND SPECIMENS SHALL NOT BE USED WITHOUT PRIOR APPROVAL BY CONSULTANT.
5. NATIVE PLANTINGS TO BE INSTALLED PER DETAILS.
6. REMOVE ALL CONTAINERS AND PACKAGING MATERIAL AND DISPOSE OF LEGALLY OFF-SITE.
7. WATER PLANT STOCK IMMEDIATELY AFTER PLANTING SUCH THAT ROOT ZONE IS THOROUGHLY SOAKED. CONTRACTOR SHALL BE RESPONSIBLE TO KEEP PLUGS ADEQUATELY WATERED , IF NECESSARY, TO ENSURE THEIR SURVIVAL.
8. IF EROSION CONTROL BLANKET IS NEEDED IN AREAS WHERE PLUGS ARE PRESENT, INSTALL EROSION CONTROL BLANKET AFTER SEEDING, BUT PRIOR TO PLANTING. EROSION CONTROL BLANKET SHALL BE INSTALLED WHERE THE CONTRACTOR FEELS IT NECESSARY TO STABILIZE THE SITE AT NO ADDITIONAL COST TO THE OWNER.
9. FIELD ADJUST PLANTINGS TO DIVERSIFY SPECIES ACROSS THE PLANTING AREAS AND TO MEET FINISH GRADE OF THE STREAMBANKS WITH PLANTING REQUIREMENTS FOR SPECIES BASED ON DEPTH. ANY ADJUSTMENTS WILL BE SHOWN ON AN AS-BUILT PLAN AND SUBMITTED TO THE CONSULTANT UPON COMPLETION.
10. MULCH FOR TREES SHALL BE COARSE GRADE OAK OR MAPLE BARK AGED AT LEAST ONE YEAR AND UNIFORM IN COLOR AND TEXTURE.

SEEDING:

1. SEED SHALL BE FRESH, CLEAN, NEW SEED OF NATIVE PLANT MATERIAL OF GENOTYPES FROM THE NORTH CENTRAL STATES ONLY (IL, IN, IA, MI, OH), AND FROM A RECOGNIZED NURSERY OF THIS REGION.
2. NATIVE SEED AREAS SHALL BE SEEDED AFTER MAY 1, (WHEN SOIL IS FREE OF FROST AND IN WORKABLE CONDITION), BUT BEFORE JUNE 30 OR AFTER OCTOBER 1, BUT BEFORE NOVEMBER 30 (OR PRIOR TO FREEZE-UP) OR AS APPROVED BY THE ENGINEER.
3. SEEDBED PREPARATION: CUT ANY EXISTING VEGETATION TO 4 (FOUR) INCH HEIGHT AND APPLY HERBICIDE AS NECESSARY. PRIOR TO SOWING NATIVE SEED, LIGHTLY SCARIFY SO THAT THE BED IS SMOOTH AND FREE OF LARGE CLUMPS. SEED BED SHALL BE FIRM, BUT NOT COMPACT. SEED IMMEDIATELY AFTER SCARIFYING. DO NOT FERTILIZE.
4. ALL SEEDED AREAS SHALL BE HYDROSEEDED. A HYDROMULCH CONSISTING OF CELLULOSE OR SIMILAR MULCH WITH TACKIFIER SUITABLE FOR HYDROSEEDING SHALL BE USED AS A SEEING METHOD. NO STRAW MULCH SHALL BE USED.
5. ALL WATER USED IN HYDROMULCH SHALL BE FREE OF SUBSTANCES DETRIMENTAL TO PLANT GROWTH AND SHALL BE SUITABLE FOR DISCHARGE INTO SURFACE WATERS BASED ON LOCAL, STATE, AND FEDERAL REGULATORY REQUIREMENTS. SEEDING METHOD SHALL ENSURE COMPLETE COVERAGE OF DESIGNATED AREA. RE-SEED AREAS WITH GAPS IN SEEDING AT NO ADDITIONAL COST TO OWNER.
6. DO NOT SOW SEED WHERE STANDING WATER IS PRESENT.
7. SOW NATIVE SEED AT A SPECIES RATE OF POUNDS PER ACRE INDICATED ON THE DRAWING. LIGHTLY RAKE TO INCORPORATE SEED INTO SOIL. DO NOT COVER SEED MORE THAN 1/4 INCH WITH SOIL. SEED DRILLING IS ALSO ACCEPTABLE.
8. CONTRACTOR SHALL REPAIR DAMAGED VEGETATION AND AERATE SOIL OVER ROOT ZONE OF NEGATIVELY IMPACTED VEGETATION. RE-SEED ALL DISTURBED AREAS TO PRE-EXISTING CONDITIONS.

EXISTING SITE CONDITIONS:

1. CONTRACTOR SHALL BECOME FAMILIAR WITH ALL EXISTING SITE CONDITIONS PRIOR TO STARTING WORK.
2. THE CONTRACTOR UNDERSTANDS AND ACKNOWLEDGES THAT THE PERFORMANCE OF THE WORK IS REQUIRED WITHIN A RIVER SYSTEM AND FLOODPLAIN.
3. THE CONTRACTOR SHALL BE FULLY AWARE OF THE ROUGE RIVER HYDROLOGY AND CURRENT WEATHER CONDITIONS SO THAT WORK IN PROGRESS CAN BE SECURED AND PROTECTED, SO THAT SAFE JOB SITE WORKING CONDITIONS ARE MAINTAINED, AND SO THAT SOIL EROSION IS MINIMIZED DURING AND FOLLOWING A RAIN EVENT.
4. ROUGE RIVER/ TAMARACK CREEK HAS A VERY SHORT RESPONSE TIME TO STORM RUNOFF.
5. THE CONTRACTOR ACKNOWLEDGES THAT DELAYS IN THE START OF OR COMPLETION OF WORK DUE TO TYPICAL SEASONAL RAINFALL AND DUE TO TYPICAL PERIODIC HIGH FLOWS IN THE ROUGE RIVER SHALL NOT CONSTITUTE A BASIS FOR ANY EXTENSION OF TIME OR DAMAGES. IF THE CONTRACTOR SHALL BE UNAVOIDABLY DELAYED IN BEGINNING OR FULFILLING THIS CONTRACT BY REASONS OF EXCESSIVE STORM OR FLOODS THE CONTRACTOR SHALL HAVE NO VALID CLAIM FOR DAMAGES, BUT HE SHALL IN SUCH CASE BE ENTITLED TO AN EXTENSION OF TIME AS THE ENGINEER SHALL ADJUDGE TO BE JUST AND REASONABLE; PROVIDED THAT FORMAL CLAIM FOR AN EXTENSION OF TIME IS MADE IN WRITING BY THE CONTRACTOR WITHIN ONE WEEK OF THE ALLEGED DELAY.

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ROUGE RIVER AOC HABITAT PROJECT: TAMARACK CREEK - STREAM AND WETLAND RESTORATION PROJECT

SOUTHFIELD, MICHIGAN

FOR BIDDING	01-2021
EGLE/USACE JOINT PERMIT APP.	06-2020

180611-0300
ECT PROJECT NUMBER

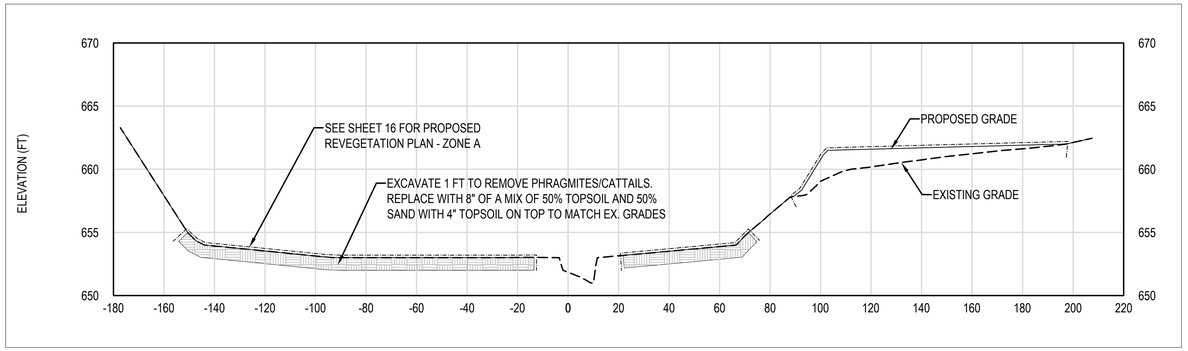
AB — DESIGNED BY
MB — CHECKED BY
AT — DRAWN BY
JO — APPROVED BY

PROPOSED REVEGETATION DETAILS

SCALE: AS SHOWN @ 22" x 34"

NORTH

SHEET NUMBER **21**



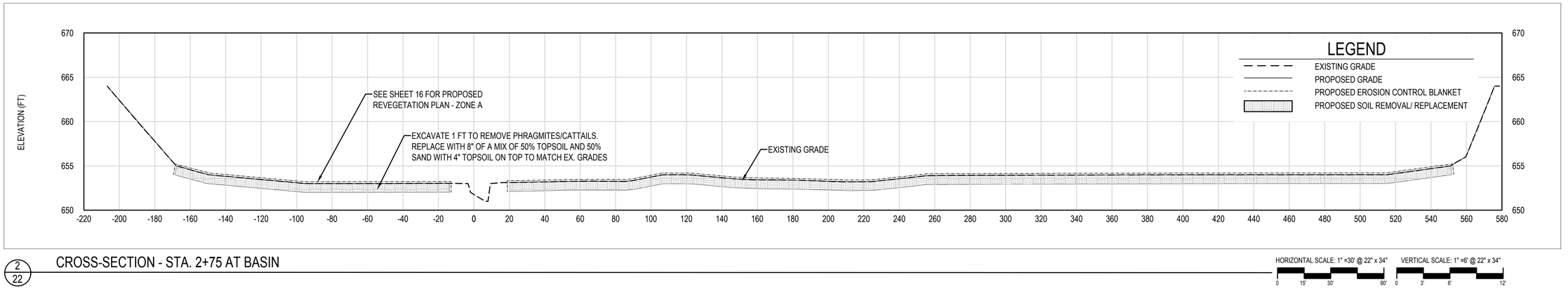
LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED SOIL REMOVAL/ REPLACEMENT

1/22 CROSS-SECTION - STA. 2+60 AT BASIN

HORIZONTAL SCALE: 1" =30' @ 22" x 34" (0, 15', 30', 60')

VERTICAL SCALE: 1" =6' @ 22" x 34" (0, 3', 6', 12')



