

ROUGE RIVER AOC: JOHNSON CREEK - FISH HATCHERY PARK

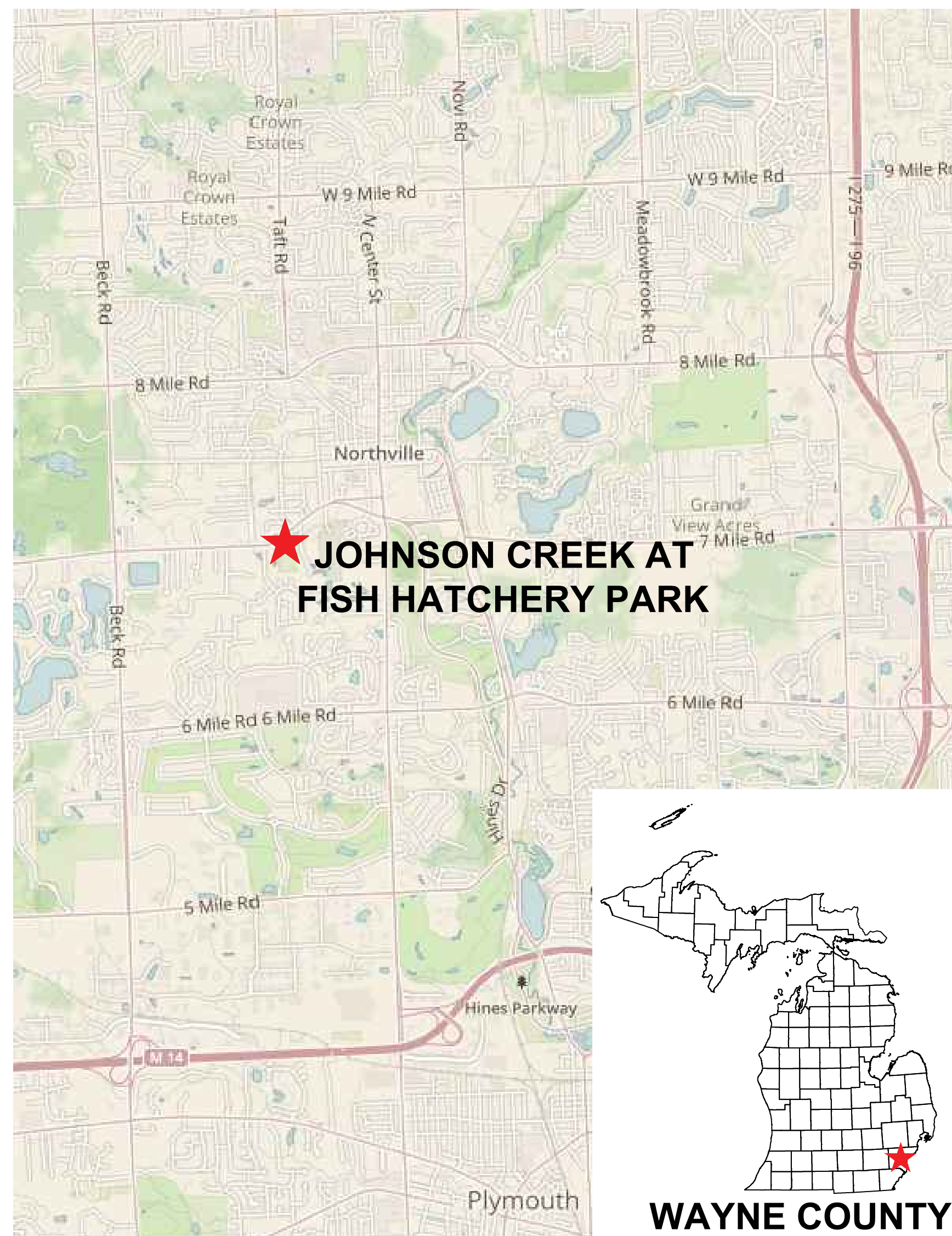
HABITAT RESTORATION PROJECT

WAYNE COUNTY, MICHIGAN

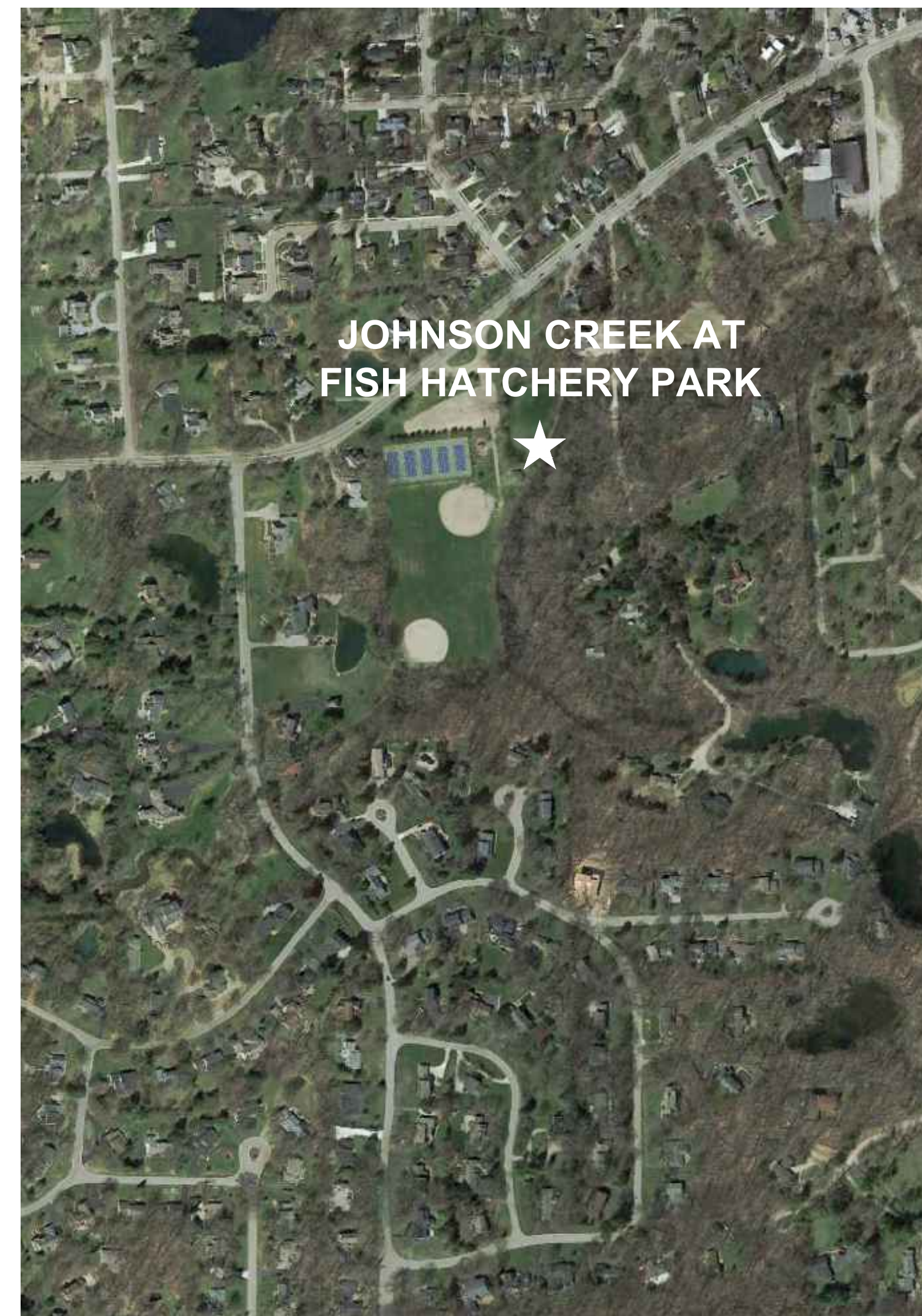
GLRI EPA AWARD NO. GL-00E02344-0 (DESIGN)

GLRI EPA AWARD NO. GL-00E02478-0 (CONSTRUCTION)

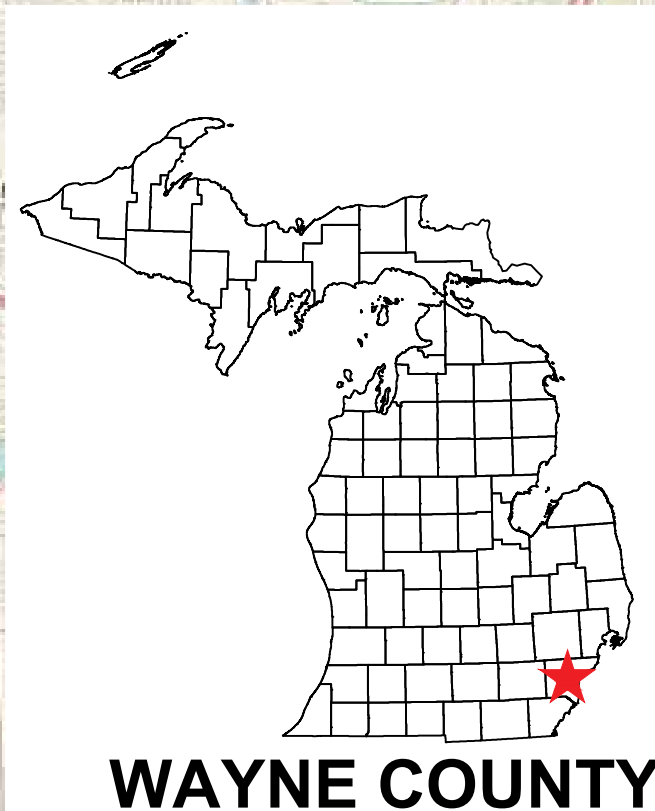
FOR BIDDING - MARCH, 2020



PROJECT LOCATION MAP
NOT TO SCALE



PROJECT VICINITY MAP
NOT TO SCALE



WAYNE COUNTY

DRAWING INDEX

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SUPPLEMENTAL INFORMATION

1. "FIGURE 2 - SITE PLAN", OHM SEDIMENT THICKNESS DATA, 2015, FOR INFORMATIONAL PURPOSES ONLY
2. "AS-BUILTS", SME, 2019, FOR INFORMATIONAL PURPOSES ONLY
3. "NORTHVILLE STATION, MICHIGAN, 1941", HISTORIC PLAN VIEW SKETCH OF FISH HATCHERY PARK

PREPARED BY:
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WITH:



**ROUGE RIVER AOC
 JOHNSON CREEK -
 FISH HATCHERY
 PARK HABITAT
 RESTORATION
 PROJECT**

**ALLIANCE OF ROUGE
 COMMUNITIES**

**NORTHVILLE,
 WAYNE COUNTY,
 MICHIGAN**

FOR BIDDING	3-2020
100% DESIGN DRAWINGS	2-2020
PERMIT APPLICATION	9-2019
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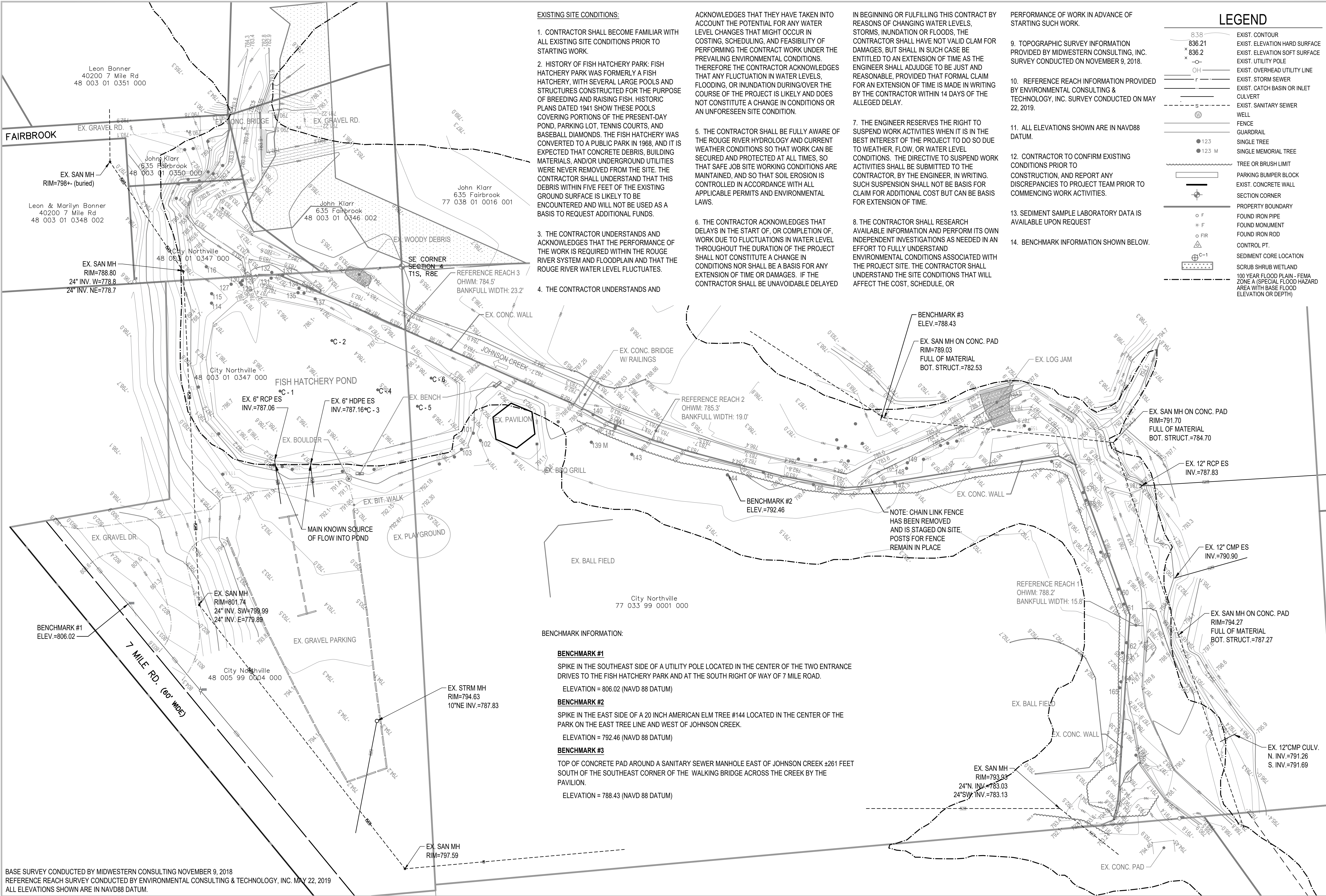
SHEET TITLE

**EXISTING
 CONDITIONS**

SCALE: 1" = 40' @ 22" x 34"

NORTH

SHEET NUMBER
2



EXISTING SITE CONDITIONS:

1. CONTRACTOR SHALL BECOME FAMILIAR WITH ALL EXISTING SITE CONDITIONS PRIOR TO STARTING WORK.
2. HISTORY OF FISH HATCHERY PARK: FISH HATCHERY PARK WAS FORMERLY A FISH HATCHERY, WITH SEVERAL LARGE POOLS AND STRUCTURES CONSTRUCTED FOR THE PURPOSE OF BREEDING AND RAISING FISH. HISTORIC PLANS DATED 1941 SHOW THESE POOLS COVERING PORTIONS OF THE PRESENT-DAY POND, PARKING LOT, TENNIS COURTS, AND BASEBALL DIAMONDS. THE FISH HATCHERY WAS CONVERTED TO A PUBLIC PARK IN 1968, AND IT IS EXPECTED THAT CONCRETE DEBRIS, BUILDING MATERIALS, AND/OR UNDERGROUND UTILITIES WERE NEVER REMOVED FROM THE SITE. THE CONTRACTOR SHALL UNDERSTAND THAT THIS DEBRIS WITHIN FIVE FEET OF THE EXISTING GROUND SURFACE IS LIKELY TO BE ENCOUNTERED AND WILL NOT BE USED AS A BASIS TO REQUEST ADDITIONAL FUNDS.
3. 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.
4. THE CONTRACTOR UNDERSTANDS AND

5. 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.
6. 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

7. 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.
8. 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.
9. TOPOGRAPHIC SURVEY INFORMATION PROVIDED BY MIDWESTERN CONSULTING, INC. SURVEY CONDUCTED ON NOVEMBER 9, 2018.
10. REFERENCE REACH INFORMATION PROVIDED BY ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC. SURVEY CONDUCTED ON MAY 22, 2019.
11. ALL ELEVATIONS SHOWN ARE IN NAVD88 DATUM.
12. CONTRACTOR TO CONFIRM EXISTING CONDITIONS PRIOR TO CONSTRUCTION, AND REPORT ANY DISCREPANCIES TO PROJECT TEAM PRIOR TO COMMENCING WORK ACTIVITIES.
13. SEDIMENT SAMPLE LABORATORY DATA IS AVAILABLE UPON REQUEST
14. BENCHMARK INFORMATION SHOWN BELOW.

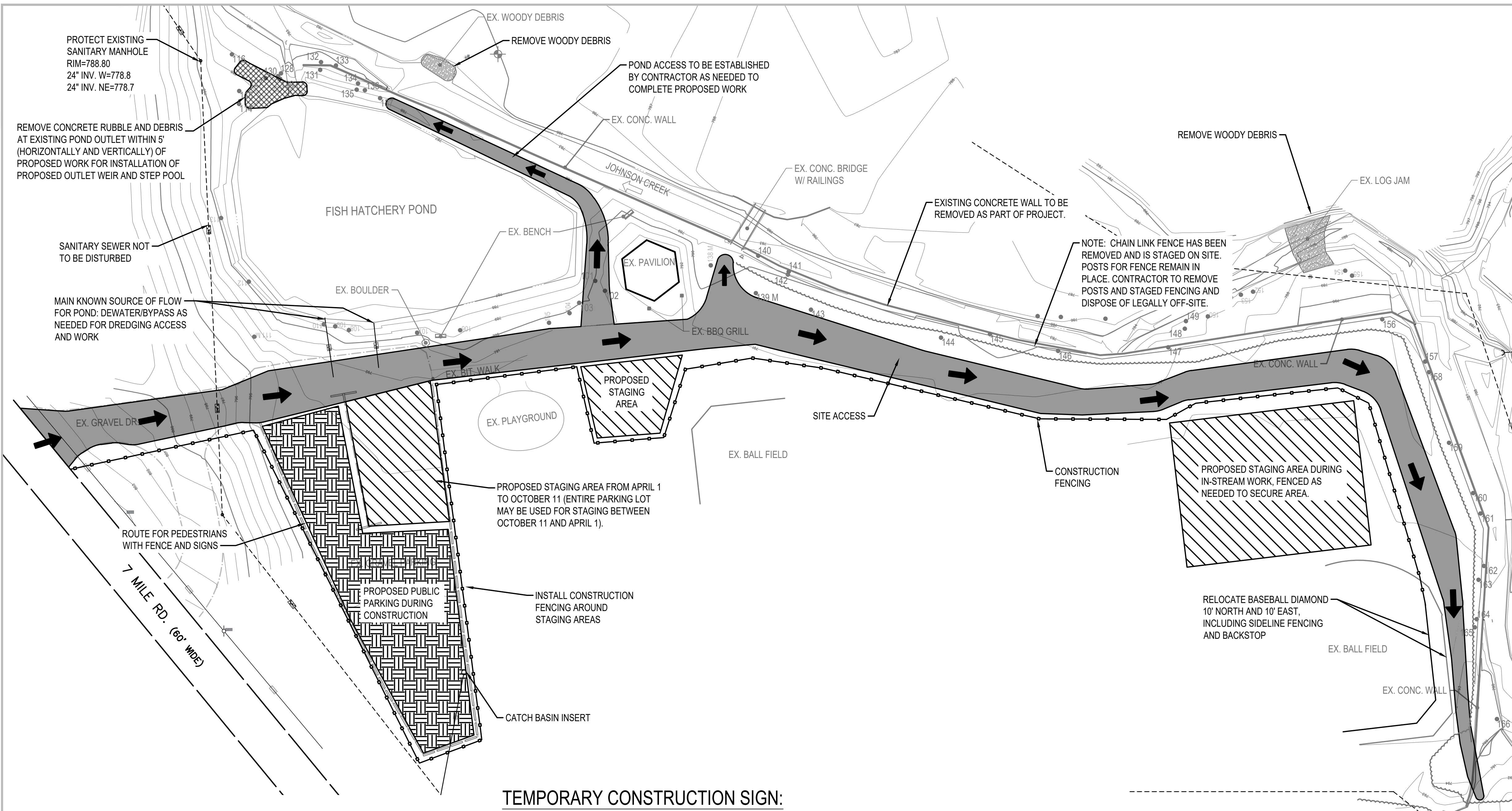
LEGEND

8.38	EXIST. CONTOUR
836.21	EXIST. ELEVATION HARD SURFACE
836.2	EXIST. ELEVATION SOFT SURFACE
x	EXIST. UTILITY POLE
OH	EXIST. OVERHEAD UTILITY LINE
r	EXIST. STORM SEWER
---	EXIST. CATCH BASIN OR INLET CULVERT
-s-	EXIST. SANITARY SEWER
⊙	WELL
---	FENCE
---	GUARDRAIL
● 123	SINGLE TREE
● 123 M	SINGLE MEMORIAL TREE
---	TREE OR BRUSH LIMIT
---	PARKING BUMPER BLOCK
---	EXIST. CONCRETE WALL
---	SECTION CORNER
---	PROPERTY BOUNDARY
○ F	FOUND IRON PIPE
○ F	FOUND MONUMENT
△ FIR	FOUND IRON ROD
⊕ C-1	CONTROL PT.
---	SEDIMENT CORE LOCATION
---	SCRUB SHRUB WETLAND
---	100 YEAR FLOOD PLAIN - FEMA ZONE A (SPECIAL FLOOD HAZARD AREA WITH BASE FLOOD ELEVATION OR DEPTH)

BENCHMARK INFORMATION:

- BENCHMARK #1**
 SPIKE IN THE SOUTHEAST SIDE OF A UTILITY POLE LOCATED IN THE CENTER OF THE TWO ENTRANCE DRIVES TO THE FISH HATCHERY PARK AND AT THE SOUTH RIGHT OF WAY OF 7 MILE ROAD.
 ELEVATION = 806.02 (NAVD 88 DATUM)
- BENCHMARK #2**
 SPIKE IN THE EAST SIDE OF A 20 INCH AMERICAN ELM TREE #144 LOCATED IN THE CENTER OF THE PARK ON THE EAST TREE LINE AND WEST OF JOHNSON CREEK.
 ELEVATION = 792.46 (NAVD 88 DATUM)
- BENCHMARK #3**
 TOP OF CONCRETE PAD AROUND A SANITARY SEWER MANHOLE EAST OF JOHNSON CREEK ±261 FEET SOUTH OF THE SOUTHEAST CORNER OF THE WALKING BRIDGE ACROSS THE CREEK BY THE PAVILION.
 ELEVATION = 788.43 (NAVD 88 DATUM)

BASE SURVEY CONDUCTED BY MIDWESTERN CONSULTING NOVEMBER 9, 2018
 REFERENCE REACH SURVEY CONDUCTED BY ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC. MAY 22, 2019
 ALL ELEVATIONS SHOWN ARE IN NAVD88 DATUM.



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. 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.
2. TEMPORARY OR PERMANENT CONTROL MEASURES SHALL BE INSTALLED TO CONVEY WATER AROUND, THROUGH OR FROM THE EARTH CHANGE AT A NON-EROSIVE VELOCITY.
3. REMOVE SEDIMENT CAUSED BY ACCELERATED SOIL EROSION FROM RUNOFF WATER BEFORE IT LEAVES THE SITE OF THE EARTH CHANGE.
4. 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.)
5. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SITE DRAINAGE.
6. CONTRACTOR IS RESPONSIBLE TO PROTECT ADJACENT WATER COURSES FROM THE DISCHARGE OF SEDIMENT DURING CONSTRUCTION.
7. INSTALL PERMANENT EROSION CONTROL MEASURES WITHIN 5 DAYS OF COMPLETING FINAL GRADING OR MAINTAIN TEMPORARY MEASURES UNTIL PERMANENT MEASURES ARE INSTALLED.
8. SILT FENCE TO BE INSTALLED AROUND OFF-SITE STOCKPILE AREAS.
9. APPLY TEMPORARY EROSION CONTROL ON OVER EXPOSED SOILS DURING WET WEATHER AND WHEN SITE IS INACTIVE FOR MORE THAN 24 HOURS.
10. DO NOT CONSTRUCT DURING HIGH FLOW OR WET WEATHER.
11. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING LANDSCAPING DURING THE WARRANTY PERIOD.
12. PROTECT ALL DRAIN INLETS WITH SEDIMENT FILTERS.
13. EXISTING LOW AREAS TO BE USED FOR STORMWATER DETENTION AND SETTLING DURING CONSTRUCTION.
14. 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.
15. 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.
16. 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.
17. 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.
18. THROUGHOUT THE CONSTRUCTION PERIOD, ALL MUD/SILT TRACKED ONTO EXISTING ROADS FROM THE SITE DUE TO CONSTRUCTION SHALL BE IMMEDIATELY REMOVED BY THE CONTRACTOR.
19. SEEDING OR OTHER STABILIZATION SHALL BE REQUIRED IMMEDIATELY TO AREAS WHICH HAVE BEEN DAMAGED BY RUNOFF.
20. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL ON THE SITE THROUGHOUT THE DURATION OF THE CONSTRUCTION PROCESS.



**ROUGE RIVER AOC
 JOHNSON CREEK -
 FISH HATCHERY
 PARK HABITAT
 RESTORATION
 PROJECT**

**ALLIANCE OF ROUGE
 COMMUNITIES**

**NORTHVILLE,
 WAYNE COUNTY,
 MICHIGAN**

TEMPORARY CONSTRUCTION SIGN:

WHITE BACKGROUND

Johnson Creek - Fish Hatchery Park Habitat Restoration
Rouge River AOC
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.

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 3/4")
PLYWOOD PANEL (APA RATED A-B GRADE-EXTERIOR)

DEMOLITION NOTE:
 FOR DEMOLITION WORK, SEE SHEET 4.

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.

STAGING AND ACCESS NOTES:
 1. PARK WILL BE USED FOR TENNIS AND SOME BASEBALL GAMES BETWEEN APRIL 1 AND OCTOBER 11. CONTRACTOR TO ACCOMMODATE PUBLIC USAGE AND TRAFFIC DURING THAT TIME.
 2. CONTRACTOR TO PROVIDE SAFE ACCESS FOR PUBLIC TO TENNIS COURTS AND BASEBALL FIELDS.
 3. THE PARK MAY BE CLOSED TO THE PUBLIC BETWEEN OCTOBER 11 AND APRIL 1 AND THE ENTIRE PARKING LOT MAY BE USED FOR STAGING.
 4. CONTRACTOR TO PROVIDE TRAFFIC SIGNAGE FOR CLOSURES AND PEDESTRIAN/ PUBLIC USE.

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. TURBIDITY CURTAIN IS REQUIRED TO BE INSTALLED FROM BANK TO BANK ON THE SAME SIDE OF THE STREAM SURROUNDING WORK AREA.
4. CONTRACTOR TO EXCAVATE 10' WIDE FLOODPLAIN BENCH TO SUBGRADE BEFORE REMOVING CONCRETE WALL.
5. AFTER REMOVING CONCRETE WALL ALONG A GIVEN PORTION OF STREAM, CONTRACTOR WILL CONSTRUCT FLOODPLAIN BENCH.
6. CONTRACTOR TO SEQUENCE WORK SUCH THAT NO MORE THAN 100 LF OF INCOMPLETE FLOODPLAIN BENCH IS EXPOSED AT ANY TIME. CONTRACTOR TO FINISH STABILIZATION OF FLOODPLAIN BENCH SECTION, INCLUDING SEEDING AND EROSION CONTROL BLANKET INSTALLATION, BEFORE MOVING ON TO NEXT SECTION.

