

# LAKE LANSING NATURAL SHORELINE DEMONSTRATION PROJECT - 2022

1621 PIKE ST, HASLETT, MI 48840

## ANTICIPATED CONSTRUCTION SCHEDULE

BEGIN CONSTRUCTION: APRIL 2023  
COMPLETE CONSTRUCTION: JUNE 15, 2023

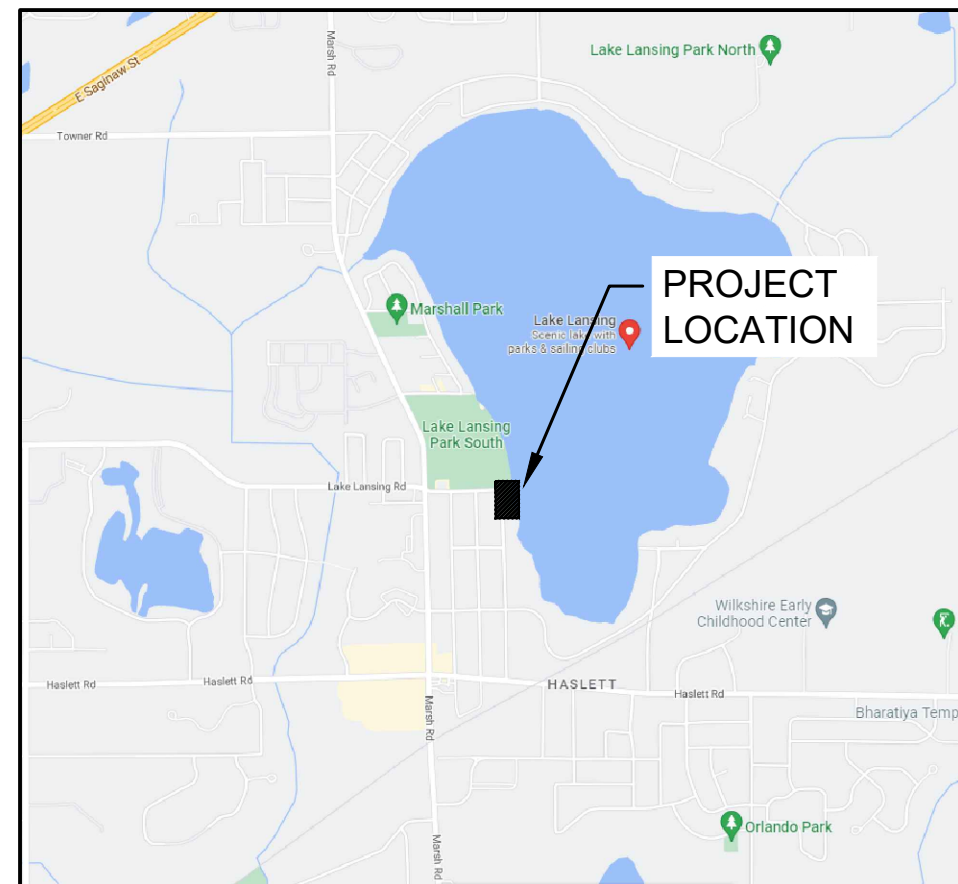
## CONTACTS & AGENCIES

INGHAM COUNTY ROAD COMMISSION  
301 BUSH STREET P.O. BOX 38  
MASON MI, 48854  
(517) 676-9722

INGHAM COUNTY PARKS DEPARTMENT  
121 E. MAPLE ST., SUITE 102  
MASON MI, 48854  
(517) 676-2233

MERIDIAN TOWNSHIP  
5151 MARSH RD.  
OKEMOS, MI 48864  
(517) 853-4000

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES,  
ENERGY (EGLE) LANSING DISTRICT OFFICE  
525 W ALLEGAN ST.  
LANSING, MI 48933  
(800) 662-9278