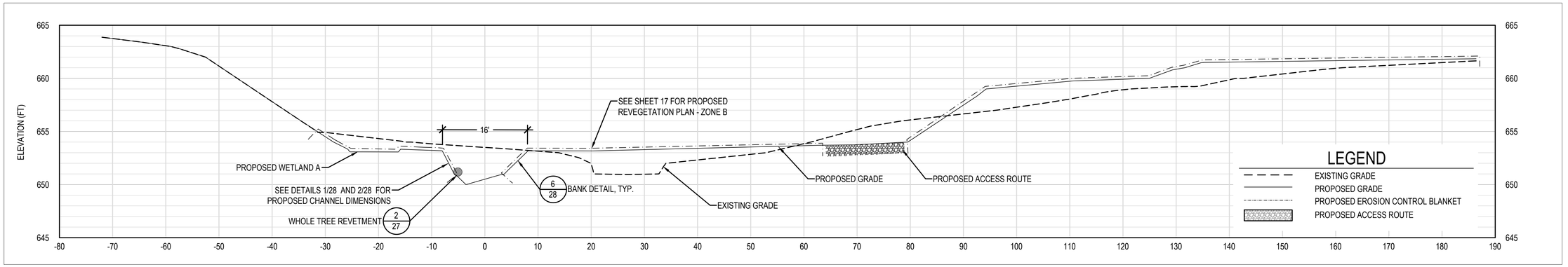
LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED SOIL REMOVAL/ REPLACEMENT

2/22 CROSS-SECTION - STA. 2+75 AT BASIN

HORIZONTAL SCALE: 1" =30' @ 22" x 34" (0, 15', 30', 60')

VERTICAL SCALE: 1" =6' @ 22" x 34" (0, 3', 6', 12')



LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED ACCESS ROUTE

3/22 CROSS-SECTION - STA. 5+01

HORIZONTAL SCALE: 1" = 10' @ 22" x 34" (0, 5', 10', 20')

VERTICAL SCALE: 1" =5' @ 22" x 34" (0, 2.5', 5', 10')

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SOUTHFIELD, MICHIGAN

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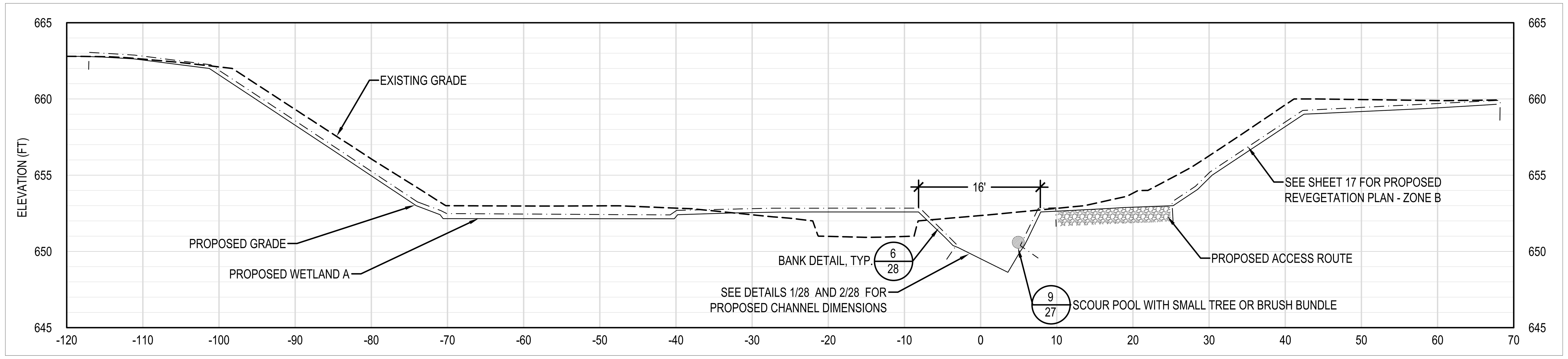
CROSS-SECTIONS (1/3)

SCALE AS SHOWN

NORTH

SHEET NUMBER 22

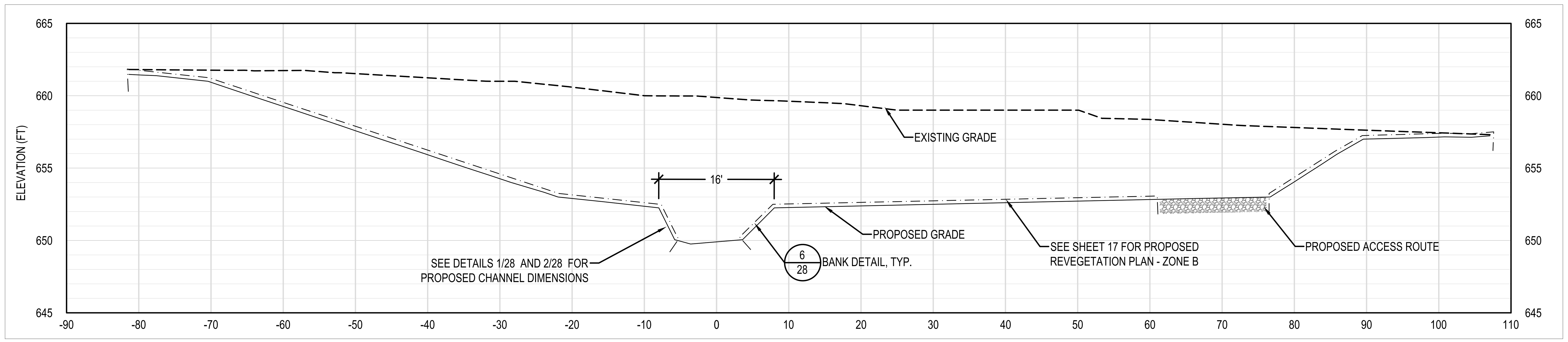


LEGEND

EXISTING GRADE
PROPOSED GRADE
PROPOSED EROSION CONTROL BLANKET
PROPOSED ACCESS ROUTE

1/23 CROSS-SECTION - STA. 7+30

HORIZONTAL SCALE: 1" = 10' @ 22" x 34" VERTICAL SCALE: 1" =5' @ 22" x 34"

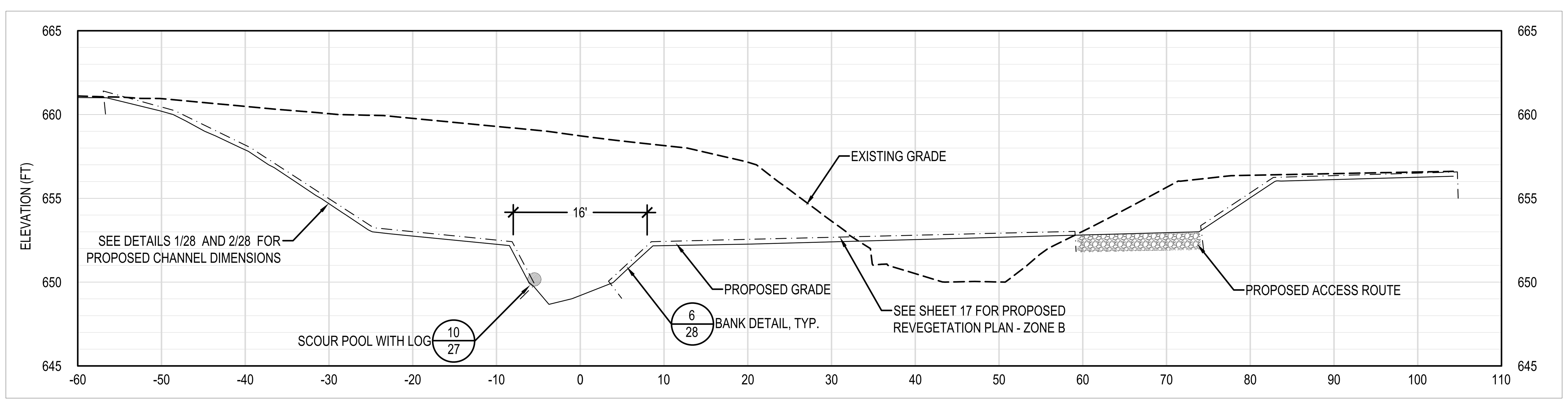


LEGEND

EXISTING GRADE
PROPOSED GRADE
PROPOSED EROSION CONTROL BLANKET
PROPOSED ACCESS ROUTE

2/23 CROSS-SECTION - STA. 8+59

HORIZONTAL SCALE: 1" = 10' @ 22" x 34" VERTICAL SCALE: 1" =5' @ 22" x 34"



LEGEND

EXISTING GRADE
PROPOSED GRADE
PROPOSED EROSION CONTROL BLANKET
PROPOSED ACCESS ROUTE

3/23 CROSS-SECTION - STA. 8+89

HORIZONTAL SCALE: 1" = 10' @ 22" x 34" VERTICAL SCALE: 1" =5' @ 22" x 34"

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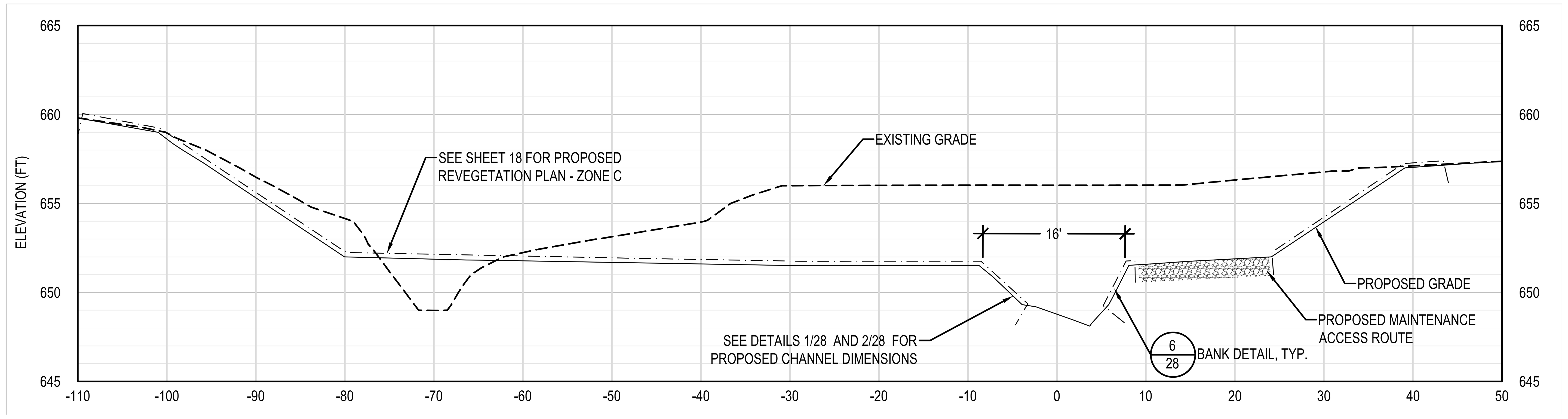
CROSS-SECTIONS (2/3)