LEGEND

	EXIST. CONTOUR
	EXIST. UTILITY POLE
	EXIST. OVERHEAD UTILITY LINE
	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	EXIST. SANITARY SEWER
	FENCE
	TREE OR BRUSH LIMIT
	GUARDRAIL
	SINGLE TREE
	SINGLE MEMORIAL TREE
	PARKING BUMPER BLOCK
	FOUND IRON PIPE
	FOUND MONUMENT
	FOUND IRON ROD
	100 YEAR FLOOD PLAIN - FEMA ZONE (SPECIAL FLOOD HAZARD AREA WITH BASE FLOOD ELEVATION OR DEPTH)
	PROPOSED STAGING AREA
	PROPOSED ACCESS ROUTE
	PROPOSED PUBLIC ACCESS/PARKIN
	CONSTRUCTION FENCING
	PROPOSED CONCRETE RUBBLE REMOVAL

FOR BIDDING	3-2020
100% DESIGN DRAWINGS	2-2020
PERMIT APPLICATION	9-2019
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PRELIMINARY DESIGN	2-26-19

180611 ECT PROJECT NUMBER	
AAB DESIGNED BY	AAB CHECKED BY
SRD DRAWN BY	JOM APPROVED BY

SHEET TITLE

**SITE
 PREPARATION**

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

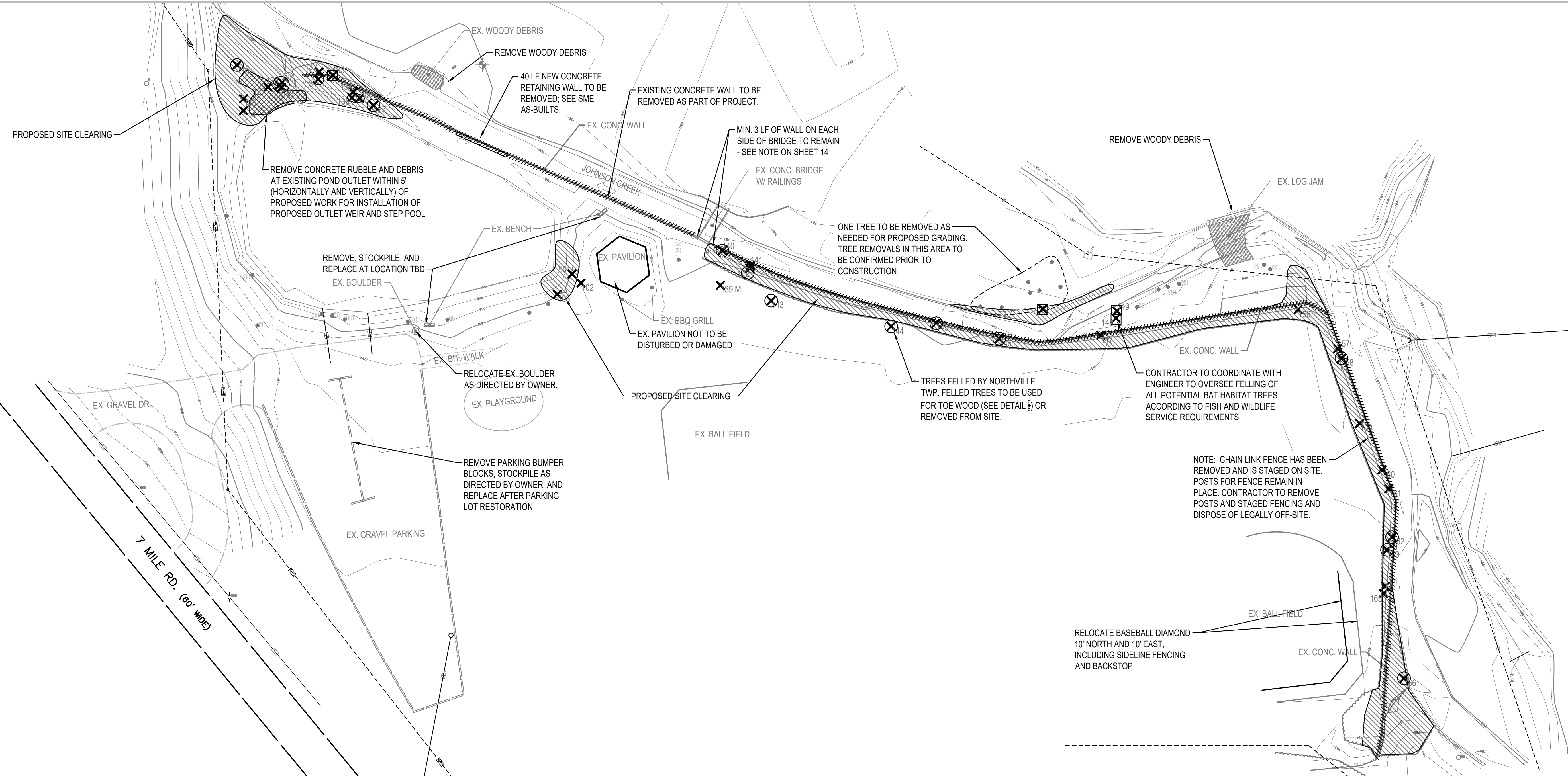
NORTH

SHEET NUMBER
3

ROUGE RIVER AOC JOHNSON CREEK - FISH HATCHERY PARK HABITAT RESTORATION PROJECT

ALLIANCE OF ROUGE COMMUNITIES

NORTHVILLE, WAYNE COUNTY, MICHIGAN



TREES TO BE REMOVED:

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	REG	BAT HABITAT
114	12"	American Elm	Ulmus americana					
115	10"	Tamarack	Larix laricina					
127	8"	Norway Maple	Acer platanoides					
132	6"	American Elm	Ulmus americana					
133	37"	Weeping Willow	Salix babylonica		40%			X
134	6"	Norway Maple	Acer platanoides					
101	22"	Box Elder	Acer negundo					
102	16"	Box Elder	Acer negundo					
103	9"	Black Alder	Alnus glutinosa	twin				
139	9"	Red Oak	Quercus rubra				M	
141	10"	Box Elder	Acer negundo					
147	21"	Black Willow	Salix nigra	twin	40%			X
148	34"	Black Willow	Salix nigra		40%			X
149	15"	Norway Maple	Acer platanoides					
156	23"	American Elm	Ulmus americana				X	
157	8"	Box Elder	Acer negundo	twin				
159	9"	White Mulberry	Morus alba					
160	7"	Box Elder	Acer negundo	triple				
161	7"	White Ash	Fraxinus americana					
162	8"	Norway Maple	Acer platanoides					
164	8"	Box Elder	Acer negundo					
165	9"	Box Elder	Acer negundo					

SITE CLEARING NOTES:

1. TOTAL SITE CLEARING AREA: 0.4 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 THIS SHEET 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 TOE WOOD FOR PROPOSED VMSE AS SHOWN ON SHEET 6, DETAIL 8. 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. ANY TREES MARKED ON SHEET AS POTENTIAL BAT HABITAT SHALL NOT BE CUT BETWEEN APRIL 1 AND SEPTEMBER 30 IN ANY YEAR TO AVOID TAKE OF INDIANA BAT (MYOTIS SODALIST), A FEDERALLY LISTED ENDANGERED SPECIES. TREE REMOVALS WITHIN THE APRIL 1 TO SEPTEMBER 30 TIMEFRAME ARE ALLOWED IF AN APPROVED METHOD OF INDIANA BAT SURVEY/ASSESSMENT HAS BEEN COMPLETED AND IS APPROVED BY THE U.S. FISH AND WILDLIFE SERVICE.

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 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.

ONE TREE ACROSS JOHNSON CREEK TO BE REMOVED AS NEEDED FOR PROPOSED GRADING. TREE REMOVALS IN THIS AREA TO BE CONFIRMED PRIOR TO CONSTRUCTION.

LEGEND

	EXIST. CONTOUR
	EXIST. UTILITY POLE
	EXIST. OVERHEAD UTILITY LINE
	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	CULVERT
	EXIST. SANITARY SEWER
	FENCE
	GUARDRAIL
	TREE OR BRUSH LIMIT
	SINGLE TREE
	SINGLE MEMORIAL TREE
	PARKING BUMPER BLOCK
	FOUND IRON PIPE
	FOUND MONUMENT
	FOUND IRON ROD
	PROPOSED TREE REMOVAL
	TREE FELLING COMPLETED BY NORTHVILLE TWP.
	FELLED TREE TO BE REMOVED.
	PROPOSED BAT ROOST TREE REMOVAL. COORDINATE WITH ENGINEER FOR REMOVAL.
	PROPOSED WOODY DEBRIS REMOVAL
	PROPOSED REMOVAL OF EXISTING CONCRETE WALL
	PROPOSED SITE CLEARING
	100 YEAR FLOOD PLAIN - FEMA ZONE A (SPECIAL FLOOD HAZARD AREA WITH BASE FLOOD ELEVATION OR DEPTH)
	PROPOSED CONCRETE RUBBLE REMOVAL

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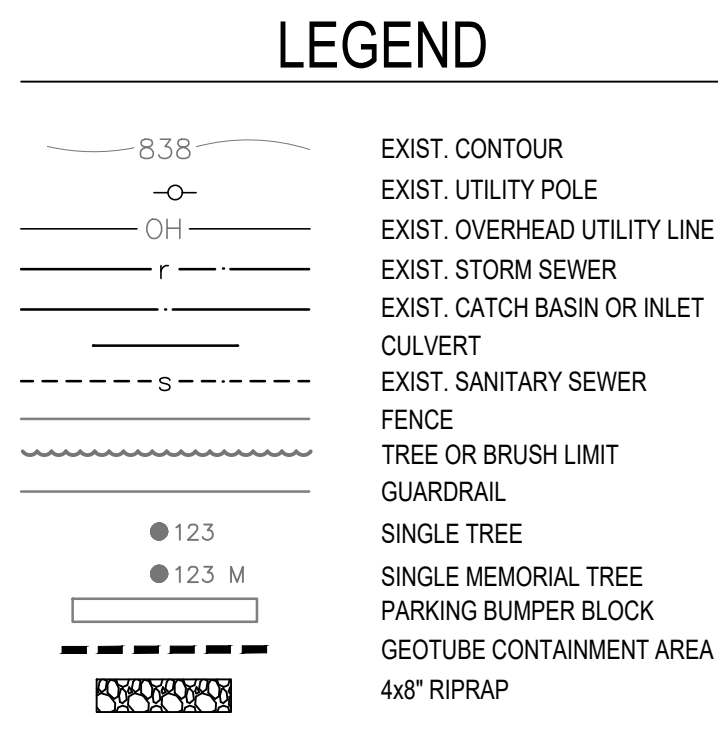
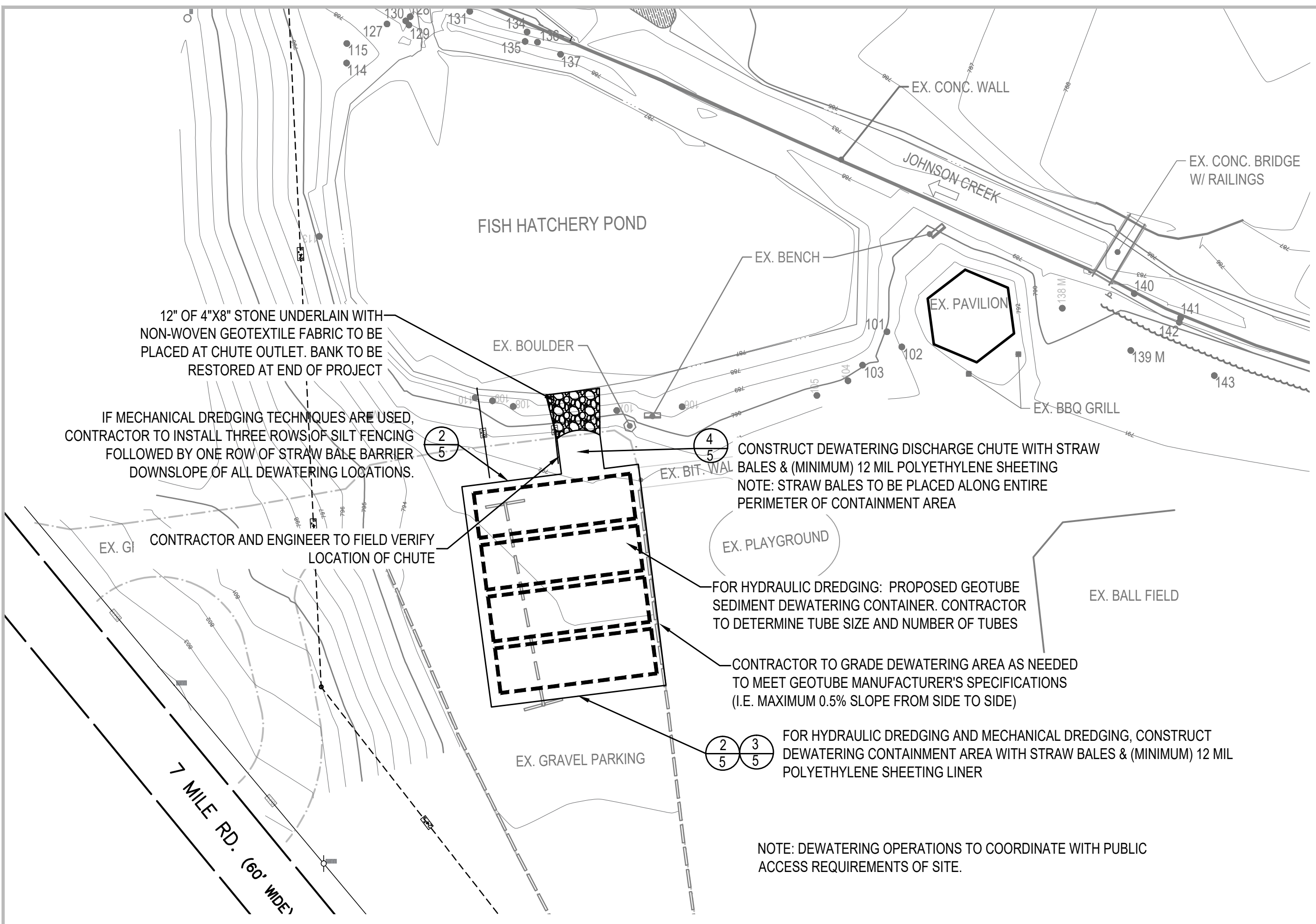
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DEMOLITION PLAN

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

NORTH

 SHEET NUMBER
4

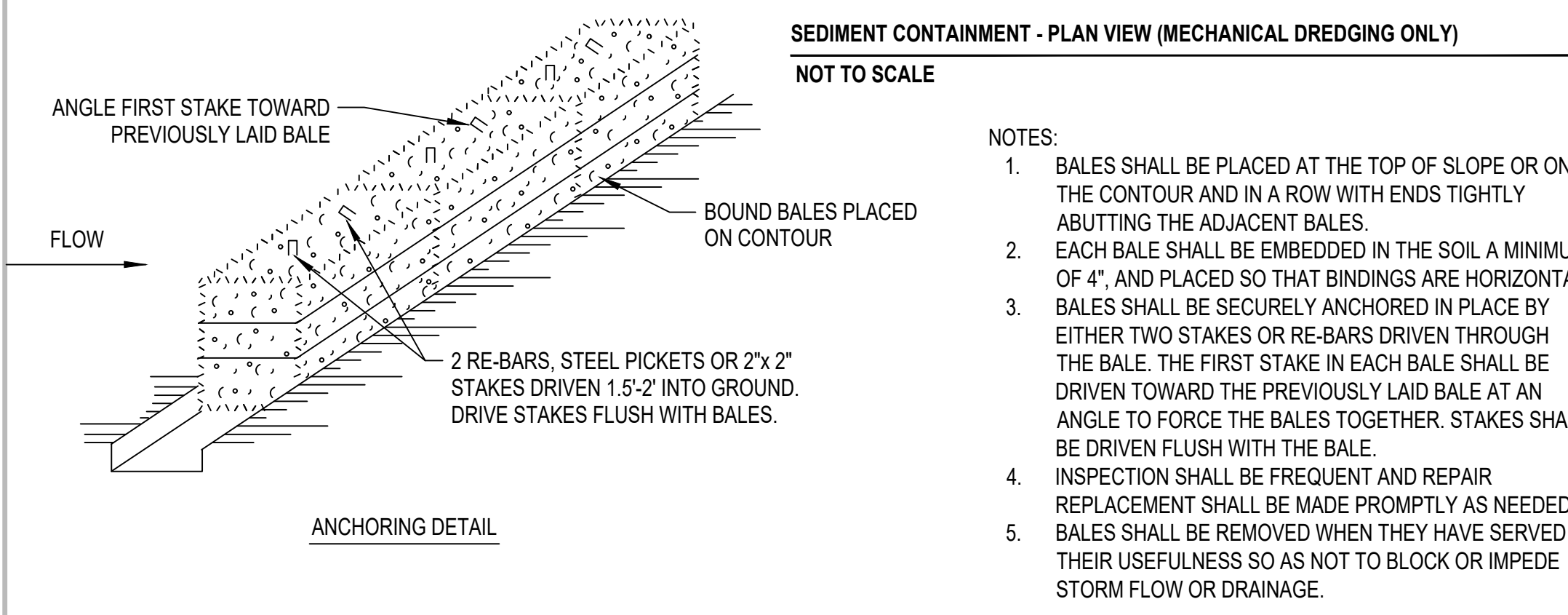
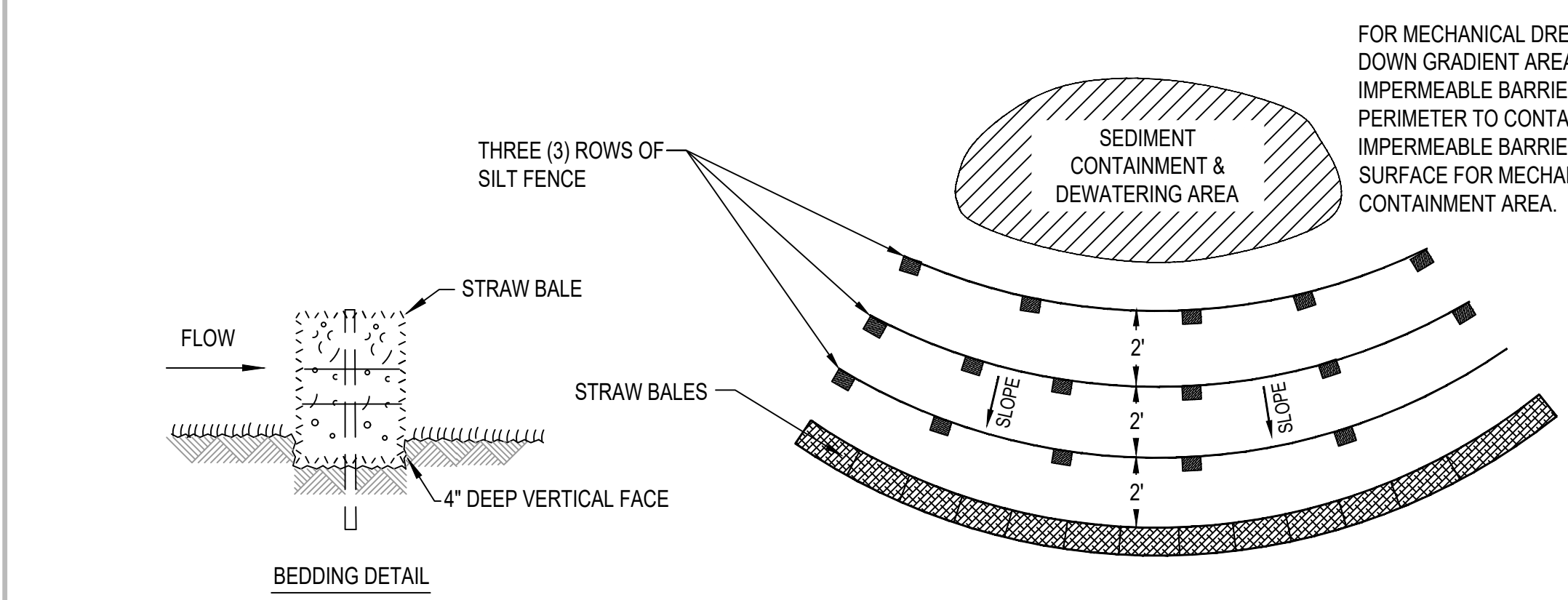


- GENERAL DREDGING NOTES:**
- CONTRACTOR TO VERIFY EXISTING CONDITIONS, INCLUDING BATHYMETRY, PRIOR TO START OF WORK BY CONDUCTING A PRE-DREDGING SURVEY AS DESCRIBED IN THE SPECIFICATIONS.
 - IF CONTRACTOR'S BATHYMETRIC DATA DIFFERS FROM THE CONTRACT PLANS, CONTACT ENGINEER FOR RESOLUTION PRIOR TO BEGINNING WORK.
 - CONTRACTOR MAY CHOOSE TO REMOVE SEDIMENT FROM FISH HATCHERY POND BY EITHER MECHANICAL OR HYDRAULIC DREDGING TECHNIQUES OR BOTH.
 - CONTRACTOR TO SUBMIT A DREDGING PLAN AND PROJECT SCHEDULE TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO START OF CONSTRUCTION.
 - EXISTING POND BOTTOM SEDIMENTS MAY BE SOFT AND TEMPORARY HAUL ROADS ALONG THE LAKE BOTTOM MAY BE NECESSARY TO FACILITATE CONSTRUCTION TRAFFIC DURING RESTORATION ACTIVITIES. CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO ACCESSING THE DREDGE AREAS.
 - REMOVE SEDIMENT FROM FISH HATCHERY POND TO PROPOSED ELEVATIONS AS SHOWN ON THE DRAWINGS.
 - CONTRACTOR TO ESTABLISH AND MAINTAIN STAGING AREA AND DEWATERING CONTAINMENT AREA AS SHOWN ON THE DRAWINGS.
 - CONTRACTOR SHALL DEWATER, LOAD, AND TRANSPORT SEDIMENT AND DEBRIS REMOVED FROM THE POND. CONTRACTOR TO ENSURE THAT SOILS HAVE A MINIMUM SOLIDS CONTENT BY WEIGHT OF 30% AND NO FREE LIQUIDS AS DESCRIBED IN THE SPECIFICATIONS OR AS REQUIRED BY THE LANDFILL FACILITY.
 - ALL DISCHARGE FROM DEWATERING ACTIVITIES SHALL BE FILTERED PRIOR TO INTRODUCTION INTO THE WATERWAY TO ELIMINATE POTENTIAL RELEASE OF SEDIMENTS.
 - ALL DREDGED MATERIAL TO BE DISPOSED OF AT A TYPE II LANDFILL.
 - THIS IS AN URBAN RIVER SYSTEM AND IT SHOULD BE ANTICIPATED THAT 'URBAN DEBRIS' MAY BE ENCOUNTERED.
 - CONTRACTOR IS RESPONSIBLE FOR STAKING AND DEMARCATING LIMITS OF EXCAVATION AND DREDGING. CONTRACTOR MAY UTILIZE WIRELESS INTEGRATED DREDGE POSITIONING TECHNOLOGY, SUCH AS 'CLAMVISION' OR SIMILAR TO CONTROL AND RECORD WORK PROGRESS. THIS INFORMATION WILL BE MADE AVAILABLE TO ENGINEER UPON REQUEST AND/OR FURNISH AS PART OF PAY REQUESTS AS DESCRIBED IN THE SPECIFICATIONS.
 - CONTRACTOR TO COMPLETE SOUNDINGS WHEN NEARING COMPLETION OF DREDGING WORK AND SUBMIT TO ENGINEER AS DESCRIBED IN THE SPECIFICATIONS.
 - CONTRACTOR TO COMPLETE POST-DREDGING SEDIMENT ELEVATION SURVEYS FOR THE PROPOSED AREA OF WORK WITHIN FISH HATCHERY POND. ENGINEER TO APPROVE POST-CONSTRUCTION SURVEY PRIOR TO CONTRACTOR DEMOBILIZING AND PROCEEDING WITH RESTORATION ACTIVITIES.
 - CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE RETURN FLOW OF EFFLUENT WATER BACK TO FISH HATCHERY POND WITHIN THE EXISTING DEWATERING AREA.
 - CONTRACTOR TO ENSURE THAT RETURN WATER DOES NOT CAUSE EROSION AT ANY TIME.

- MECHANICAL DREDGING NOTES:**
- IF MECHANICAL DREDGING TECHNIQUES ARE USED, THREE ROWS OF SILT FENCING FOLLOWED BY ONE ROW OF STRAW BALE FILTER MUST BE INSTALLED DOWNSLOPE OF ALL DEWATERING LOCATIONS. THE STRAW BALE FILTER SHOULD BE INSTALLED DOWNSLOPE OF THE SILT FENCE ROWS.
 - FOR MECHANICAL DREDGING, A DEWATER CONTAINMENT AREA SHALL BE CONSTRUCTED. STRAW BALES WITH IMPERMEABLE PLASTIC LINER TO BE USED AROUND PERIMETER TO CONTAIN SEDIMENTS AND WATER. IMPERMEABLE LAYER NOT TO BE USED ON GRADE.

- HYDRAULIC DREDGING NOTES:**
- FOR HYDRAULIC DREDGING, GEOTUBES (OR APPROVED EQUAL) MUST BE USED TO SUFFICIENTLY DEWATER SEDIMENTS.
 - CONTRACTOR TO CONFIGURE STAGING AREA TO INCLUDE A GEOTUBE CONTAINMENT AREA WITH STRAW BALES INSTALLED AROUND ITS PERIMETER TO A HEIGHT AS SPECIFIED BY THE MANUFACTURER.
 - CONTRACTOR TO GRADE DEWATERING AREA AS NEEDED TO MEET GEOTUBE MANUFACTURER'S SPECIFICATIONS.
 - NO MORE THAN 0.5% GRADE FROM END TO END OF THE GEOTUBE CONTAINMENT AREA AND SHALL BE FREE OF ANY DEBRIS OR SHARP OBJECTS THAT MAY PUNCTURE THE PERMEABLE MEMBRANE OF THE GEOTUBE.
 - GEOTUBE CONTAINMENT AREA TO BE SLOPED TOWARD THE POND WITH SWALE DIRECTED TOWARD POND.
 - CONTRACTOR IS RESPONSIBLE FOR ORDERING THE APPROPRIATE NUMBER OF GEOTUBE DEWATERING CONTAINERS TO PROVIDE ADEQUATE REMOVAL OF SEDIMENTS VIA HYDRAULIC DREDGING.

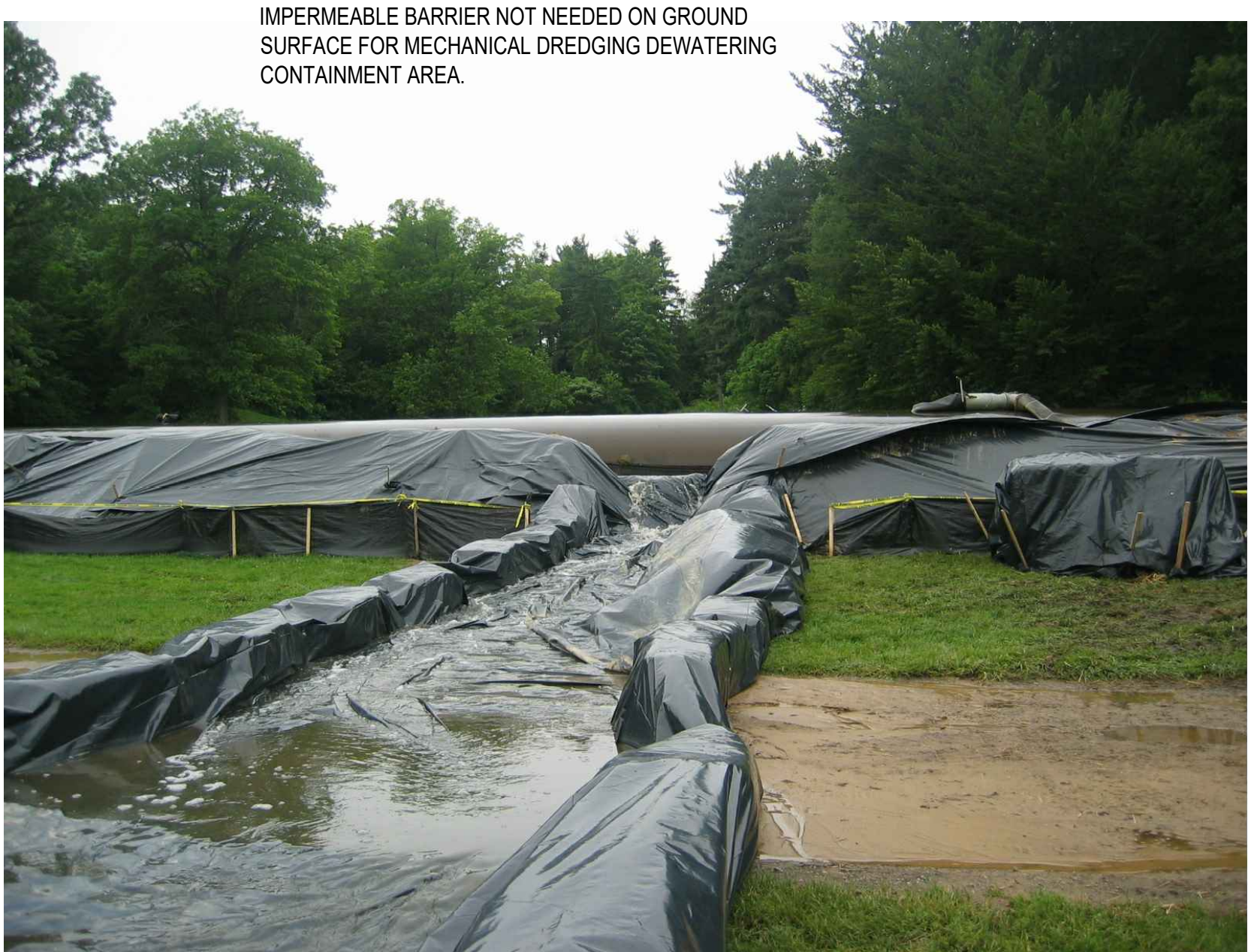
1 DREDGE STAGING AND DEWATERING - FISH HATCHERY POND
SCALE: 1" = 10'



2 STRAW BALE BARRIER DETAIL
NOT TO SCALE



3 EXAMPLE GEOTUBE® CONTAINMENT AREA (HYDRAULIC DREDGING ONLY)
NOT TO SCALE



4 EXAMPLE GEOTUBE® DEWATERING CHUTE (HYDRAULIC DREDGING ONLY)
NOT TO SCALE

ROUGE RIVER AOC JOHNSON CREEK - FISH HATCHERY PARK HABITAT RESTORATION PROJECT

ALLIANCE OF ROUGE COMMUNITIES

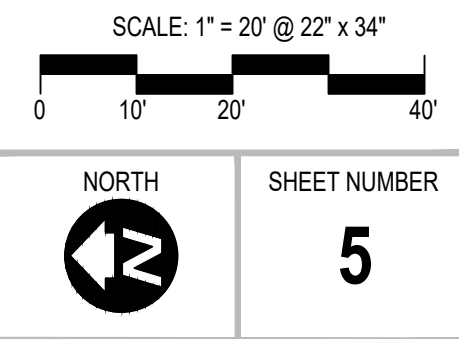
NORTHVILLE, WAYNE COUNTY, MICHIGAN

FOR BIDDING	3-2020
100% DESIGN DRAWINGS	2-2020
PERMIT APPLICATION	9-2019
PRE-APPLICATION MEETING	7-26-19
CLIENT MEETING	5-1-19
PRELIMINARY DESIGN	2-26-19

180611 ECT PROJECT NUMBER	
AAB DESIGNED BY	AAB CHECKED BY
SRD DRAWN BY	JOM APPROVED BY

SHEET TITLE

DREDGE STAGING AND DEWATERING DETAILS



FAIRBROOK

- 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. TURBIDITY CURTAIN IS REQUIRED TO BE INSTALLED FROM BANK TO BANK ON THE SAME SIDE OF THE STREAM SURROUNDING WORK AREA.
 4. CONTRACTOR TO EXCAVATE 10' WIDE FLOODPLAIN BENCH TO SUBGRADE BEFORE REMOVING CONCRETE WALL.
 5. AFTER REMOVING CONCRETE WALL ALONG A GIVEN PORTION OF STREAM, CONTRACTOR WILL CONSTRUCT FLOODPLAIN BENCH.
 6. CONTRACTOR TO SEQUENCE WORK SUCH THAT NO MORE THAN 100 LF OF INCOMPLETE FLOODPLAIN BENCH IS EXPOSED AT ANY TIME. CONTRACTOR TO FINISH STABILIZATION OF FLOODPLAIN BENCH SECTION, INCLUDING SEEDING AND EROSION CONTROL BLANKET INSTALLATION, BEFORE MOVING ON TO NEXT SECTION.