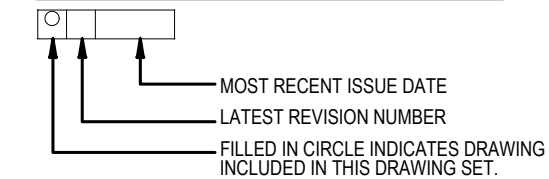


 **LOCATION MAP**  
NO SCALE

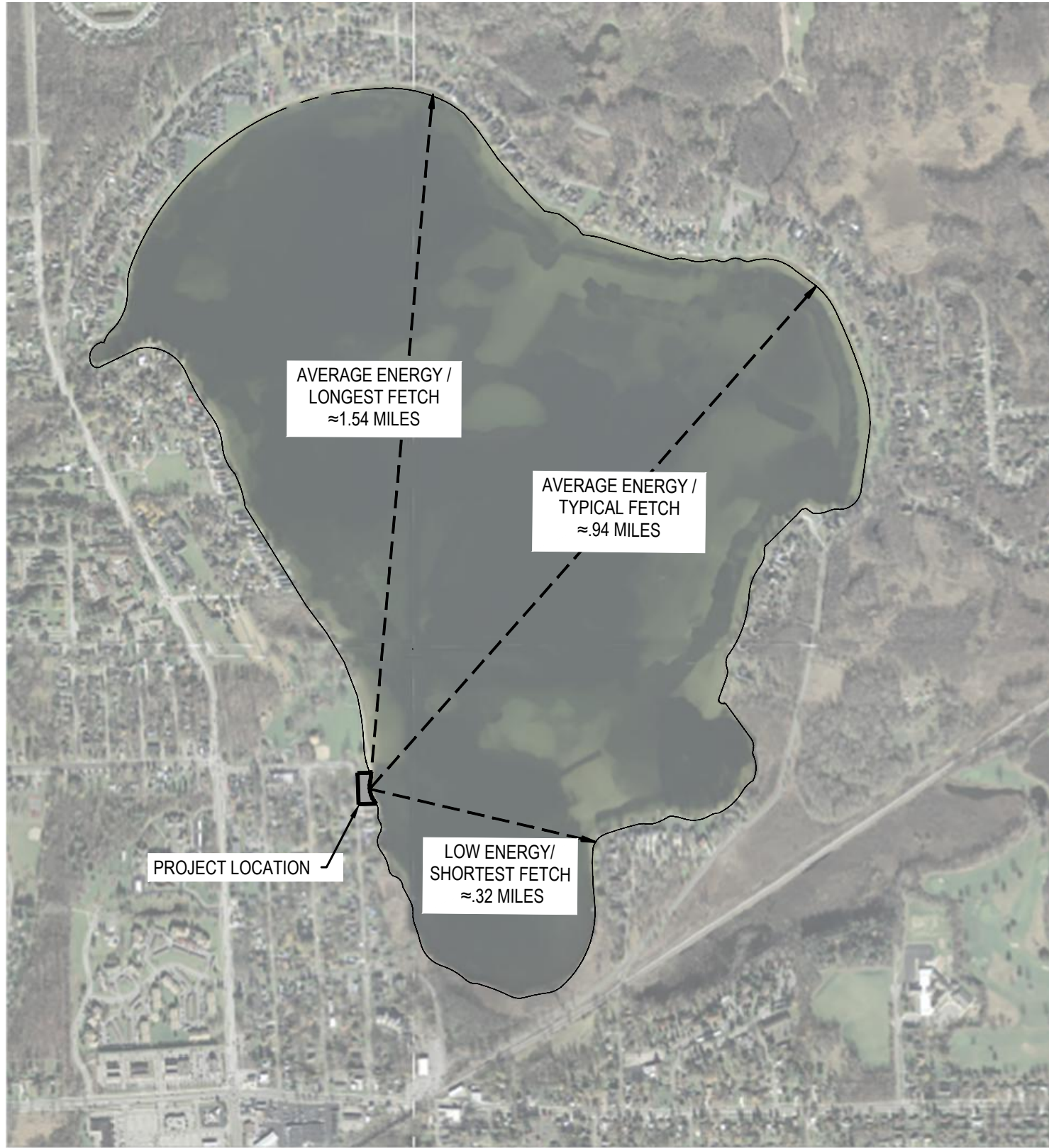
## DRAWING INDEX

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● - 12/14/2022	C102	SITE CLEARING, EARTHWORK, AND SESC
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● - 12/14/2022	C301	LANDSCAPE DESIGN CRITERIA AND DETAILS
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● - 12/14/2022	C401	MAINTENANCE AND WARRANTY SPECIFICATIONS