SCALE AS SHOWN

NORTH

SHEET NUMBER
23

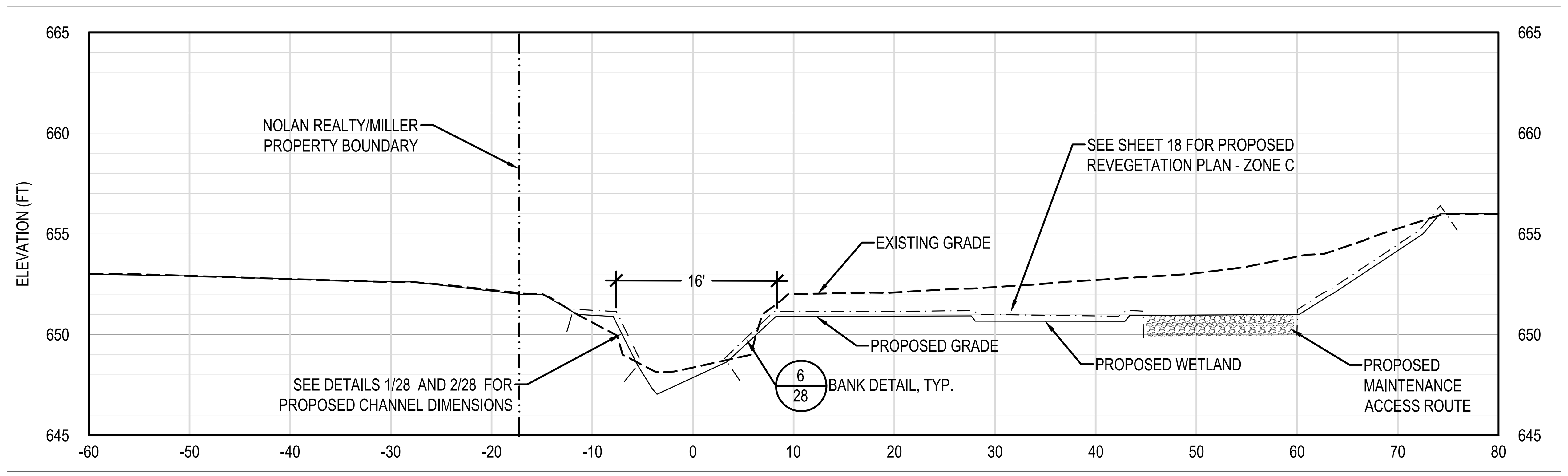


LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED ACCESS ROUTE

1/24 CROSS-SECTION - STA. 11+39

HORIZONTAL SCALE: 1" = 10' @ 22" x 34" VERTICAL SCALE: 1" =5' @ 22" x 34"

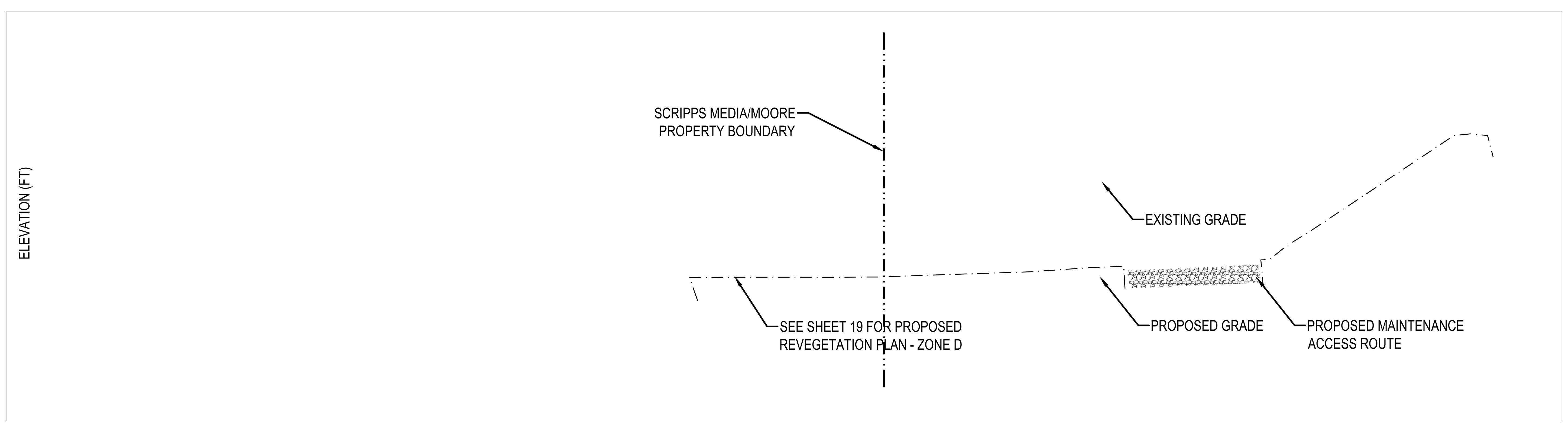


LEGEND

- EXISTING GRADE
- PROPERTY BOUNDARY
- PROPOSED GRADE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED ACCESS ROUTE

2/24 CROSS-SECTION - STA. 13+79

HORIZONTAL SCALE: 1" = 10' @ 22" x 34" VERTICAL SCALE: 1" =5' @ 22" x 34"



LEGEND

- EXISTING GRADE
- PROPERTY BOUNDARY
- PROPOSED GRADE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED ACCESS ROUTE

3/24 CROSS-SECTION - STA. 16+12

HORIZONTAL SCALE: 1" = 10' @ 22" x 34" VERTICAL SCALE: 1" =5' @ 22" x 34"

PROPOSED WETLAND NOTES
1. PROPOSED WETLANDS TO BE AT LOCATIONS SHOWN ON SHEET 10
2. ROUGH GRADES OF PROPOSED WETLANDS TO BE 6" BELOW ADJACENT GRADES, +/- 3 INCHES

ECT Environmental Consulting & Technology, Inc.
2200 Commonwealth Blvd, Suite 300
Ann Arbor, Michigan 48105
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ROUGE RIVER AOC HABITAT PROJECT: TAMARACK CREEK - STREAM AND WETLAND RESTORATION PROJECT

SOUTHFIELD, MICHIGAN

FOR BIDDING	01-2021
EGLE/USACE JOINT PERMIT APP.	06-2020

180611-0300
ECT PROJECT NUMBER

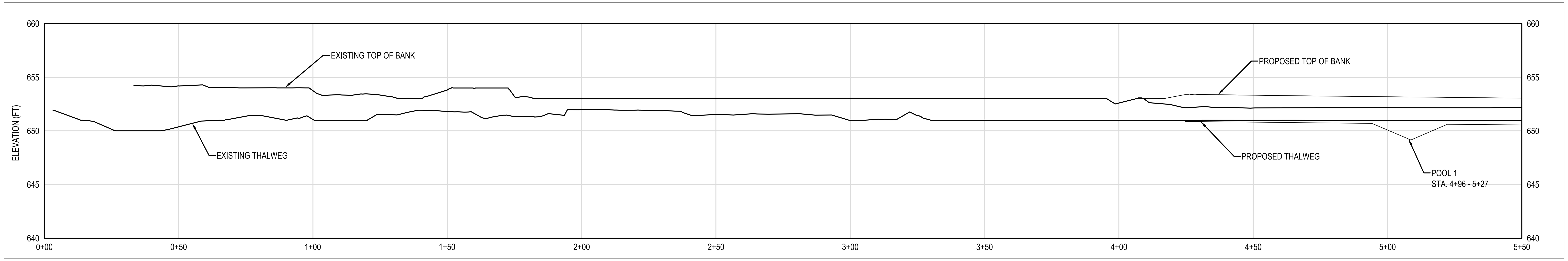
AB	MB
DESIGNED BY	CHECKED BY
AB/ AK	JO
DRAWN BY	APPROVED BY

CROSS-SECTIONS (3/3)

SCALE AS SHOWN

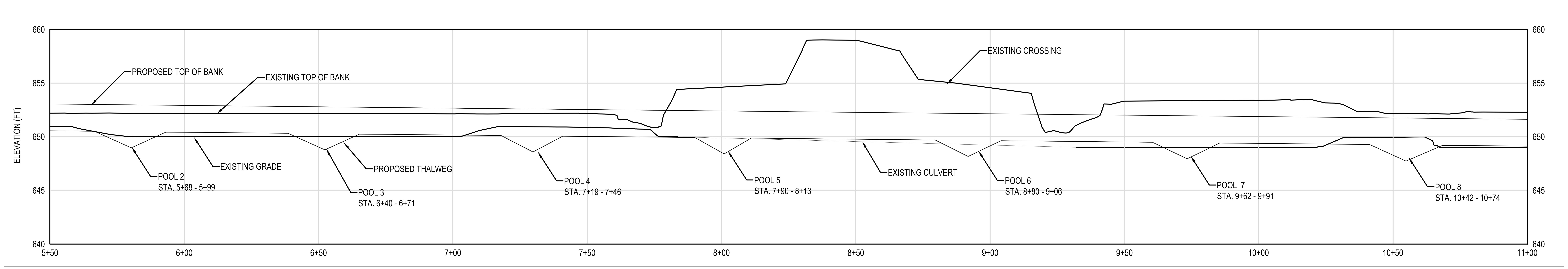
NORTH

SHEET NUMBER
24



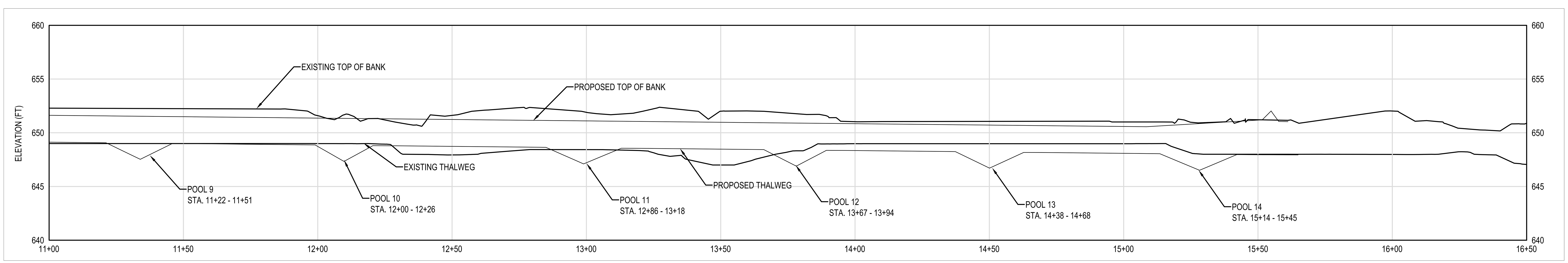
1/25 PROPOSED STREAM PROFILE - STA. 0+00 TO 5+50

HORIZONTAL SCALE: 1" = 20' @ 22" x 34" VERTICAL SCALE: 1" = 5' @ 22" x 34"



2/25 PROPOSED STREAM PROFILE - STA. 5+50 TO 11+00

HORIZONTAL SCALE: 1" = 20' @ 22" x 34" VERTICAL SCALE: 1" = 5' @ 22" x 34"



3/25 PROPOSED STREAM PROFILE - STA. 11+00 TO 16+50

HORIZONTAL SCALE: 1" = 20' @ 22" x 34" VERTICAL SCALE: 1" = 5' @ 22" x 34"

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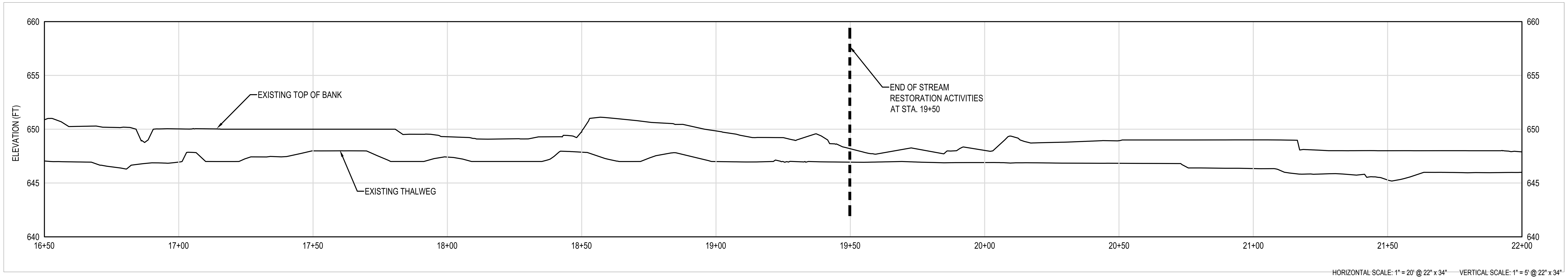
STREAM PROFILE (1/2)