LEGEND

	EXIST. CONTOUR
	EXIST. UTILITY POLE
	EXIST. OVERHEAD UTILITY LINE
	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	EXIST. CULVERT
	EXIST. SANITARY SEWER
	FENCE
	GUARDRAIL
	PARKING BUMPER BLOCK
	FOUND IRON PIPE
	FOUND MONUMENT
	FOUND IRON ROD
	PROPOSED FLOODPLAIN BENCH
	PROPOSED COBBLE
	PROPOSED CONTOUR
	PROPOSED SHEET PILE WALL
	100 YEAR FLOOD PLAIN - FEMA ZONE A (SPECIAL FLOOD HAZARD AREA WITH BASE FLOOD ELEVATION OR DEPTH)
	FACE OF FLOODPLAIN BENCH/ VMSE WALL
	RESTORED ACCESS PATH

NOTE: SEE SHEET 16 FOR REVEGETATION PLAN

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**ROUGE RIVER AOC
 JOHNSON CREEK -
 FISH HATCHERY
 PARK HABITAT
 RESTORATION
 PROJECT**

**ALLIANCE OF ROUGE
 COMMUNITIES**

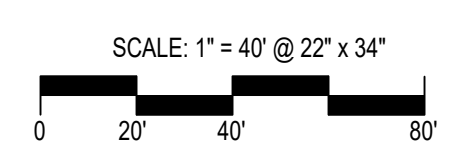
**NORTHVILLE,
 WAYNE COUNTY,
 MICHIGAN**

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180611 ECT PROJECT NUMBER	
AAB DESIGNED BY	AAB CHECKED BY
SRD DRAWN BY	JOM APPROVED BY

SHEET TITLE

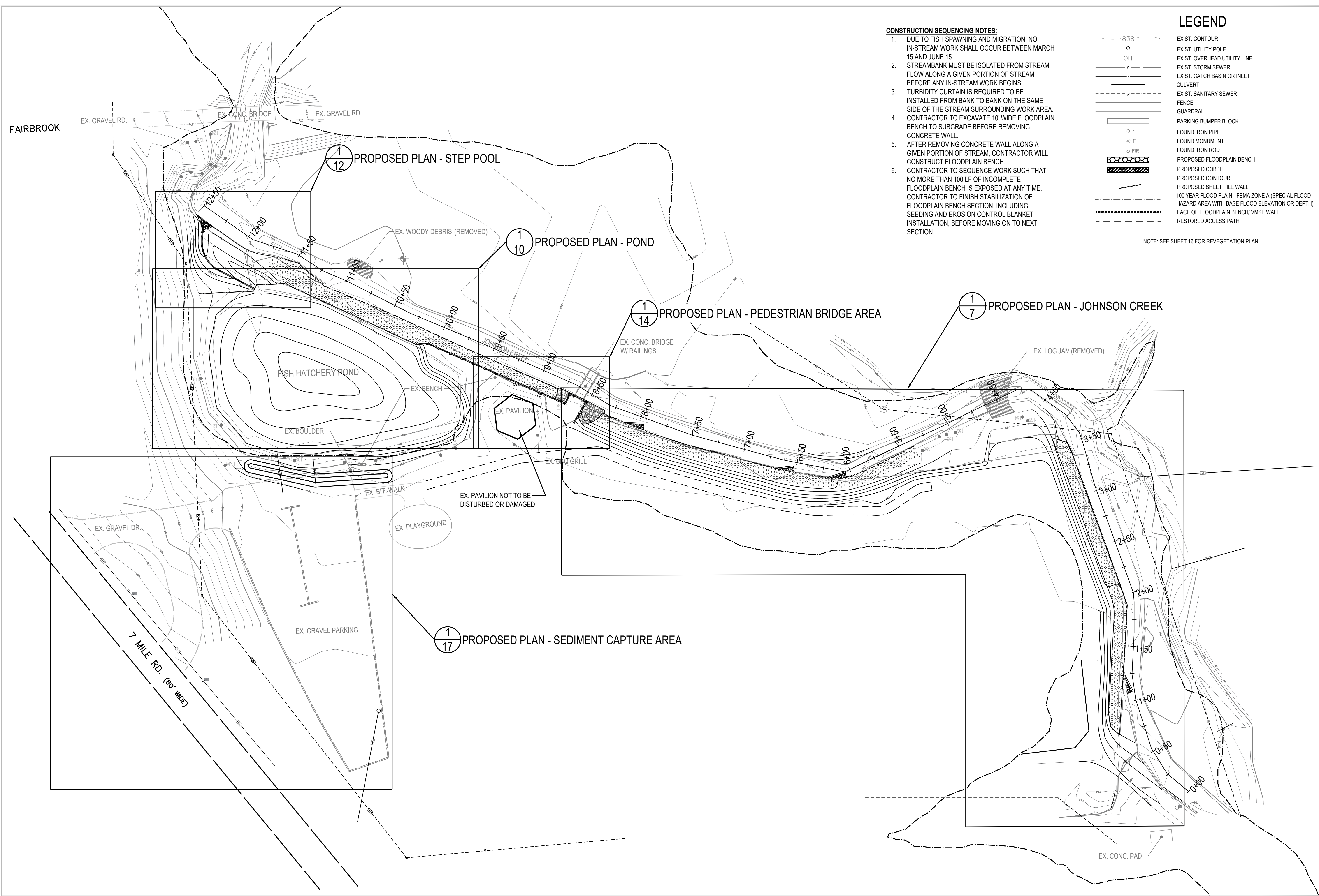
**PROPOSED PLAN -
 OVERVIEW**



NORTH

SHEET NUMBER

6



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**ROUGE RIVER AOC
 JOHNSON CREEK -
 FISH HATCHERY
 PARK HABITAT
 RESTORATION
 PROJECT**

**ALLIANCE OF ROUGE
 COMMUNITIES**

**NORTHVILLE,
 WAYNE COUNTY,
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180611 ECT PROJECT NUMBER	
AAB DESIGNED BY	AAB CHECKED BY
SRD DRAWN BY	JOM APPROVED BY

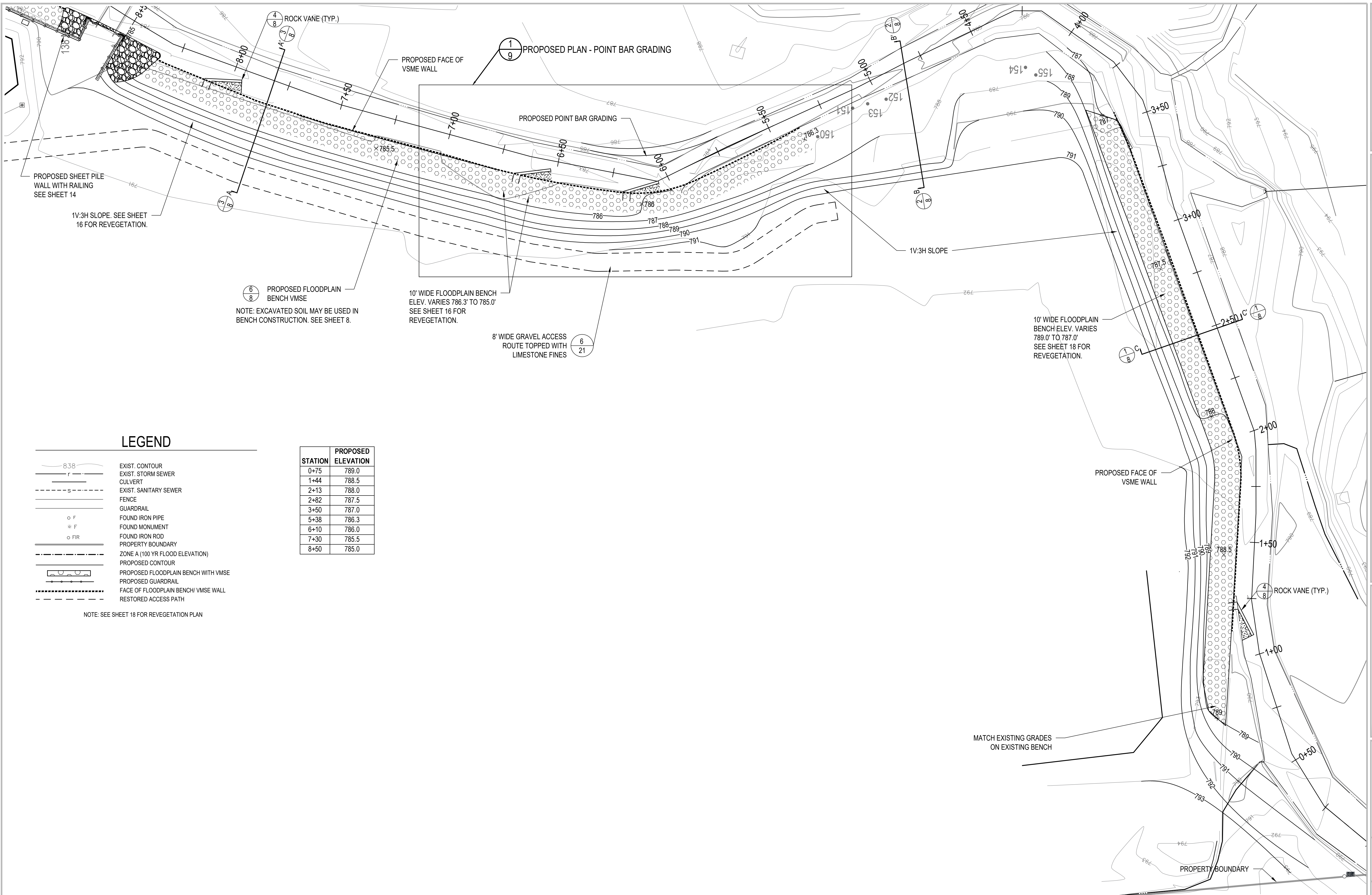
SHEET TITLE

**PROPOSED PLAN -
 JOHNSON CREEK**

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

NORTH

 SHEET NUMBER
7

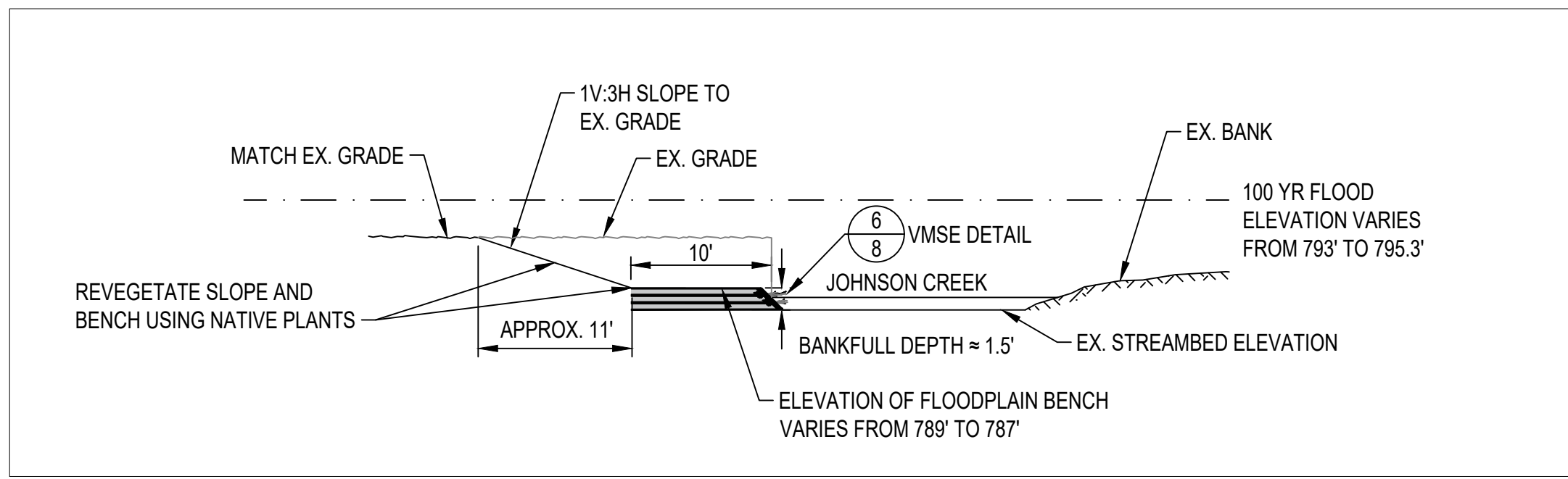


LEGEND

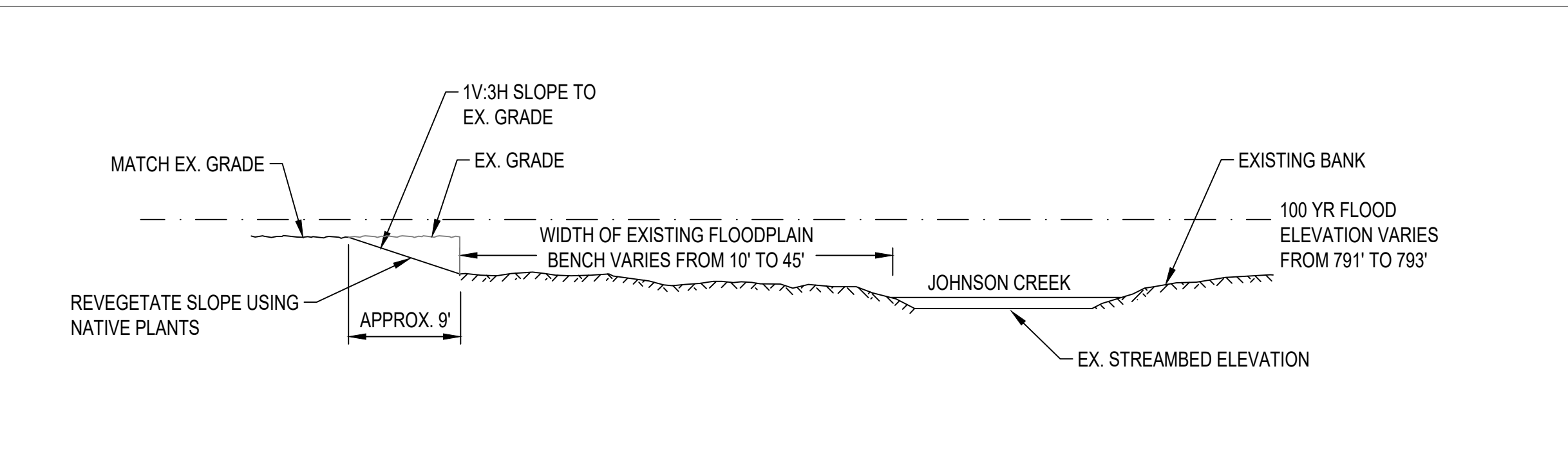
	EXIST. CONTOUR
	EXIST. STORM SEWER
	EXIST. CULVERT
	EXIST. SANITARY SEWER
	FENCE
	GUARDRAIL
	FOUND IRON PIPE
	FOUND MONUMENT
	FOUND IRON ROD
	PROPERTY BOUNDARY
	ZONE A (100 YR FLOOD ELEVATION)
	PROPOSED CONTOUR
	PROPOSED FLOODPLAIN BENCH WITH VMSE
	PROPOSED GUARDRAIL
	FACE OF FLOODPLAIN BENCH/ VMSE WALL
	RESTORED ACCESS PATH

NOTE: SEE SHEET 18 FOR REVEGETATION PLAN

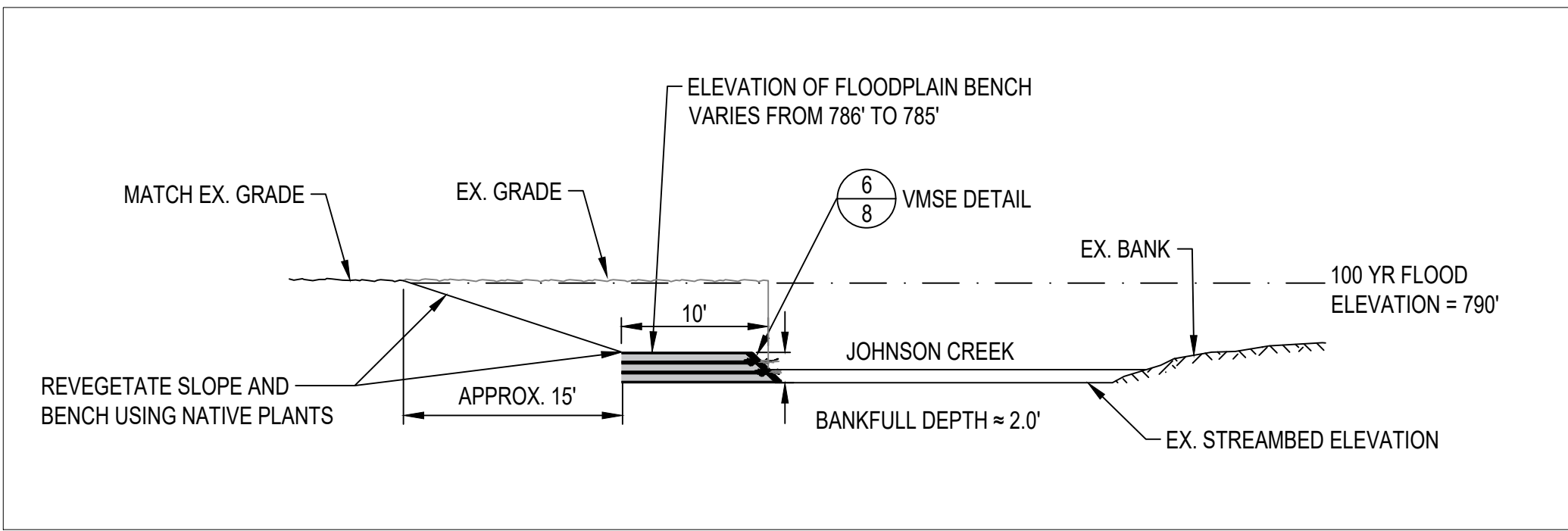
STATION	PROPOSED ELEVATION
0+75	789.0
1+44	788.5
2+13	788.0
2+82	787.5
3+50	787.0
5+38	786.3
6+10	786.0
7+30	785.5
8+50	785.0



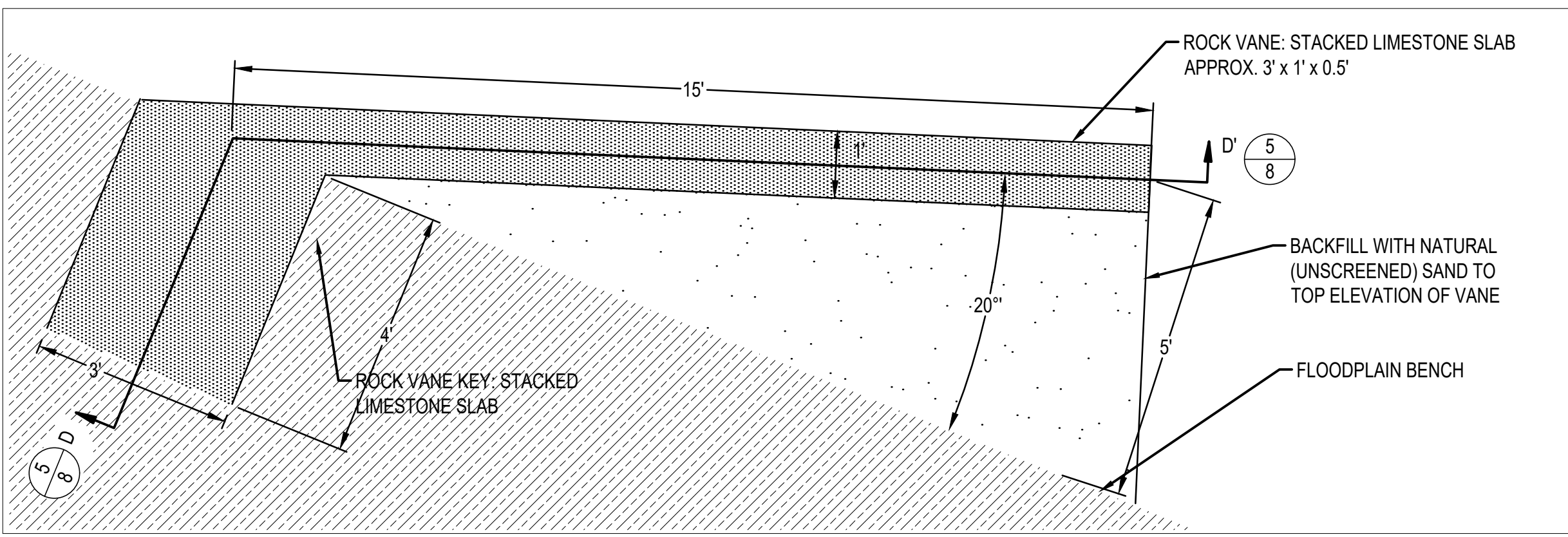
1
8 TYPICAL SECTION C-C' (STA 0+85 TO 3+53)
SCALE: 1" = 10'



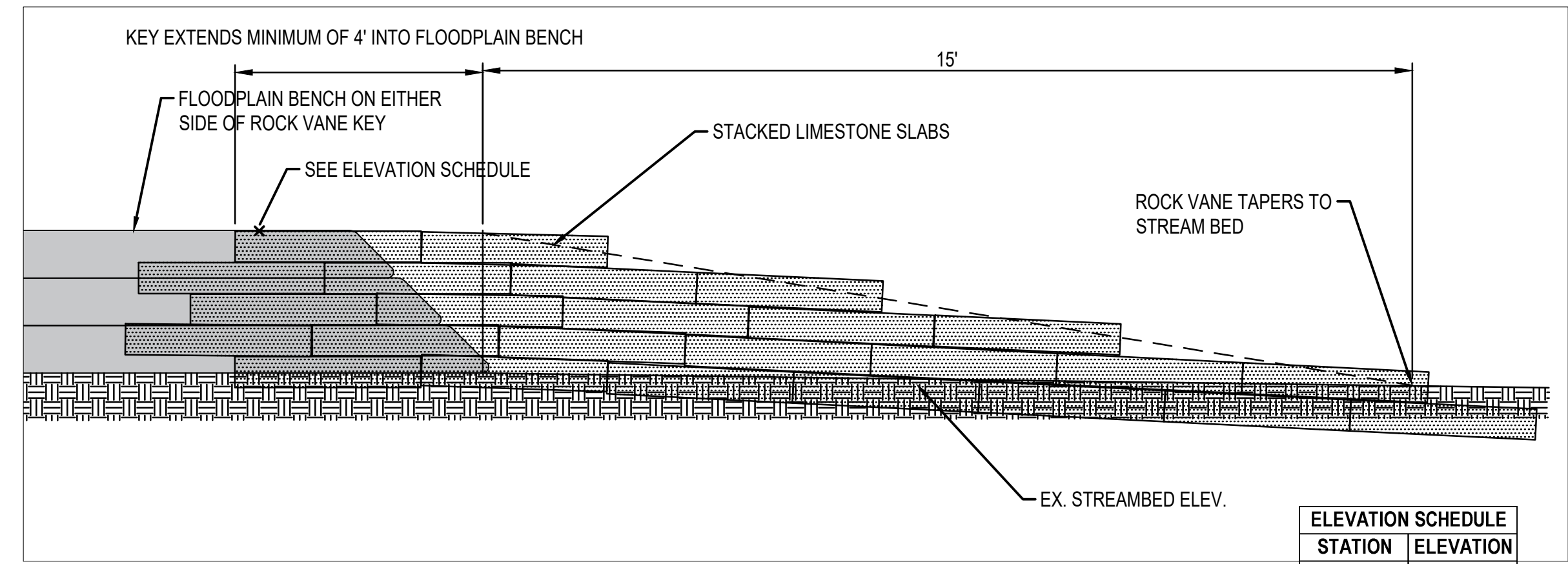
2
8 TYPICAL SECTION B-B' (STA 3+53 TO 5+38)
SCALE: 1" = 10'



3
8 TYPICAL SECTION A-A' (STA 5+38 TO 8+54)
SCALE: 1" = 10'

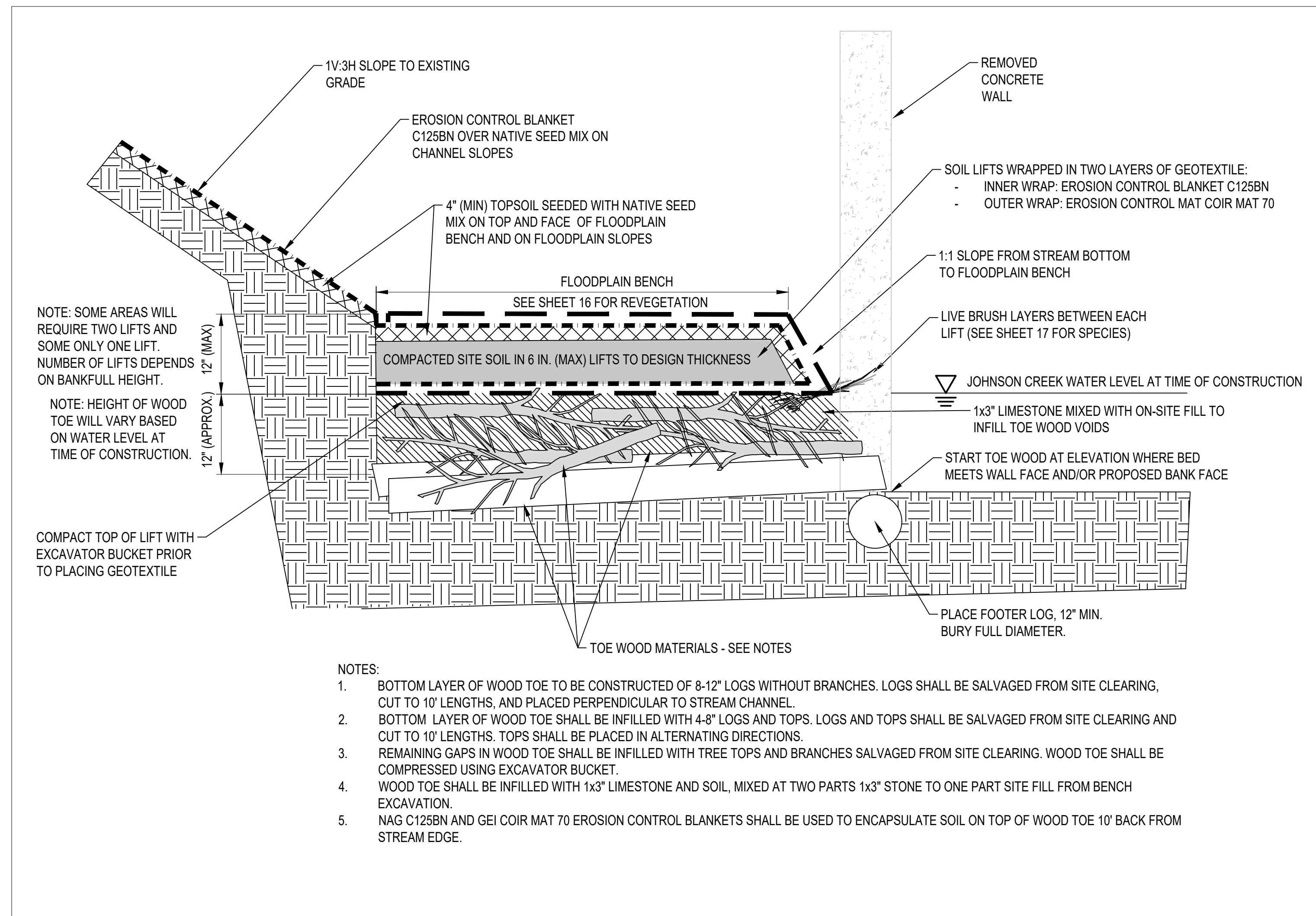


4
8 TYPICAL ROCK VANE - PLAN VIEW
SCALE: 1" = 2'



5
8 TYPICAL ROCK VANE PROFILE - SECTION D-D'
SCALE: 1" = 2'

STATION	ELEVATION
1+22.7	788.75
6+17.8	785.85
6+66.2	785.70
8+09.1	785.15



6
8 VEGETATED MECHANICALLY-STABILIZED EARTH (VMSE) DETAIL (STA. 0+85 TO 3+53 AND STA. 5+38 TO 8+54)
NOT TO SCALE

**ROUGE RIVER AOC
JOHNSON CREEK -
FISH HATCHERY
PARK HABITAT
RESTORATION
PROJECT**

**ALLIANCE OF ROUGE
COMMUNITIES**

**NORTHVILLE,
WAYNE COUNTY,
MICHIGAN**

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180611 ECT PROJECT NUMBER	
DESIGNED BY AAB	CHECKED BY AAB
DRAWN BY SRD	APPROVED BY JOM

SHEET TITLE

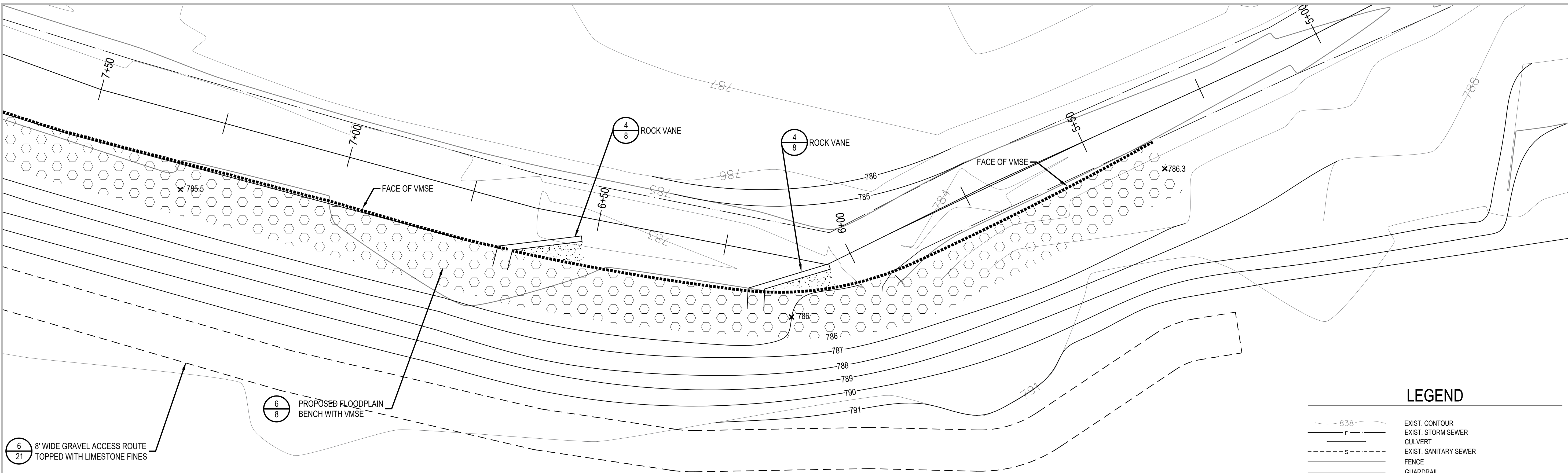
**PROPOSED CROSS
SECTIONS -
JOHNSON CREEK**

SCALE: VARIES

**ROUGE RIVER AOC
 JOHNSON CREEK -
 FISH HATCHERY
 PARK HABITAT
 RESTORATION
 PROJECT**

**ALLIANCE OF ROUGE
 COMMUNITIES**

**NORTHVILLE,
 WAYNE COUNTY,
 MICHIGAN**



1
9 **POINT BAR GRADING - PLAN VIEW**
 SCALE: 1" = 10'

LEGEND

	EXIST. CONTOUR
	EXIST. STORM SEWER
	EXIST. SANITARY SEWER
	FENCE
	GUARDRAIL
	FOUND IRON PIPE
	FOUND MONUMENT
	FOUND IRON ROD
	PROPOSED CONTOUR
	PROPOSED FLOODPLAIN BENCH WITH VMSE
	FACE OF FLOODPLAIN BENCH/ VMSE WALL
	RESTORED ACCESS PATH