## DRAWING LIST LEGEND



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## GENERAL NOTES

1. APPROXIMATELY +/-140' LF OF SHORELINE TO BE RESTORED. CONTRACTOR TO VERIFY LOCATION AND EXTENT OF SHORELINE RESTORATION.
2. SHORELINE TO BE DESIGNED TO ACCOMMODATE THE TYPICAL HIGHEST EXPECTED STORM WAVE HEIGHT FROM THE LONGEST LAKE FETCH AND FASTEST TYPICAL WIND SPEED. SHORELINE RESTORATION TO ALSO WITHSTAND TYPICAL EXPECTED WINTER ICE PUSH AND EROSION.
3. PLANTING PLAN PROVIDED ON SHEET C201B IS INTENDED FOR DESIGN INTENT PURPOSES. THE FINAL PLANTING PLAN IS TO BE SUBMITTED BY THE CONTRACTOR TO THE OWNER AND CONSULTANT FOR FINAL APPROVAL PRIOR TO INSTALLATION.
4. THE ESTABLISHMENT PERIOD FOR THE NATURAL SHORELINE RESTORATION SHALL BE 3-5 YEARS WITH A WARRANTY PERIOD OF 1 YEAR STARTING AFTER THE POST CONSTRUCTION REVIEW AND WALK THROUGH. AT THE END OF THE WARRANTY PERIOD THE OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND MONITORING OF THE SHORELINE. A MAINTENANCE AGREEMENT MAY BE MADE WITH THE CONTRACTOR TO MAINTAIN THE SHORELINE AFTER THE WARRANTY PERIOD UNTIL THE POINT OF ESTABLISHMENT.
5. PLANT MATERIAL TO BE NATIVE TO SOUTHERN MICHIGAN/ NORTHERN INDIANA DRIFT PLAIN ECO REGION (56) WITH ZONE 5 COLD HARDINESS. PROPOSED PLANT SELECTION TO BE NATIVE AND SIMILAR TO THE SURROUNDING PLANT COMMUNITY AND ECO REGION. PLANTS TO BE SELECTED FOR ENHANCED SURVIVABILITY IN DISTURBED SITES.
6. SHORELINE RESTORATION TO COMPLY WITH PART 301 INLAND LAKES AND STREAMS, NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, 1994 PA 451. AND SECTION 404 OF THE FEDERAL CLEAN WATER ACT. RESTORATION TO ALSO TO COMPLY WITH THE MICHIGAN DEPARTMENT OF OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE) .
7. WORK SHALL COMPLY WITH EGLE PERMIT #WRP035034
8. CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS FOR ANY AND ALL EARTHWORK, SESC, AND WORK BELOW THE O.H.W.M. CONTRACTOR TO COMPLY WITH ALL NECESSARY INSPECTIONS, PROCEDURES, CONSTRUCTION STANDARDS, MAINTENANCE, AND WARRANTY STANDARDS AS SET FORTH BY THIS DOCUMENT AND RELATED GOVERNING AGENCIES.
8. SHORELINE RESTORATION TO USE NATURAL / BIODEGRADABLE MATERIALS AND TREATMENTS THAT ARE NON TOXIC OR HARMFUL TO SURROUNDING WILDLIFE AND ENVIRONMENTAL SYSTEMS.