SCALE AS SHOWN

NORTH

SHEET NUMBER
25



1/26 PROPOSED STREAM PROFILE - STA. 16+50 TO 22+00

HORIZONTAL SCALE: 1" = 20' @ 22" x 34"

VERTICAL SCALE: 1" = 5' @ 22" x 34"

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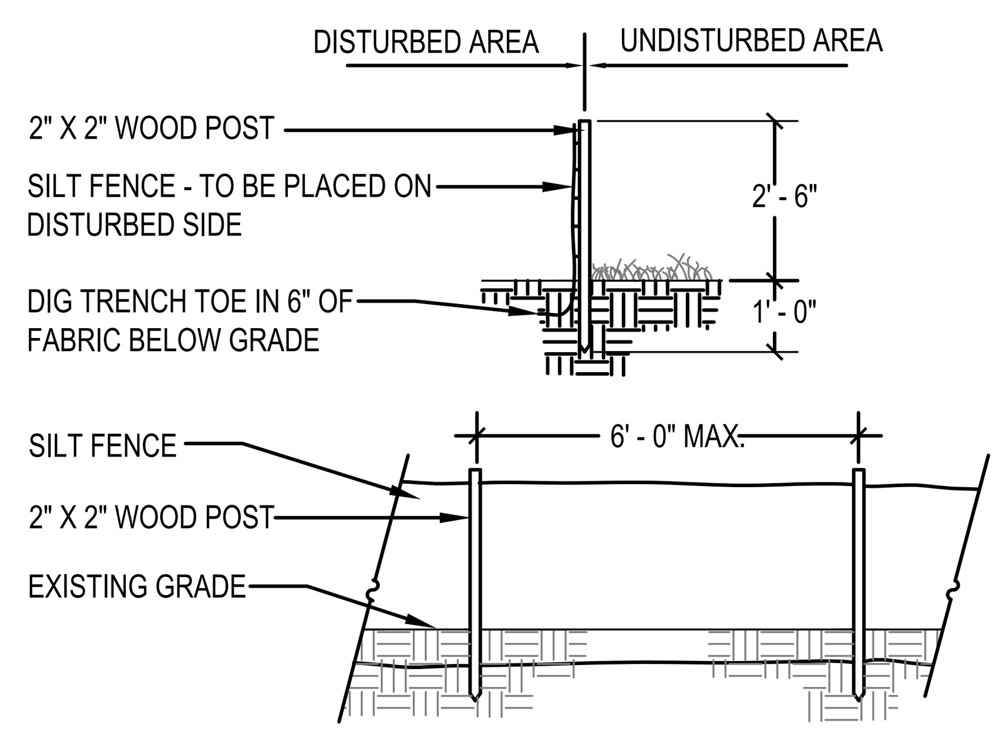
STREAM PROFILE (2/2)