NOTE: SEE SHEET 18 FOR REVEGETATION PLAN

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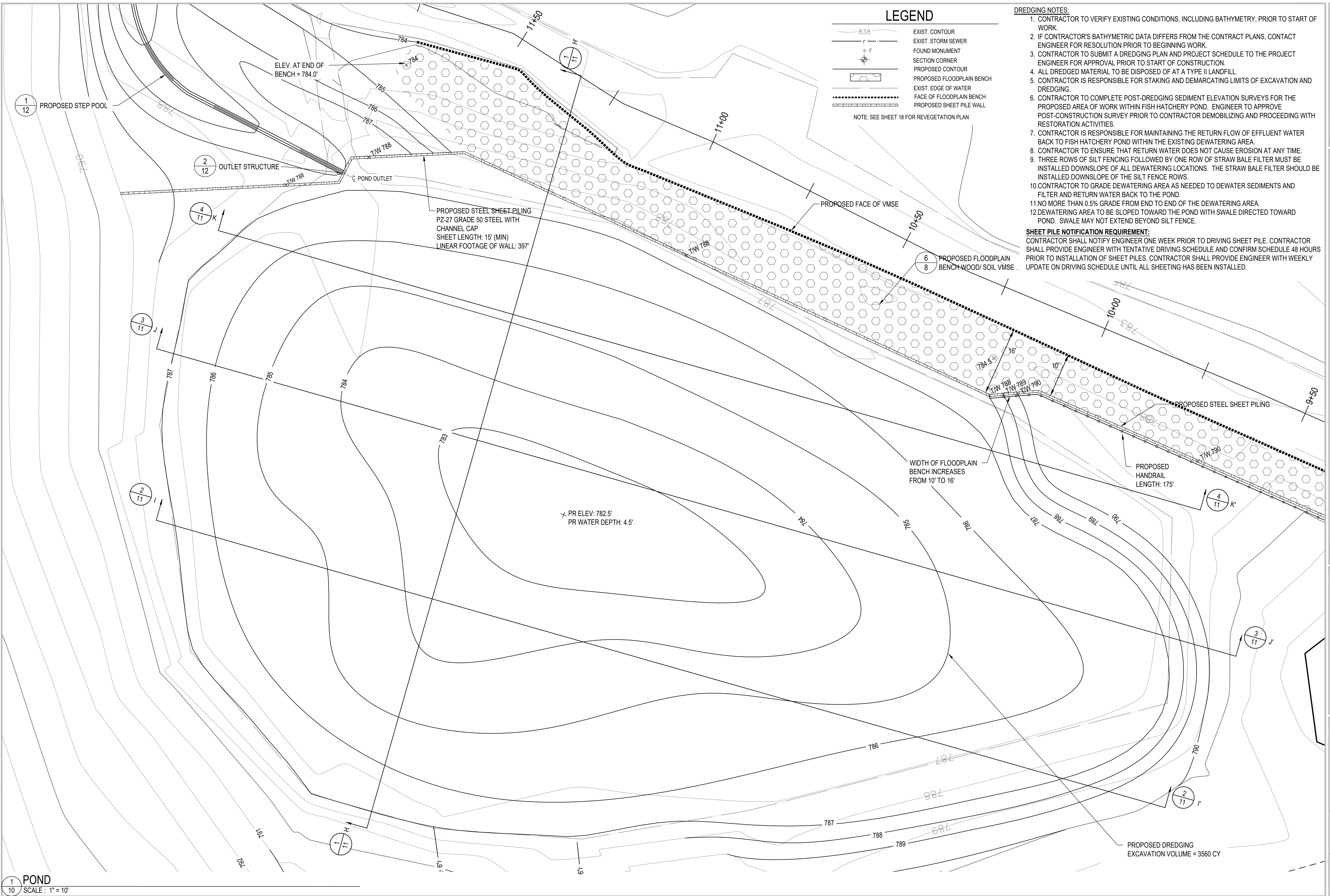
180611 ECT PROJECT NUMBER	
AAB DESIGNED BY	AAB CHECKED BY
SRD DRAWN BY	JOM APPROVED BY

SHEET TITLE
**PROPOSED PLAN -
 POINT BAR
 GRADING**

SCALE: VARIES

NORTH

SHEET NUMBER
9



LEGEND

- EXIST. CONTOUR
- EXIST. STORM SEWER
- FOUND MONUMENT
- SECTION CORNER
- PROPOSED CONTOUR
- PROPOSED FLOODPLAIN BENCH
- EXIST. EDGE OF WATER
- FACE OF FLOODPLAIN BENCH
- PROPOSED SHEET PILE WALL

NOTE: SEE SHEET 18 FOR REVEGETATION PLAN

- ### DREDGING NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS, INCLUDING BATHYMETRY, PRIOR TO START OF WORK.
 2. IF CONTRACTOR'S BATHYMETRIC DATA DIFFERS FROM THE CONTRACT PLANS, CONTACT ENGINEER FOR RESOLUTION PRIOR TO BEGINNING WORK.
 3. CONTRACTOR TO SUBMIT A DREDGING PLAN AND PROJECT SCHEDULE TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO START OF CONSTRUCTION.
 4. ALL DREDGED MATERIAL TO BE DISPOSED OF AT A TYPE II LANDFILL.
 5. CONTRACTOR IS RESPONSIBLE FOR STAKING AND DEMARCATING LIMITS OF EXCAVATION AND DREDGING.
 6. CONTRACTOR TO COMPLETE POST-DREDGING SEDIMENT ELEVATION SURVEYS FOR THE PROPOSED AREA OF WORK WITHIN FISH HATCHERY POND. ENGINEER TO APPROVE POST-CONSTRUCTION SURVEY PRIOR TO CONTRACTOR DEMOBILIZING AND PROCEEDING WITH RESTORATION ACTIVITIES.
 7. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE RETURN FLOW OF EFFLUENT WATER BACK TO FISH HATCHERY POND WITHIN THE EXISTING DEWATERING AREA.
 8. CONTRACTOR TO ENSURE THAT RETURN WATER DOES NOT CAUSE EROSION AT ANY TIME.
 9. THREE ROWS OF SILT FENCING FOLLOWED BY ONE ROW OF STRAW BALE FILTER MUST BE INSTALLED DOWNSLOPE OF ALL DEWATERING LOCATIONS. THE STRAW BALE FILTER SHOULD BE INSTALLED DOWNSLOPE OF THE SILT FENCE ROWS.
 10. CONTRACTOR TO GRADE DEWATERING AREA AS NEEDED TO DEWATER SEDIMENTS AND FILTER AND RETURN WATER BACK TO THE POND.
 11. NO MORE THAN 0.5% GRADE FROM END TO END OF THE DEWATERING AREA.
 12. DEWATERING AREA TO BE SLOPED TOWARD THE POND WITH SWALE DIRECTED TOWARD POND. SWALE MAY NOT EXTEND BEYOND SILT FENCE.
- ### SHEET PILE NOTIFICATION REQUIREMENT:
- CONTRACTOR SHALL NOTIFY ENGINEER ONE WEEK PRIOR TO DRIVING SHEET PILE. CONTRACTOR SHALL PROVIDE ENGINEER WITH TENTATIVE DRIVING SCHEDULE AND CONFIRM SCHEDULE 48 HOURS PRIOR TO INSTALLATION OF SHEET PILES. CONTRACTOR SHALL PROVIDE ENGINEER WITH WEEKLY UPDATE ON DRIVING SCHEDULE UNTIL ALL SHEETING HAS BEEN INSTALLED.

ECT Environmental Consulting & Technology, Inc.
 2200 Commonwealth Boulevard, Suite 300
 Ann Arbor, Michigan 48105
 Phone: 734.769.3004
 Fax: 734.769.31694

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ROUGE RIVER AOC JOHNSON CREEK - FISH HATCHERY PARK HABITAT RESTORATION PROJECT

ALLIANCE OF ROUGE
COMMUNITIES

NORTHVILLE,
WAYNE COUNTY,
MICHIGAN

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AAB DESIGNED BY	AAB CHECKED BY
SRD DRAWN BY	JOM APPROVED BY

SHEET TITLE

PROPOSED PLAN - POND

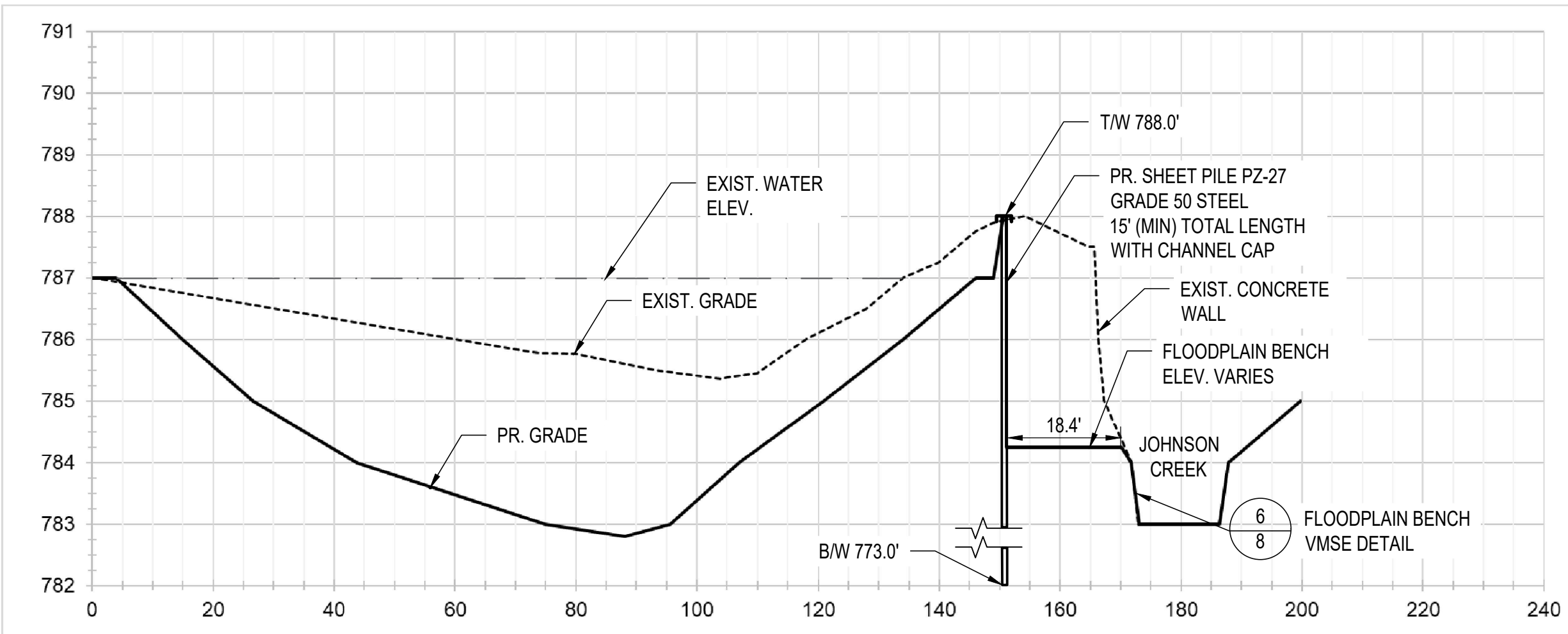
SCALE: 1" = 10' @ 22" x 34"

NORTH

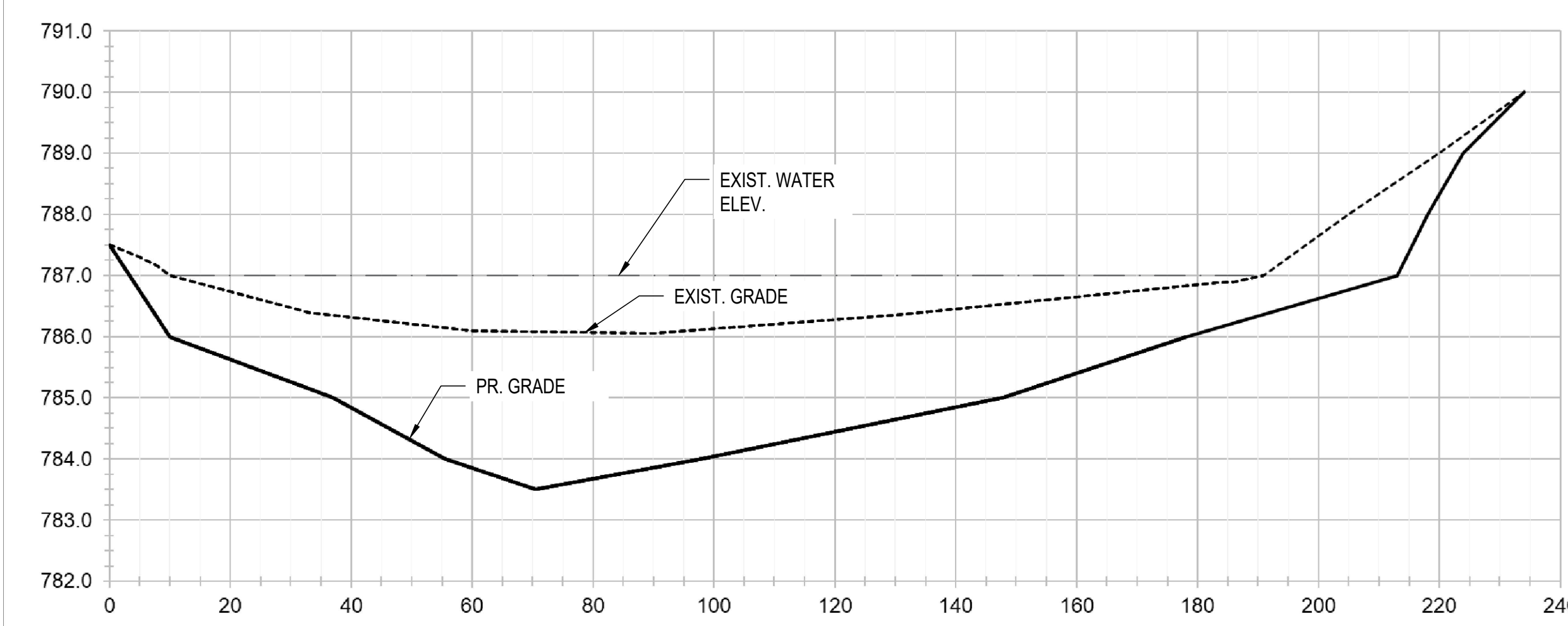
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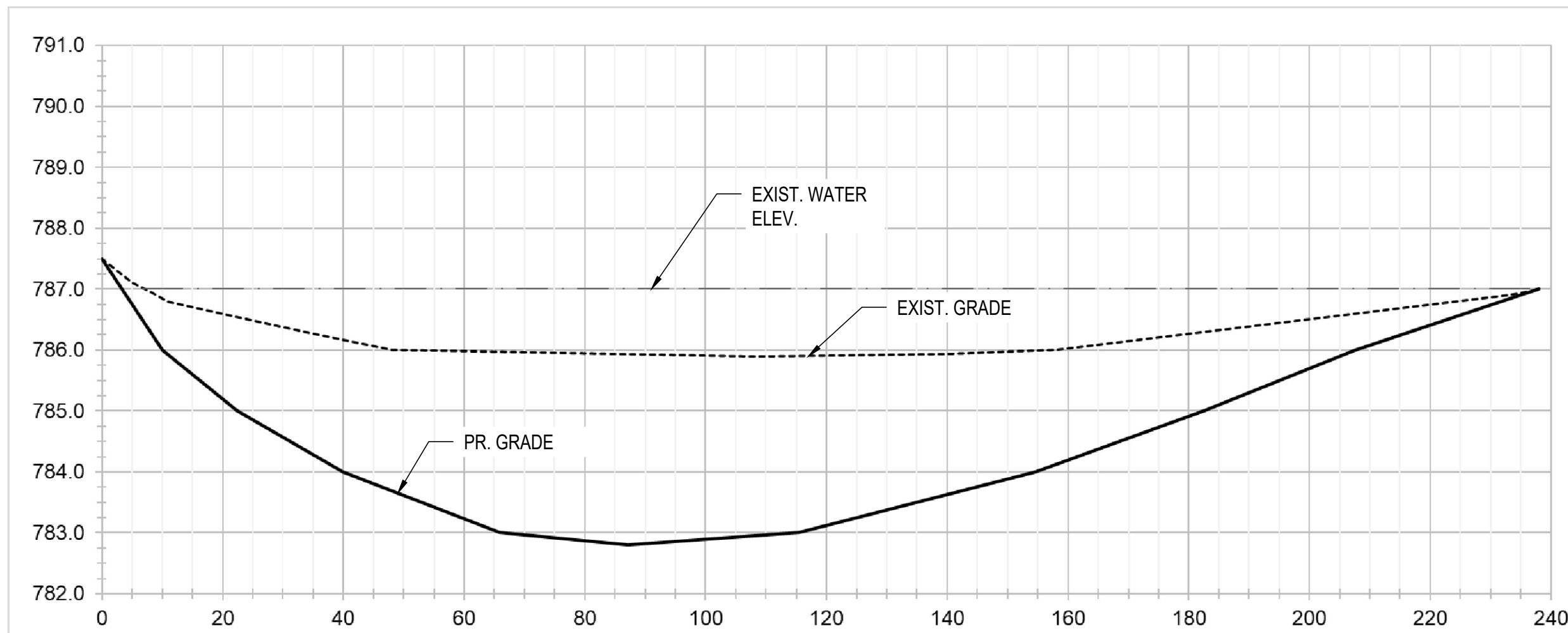
1
10
POND
SCALE: 1" = 10'



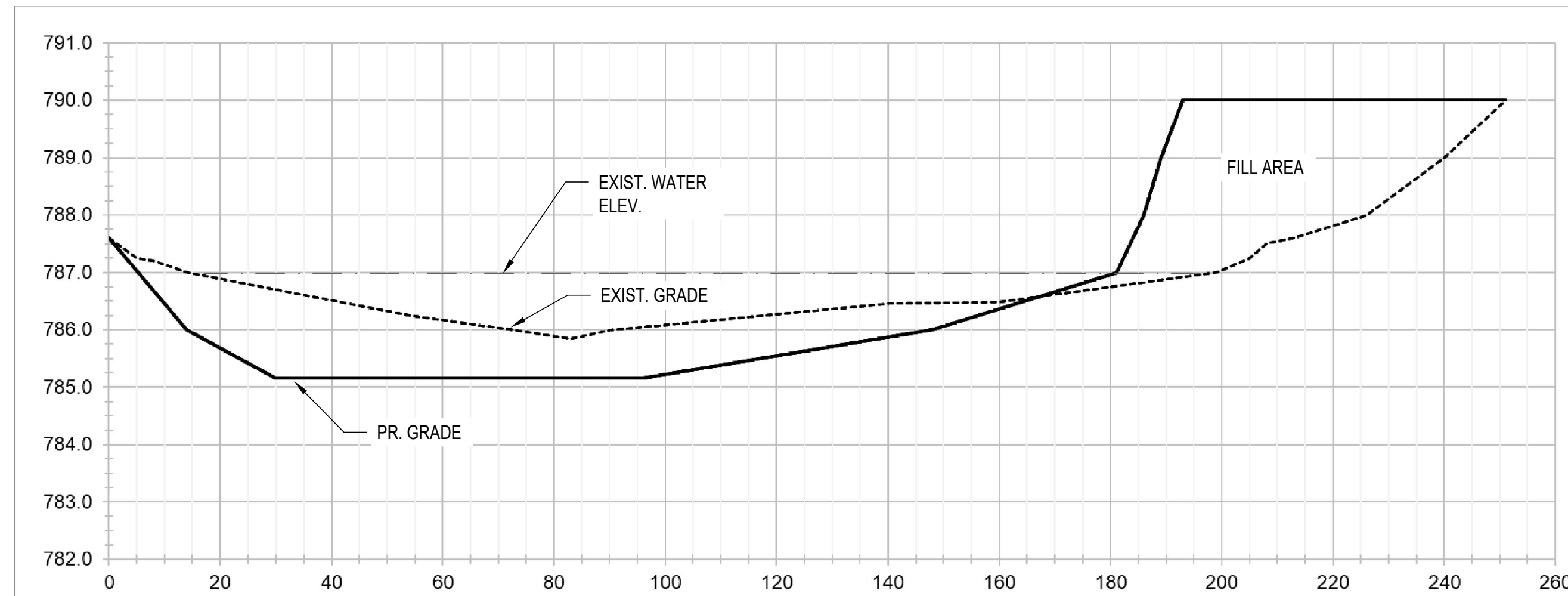
1 DREDGING OF FISH HATCHERY POND - CROSS SECTION H-H'
11 SCALE - HORIZONTAL: 1" = 20' VERTICAL: 1" = 2'



2 DREDGING OF FISH HATCHERY POND - CROSS SECTION I-I'
11 SCALE - HORIZONTAL: 1" = 20' VERTICAL: 1" = 2'



3 DREDGING OF FISH HATCHERY POND - CROSS SECTION J-J'
11 SCALE - HORIZONTAL: 1" = 20' VERTICAL: 1" = 2'



4 DREDGING OF FISH HATCHERY POND - CROSS SECTION K-K'
11 SCALE - HORIZONTAL: 1" = 20' VERTICAL: 1" = 2'

LEGEND

---	EXIST. GRADE
---	PROPOSED GRADE
---	EXIST. WATER ELEV.

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FISH HATCHERY
PARK HABITAT
RESTORATION
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**ALLIANCE OF ROUGE
COMMUNITIES**

**NORTHVILLE,
WAYNE COUNTY,
MICHIGAN**

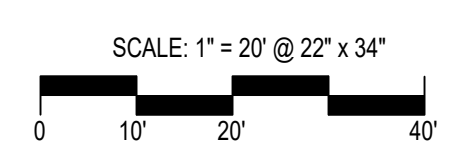
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180611
ECT PROJECT NUMBER

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SHEET TITLE

**PROPOSED CROSS
SECTIONS - POND**



NORTH

SHEET NUMBER

11

P:\Alliance of Rouge Communities\Grant Projects\2018 EPA Rouge Habitat\Johnson Creek Fish Hatchery For Bidding.dwg

**ROUGE RIVER AOC
 JOHNSON CREEK -
 FISH HATCHERY
 PARK HABITAT
 RESTORATION
 PROJECT**

**ALLIANCE OF ROUGE
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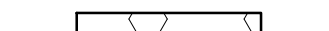




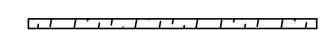
180611	ECT PROJECT NUMBER
AAB	DESIGNED BY
AAB	CHECKED BY
SRD	DRAWN BY
JOM	APPROVED BY

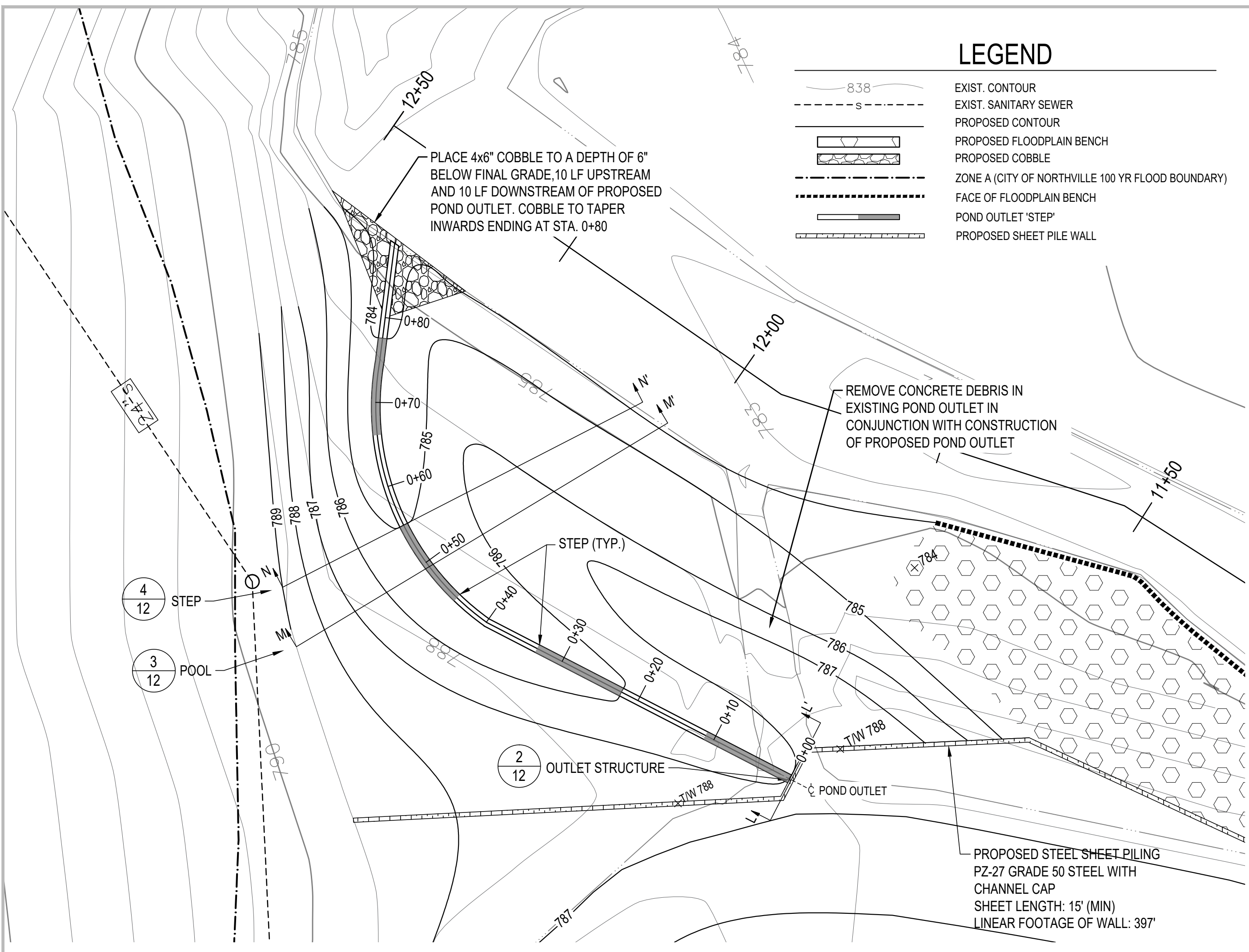
SHEET TITLE

**PROPOSED
 DETAILS - POND
 OUTLET**

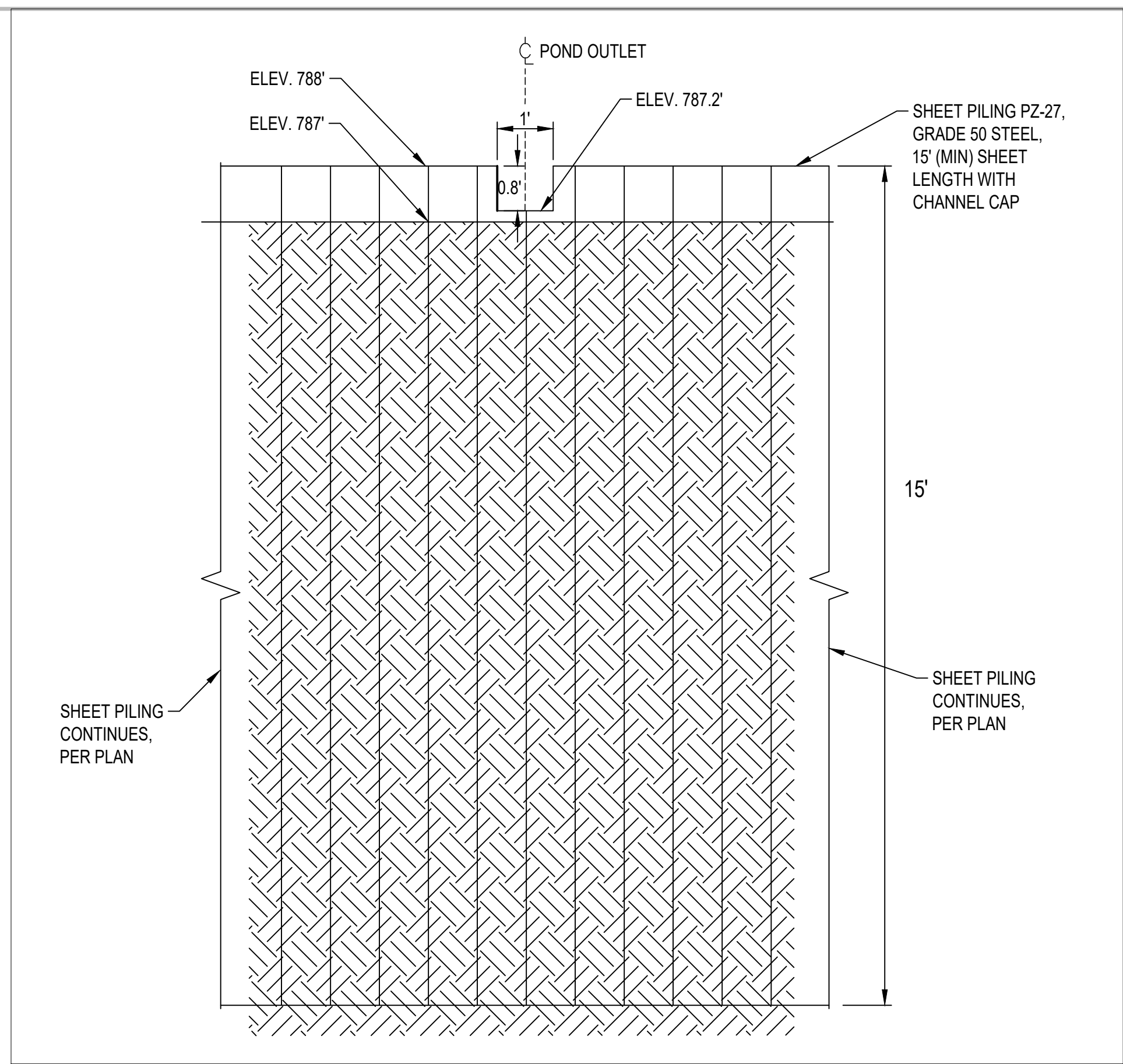
SCALE: VARIES

LEGEND

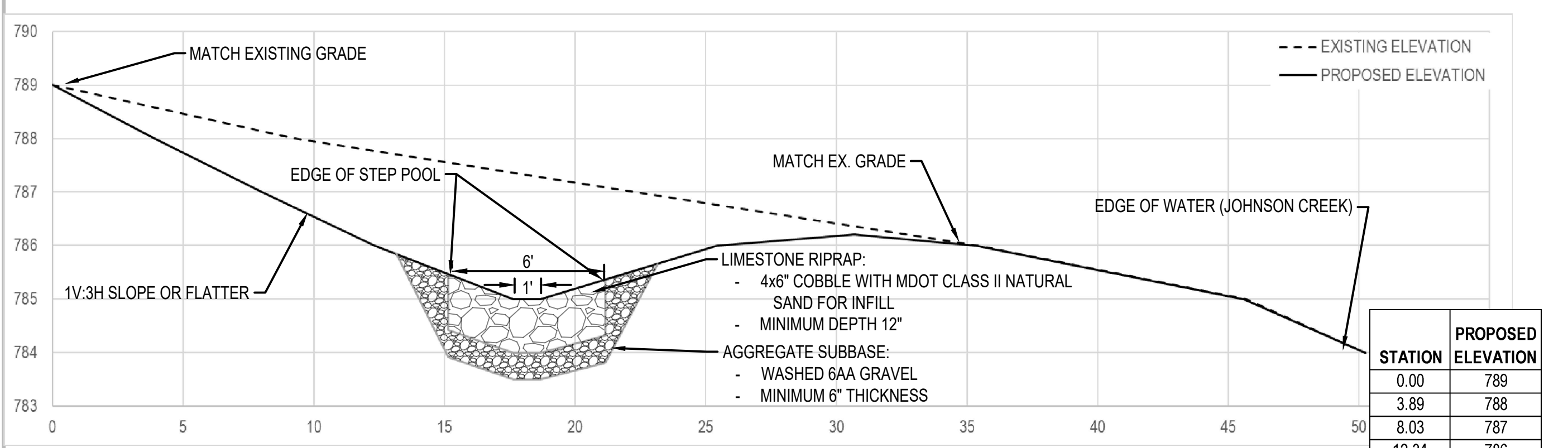
-  83.8 EXIST. CONTOUR
-  EXIST. SANITARY SEWER
-  PROPOSED CONTOUR
-  PROPOSED FLOODPLAIN BENCH
-  PROPOSED COBBLE
-  ZONE A (CITY OF NORTHVILLE 100 YR FLOOD BOUNDARY)
-  FACE OF FLOODPLAIN BENCH
-  POND OUTLET 'STEP'
-  PROPOSED SHEET PILE WALL



1
12 PROPOSED PLAN - STEP POOL
 SCALE : 1" = 10'