## SITE CLEARING AND DEMOLITION NOTES

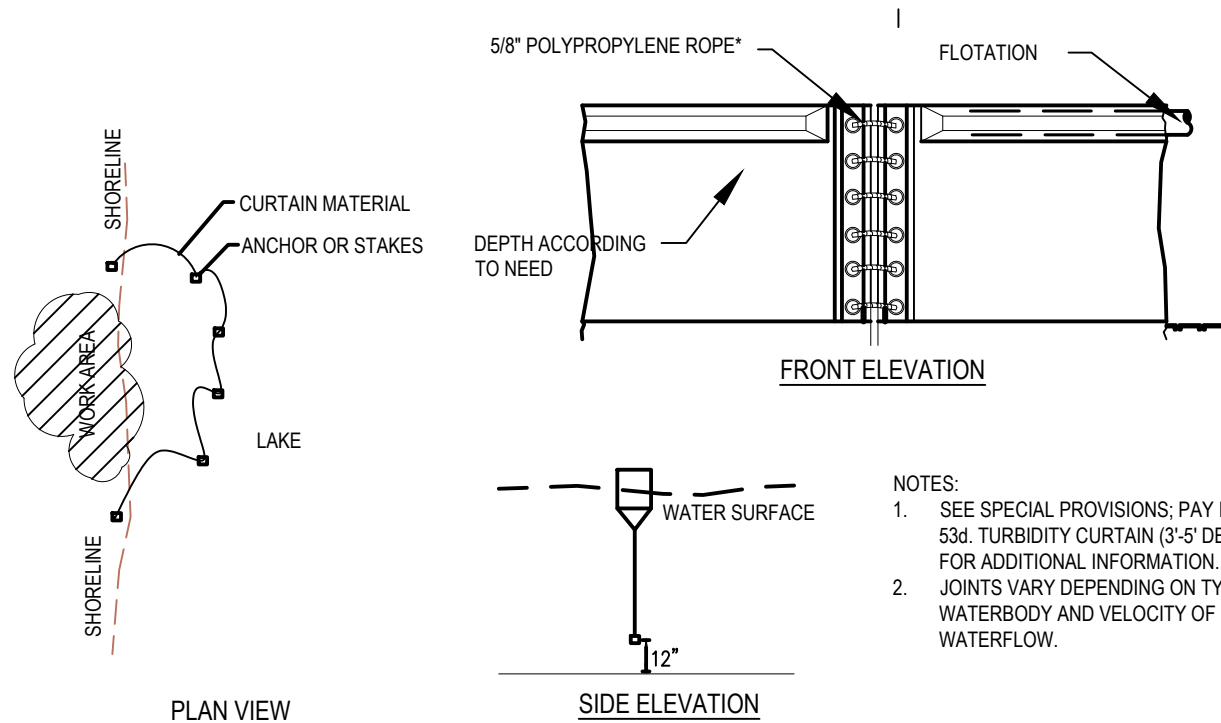
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE AND BECOMING FAMILIAR WITH THE CLEARING AND RELATED PREPARATION REQUIREMENTS.
2. NO REMOVAL CLEARING OR TOPSOIL REMOVAL SHALL OCCUR ON SITE UNTIL THE SESC AND INLAND LAKE PERMITS HAVE BEEN ISSUED AND THE CONTRACTOR HAS VERIFIED AND STAKED THE LIMITS OF REMOVAL IN THE FIELD. NOTIFY OWNER AND CONSULTANT OF THE START OF CONSTRUCTION DATE WHEN THE LIMITS LINE WILL BE ESTABLISHED FOR REVIEW AND APPROVAL.
3. NO BURNING OR BURYING OF CLEARED OR DEMOLITION MATERIAL SHALL BE ALLOWED ON SITE.
4. THE CONTRACTOR WILL BE RESPONSIBLE FOR VERIFYING EXISTING UTILITY LOCATIONS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL PROTECT AND MAINTAIN EXISTING UTILITY SERVICES AT ALL TIMES. CONTRACTOR TO CALL 811 AT LEAST 3 WORKING DAYS PRIOR TO CONSTRUCTION, TO CONFIRM LOCATION OF EXISTING UTILITIES.
5. ALL EXCESS OR UNSUITABLE TOPSOIL OR SUBSOIL TO BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED OFFSITE.
6. CONTRACTOR MUST RESTORE AND REPAIR ANY EXISTING CONDITIONS DISTURBED BY CONSTRUCTION. ANY AREA DISTURBED BY CONSTRUCTION TO BE RESTORED TO CONDITION EQUAL TO OR BETTER THAN BEFORE CONSTRUCTION BEGAN. ALL DISTURBED AREAS TO BE LANDSCAPED OR SEEDED.

## EARTHWORK & GRADING NOTES

1. EARTHWORK CONSTRUCTION IS TO BE PERFORMED IN ACCORDANCE WITH DIVISION 1 (EARTHWORKS) OF BID DOCUMENT UNLESS OTHERWISE NOTED IN THE FOLLOWING ITEMS.
2. SIDE SLOPES SHALL NOT EXCEED 1 VERTICAL OVER 3 HORIZONTAL SLOPE UNLESS SHOWN OTHERWISE.
3. EXCESS TOPSOIL SHALL BE SPOILED ON SITE IN LOCATION DETERMINED WITH OWNER AND LANDSCAPE ARCHITECT AND SEEDED.
4. PLACE 3-6" MINIMUM TOPSOIL FROM EXISTING EXCAVATED TOPSOIL IN ALL LANDSCAPE AREAS TO BE SEEDED OR LANDSCAPED. PROVIDE POSITIVE DRAINAGE AT ALL TIMES TO ENSURE NO STANDING WATER WITHIN PAVEMENT OR LANDSCAPED AREA. NO TOPSOIL TO BE PLACED BELOW ORDINARY HIGH WATER MARK.
5. THE SITE MAY BE DESIGNATED AS A FACILITY BECAUSE OF ENVIRONMENTAL IMPACTS. IN THE EVENT MATERIALS MUST BE REMOVED FROM THE SITE, TRANSPORTATION, HANDLING AND DISPOSAL OF EXCAVATED SOIL MATERIALS SHOULD BE PERFORMED IN ACCORDANCE WITH APPLICABLE ENVIRONMENTAL REGULATIONS.