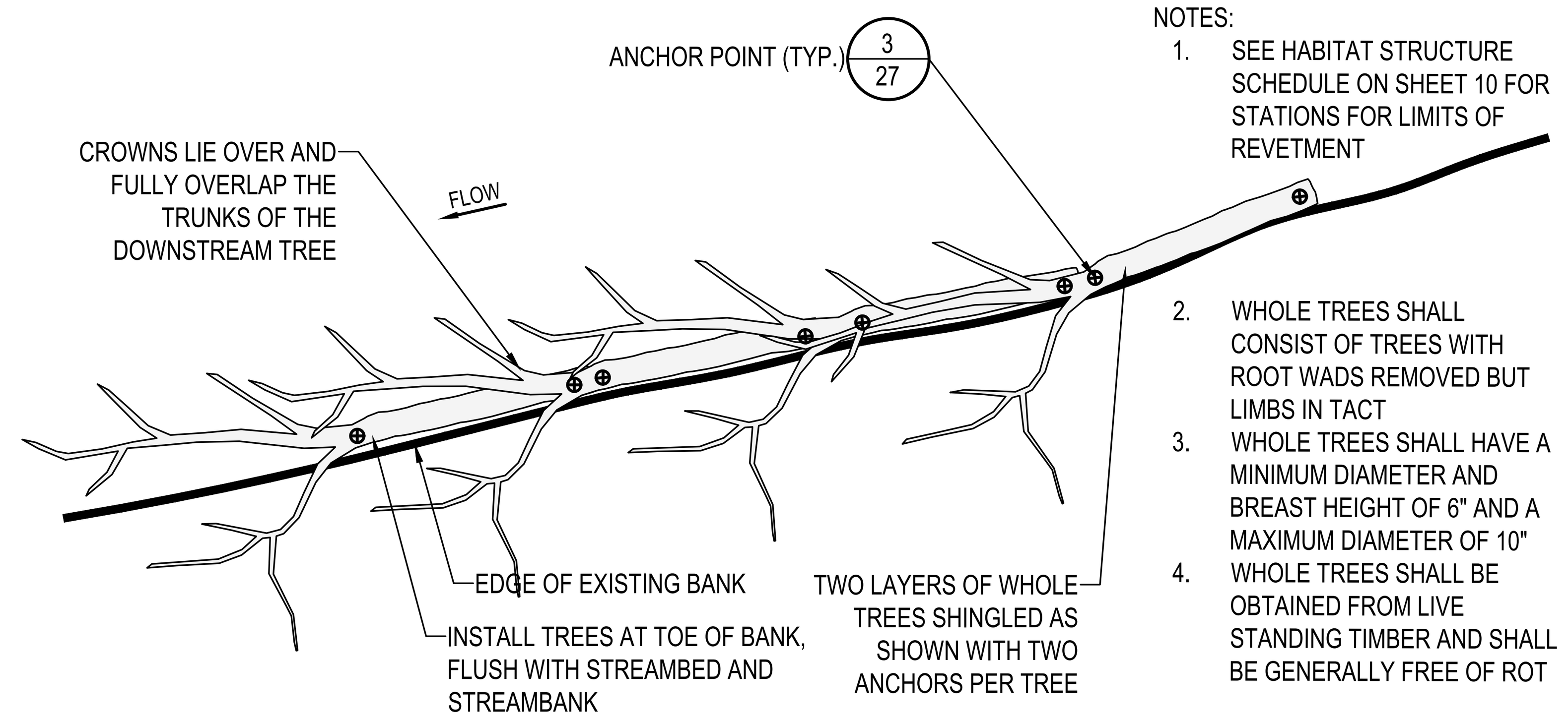
SCALE AS SHOWN

NORTH

SHEET NUMBER
26

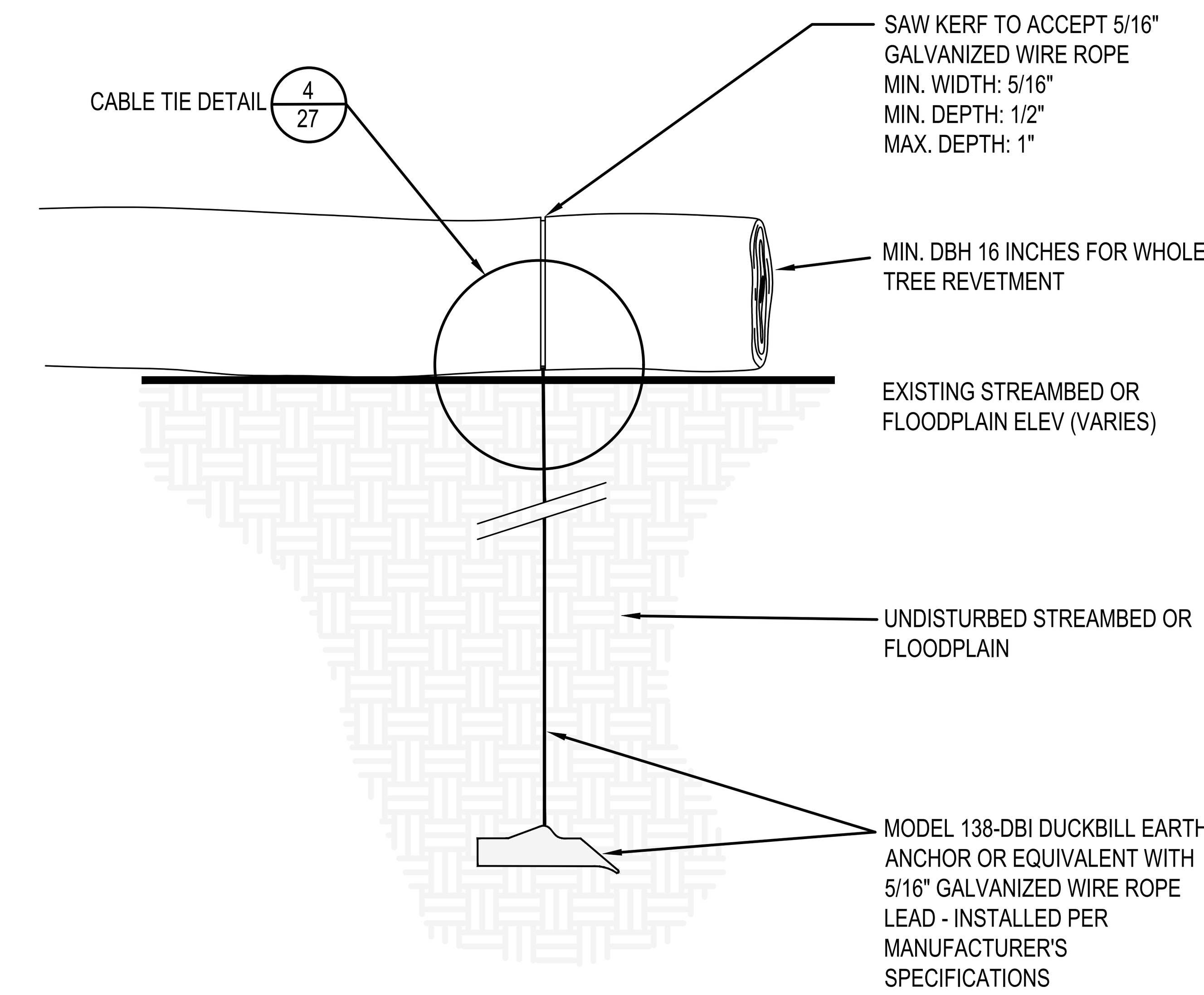


1/27 SILT FENCE
NOT TO SCALE

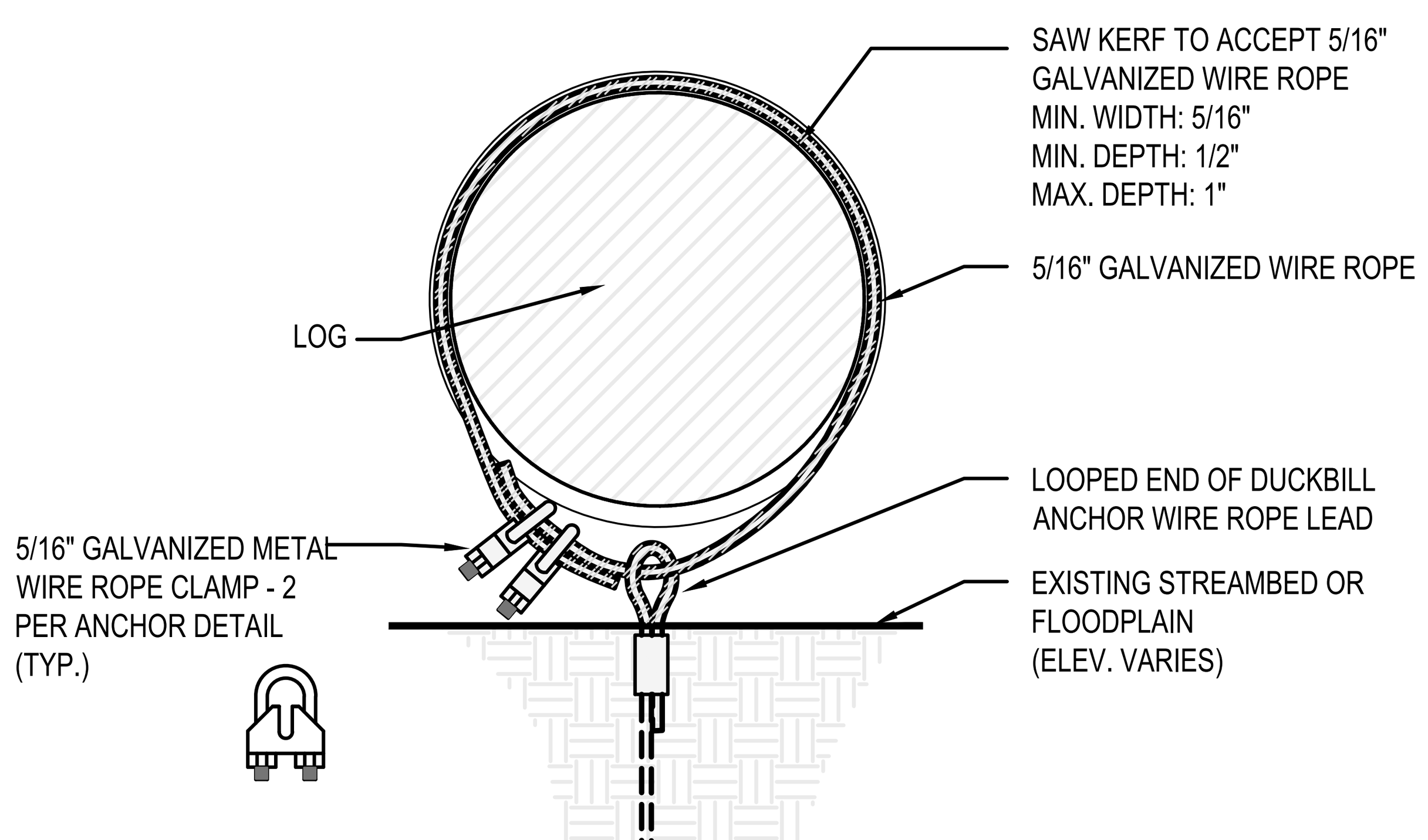


NOTES:
1. SEE HABITAT STRUCTURE SCHEDULE ON SHEET 10 FOR STATIONS FOR LIMITS OF REVETMENT
2. WHOLE TREES SHALL CONSIST OF TREES WITH ROOT WADS REMOVED BUT LIMBS IN TACT
3. WHOLE TREES SHALL HAVE A MINIMUM DIAMETER AND BREAST HEIGHT OF 6" AND A MAXIMUM DIAMETER OF 10"
4. WHOLE TREES SHALL BE OBTAINED FROM LIVE STANDING TIMBER AND SHALL BE GENERALLY FREE OF ROT

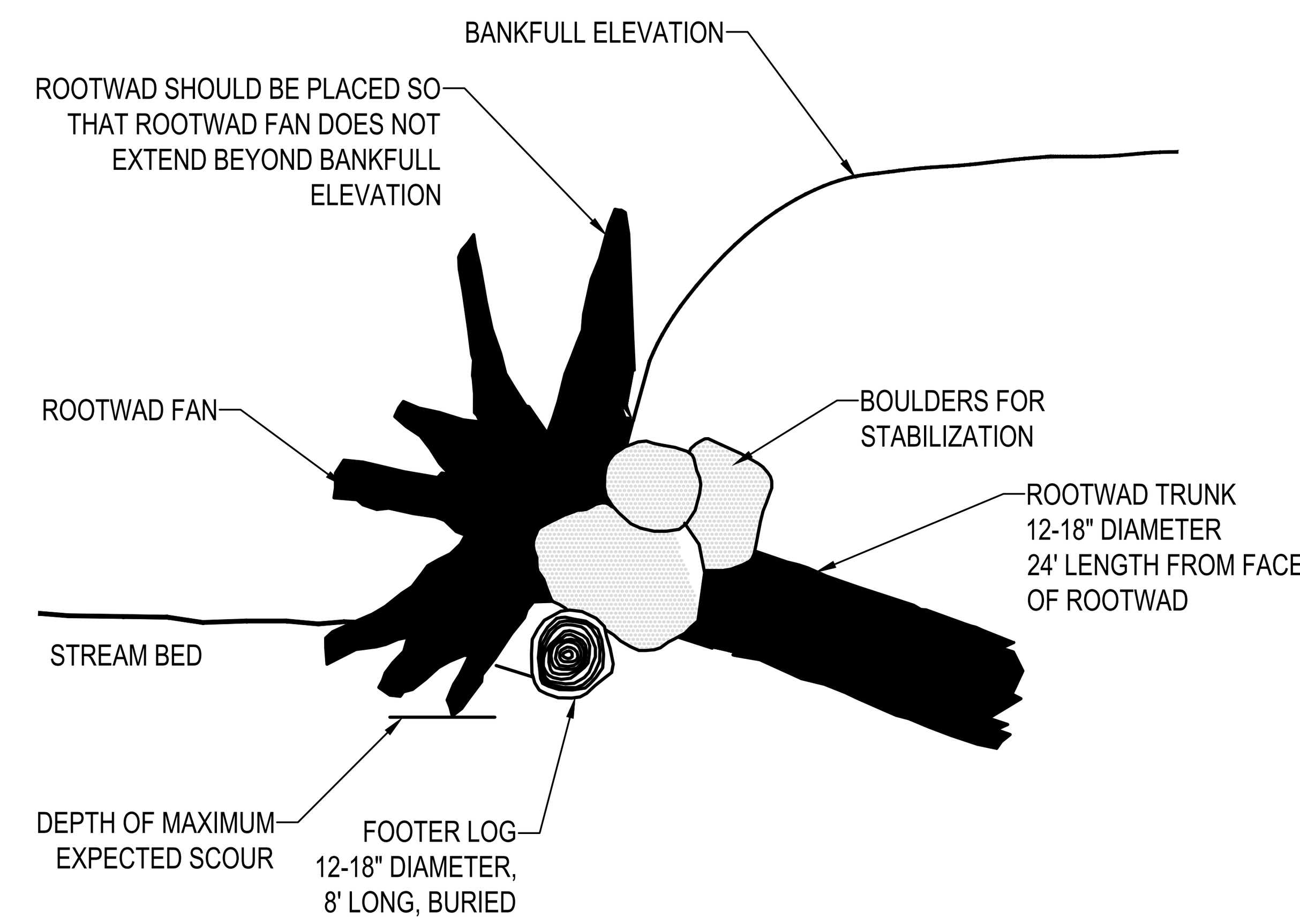
2/27 WHOLE TREE REVETMENT PLAN VIEW (TYP.)
NOT TO SCALE



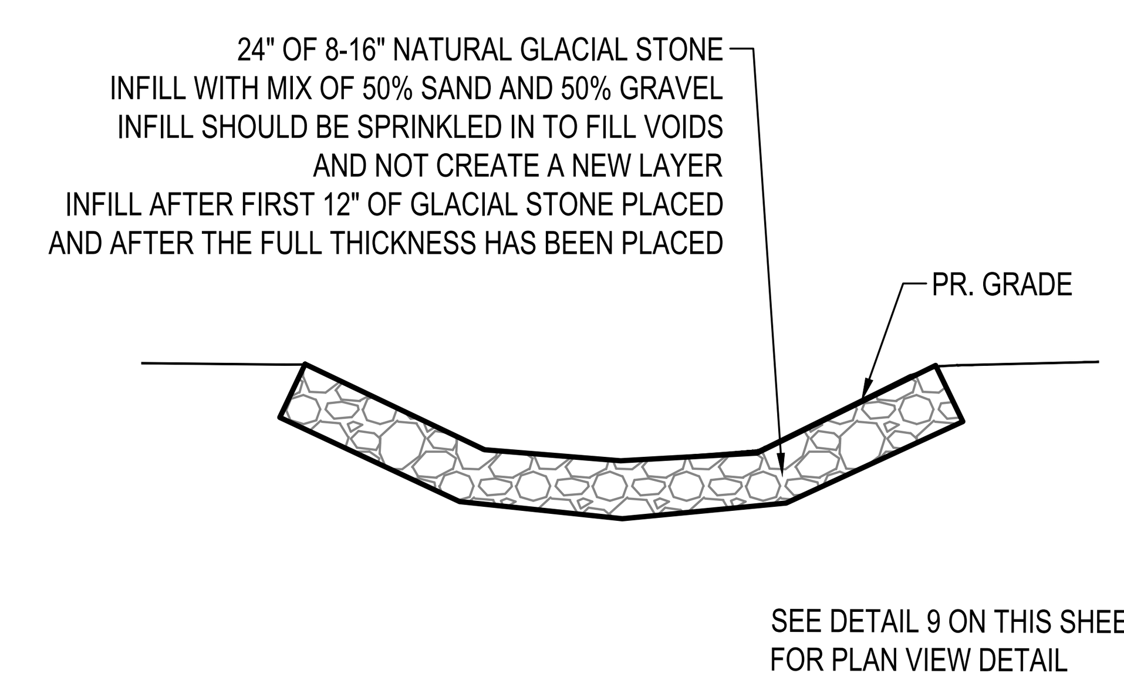
3/27 ANCHOR POINT DETAIL (TYP.)
NOT TO SCALE