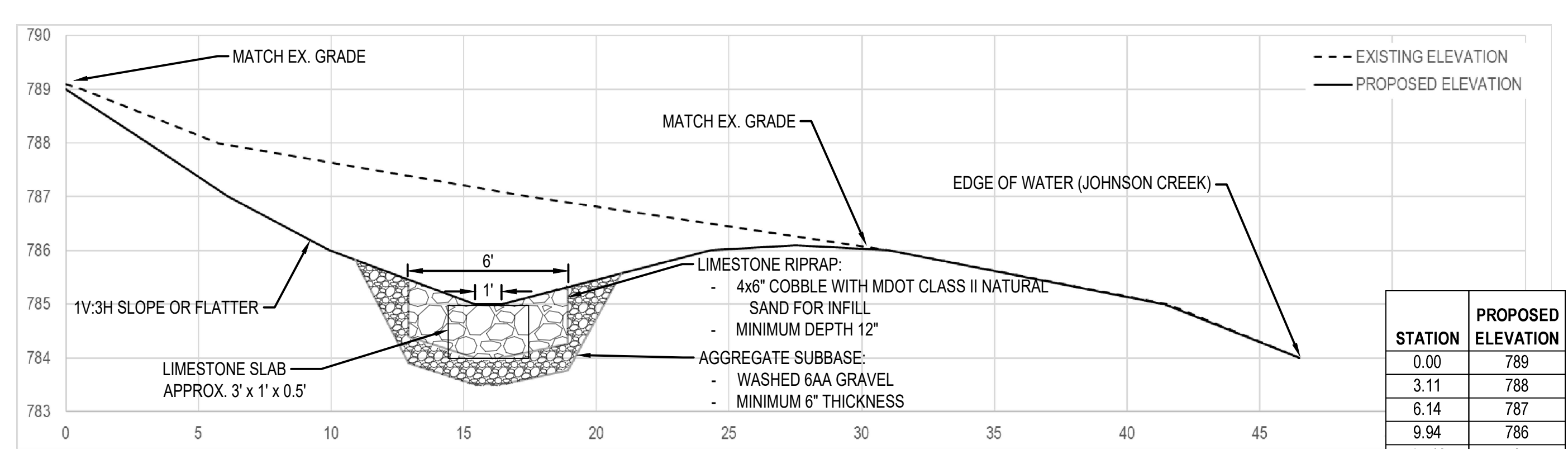
2
12 SECTION L-L' POND OUTLET STRUCTURE
 SCALE : 1" = 2'



3
12 SECTION M-M' POOL
 VERTICAL SCALE : 1" = 2', HORIZONTAL SCALE : 1" = 4'

STATION	PROPOSED ELEVATION
0.00	789
3.89	788
8.03	787
12.34	786
17.66	785
18.66	785
25.44	786
30.69	786.2
35.33	786
45.60	785
50.24	784

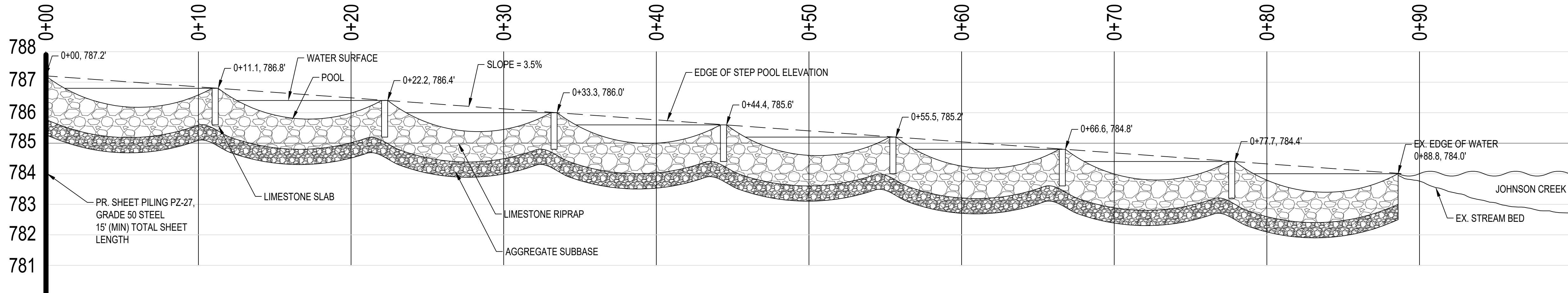
STATION	EXISTING ELEVATION
0.00	789
9.28	788
22.32	787
35.42	786
45.71	785
50.24	784



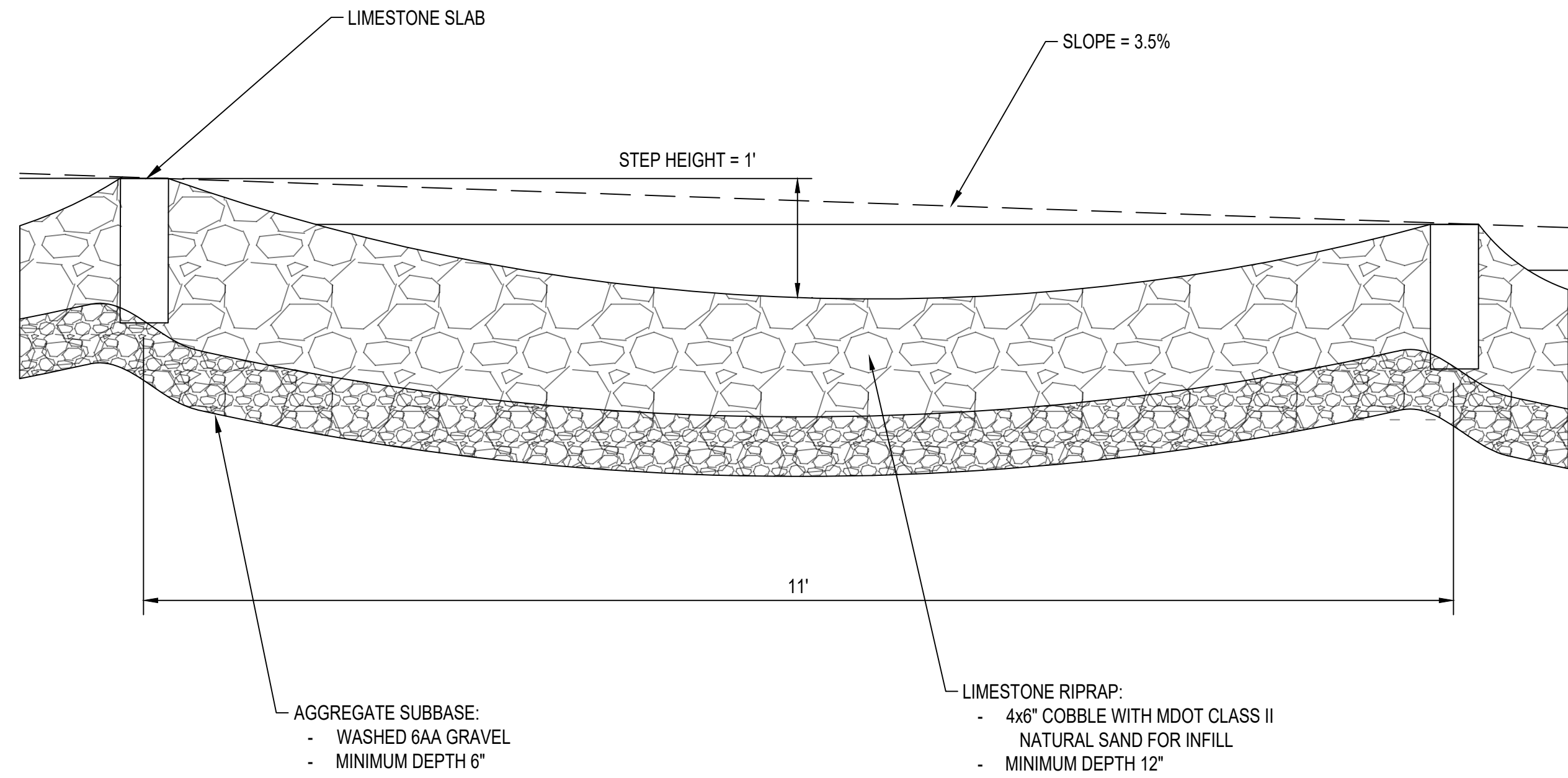
4
12 SECTION N-N' STEP
 VERTICAL SCALE : 1" = 2', HORIZONTAL SCALE : 1" = 4'

STATION	PROPOSED ELEVATION
0.00	789
3.11	788
6.14	787
9.94	786
15.42	785
16.42	785
24.31	786
27.50	786.1
31.00	786
41.40	785
46.50	784

STATION	EXISTING ELEVATION
0.00	789.1
0.60	789
5.76	788
17.50	787
31.00	786
41.55	785
46.50	784



1 STEP POOL PROFILE
 13 VERTICAL SCALE: 1" = 0.5'; HORIZONTAL SCALE: 1" = 4'



2 STEP POOL PROFILE DETAIL
 13 SCALE: 1" = 2'

**ROUGE RIVER AOC
 JOHNSON CREEK -
 FISH HATCHERY
 PARK HABITAT
 RESTORATION
 PROJECT**

**ALLIANCE OF ROUGE
 COMMUNITIES**

**NORTHVILLE,
 WAYNE COUNTY,
 MICHIGAN**

FOR BIDDING	3-2020
100% DESIGN DRAWINGS	2-2020
PERMIT APPLICATION	9-2019
PRE-APPLICATION MEETING	7-26-19
CLIENT MEETING	5-1-19
PRELIMINARY DESIGN	2-26-19

180611 ECT PROJECT NUMBER	
AAB DESIGNED BY	AAB CHECKED BY
SRD DRAWN BY	JOM APPROVED BY

SHEET TITLE
**PROPOSED
 PROFILE - POND
 OUTLET**

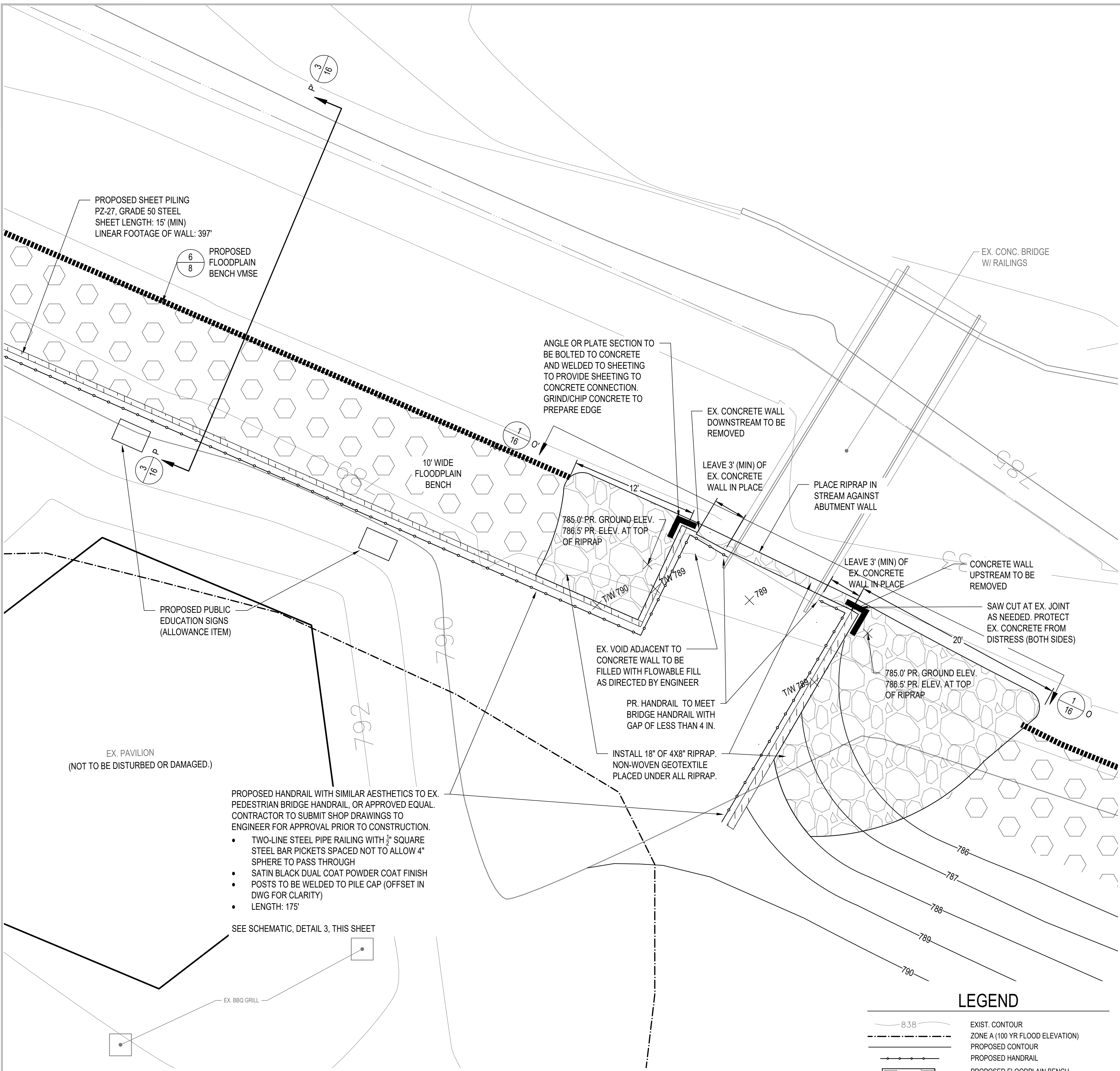
SCALE: VARIES

ROUGE RIVER AOC JOHNSON CREEK - FISH HATCHERY PARK HABITAT RESTORATION PROJECT

ALLIANCE OF ROUGE COMMUNITIES

NORTHVILLE, WAYNE COUNTY, MICHIGAN

SHEET PILE NOTIFICATION REQUIREMENT:
CONTRACTOR SHALL NOTIFY ENGINEER ONE WEEK PRIOR TO DRIVING SHEET PILE. CONTRACTOR SHALL PROVIDE ENGINEER WITH TENTATIVE DRIVING SCHEDULE AND CONFIRM SCHEDULE 48 HOURS PRIOR TO INSTALLATION OF SHEET PILES. CONTRACTOR SHALL PROVIDE ENGINEER WITH WEEKLY UPDATE ON DRIVING SCHEDULE UNTIL ALL SHEETING HAS BEEN INSTALLED.



LEGEND

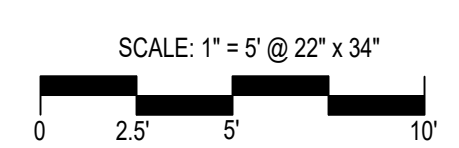
	EXIST. CONTOUR
	ZONE A (100 YR FLOOD ELEVATION)
	PROPOSED CONTOUR
	PROPOSED HANDRAIL
	PROPOSED FLOODPLAIN BENCH
	PROPOSED RIPRAP
	FACE OF FLOODPLAIN BENCH/ VMSE WALL
	PROPOSED SHEET PILE WALL

1 PROPOSED PLAN - PEDESTRIAN BRIDGE AREA
SCALE: 1" = 5'

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CLIENT MEETING	5-1-19
PRELIMINARY DESIGN	2-26-19

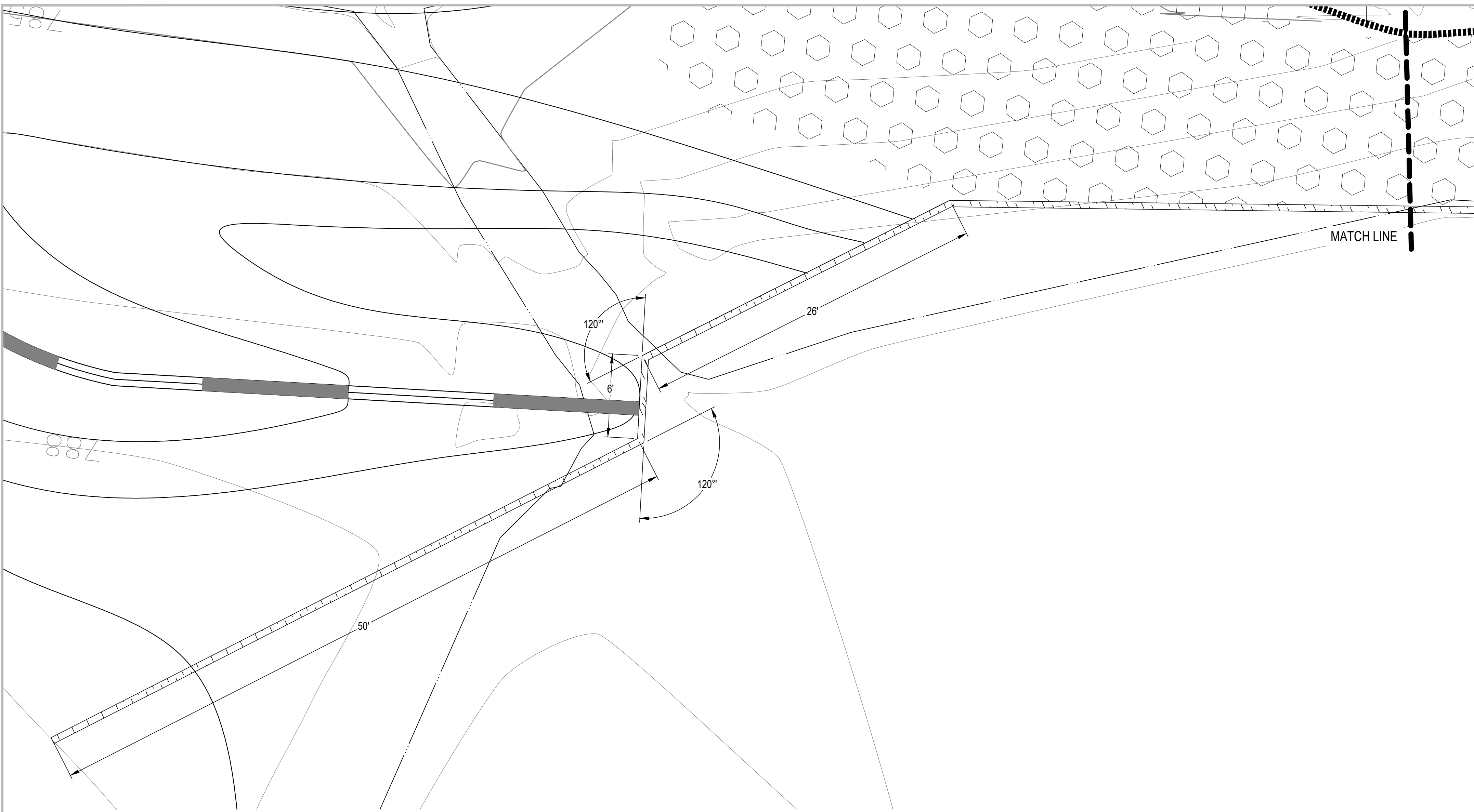
180611 ECT PROJECT NUMBER	
AAB DESIGNED BY	AAB CHECKED BY
SRD DRAWN BY	JOM APPROVED BY

SHEET TITLE
JOHNSON CREEK PEDESTRIAN BRIDGE



NORTH

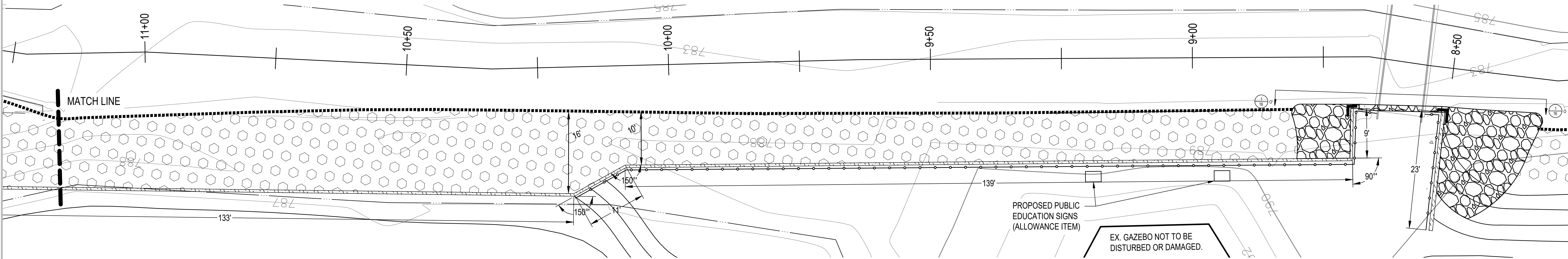
SHEET NUMBER
14



- LEGEND**
- 8.38 EXIST. CONTOUR
 - EXIST. EDGE OF WATER
 - PROPOSED CONTOUR
 - PROPOSED SHEET PILE WALL
 - FACE OF FLOODPLAIN BENCH
 - PROPOSED FLOODPLAIN BENCH
 - POND OUTLET 'STEP'

SHEET PILE NOTIFICATION REQUIREMENT:
 CONTRACTOR SHALL NOTIFY ENGINEER ONE WEEK PRIOR TO DRIVING SHEET PILE.
 CONTRACTOR SHALL PROVIDE ENGINEER WITH TENTATIVE DRIVING SCHEDULE AND
 CONFIRM SCHEDULE 48 HOURS PRIOR TO INSTALLATION OF SHEET PILES.
 CONTRACTOR SHALL PROVIDE ENGINEER WITH WEEKLY UPDATE ON DRIVING
 SCHEDULE UNTIL ALL SHEETING HAS BEEN INSTALLED.

1 SHEET PILING DETAIL A
 SCALE: 1" = 5'



- LEGEND**
- 8.38 EXIST. CONTOUR
 - EXIST. EDGE OF WATER
 - PROPOSED CONTOUR
 - PROPOSED SHEET PILE WALL
 - FACE OF FLOODPLAIN BENCH
 - PROPOSED FLOODPLAIN BENCH
 - PROPOSED RIPRAP

2 SHEET PILING DETAIL B
 SCALE: 1" = 10'

ECT Environmental Consulting & Technology, Inc.
 2200 Commonwealth Boulevard, Suite 300
 Ann Arbor, Michigan 48105
 Phone: 734.769.3004
 Fax: 734.769.31694

Alliance of Rouge Communities
 OURS TO PROTECT
 Working together, restoring the river

**ROUGE RIVER AOC
 JOHNSON CREEK -
 FISH HATCHERY
 PARK HABITAT
 RESTORATION
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**ALLIANCE OF ROUGE
 COMMUNITIES**

**NORTHVILLE,
 WAYNE COUNTY,
 MICHIGAN**

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180611
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SHEET TITLE

**SHEET PILE WALL
 DETAILS**

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

NORTH

SHEET NUMBER

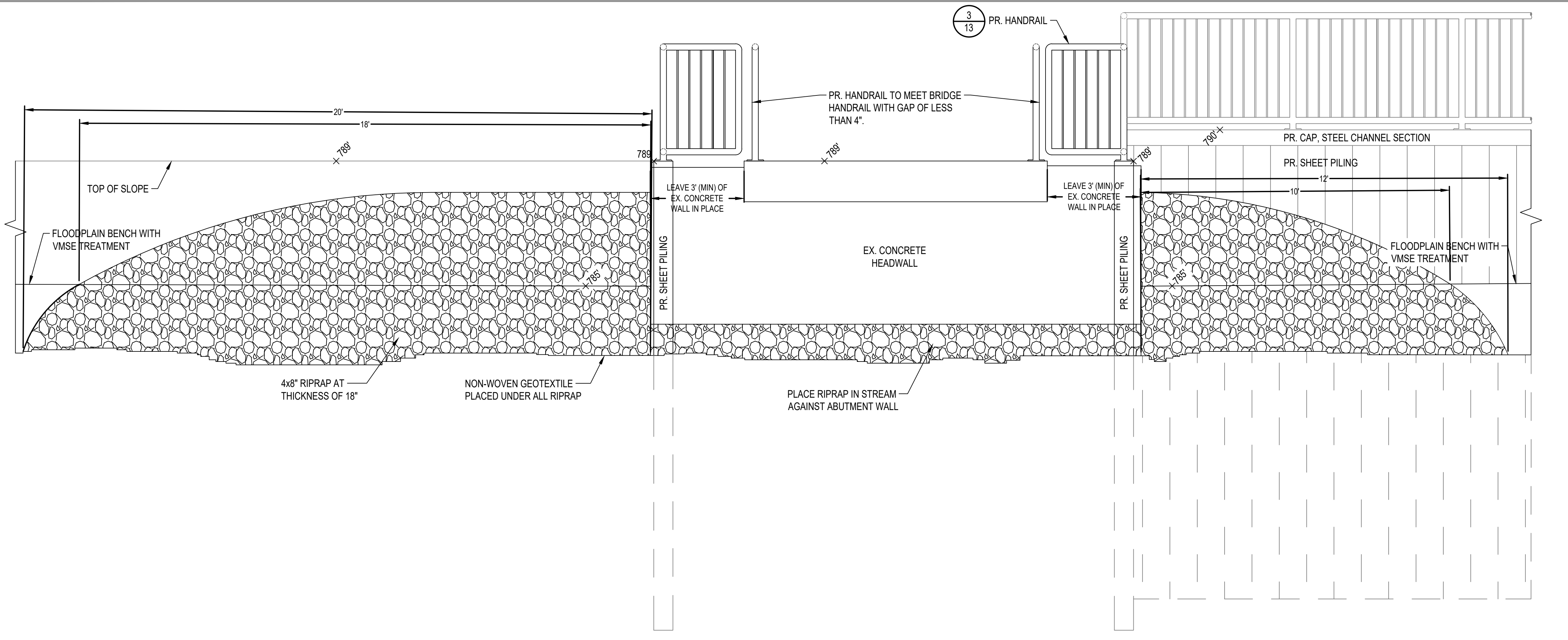
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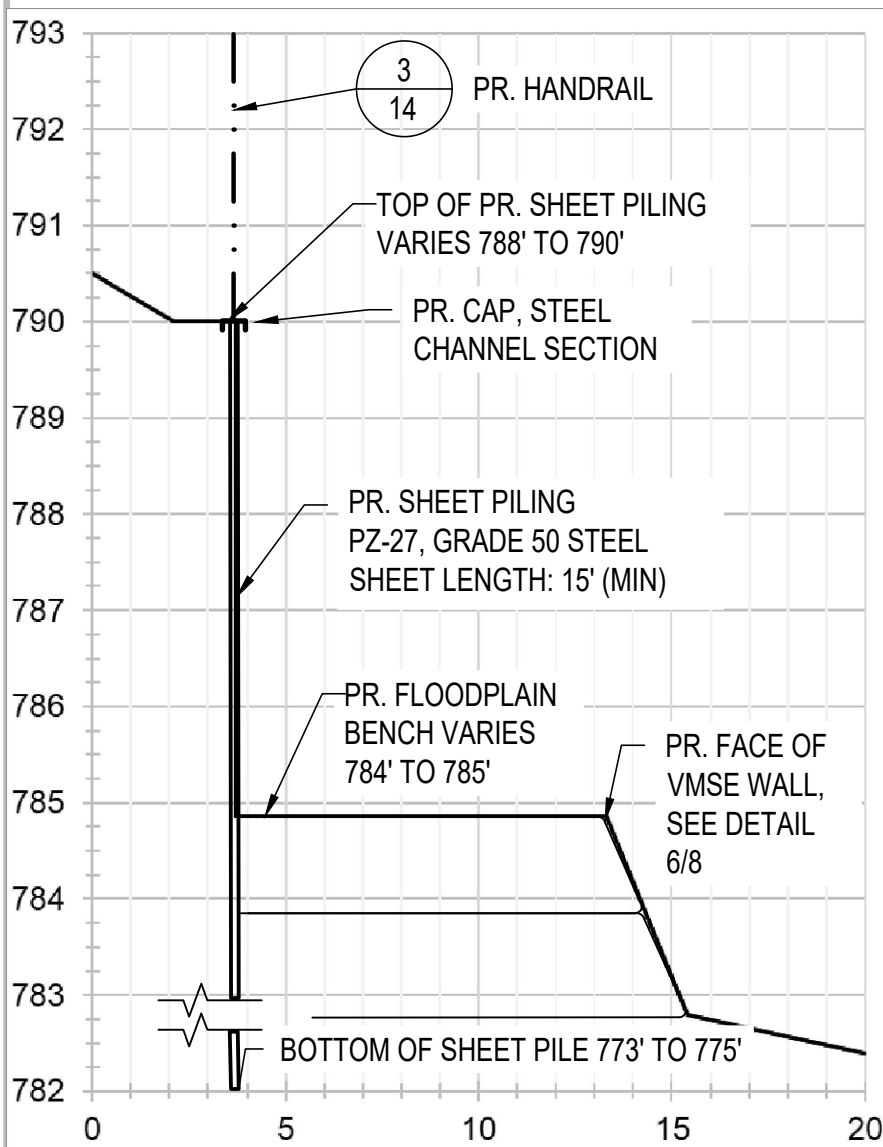
**ROUGE RIVER AOC
 JOHNSON CREEK -
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**ALLIANCE OF ROUGE
 COMMUNITIES**

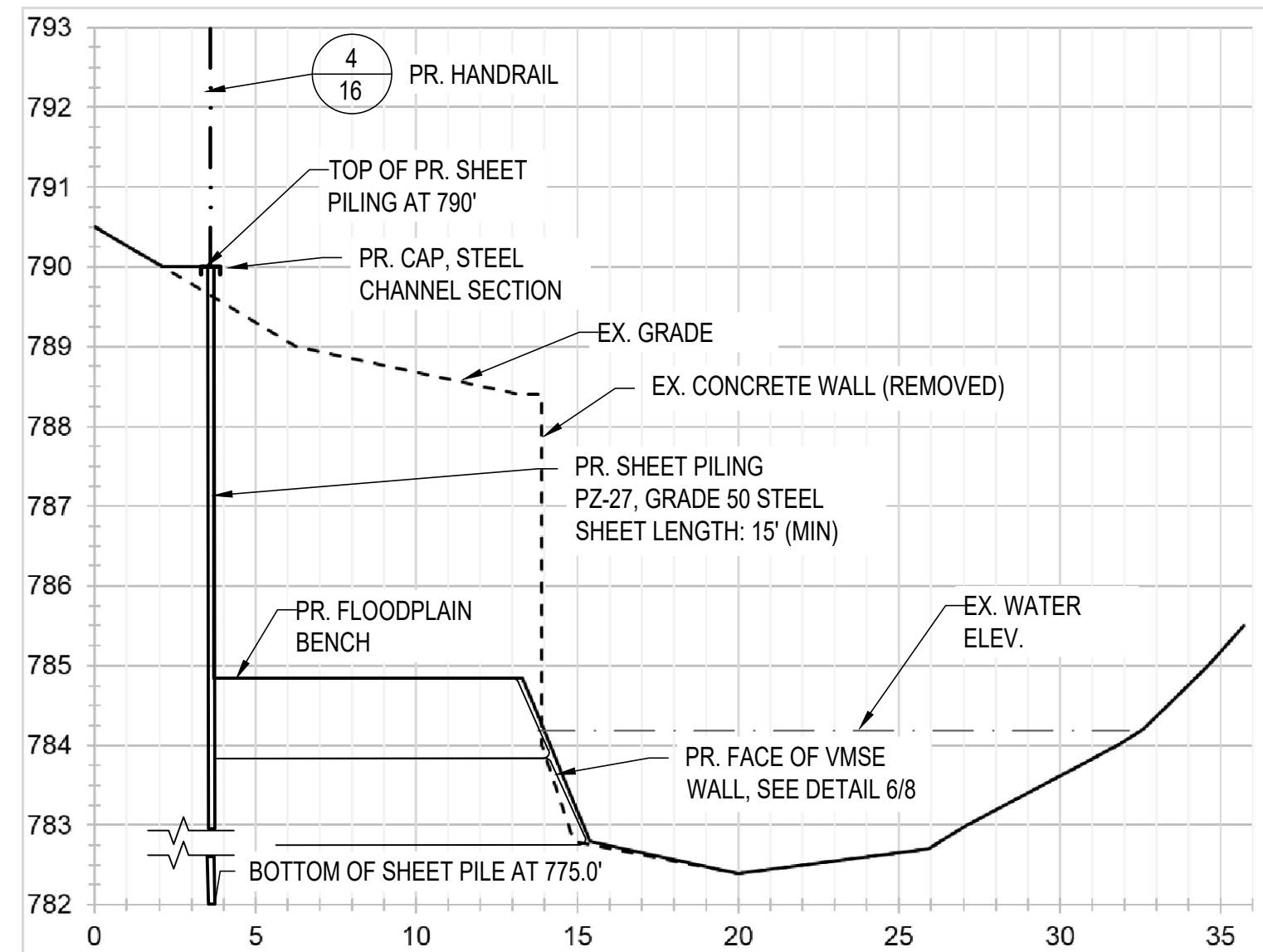
**NORTHVILLE,
 WAYNE COUNTY,
 MICHIGAN**