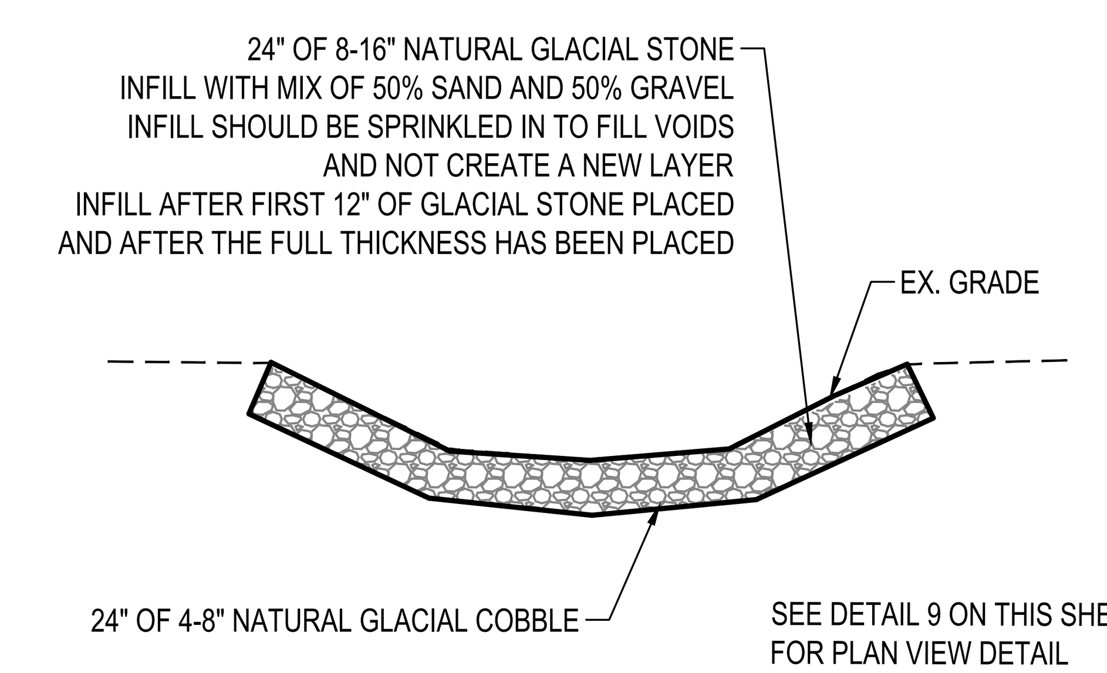
4/27 CABLE TIE DETAIL - WHOLE TREE REVETMENT
NOT TO SCALE



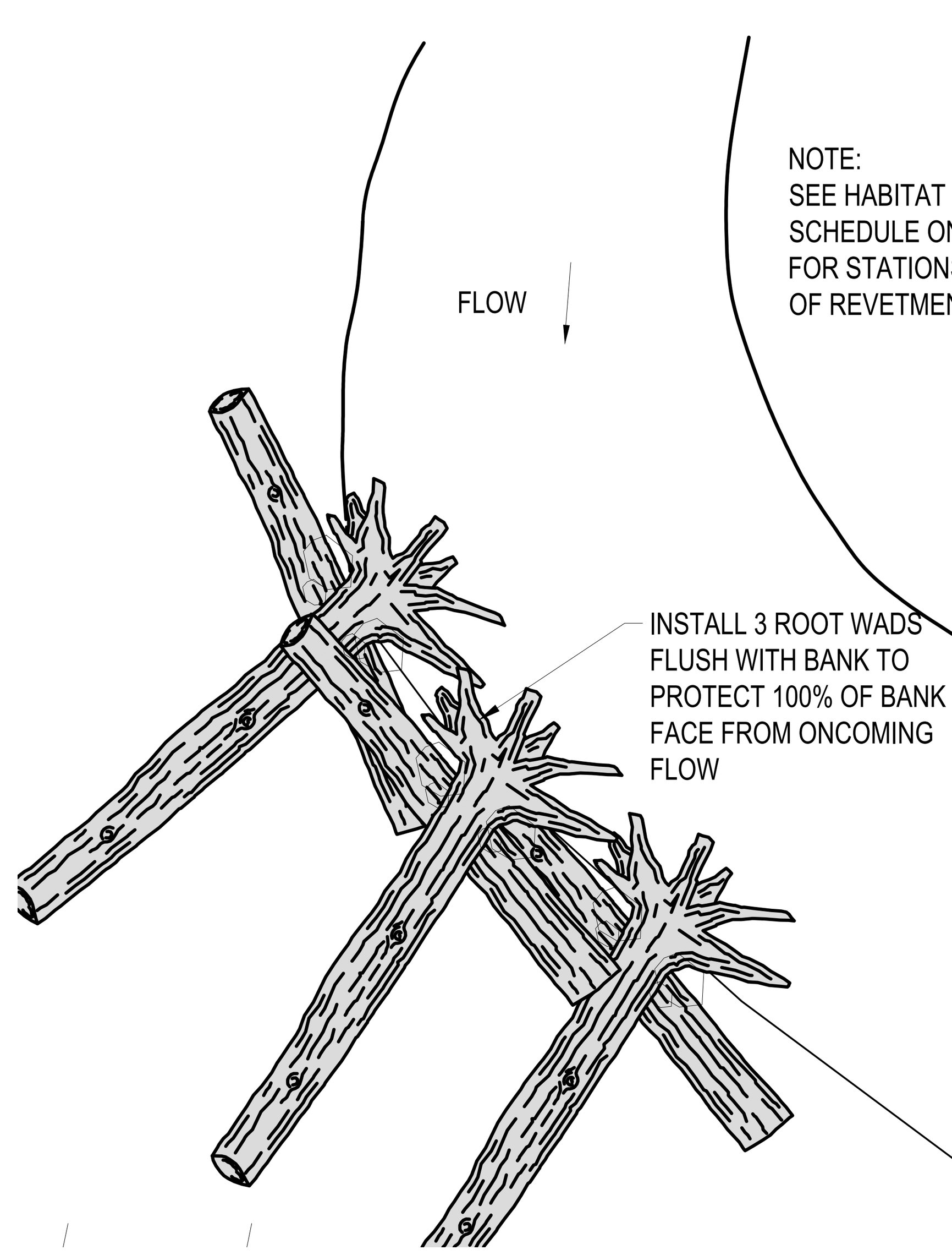
5/27 ROOTWAD REVETMENT CROSS-SECTION (TYP.)
NOT TO SCALE



6/27 AT-GRADE RIFFLE (STA. 15+40)
NOT TO SCALE

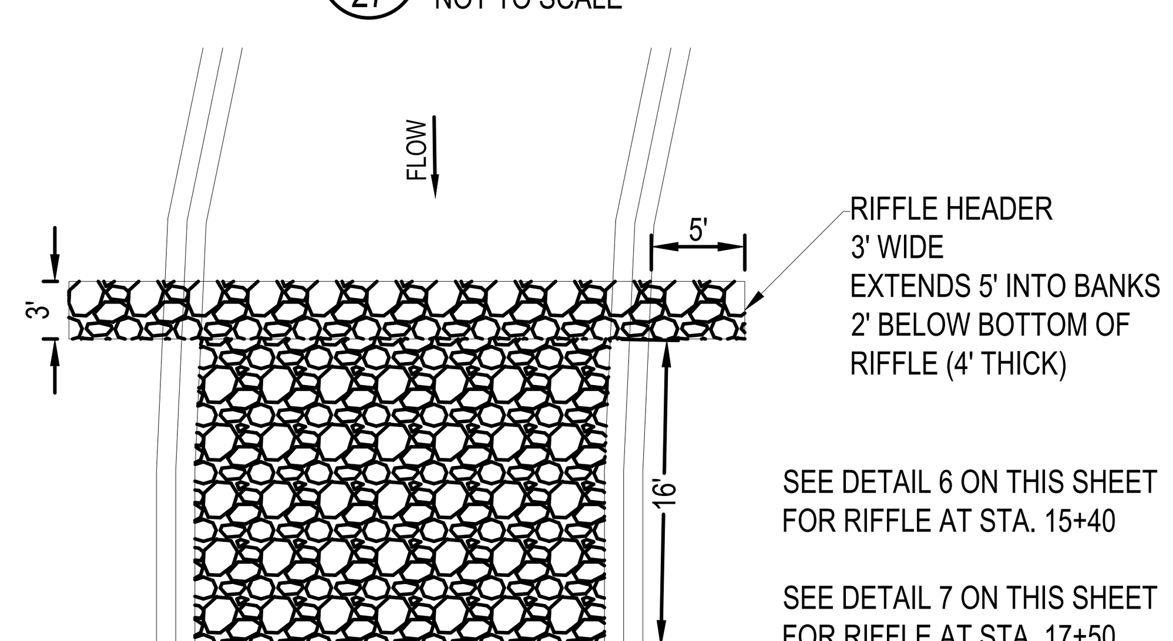


7/27 AT-GRADE RIFFLE (STA. 17+50)
NOT TO SCALE

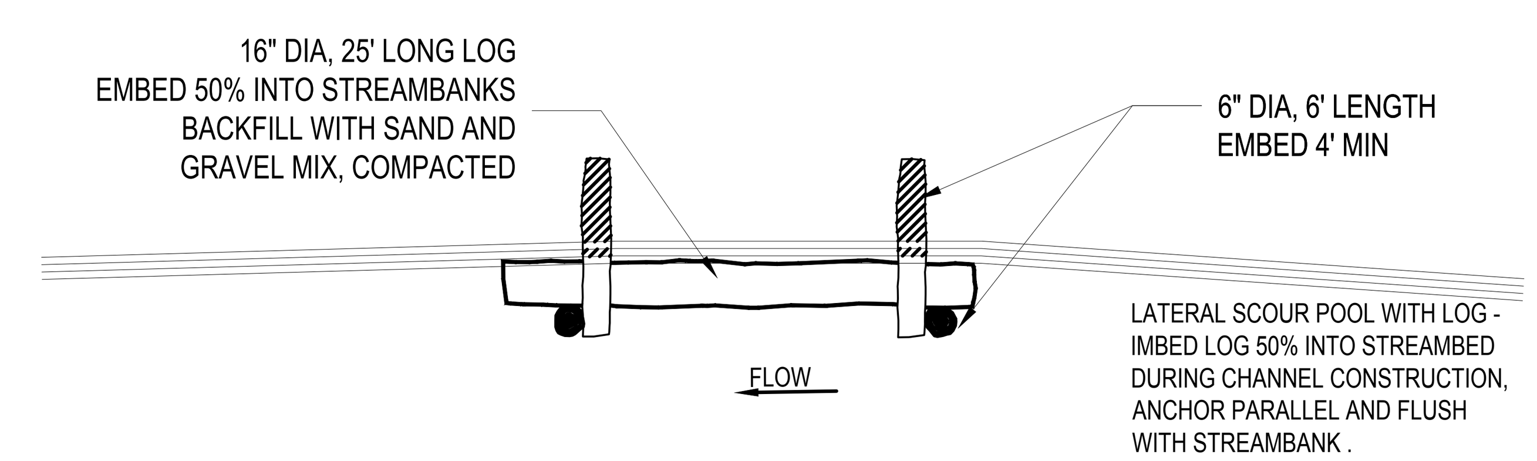


NOTE:
SEE HABITAT STRUCTURE SCHEDULE ON SHEET 10 FOR STATIONS FOR LIMITS OF REVETMENT

8/27 ROOTWAD REVETMENT PLAN VIEW (TYP.)
NOT TO SCALE



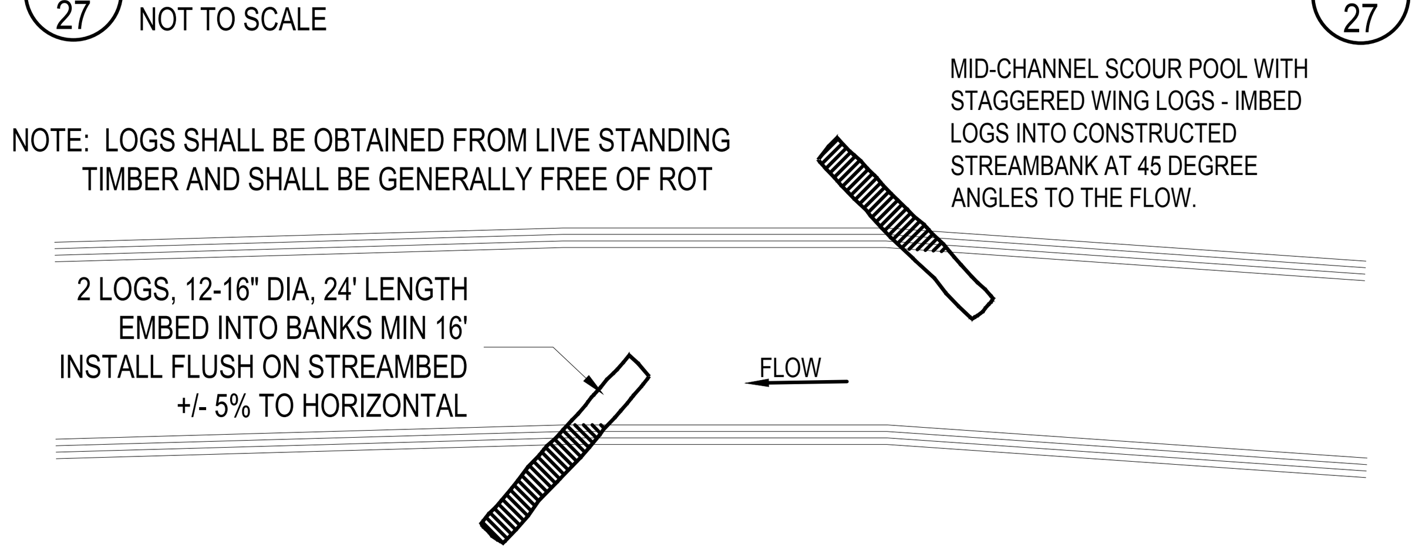
9/27 AT GRADE RIFFLE PLAN VIEW
NOT TO SCALE



NOTE: LOGS SHALL BE OBTAINED FROM LIVE STANDING TIMBER AND SHALL BE GENERALLY FREE OF ROT

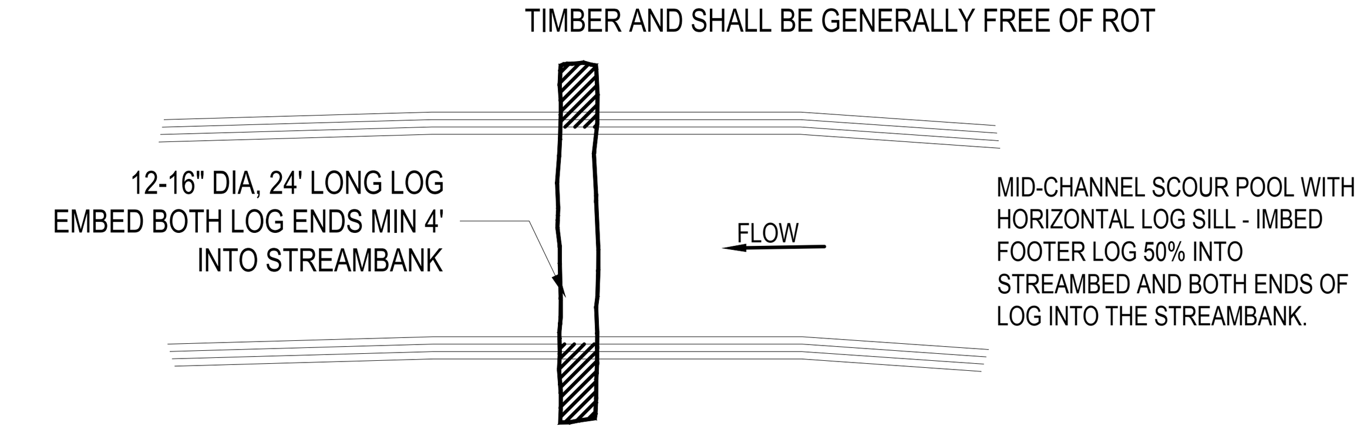
10/27 SCOUR POOL LOG
NOT TO SCALE

NOTE: LOGS SHALL BE OBTAINED FROM LIVE STANDING TIMBER AND SHALL BE GENERALLY FREE OF ROT

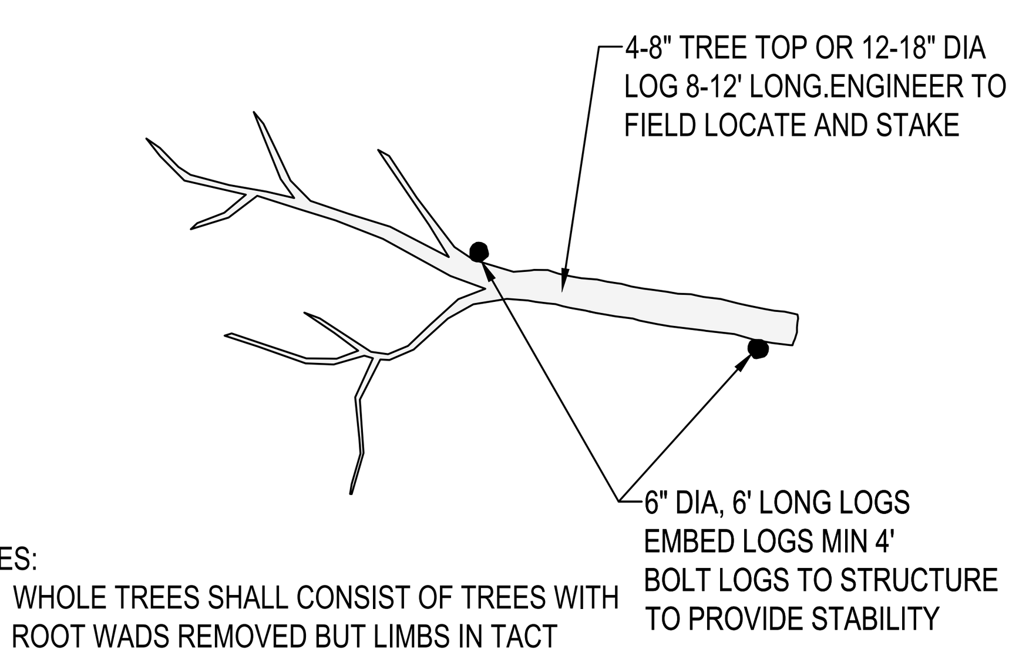


11/27 STAGGERED WING LOGS
NOT TO SCALE

NOTE: LOGS SHALL BE OBTAINED FROM LIVE STANDING TIMBER AND SHALL BE GENERALLY FREE OF ROT



12/27 HORIZONTAL LOG SILL
NOT TO SCALE



NOTES:
1. WHOLE TREES SHALL CONSIST OF TREES WITH ROOT WADS REMOVED BUT LIMBS IN TACT
2. WHOLE TREES AND LOGS SHALL BE OBTAINED FROM LIVE STANDING TIMBER AND SHALL BE GENERALLY FREE OF ROT
3. VARY ORIENTATION OF STRUCTURES FROM 0 TO 90 DEGREES W.R.T. THE DIRECTION OF FLOW

13/27 WOODY HABITAT
NOT TO SCALE

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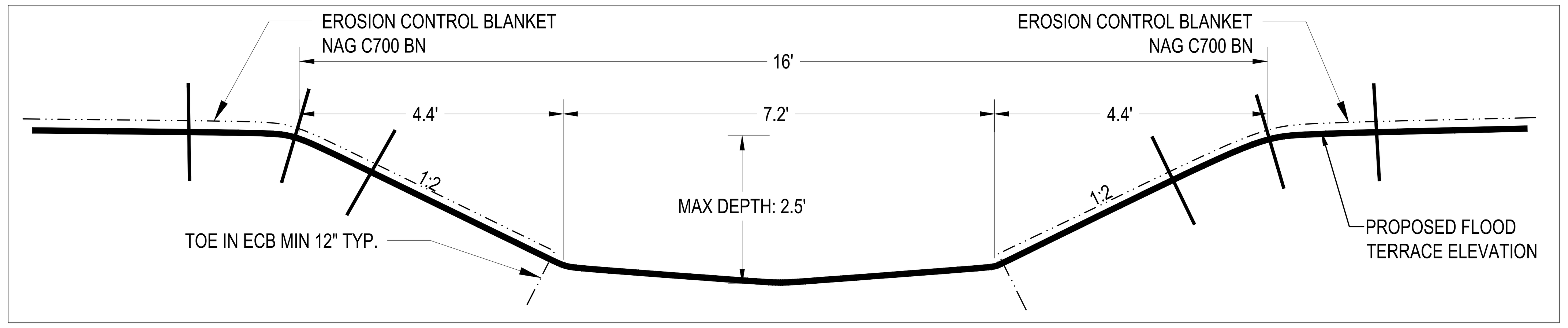
DETAILS (1/2)