1 SECTION O-O'
 SCALE: 1" = 2'



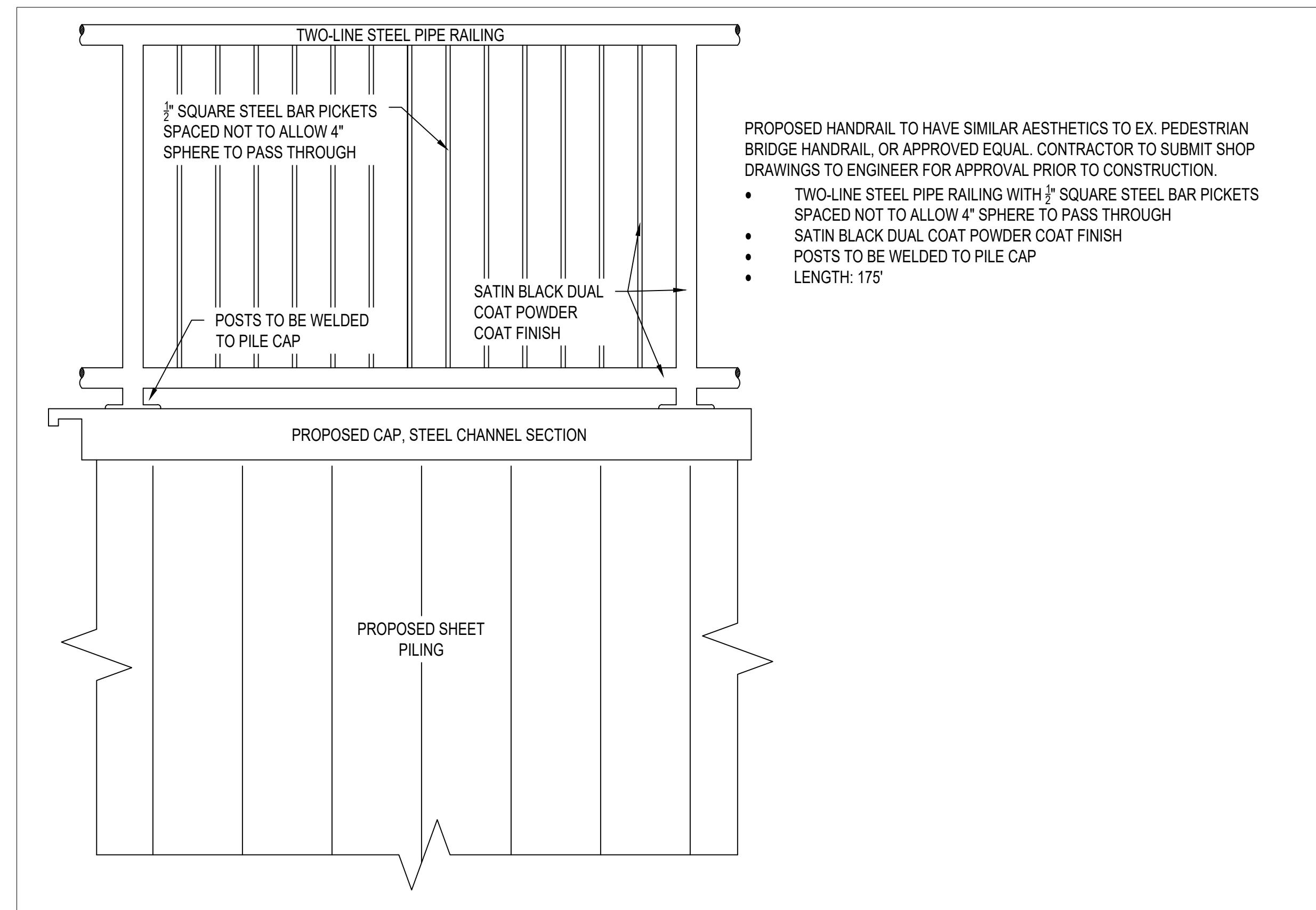
2 TYPICAL SHEET PILE SECTION
 SCALE - HORIZONTAL: 1" = 5' VERTICAL: 1" = 2'



3 CROSS SECTION P-P'
 SCALE - HORIZONTAL: 1" = 5' VERTICAL: 1" = 2'

LEGEND

- EXIST. GRADE
- PROPOSED GRADE
- EXIST. WATER ELEV.



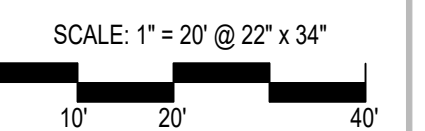
4 HANDRAIL - SCHEMATIC
 SCALE: 1" = 1'

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SHEET TITLE

**DETAILS -
 SHEET PILE WALL**



ROUGE RIVER AOC JOHNSON CREEK - FISH HATCHERY PARK HABITAT RESTORATION PROJECT

ALLIANCE OF ROUGE COMMUNITIES

NORTHVILLE, WAYNE COUNTY, MICHIGAN

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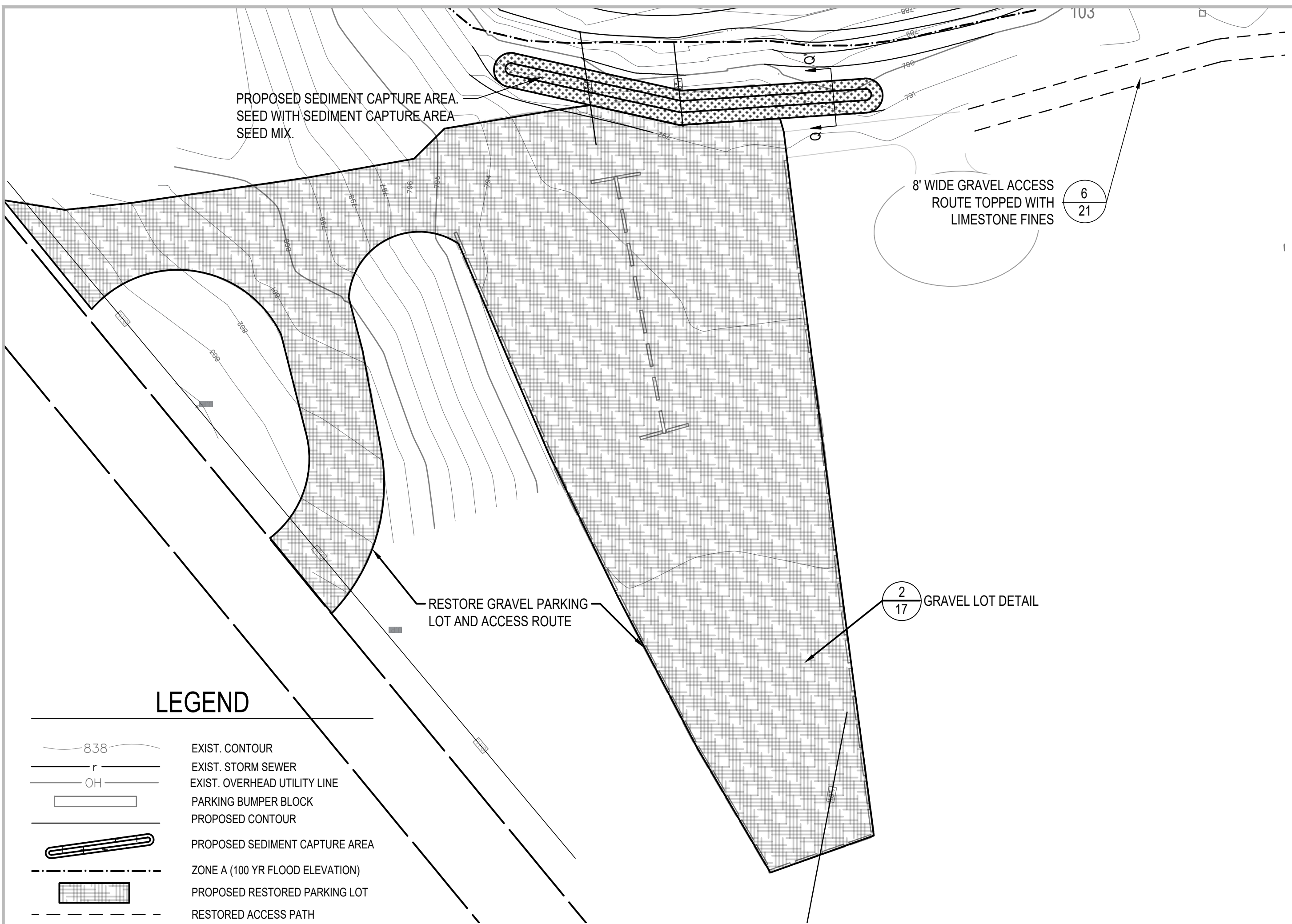
180611 ECT PROJECT NUMBER	
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SHEET TITLE

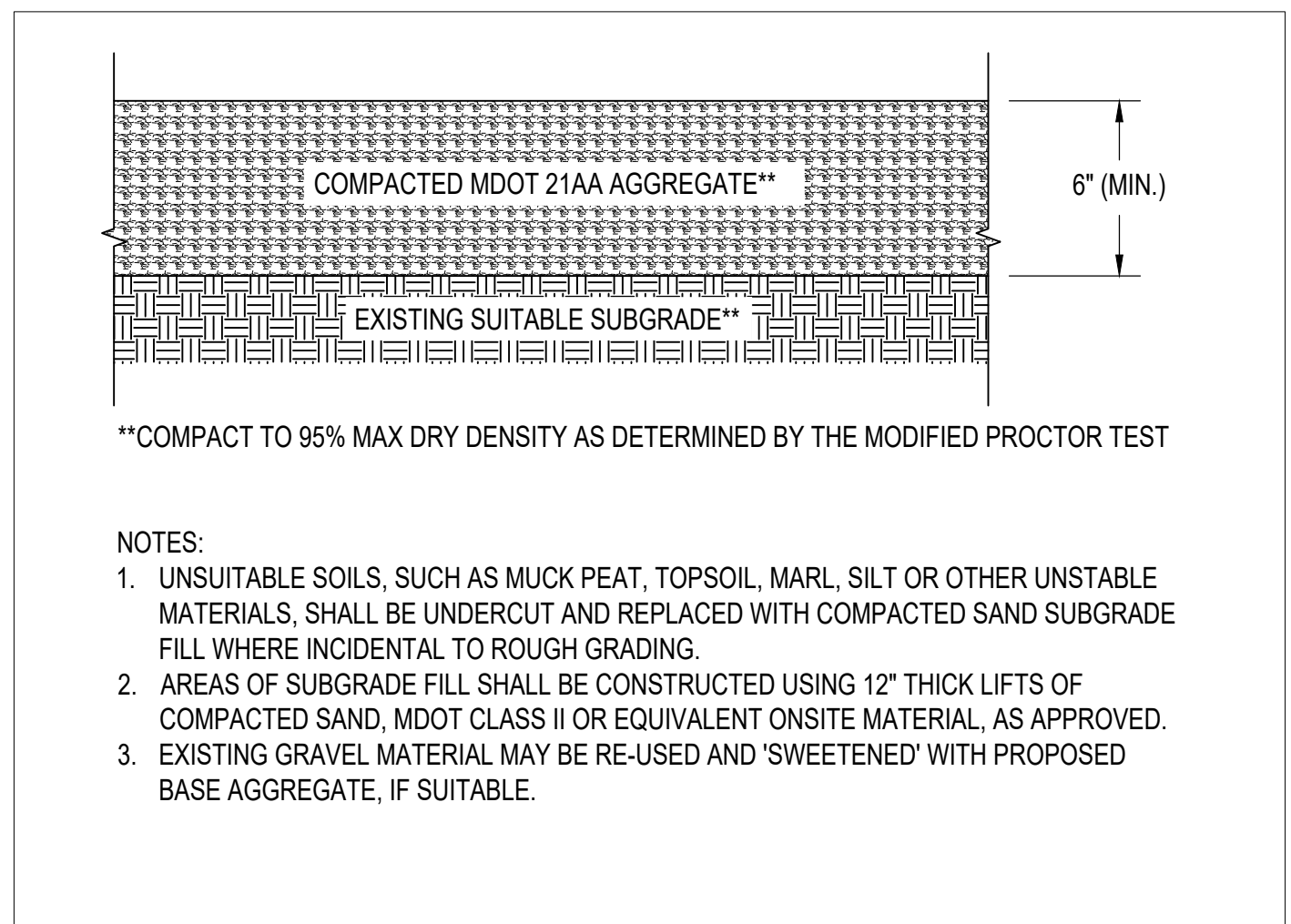
SEDIMENT CAPTURE AREA

SCALE: VARIES

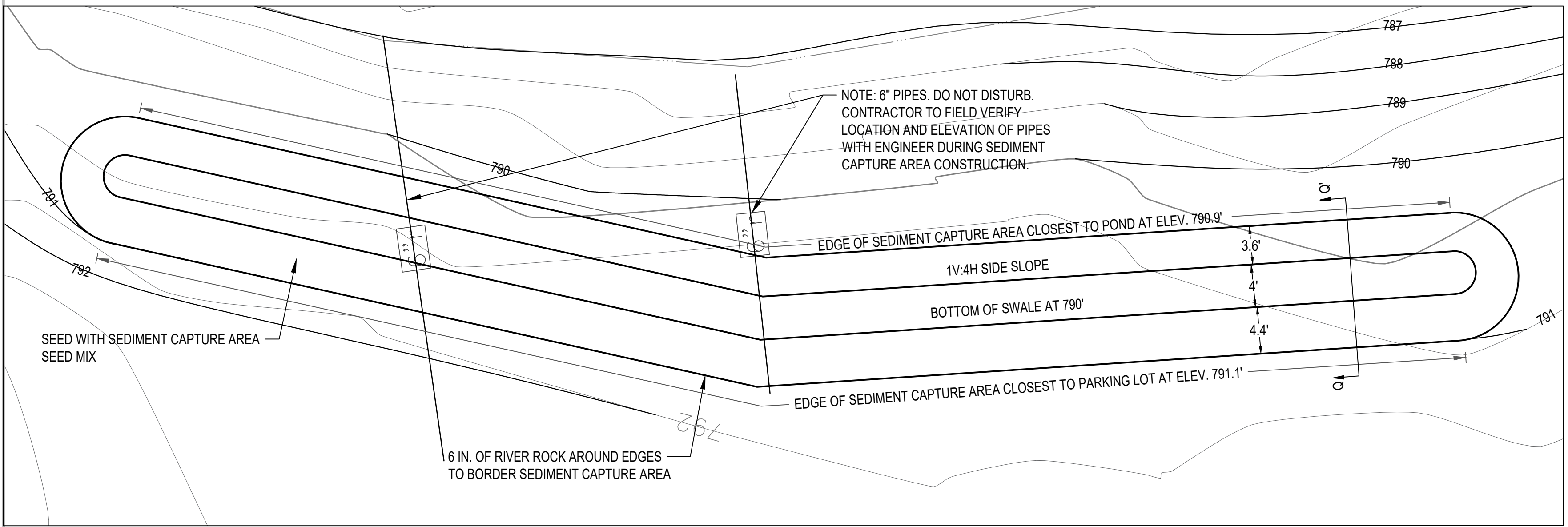
NORTH	SHEET NUMBER
	17



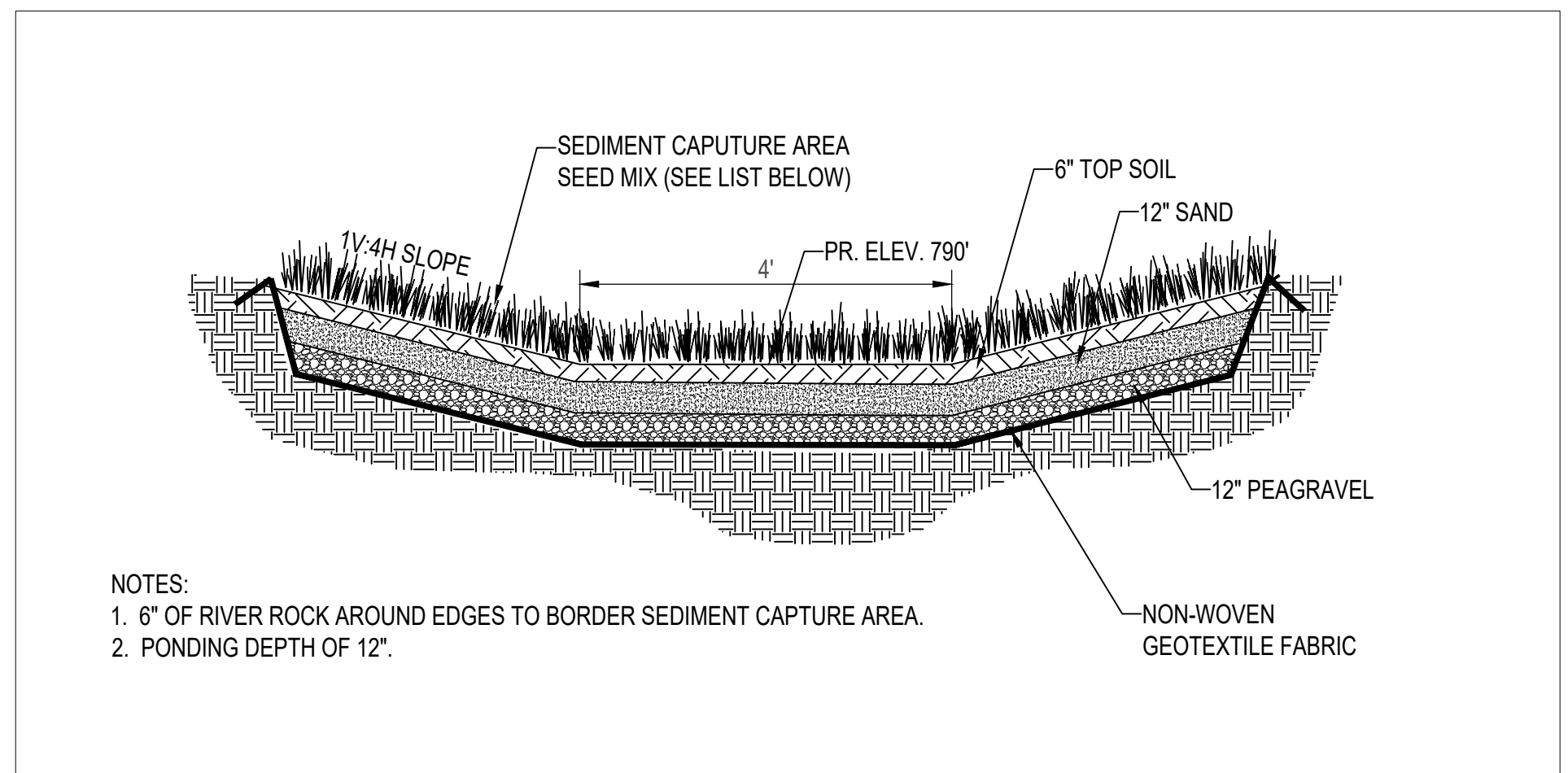
1
17 PROPOSED PLAN - SEDIMENT CAPTURE AREA
SCALE: 1" = 30'



2
17 GRAVEL LOT DETAIL
SCALE: NOT TO SCALE



3
17 SEDIMENT CAPTURE AREA - PLAN VIEW
SCALE: 1" = 8'



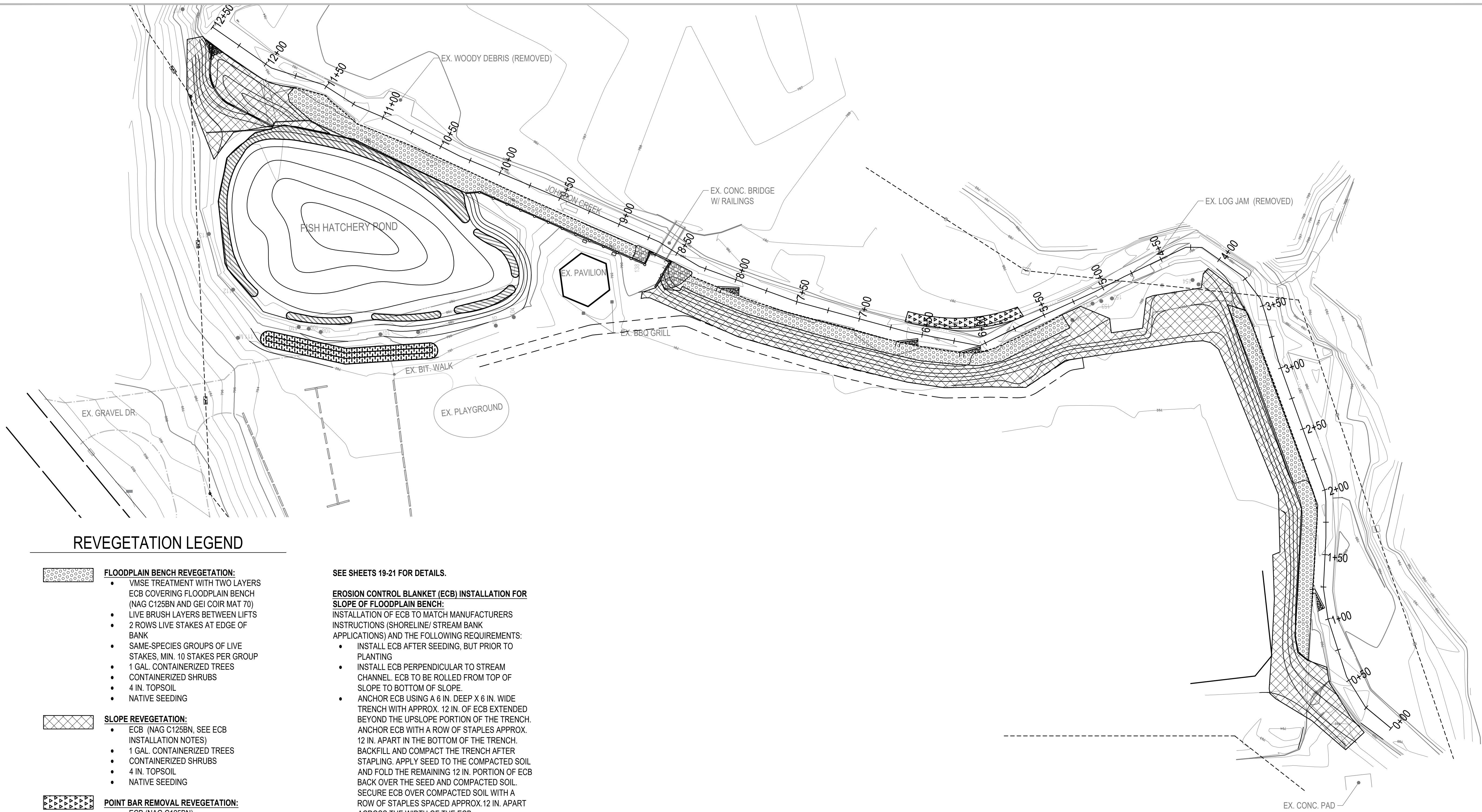
4
17 SECTION Q-Q' TYPICAL SEDIMENT CAPTURE AREA SECTION
SCALE: NOT TO SCALE

SEDIMENT CAPTURE AREA SEED MIX		
SCIENTIFIC NAME	COMMON NAME	OZ/AC
CAREX VULPINOIDEA	FOX SEDGE	25.00
ELYMUS CANADENSIS	CANADA WILD RYE	40.00
GLYCERIA STRIATA	FOWL MANNA GRASS	10.00
PANICUM VIRGATUM	SWITCH GRASS	12.00
SCHOENOPLECTUS ACUTUS	HARDSTEM BULRUSH	12.00
SCHOENOPLECTUS PUNGENS	THREE-SQUARE BULRUSH	12.00
TOTAL		111.00
AVENA SATIVA	SEED OATS	320.0

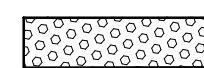
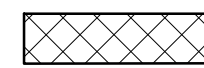
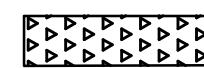


**ROUGE RIVER AOC
 JOHNSON CREEK -
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 PARK HABITAT
 RESTORATION
 PROJECT**

**ALLIANCE OF ROUGE
 COMMUNITIES**

**NORTHVILLE,
 WAYNE COUNTY,
 MICHIGAN**



REVEGETATION LEGEND

-  **FLOODPLAIN BENCH REVEGETATION:**
 - VMSE TREATMENT WITH TWO LAYERS ECB COVERING FLOODPLAIN BENCH (NAG C125BN AND GEI COIR MAT 70)
 - LIVE BRUSH LAYERS BETWEEN LIFTS
 - 2 ROWS LIVE STAKES AT EDGE OF BANK
 - SAME-SPECIES GROUPS OF LIVE STAKES, MIN. 10 STAKES PER GROUP
 - 1 GAL. CONTAINERIZED TREES
 - CONTAINERIZED SHRUBS
 - 4 IN. TOPSOIL
 - NATIVE SEEDING
-  **SLOPE REVEGETATION:**
 - ECB (NAG C125BN, SEE ECB INSTALLATION NOTES)
 - 1 GAL. CONTAINERIZED TREES
 - CONTAINERIZED SHRUBS
 - 4 IN. TOPSOIL
 - NATIVE SEEDING
-  **POINT BAR REMOVAL REVEGETATION:**
 - ECB (NAG C125BN)
 - LIVE STAKES
 - 4 IN. TOPSOIL
 - NATIVE SEEDING
-  **SEDIMENT CAPTURE AREA REVEGETATION:**
 - ECB (NAG S75BN)
 - 6 IN. TOPSOIL
 - NATIVE SEEDING
-  **POND REVEGETATION:**
 - EMERGENT PLANTINGS
- ALL OTHER DISTURBED AREA:**
 - ECB (NAG S75BN), HYDROSEEDING, OR BLOWN AND CRIMPED STRAW
 - 4 IN. TOPSOIL
 - TURF SEEDING

SEE SHEETS 19-21 FOR DETAILS.

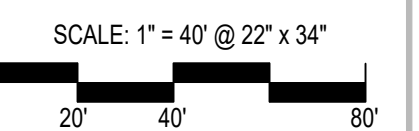
- EROSION CONTROL BLANKET (ECB) INSTALLATION FOR SLOPE OF FLOODPLAIN BENCH:**
 INSTALLATION OF ECB TO MATCH MANUFACTURERS INSTRUCTIONS (SHORELINE/ STREAM BANK APPLICATIONS) AND THE FOLLOWING REQUIREMENTS:
- INSTALL ECB AFTER SEEDING, BUT PRIOR TO PLANTING
 - INSTALL ECB PERPENDICULAR TO STREAM CHANNEL. 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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ECT PROJECT NUMBER	
AAB	AAB
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SRD	JOM
DRAWN BY	APPROVED BY

SHEET TITLE

**REVEGETATION
 PLAN - OVERVIEW**



ROUGE RIVER AOC JOHNSON CREEK - FISH HATCHERY PARK HABITAT RESTORATION PROJECT

ALLIANCE OF ROUGE COMMUNITIES

NORTHVILLE, WAYNE COUNTY, MICHIGAN

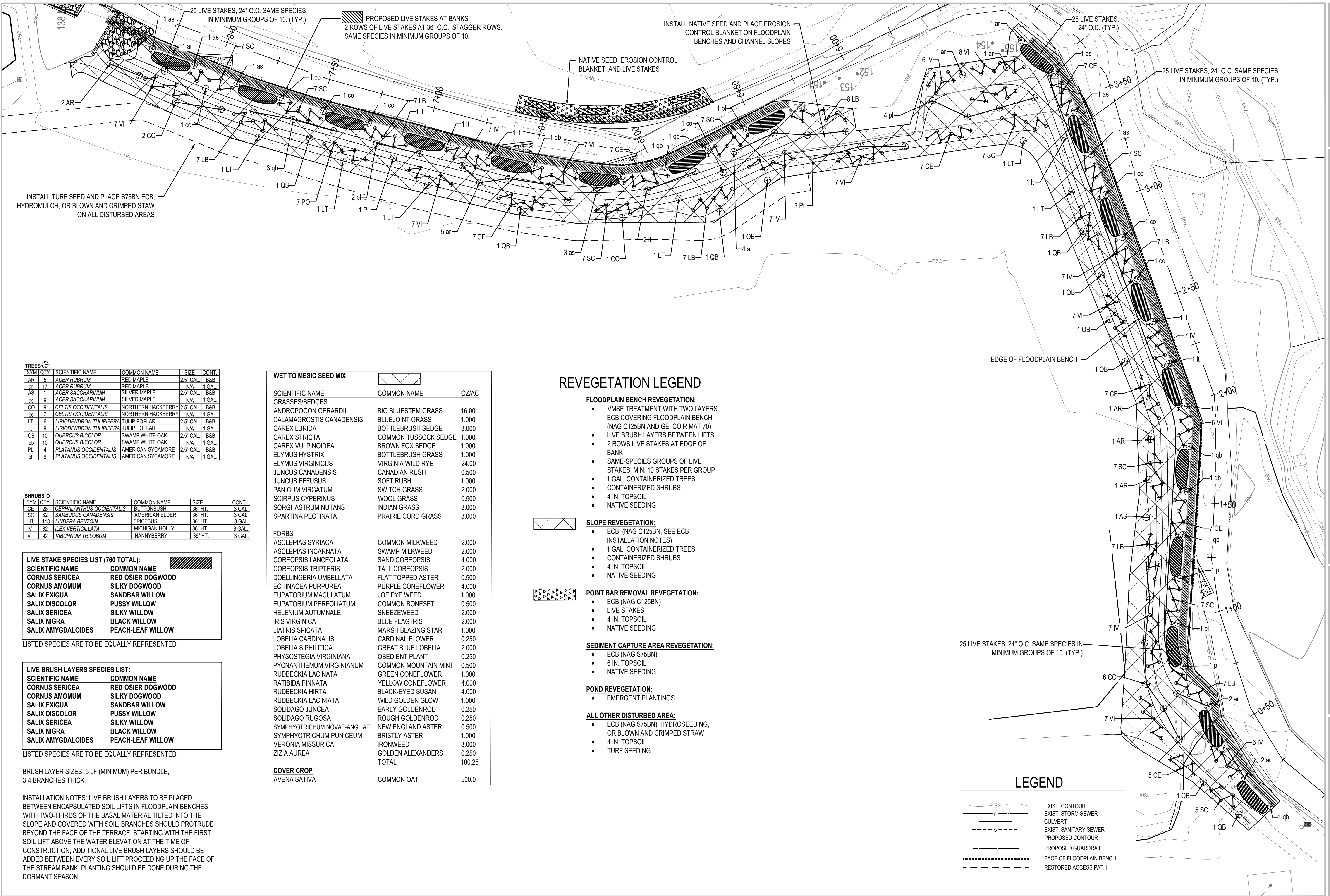
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SHEET TITLE
REVEGETATION PLAN - JOHNSON CREEK

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

NORTH
 SHEET NUMBER
19



TREES

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.
AR	5	ACER RUBRUM	RED MAPLE	2.5" CAL	B&B
ar	17	ACER RUBRUM	RED MAPLE	N/A	1 GAL
AS	1	ACER SACCHARINUM	SILVER MAPLE	2.5" CAL	B&B
as	9	ACER SACCHARINUM	SILVER MAPLE	N/A	1 GAL
CO	9	CELTIS OCCIDENTALIS	NORTHERN HACKBERRY	2.5" CAL	B&B
co	7	CELTIS OCCIDENTALIS	NORTHERN HACKBERRY	N/A	1 GAL
LT	6	LIRIODENDRON TULIPIFERA	TULIP POPLAR	2.5" CAL	B&B
lt	9	LIRIODENDRON TULIPIFERA	TULIP POPLAR	N/A	1 GAL
QB	10	QUERCUS BICOLOR	SWAMP WHITE OAK	2.5" CAL	B&B
qb	10	QUERCUS BICOLOR	SWAMP WHITE OAK	N/A	1 GAL
PL	4	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	2.5" CAL	B&B
pl	9	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	N/A	1 GAL

SHRUBS

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.
CE	28	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	36" HT.	3 GAL
SC	32	SAMBUCUS CANADENSIS	AMERICAN ELDER	36" HT.	3 GAL
LB	118	LINDERA BENZOIN	SPICEBUSH	36" HT.	3 GAL
IV	32	ILEX VERTICILLATA	MICHIGAN HOLLY	36" HT.	3 GAL
VI	92	VIBURNUM TRILOBUM	NANNYBERRY	36" HT.	3 GAL

LIVE STAKE SPECIES LIST (760 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.

LIVE BRUSH LAYERS SPECIES LIST:

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.

BRUSH LAYER SIZES: 5 LF (MINIMUM) PER BUNDLE, 3-4 BRANCHES THICK.

INSTALLATION NOTES: LIVE BRUSH LAYERS TO BE PLACED BETWEEN ENCAPSULATED SOIL LIFTS IN FLOODPLAIN BENCHES WITH TWO-THIRDS OF THE BASAL MATERIAL TILTED INTO THE SLOPE AND COVERED WITH SOIL. BRANCHES SHOULD PROTRUDE BEYOND THE FACE OF THE TERRACE. STARTING WITH THE FIRST SOIL LIFT ABOVE THE WATER ELEVATION AT THE TIME OF CONSTRUCTION, ADDITIONAL LIVE BRUSH LAYERS SHOULD BE ADDED BETWEEN EVERY SOIL LIFT PROCEEDING UP THE FACE OF THE STREAM BANK. PLANTING SHOULD BE DONE DURING THE DORMANT SEASON.

WET TO MESIC SEED MIX

SCIENTIFIC NAME	COMMON NAME	OZ/AC
GRASSES/SEDGES		
ANDROPOGON GERARDII	BIG BLUESTEM GRASS	16.00
CALAMAGROSTIS CANADENSIS	BLUEJOINT GRASS	1.000
CAREX LURIDA	BOTTLEBRUSH SEDGE	3.000
CAREX STRICTA	COMMON TUSsock SEDGE	1.000
CAREX VULPINOIDEA	BROWN FOX SEDGE	1.000
ELYMUS HYSTRIX	BOTTLEBRUSH GRASS	1.000
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	24.00
JUNCUS CANADENSIS	CANADIAN RUSH	0.500
JUNCUS EFFUSUS	SOFT RUSH	1.000
PANICUM VIRGATUM	SWITCH GRASS	2.000
SCIRPUS CYPERINUS	WOOL GRASS	0.500
SORGHASTRUM NUTANS	INDIAN GRASS	8.000
SPARTINA PECTINATA	PRAIRIE CORD GRASS	3.000
FORBS		
ASCLEPIAS SYRIACA	COMMON MILKWEED	2.000
ASCLEPIAS INCARNATA	SWAMP MILKWEED	2.000
COREOPSIS LANCEOLATA	SAND COREOPSIS	4.000
COREOPSIS TRIPTERIS	TALL COREOPSIS	2.000
DOELLINGERIA UMBELLATA	FLAT TOPPED ASTER	0.500
ECHINACEA PURPUREA	PURPLE CONEFLOWER	4.000
EUPATORIUM MACULATUM	JOE PYE WEED	1.000
EUPATORIUM PERFOLIATUM	COMMON BONESET	0.500
HELENIUM AUTUMNALE	SNEEZEWEED	2.000
IRIS VIRGINICA	BLUE FLAG IRIS	2.000
LIATRIS SPICATA	MARSH BLAZING STAR	1.000
LOBELIA CARDINALIS	CARDINAL FLOWER	0.250
LOBELIA SIPHILITICA	GREAT BLUE LOBELIA	2.000
PHYSOSTEGIA VIRGINIANA	OBEDIENT PLANT	0.250
PYCNANTHEMUM VIRGINIANUM	COMMON MOUNTAIN MINT	0.500
RUDBECKIA LACINATA	GREEN CONEFLOWER	1.000
RATIBIDA PINNATA	YELLOW CONEFLOWER	4.000
RUDBECKIA HIRTA	BLACK-EYED SUSAN	4.000
RUDBECKIA LACINIATA	WILD GOLDEN GLOW	1.000
SOLIDAGO JUNCEA	EARLY GOLDENROD	0.250
SOLIDAGO RUGOSA	ROUGH GOLDENROD	0.250
SYMPHYOTRICHUM NOVAE-ANGLIAE	NEW ENGLAND ASTER	0.500
SYMPHYOTRICHUM PUNICEUM	BRISTLY ASTER	1.000
VERONIA MISSURICA	IRONWEED	3.000
ZIZIA AUREA	GOLDEN ALEXANDERS	0.250
	TOTAL	100.25
COVER CROP		
AVENA SATIVA	COMMON OAT	500.0

REVEGETATION LEGEND

- FLOODPLAIN BENCH REVEGETATION:**
- VMSE TREATMENT WITH TWO LAYERS ECB COVERING FLOODPLAIN BENCH (NAG C125BN AND GEI COIR MAT 70)
 - LIVE BRUSH LAYERS BETWEEN LIFTS
 - 2 ROWS LIVE STAKES AT EDGE OF BANK
 - SAME-SPECIES GROUPS OF LIVE STAKES, MIN. 10 STAKES PER GROUP
 - 1 GAL. CONTAINERIZED TREES
 - CONTAINERIZED SHRUBS
 - 4 IN. TOPSOIL
 - NATIVE SEEDING
- SLOPE REVEGETATION:**
- ECB (NAG C125BN, SEE ECB INSTALLATION NOTES)
 - 1 GAL. CONTAINERIZED TREES
 - CONTAINERIZED SHRUBS
 - 4 IN. TOPSOIL
 - NATIVE SEEDING
- POINT BAR REMOVAL REVEGETATION:**
- ECB (NAG C125BN)
 - LIVE STAKES
 - 4 IN. TOPSOIL
 - NATIVE SEEDING
- SEDIMENT CAPTURE AREA REVEGETATION:**
- ECB (NAG S75BN)
 - 6 IN. TOPSOIL
 - NATIVE SEEDING
- POND REVEGETATION:**
- EMERGENT PLANTINGS
- ALL OTHER DISTURBED AREA:**
- ECB (NAG S75BN), HYDROSEEDING, OR BLOWN AND CRIMPED STRAW
 - 4 IN. TOPSOIL
 - TURF SEEDING

LEGEND

- EXIST. CONTOUR
- EXIST. STORM SEWER
- CULVERT
- EXIST. SANITARY SEWER
- PROPOSED CONTOUR
- PROPOSED GUARDRAIL
- FACE OF FLOODPLAIN BENCH
- RESTORED ACCESS PATH



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FISH HATCHERY
PARK HABITAT
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**ALLIANCE OF ROUGE
COMMUNITIES**

**NORTHVILLE,
WAYNE COUNTY,
MICHIGAN**

EMERGENT PLANT LIST

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SPACING	SIZE	PLANTING DEPTH
AC	168	ACORUS CALAMUS	SWEET FLAG	18" O.C.	BARE ROOT	7"-6" BELOW WATER
NA	168	NUPHAR ADVENA	YELLOW POND LILY	18" O.C.	BARE ROOT	3"-6" BELOW WATER
NO	168	NYMPHAEA ODORATA	WHITE WATER LILY	18" O.C.	BARE ROOT	7"-6" BELOW WATER
PC	168	PONTEDERIA CORDATA	PICKEREL WEED	18" O.C.	PLUG/BARE ROOT	3"-6" BELOW WATER
PI	168	PELTANDRA VIRGINICA	ARROW ARUM	18" O.C.	BARE ROOT	7"-6" BELOW WATER
SA	168	SCHOENOPLECTUS ACUTUS	HARD-STEMMED BULRUSH	18" O.C.	PLUG/BARE ROOT	7"-6" BELOW WATER
SL	168	SAGITTARIA LATIFOLIA	COMMON ARROWHEAD	18" O.C.	PLUG/BARE ROOT	7"-6" BELOW WATER
BF	168	BOLBOSCHOENUS FLUVIATILIS	RIVER BULRUSH	18" O.C.	PLUG/BARE ROOT	7"-6" BELOW WATER
ST	168	SCHOENOPLECTUS TABERNAEMONTANI	GREAT BULRUSH	18" O.C.	PLUG/BARE ROOT	7"-6" BELOW WATER
SP	168	SPARGANIUM AMERICANUM	AM. BUR REED	18" O.C.	PLUG/BARE ROOT	7"-6" BELOW WATER

TREES

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.
ar	2	ACER RUBRUM	RED MAPLE	N/A	1 GAL.
as	2	ACER SACCHARINUM	SILVER MAPLE	N/A	1 GAL.
co	1	CELTIS OCCIDENTALIS	NORTHERN HACKBERRY	N/A	1 GAL.
il	2	LIRIODENDRON TULPIFERA	TULIP POPLAR	N/A	1 GAL.
qb	2	QUERCUS BICOLOR	SWAMP WHITE OAK	N/A	1 GAL.
pl	1	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	N/A	1 GAL.

SHRUBS

SYM	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.
CE	10	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	36" HT.	3 GAL.
SC	5	SAMBUCUS CANADENSIS	AMERICAN ELDER	36" HT.	3 GAL.
LB	5	LINDERA BENZOIN	SPICEBUSH	36" HT.	3 GAL.
IV	5	ILEX VERTICILLATA	MICHIGAN HOLLY	36" HT.	3 GAL.
VI	5	VIBURNUM TRILOBUM	NANNYBERRY	36" HT.	3 GAL.

LIVE STAKE SPECIES LIST (280 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.

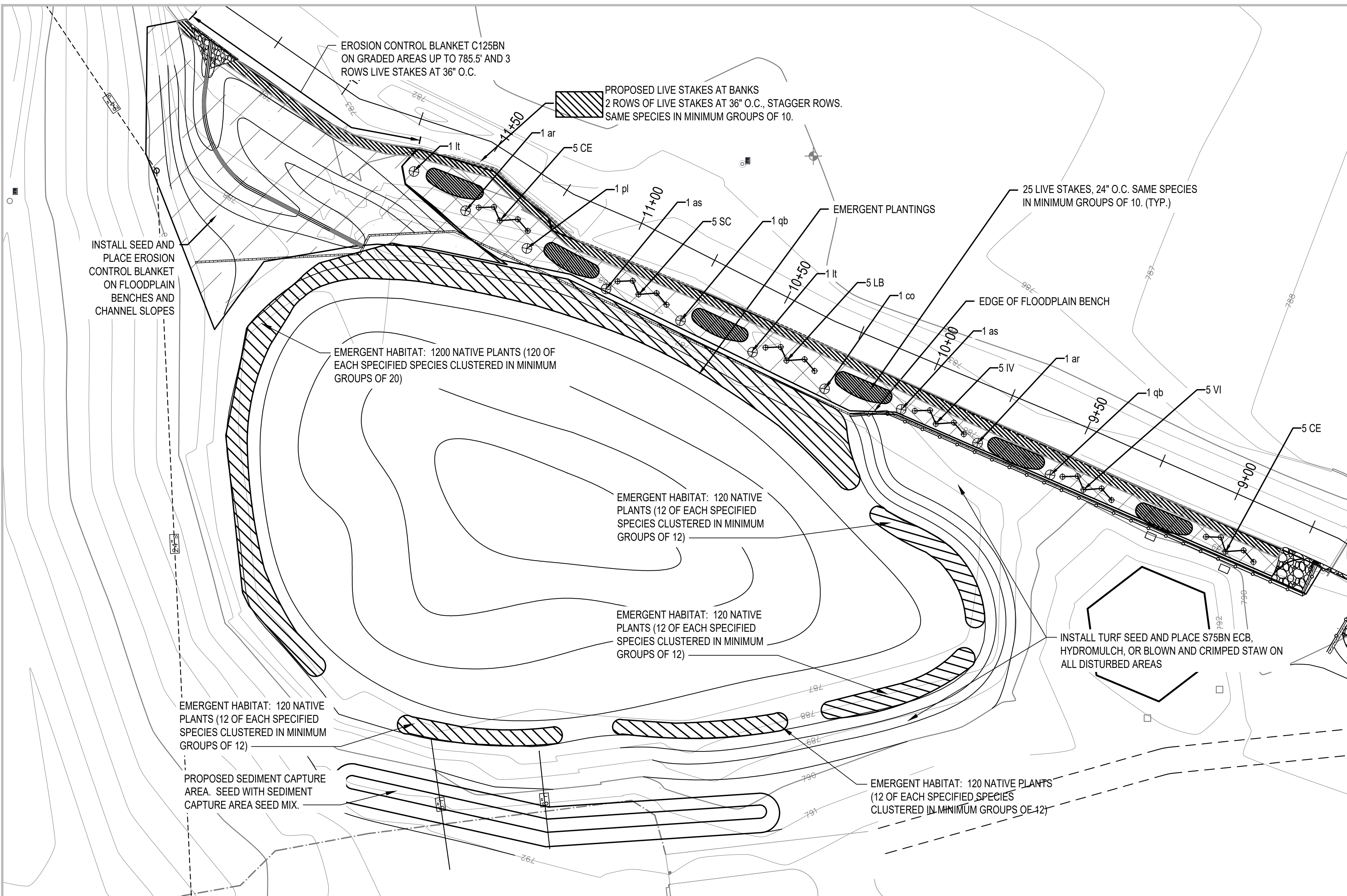
LIVE BRUSH LAYERS SPECIES LIST:

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.

BRUSH LAYER SIZES: 5 LF (MINIMUM) PER BUNDLE,
3-4 BRANCHES THICK.

INSTALLATION NOTES: LIVE BRUSH LAYERS TO BE PLACED BETWEEN ENCAPSULATED SOIL LIFTS IN FLOODPLAIN BENCHES WITH TWO-THIRDS OF THE BASAL MATERIAL TILTED INTO THE SLOPE AND COVERED WITH SOIL. BRANCHES SHOULD PROTRUDE BEYOND THE FACE OF THE TERRACE. STARTING WITH THE FIRST SOIL LIFT ABOVE THE WATER ELEVATION AT THE TIME OF CONSTRUCTION, ADDITIONAL LIVE BRUSH LAYERS SHOULD BE ADDED BETWEEN EVERY SOIL LIFT PROCEEDING UP THE FACE OF THE STREAM BANK. PLANTING SHOULD BE DONE DURING THE DORMANT SEASON.



1 REVEGETATION AT POND - PLAN VIEW
SCALE: 1" = 20'

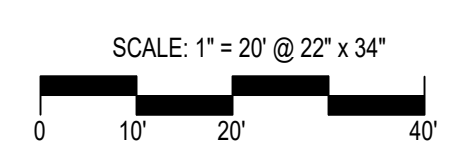
LEGEND

838	EXIST. CONTOUR
r	EXIST. STORM SEWER CULVERT
s	EXIST. SANITARY SEWER
—	FENCE
—	GUARDRAIL
o F	FOUND IRON PIPE
o F	FOUND MONUMENT
o FIR	FOUND IRON ROD
—	PROPOSED CONTOUR
—	PROPOSED GUARDRAIL
—	PROPOSED TURF SEED AND ECB
—	PROPOSED NATIVE SEED AND ECB
—	FACE OF FLOODPLAIN BENCH
—	EMERGENT PLANTINGS
—	RESTORED ACCESS PATH
—	PROPOSED COBBLE

FOR BIDDING	3-2020
100% DESIGN DRAWINGS	2-2020
PERMIT APPLICATION	9-2019
PRE-APPLICATION MEETING	7-26-19
CLIENT MEETING	5-1-19
PRELIMINARY DESIGN	2-26-19

180611 ECT PROJECT NUMBER	
AAB DESIGNED BY	AAB CHECKED BY
SRD DRAWN BY	JOM APPROVED BY

SHEET TITLE
**REVEGETATION
PLAN - POND**



P:\Alliance of Rouge Communities\Grant Projects\2018 EPA Rouge Habitat\Johnson Creek Fish Hatchery For Bidding.dwg

**ROUGE RIVER AOC
 JOHNSON CREEK -
 FISH HATCHERY
 PARK HABITAT
 RESTORATION
 PROJECT**

**ALLIANCE OF ROUGE
 COMMUNITIES**

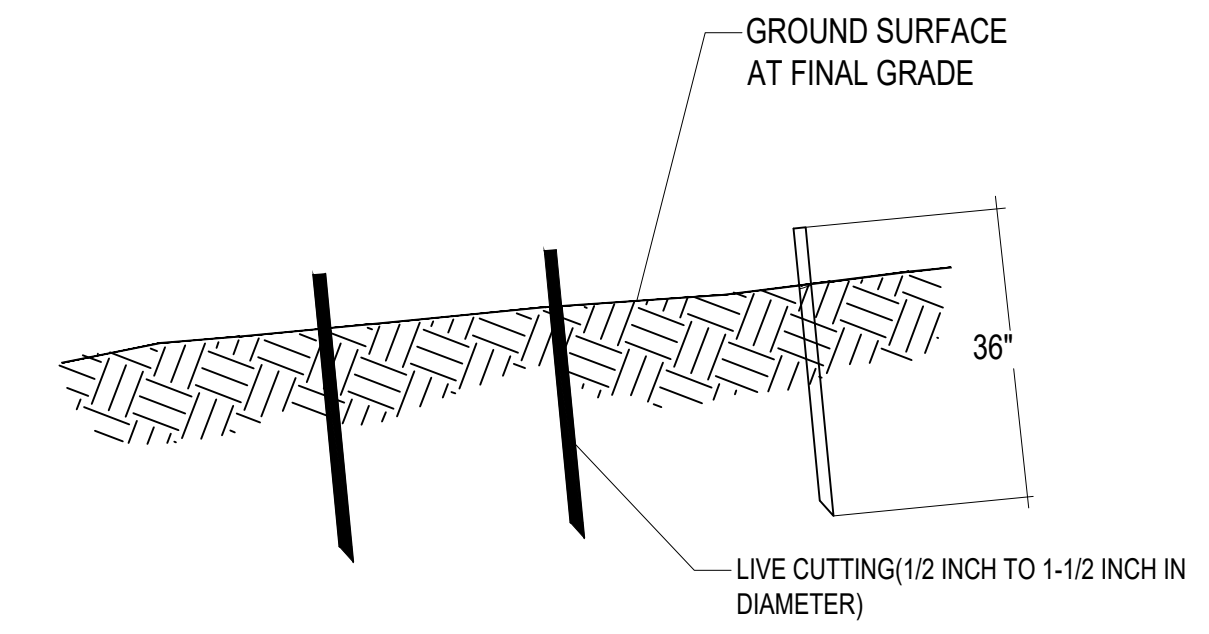
**NORTHVILLE,
 WAYNE COUNTY,
 MICHIGAN**

FOR BIDDING	3-2020
100% DESIGN DRAWINGS	2-2020
PERMIT APPLICATION	9-2019
PRE-APPLICATION MEETING	7-26-19
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180611 ECT PROJECT NUMBER	
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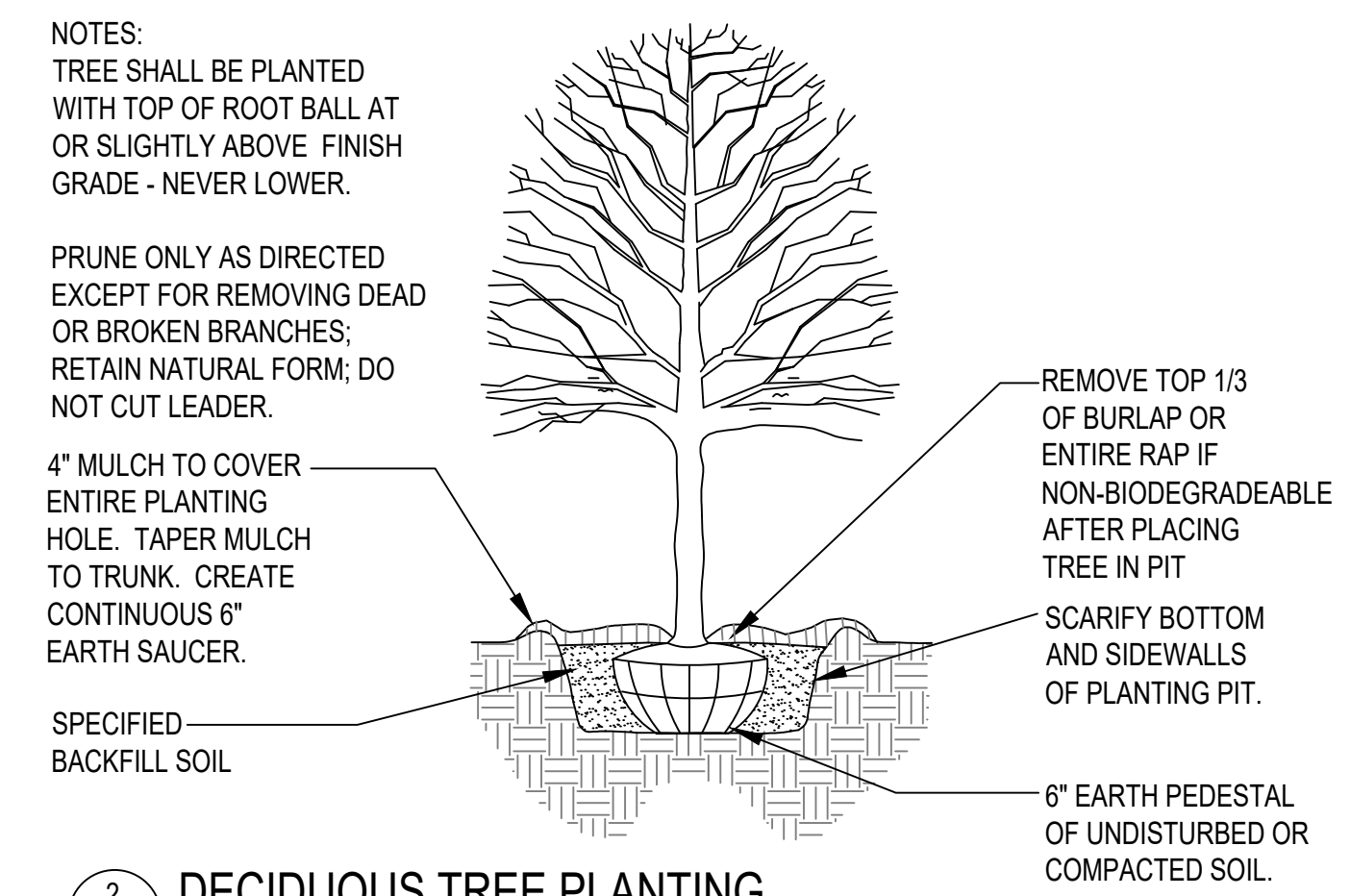
SHEET TITLE
**DETAILS -
 REVEGETATION**

SCALE: VARIES



- NOTES:**
1. INSTALL LIVE STAKES AT RIGHT ANGLES 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.

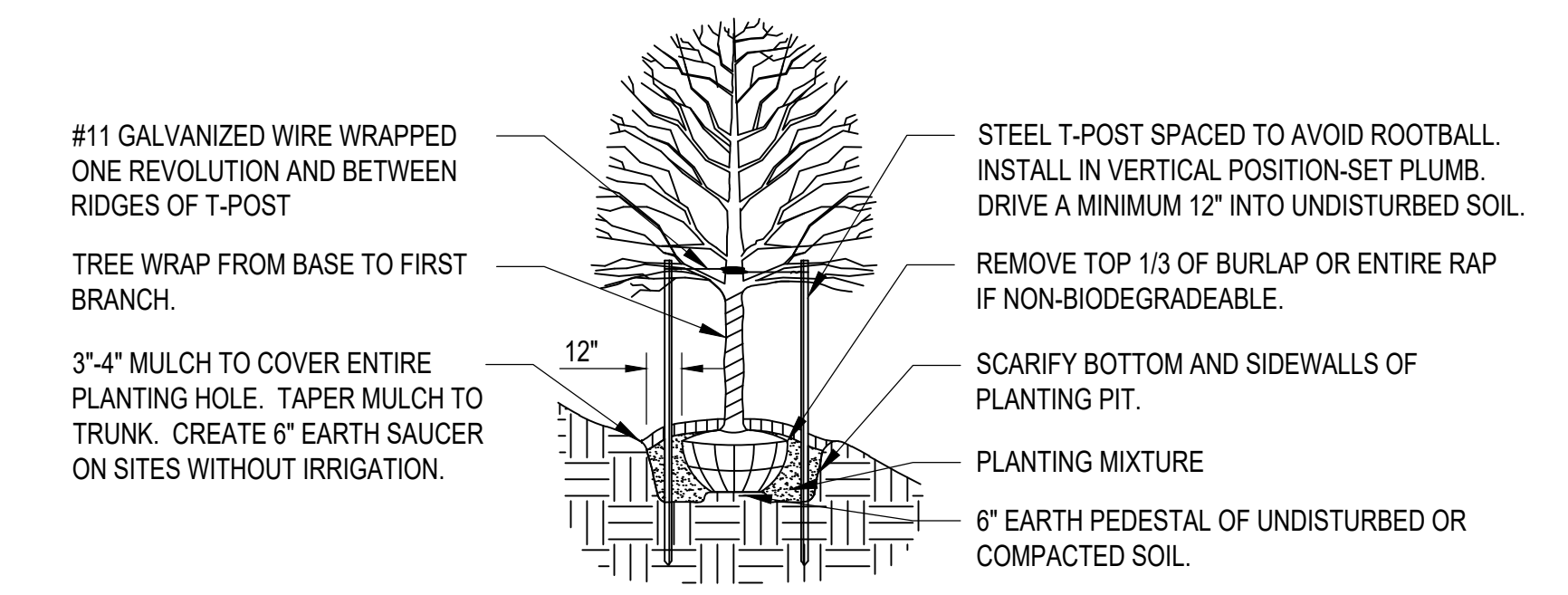
1 LIVE STAKE INSTALLATION
 21 NOT TO SCALE



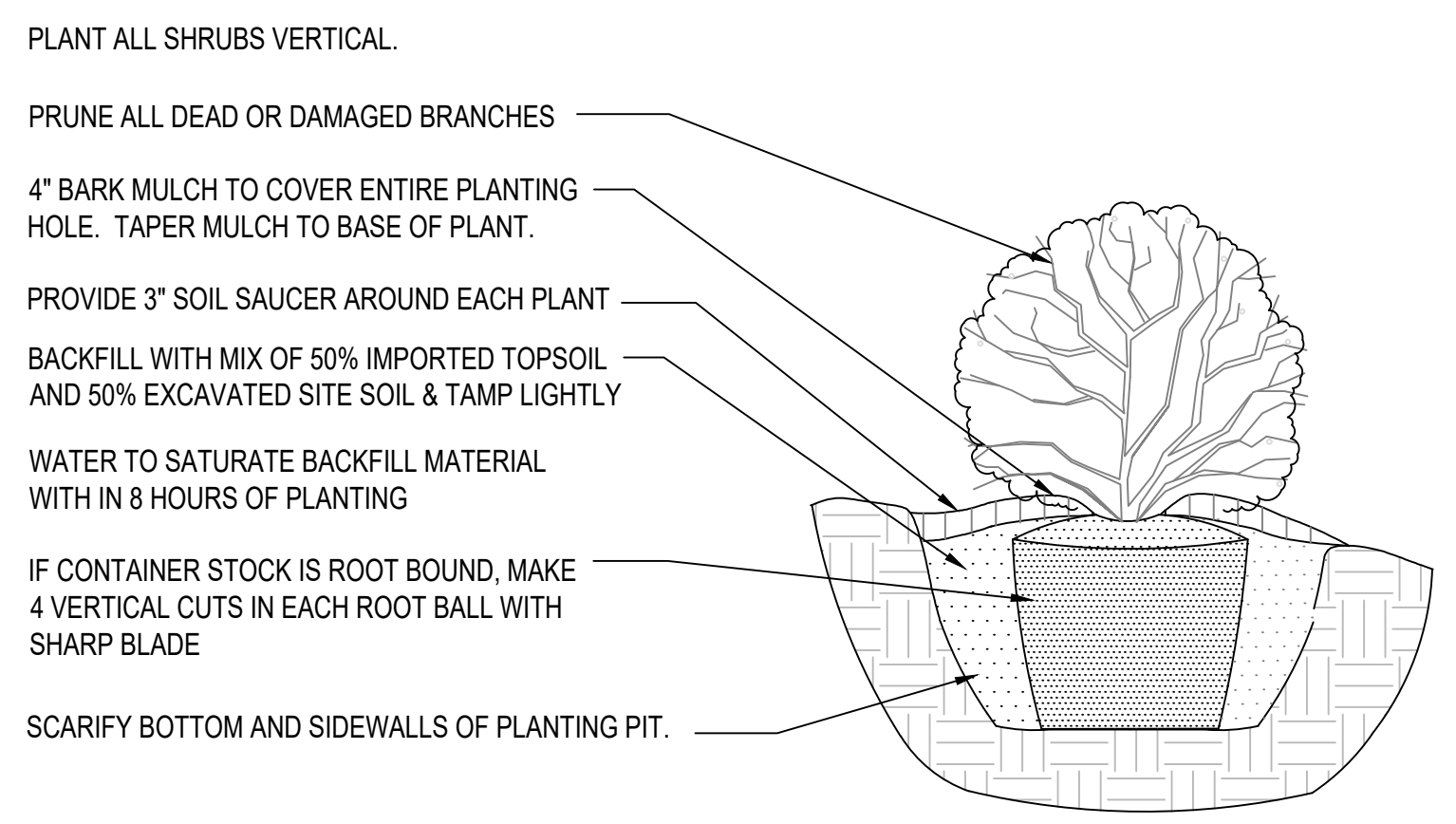
- NOTES:**
- TREE SHALL BE PLANTED WITH TOP OF ROOT BALL AT OR SLIGHTLY ABOVE FINISH GRADE - NEVER LOWER.
- PRUNE ONLY AS DIRECTED EXCEPT FOR REMOVING DEAD OR BROKEN BRANCHES; RETAIN NATURAL FORM; DO NOT CUT LEADER.