SCALE AS SHOWN

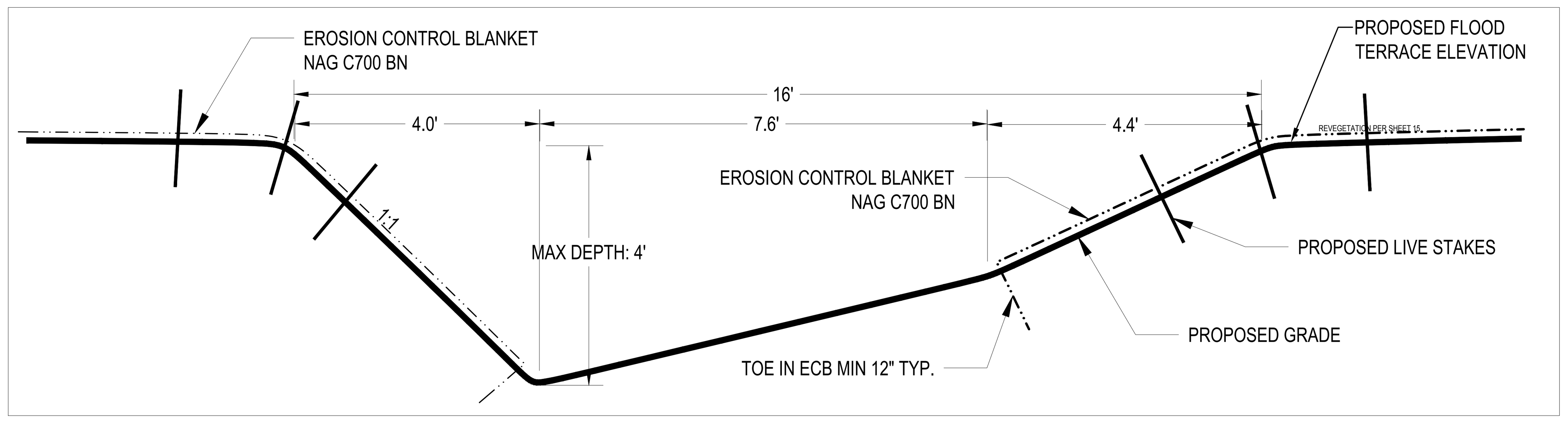
NORTH

SHEET NUMBER
27



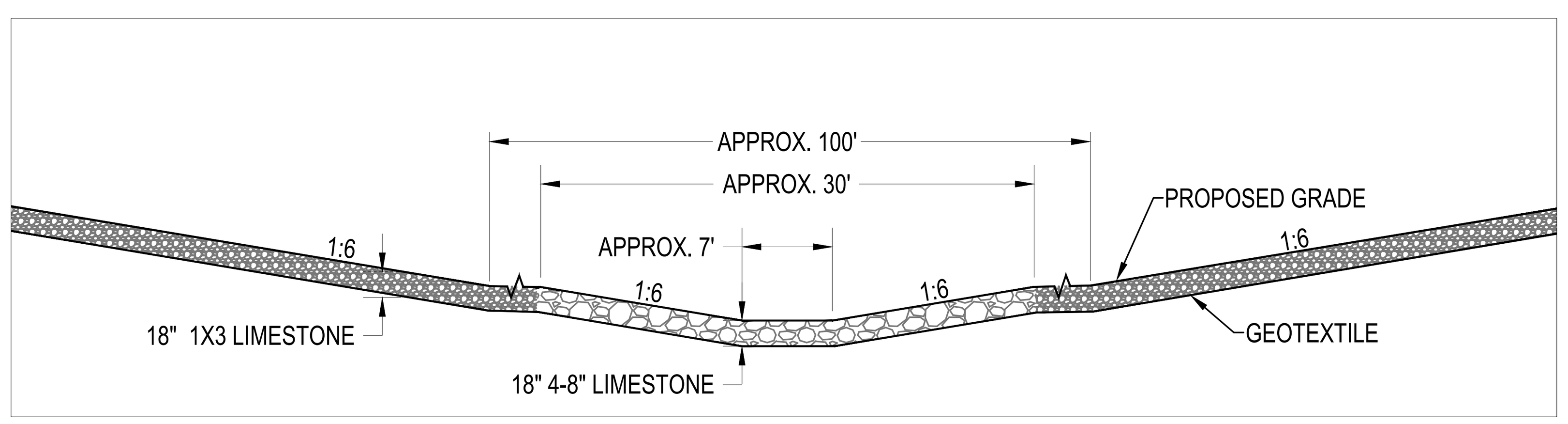
1/28 TYP. CHANNEL CROSS-SECTION

SCALE: 1" = 2' @ 22" x 34"



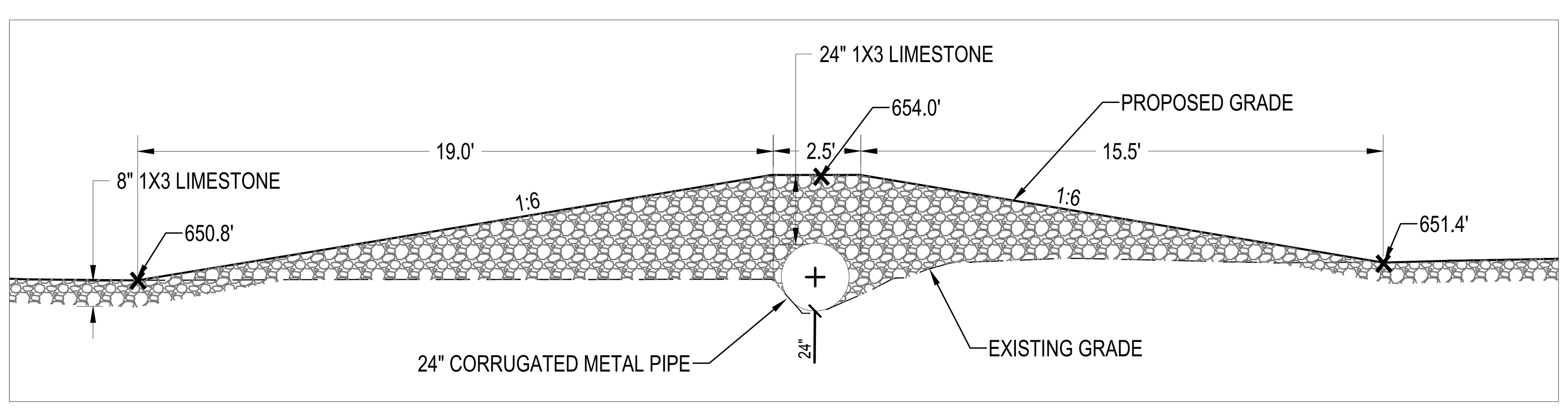
2/28 TYP. POOL CROSS-SECTION

SCALE: 1" = 2' @ 22" x 34"



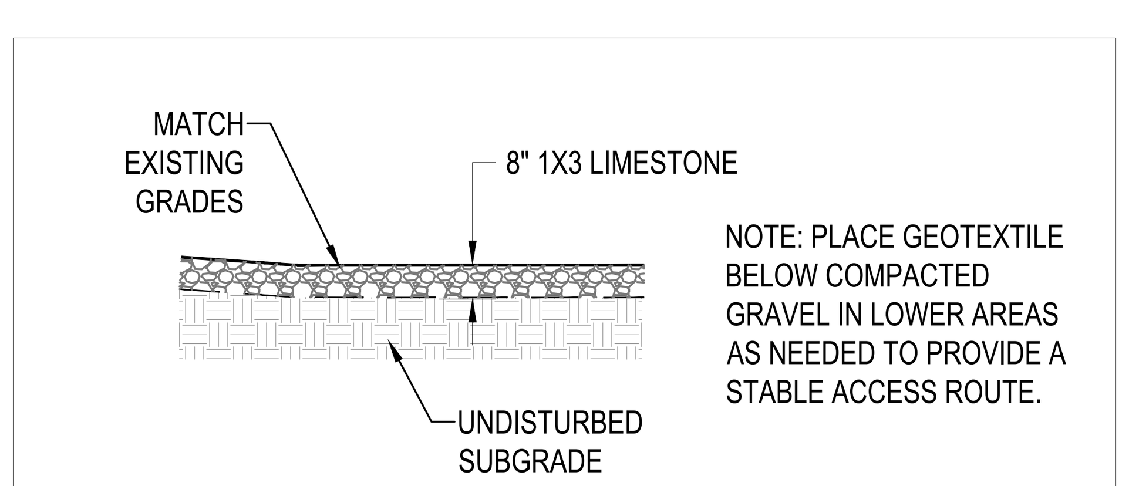
3/28 TEMPORARY AT-GRADE STREAM CROSSING

NOT TO SCALE



4/28 TRIBUTARY CULVERTS FOR ACCESS ROUTE - CROSS-SECTION

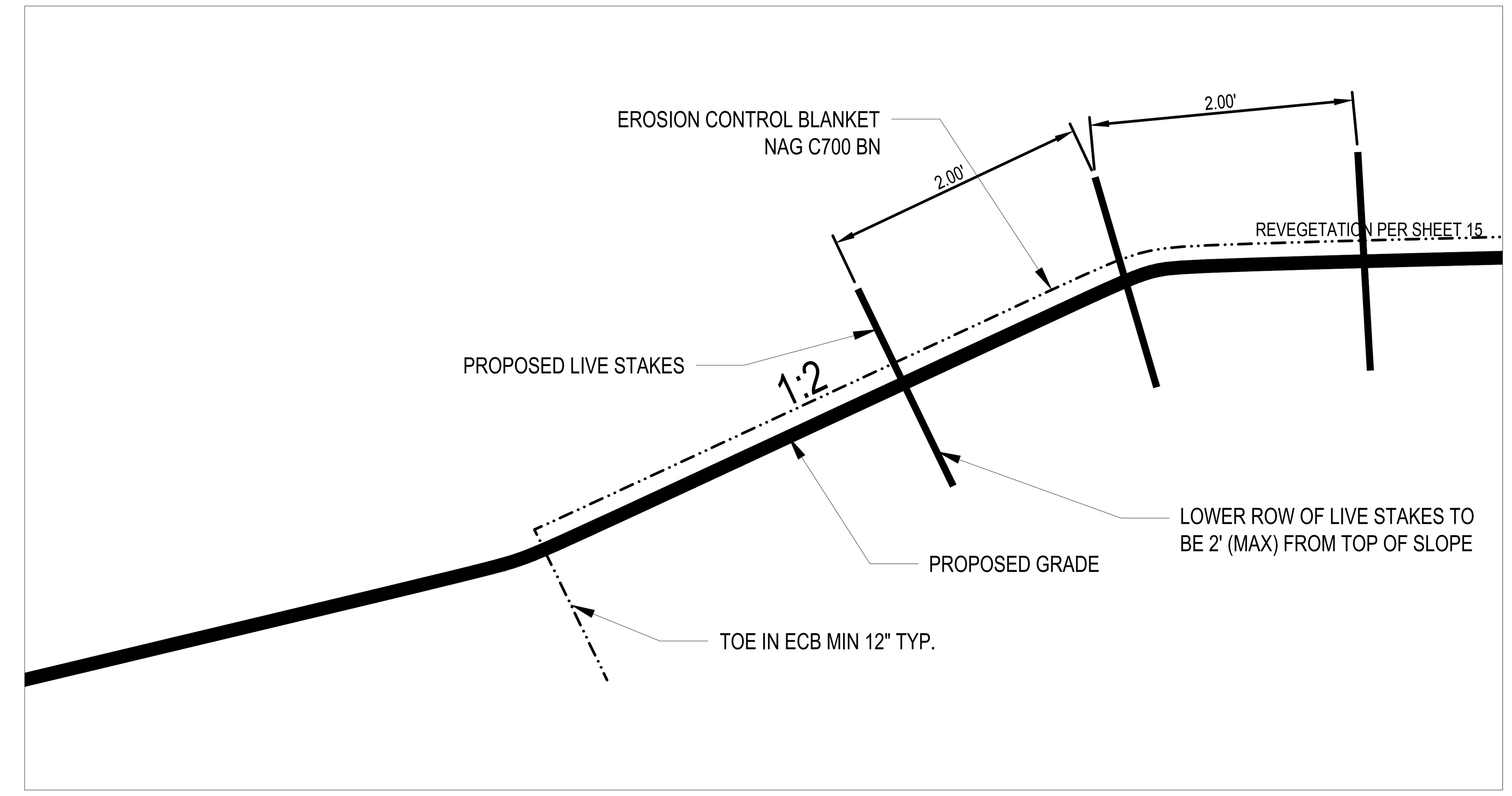
SCALE: 1" = 4' @ 22" x 34"



NOTE: PLACE GEOTEXTILE BELOW COMPACTED GRAVEL IN LOWER AREAS AS NEEDED TO PROVIDE A STABLE ACCESS ROUTE.

5/28 ACCESS ROUTE

NOT TO SCALE



6/28 BANK DETAIL

SCALE: 1" = 1' @ 22" x 34"

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DETAILS (2/2)

SCALE AS SHOWN

NORTH

SHEET NUMBER 28