2 DECIDUOUS TREE PLANTING
 21 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.

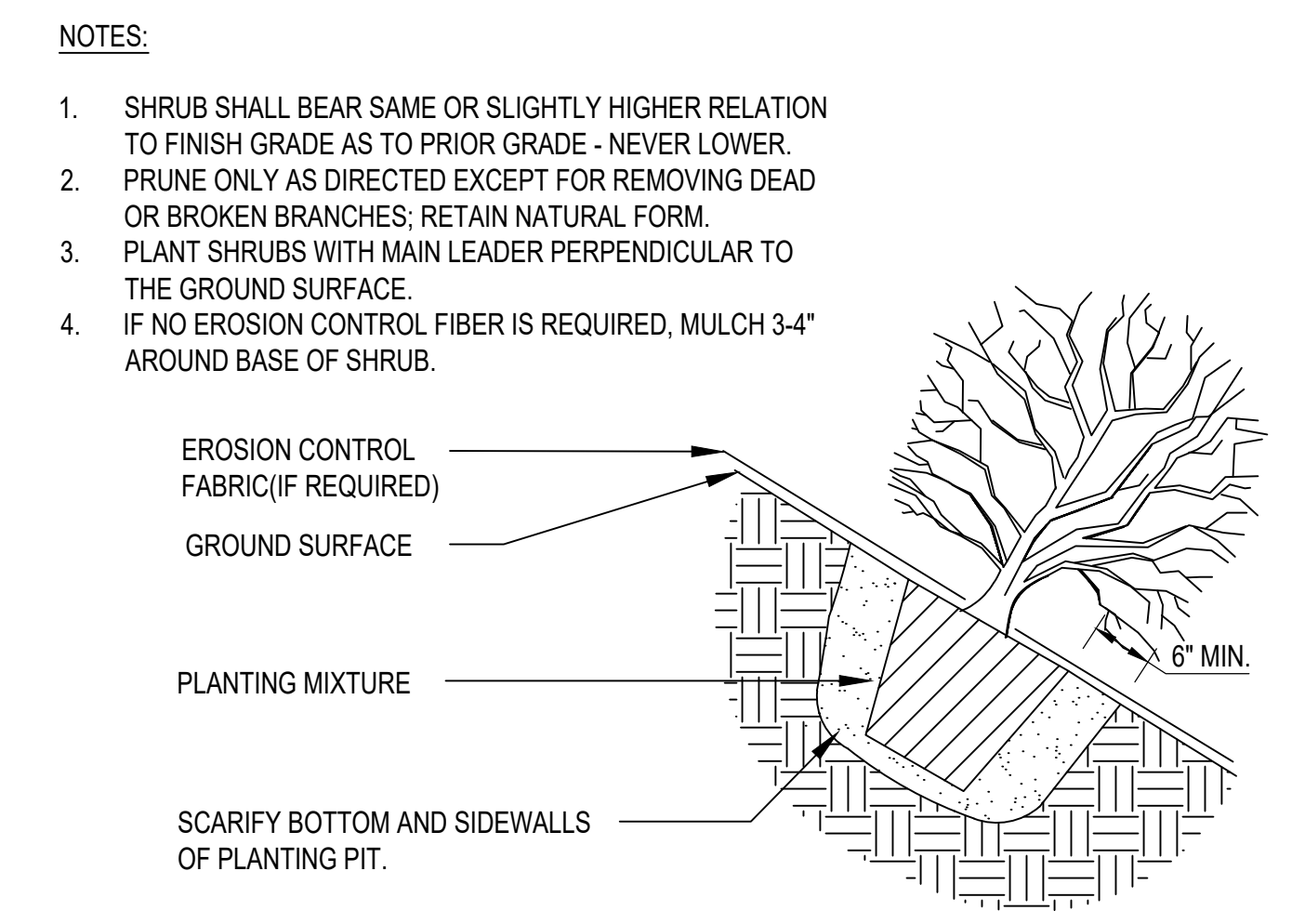


3 SLOPE TREE PLANTING
 21 NOT TO SCALE



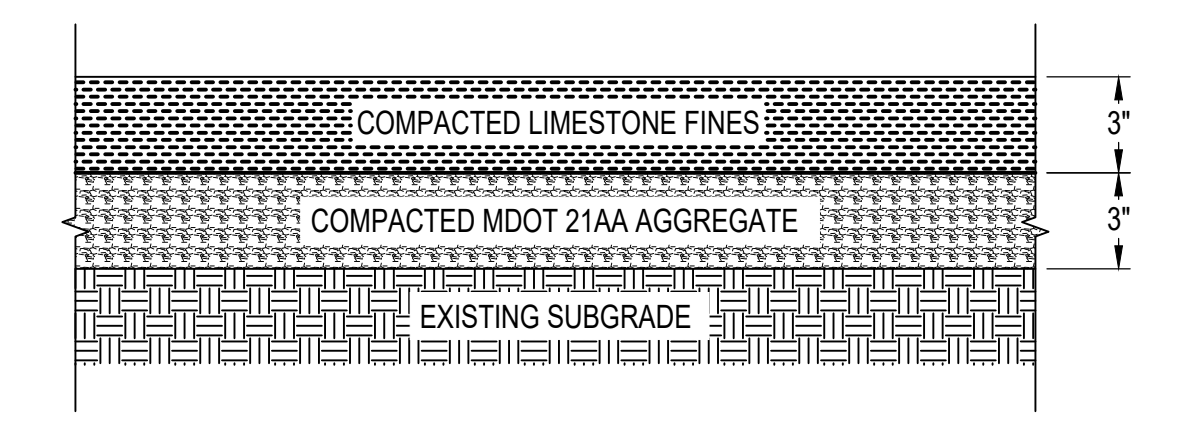
- PLANT ALL SHRUBS VERTICAL.

4 SHRUB PLANTING DETAIL
 21 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 SLOPE SHRUB PLANTING
 21 NOT TO SCALE



6 GRAVEL ACCESS PATH
 21 NOT TO SCALE

JOB BENCHMARK #200 FOUND RR SPIKE IN S SIDE OF WOOD LT POLE S OF FAIRBROOK ST 25' NE OF PARK SIGN, 45' NW OF FP ELEV 805.45
JOB BENCHMARK #201 SET SPINDLE IN S SIDE OF WOOD LP S SIDE OF FAIRBROOK ST 60' N OF W END OF GRAVEL LOT ELEV 801.80
JOB BENCHMARK #202 SET SPINDLE IN W SIDE OF 24" TREE 18' E OF GRAVEL LOT 60' N OF S EDGE OF GRAVEL LOT ELEV 791.52
JOB BENCHMARK #203 SET "1" ON CONCRETE WALL, E SIDE OF POND 135' N OF CONC BRIDGE ELEV 788.23
TRAVERSE POINT #100 N 339120.00 E 13359131.26 ELEV 804.31
TRAVERSE POINT #101 N 337904.89 E 13358971.75 ELEV 794.65
TRAVERSE POINT #102 N 337948.53 E 13359249.58 ELEV 791.37
TRAVERSE POINT #103 N 337887.02 E 13359367.70 ELEV 787.89

- #325 SANITARY MANHOLE T/CAST 805.20
BOLTED ON
- #463 SANITARY MANHOLE T/CAST 801.74
24" CLAY INV E 779.84
24" CLAY INV SW 779.84
FLOWS EAST
- #485 STORM MANHOLE T/CAST 798.75
6" INV N 793.25
12" INV N 792.85
12" CONC INV S 790.85
- #504 SANITARY MANHOLE T/CAST 797.67
24" CLAY INV S 781.17
24" CLAY INV E 780.97
- #531 YARD DRAIN T/CAST 792.72
8" CLAY INV W 788.62
- #538 STORM MANHOLE T/CAST 794.59
8" CLAY INV NW 786.79

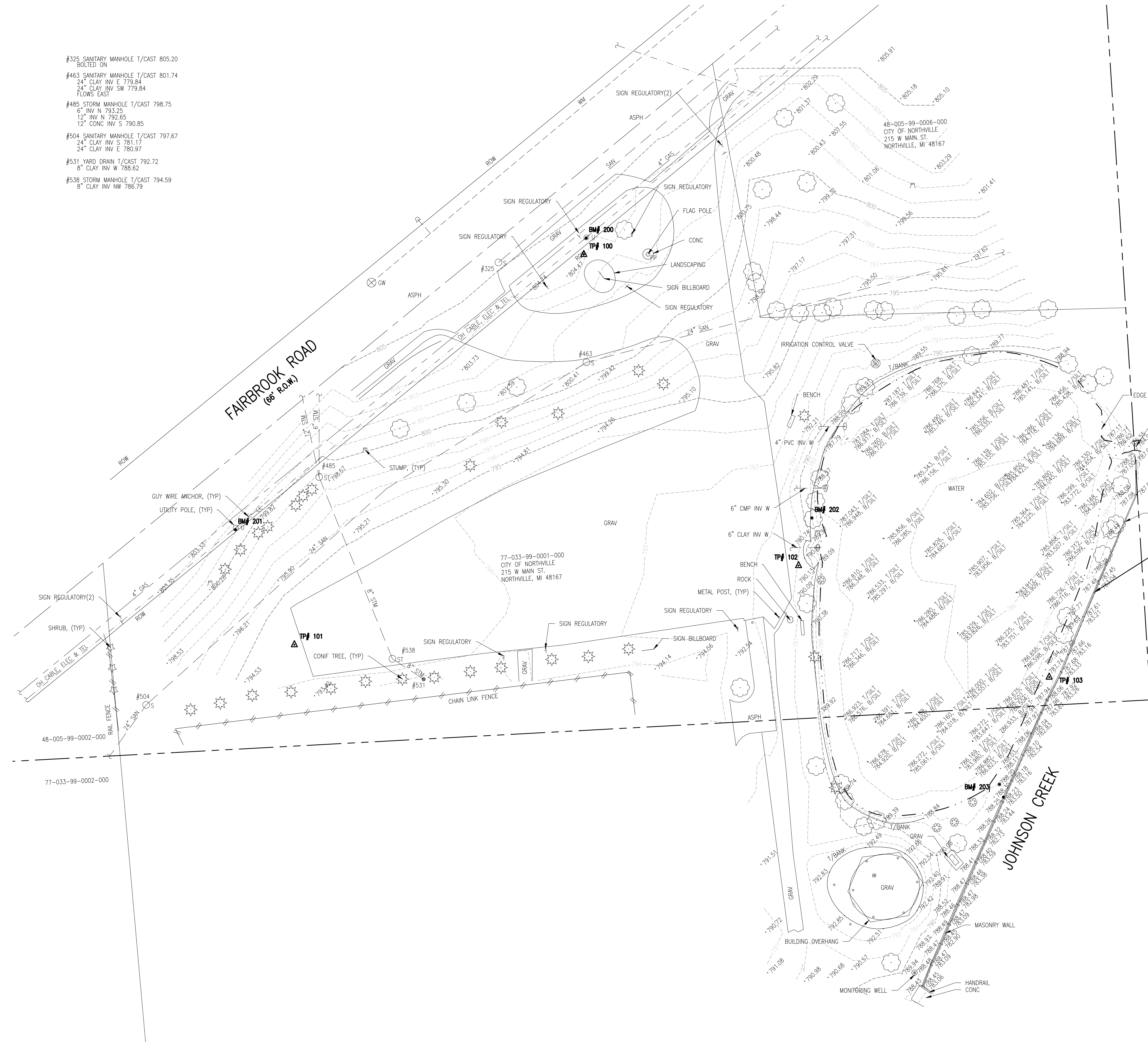


OHM
ARCHITECTS ENGINEERS PLANNERS

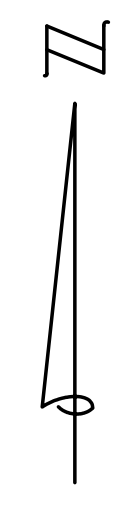
3400 Plymouth Road
Livonia, MI 48150
P (734) 522-6711 | F (734) 522-6427

OHM-ADVISORS.COM

DRAWING PATH: P:\1000_1998\1867150101_Fish_Hatchery_Park_Engineering_Services\Drawings\Civil\Plans_Const\150101CON.dwg Aug 13, 2015 - 8:40am



REHABILITATE APPROX. 315 FEET OF
EXISTING POURED CONCRETE
RETAINING WALL - DESIGN
CURRENTLY IN PROGRESS BY SME



Know what's below.
Call before you dig.

REVISIONS:

NO.	DATE	DESCRIPTION

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
10/15/2010	1007	Val	Val	ALL	WAYNE	NORTHVILLE	1"=40'	NAD 27	NAD 27

NORTHVILLE PARKS & RECREATION
FISH HATCHERY PARK
FIGURE 2 - SITE PLAN

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Revisions

REV	ISSUED FOR	DATE	BY

Date 01/16/2019

SME Project No. 072155.03

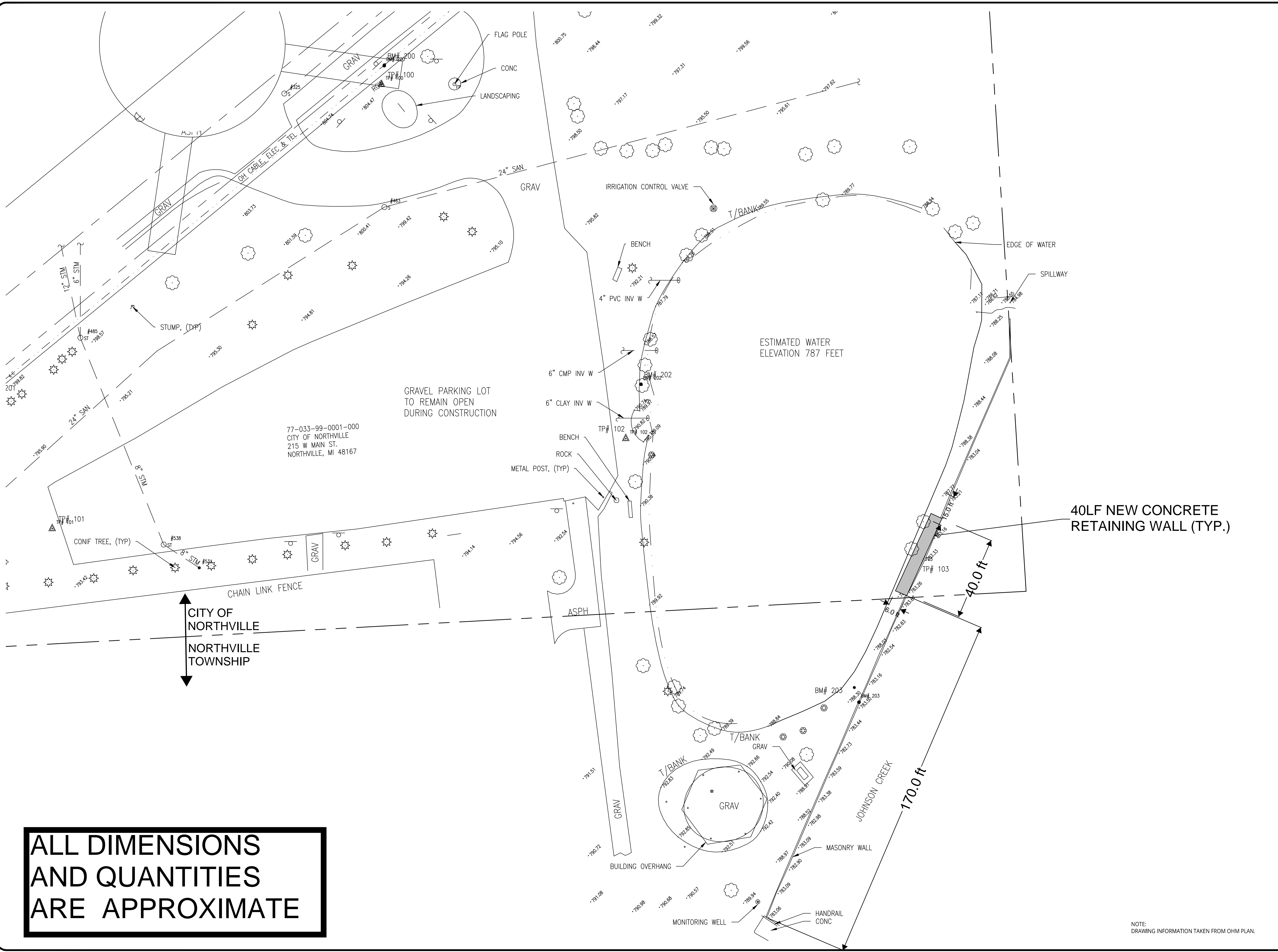
Project Manager: CGN

Designer: CGN

CADD:

Checked By: JWR

Sheet No. **CG1**



ALL DIMENSIONS AND QUANTITIES ARE APPROXIMATE

NOTE: DRAWING INFORMATION TAKEN FROM OHM PLAN.

Orientation	Scale
	NTS

Project
CONCRETE RETAINING WALL REPAIR
 JOHNSON DRAIN

Project Location
 FISH HATCHERY PARK
 NORTHVILLE, MICHIGAN

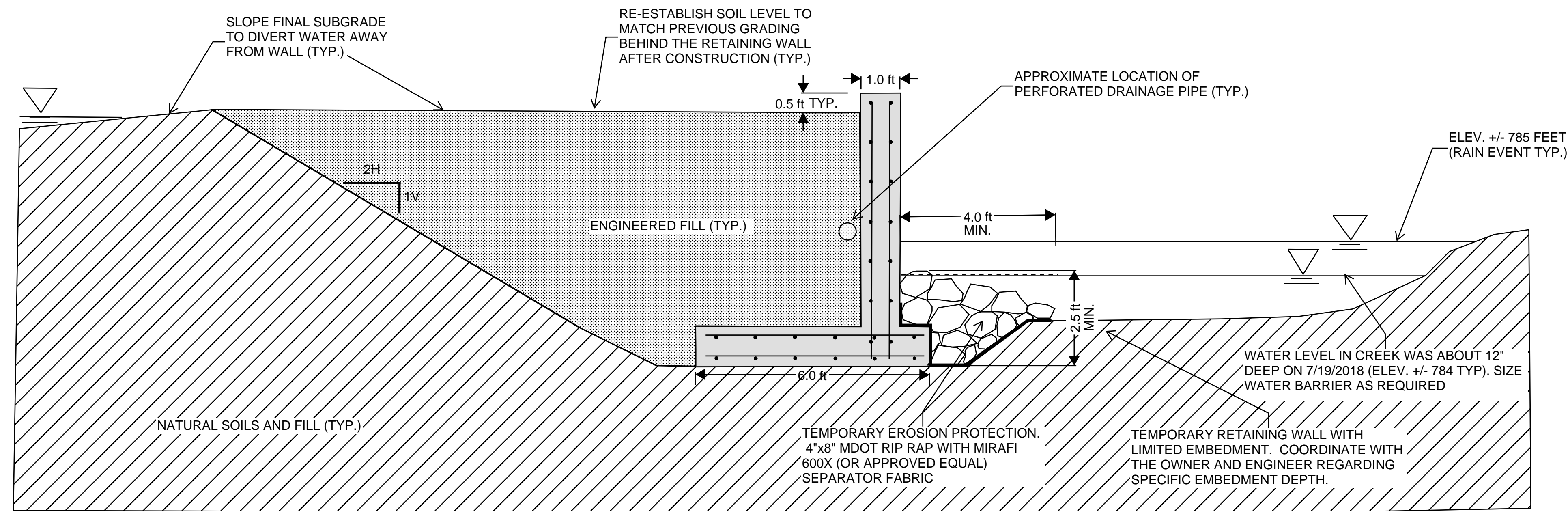
Sheet Name
 SECTIONS AND DETAILS

Engineer's Seal
 AS-BUILT

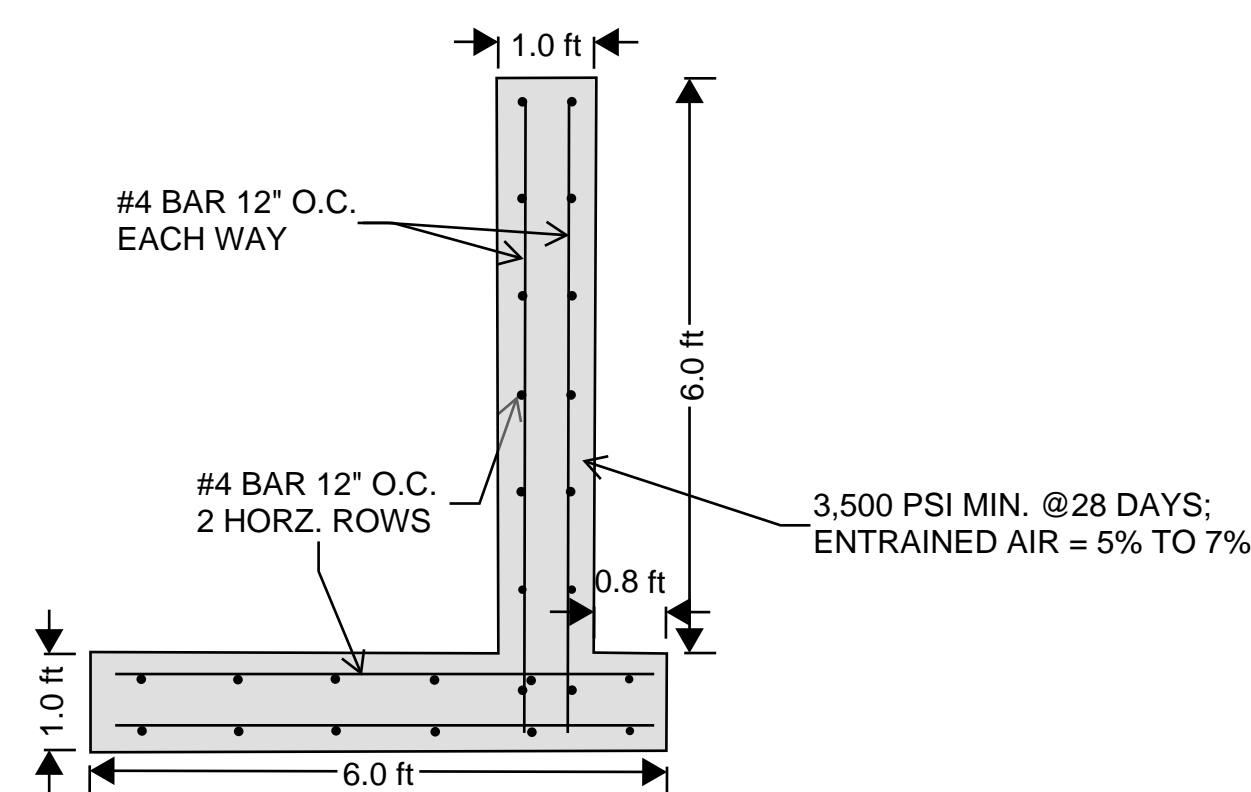
Revisions

REV	ISSUED FOR	DATE	BY

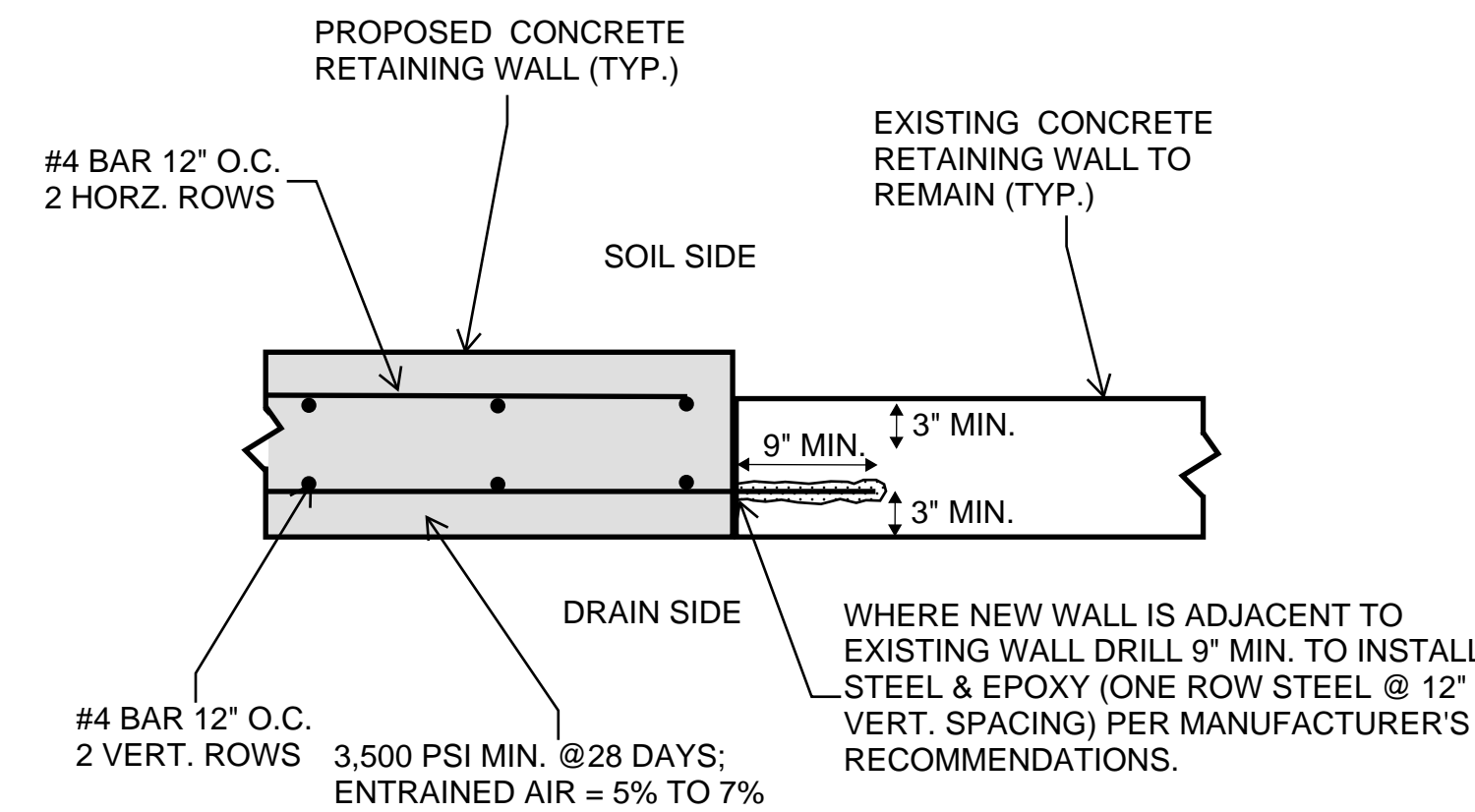
Date	01/16/2019
SME Project No.	072155.03
Project Manager:	CGN
Designer:	CGN
CADD:	
Checked By:	JWR
Sheet No.	CG1.01



SECTION 1: NEW WALL - AFTER CONSTRUCTION



DETAIL 1: PROPOSED WALL STEEL REINFORCEMENT



DETAIL 2: PROPOSED WALL AND EXISTING WALL CONNECTION

ALL DIMENSIONS AND QUANTITIES ARE APPROXIMATE

S \longleftarrow TRUE MERIDIAN (VAR. 151 N) \longrightarrow N



DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE

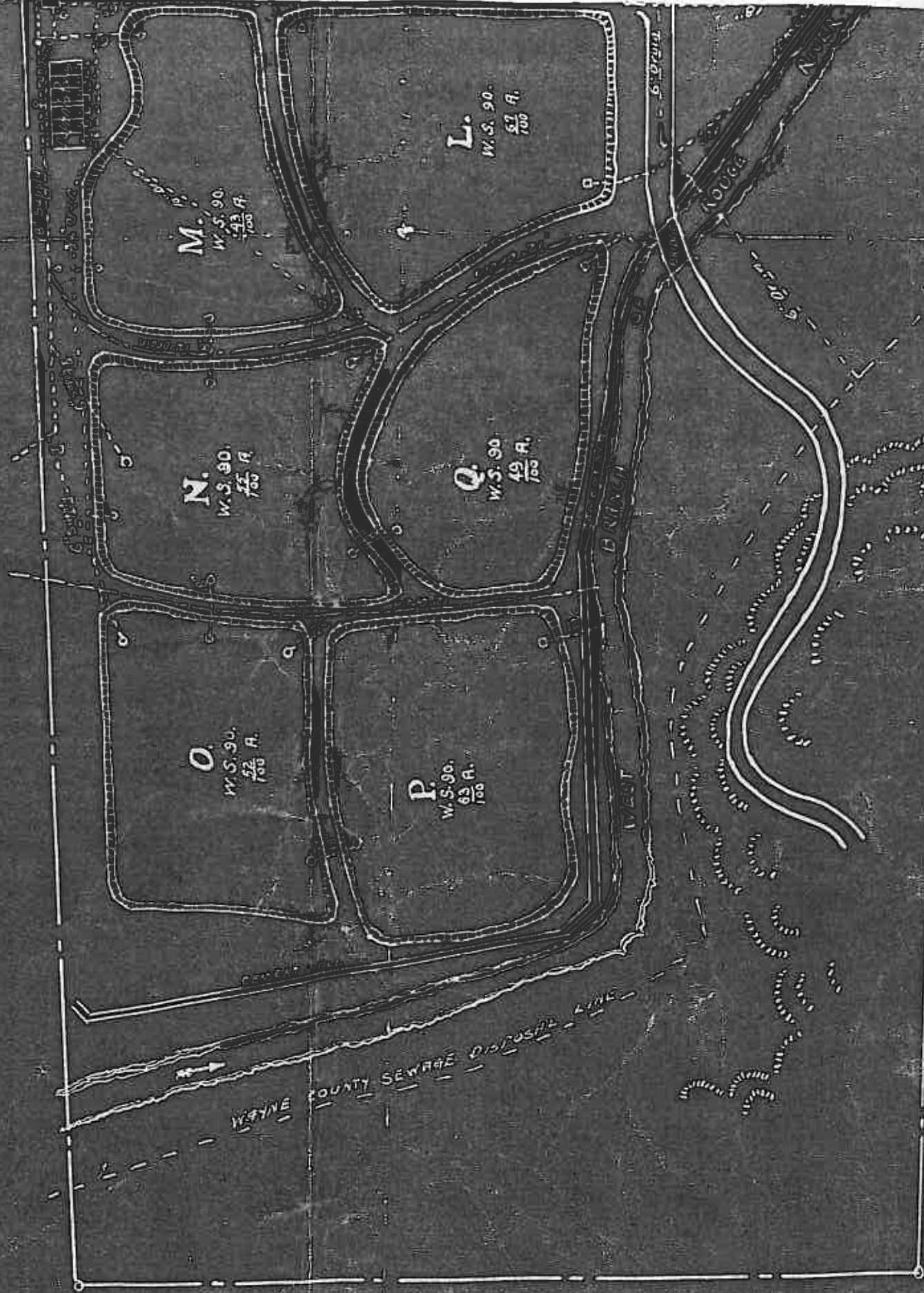
NORTHVILLE STATION

MICHIGAN.

1941

S7

SCALE 80 FEET = 1 INCH



NOTE: Total area of ponds = 495 Acres.