## EROSION CONTROL NOTES

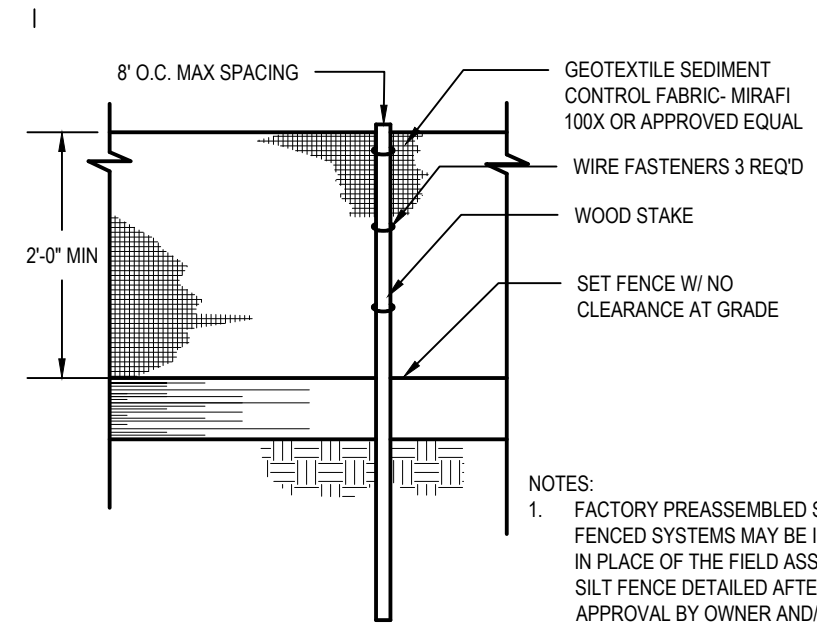
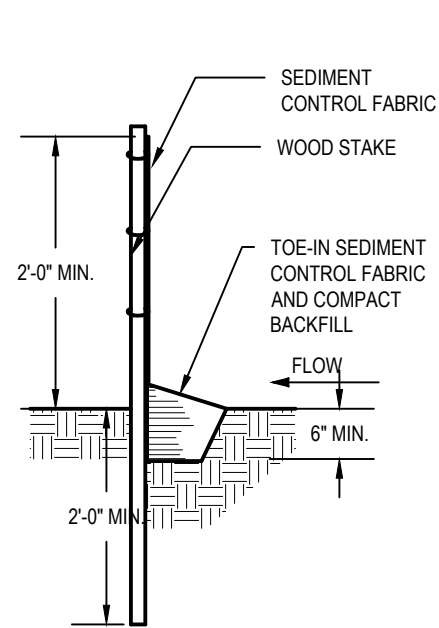
1. INSTALL EROSION CONTROL MEASURES AT THE LIMITS OF EARTHWORK PRIOR TO THE START OF ANY EARTHWORK OPERATIONS. ALL OTHER EROSION CONTROL MEASURES SHALL BE INSTALLED IN CONJUNCTION WITH THE CONSTRUCTION SCHEDULE.
2. MAINTAIN ALL EROSION CONTROL INSTALLATIONS DURING THE COURSE OF CONSTRUCTION. MAKE INSPECTIONS AFTER EACH STORM EVENT AND REPAIR OR REPLACE ANY DAMAGE. REMOVE ACCUMULATED SEDIMENT TO MAINTAIN EFFECTIVENESS OF EROSION CONTROL INSTALLATIONS. REPAIR ANY ERODED AREAS ON SLOPES OR NEAR SILT FENCE. RE GRADE AND RESEED ANY TEMPORARY SEEDED AREAS AS NECESSARY TO PREVENT EROSION.
3. THE EROSION CONTROL MEASURES INDICATED ON THIS DOCUMENT ARE BASED ON "THE MICHIGAN SOIL EROSION & SEDIMENTATION CONTROL GUIDEBOOK". THE SOIL EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED AND MAINTAINED PER SPECIFICATIONS.
4. KEEP PUBLIC ROADWAYS CLEAR OF ACCUMULATED SEDIMENT. SEDIMENTS SHALL BE REMOVED IMMEDIATELY UPON ENTERING PUBLIC ROADWAYS AND SHALL BE RETURNED TO THE LIKELY POINT OF ORIGIN. SEDIMENTS SHALL NOT BE FLUSHED OR WASHED FROM THE AREA WITH WATER.
5. CONTRACTOR SHALL INSTALL AND MAINTAIN SILT FENCE AROUND ALL SUBSOIL SPOIL AND TOPSOIL STOCKPILE AREAS. ALL SOIL PILES SHALL BE SEEDED WITH APPROVED SEED MIXTURES AND BE LOCATED AWAY FROM ANY DOWNSLOPE STREET, DRIVEWAY, DITCH OR DRAINAGE WAY
6. SILT FENCE SHALL BE INSPECTED AND REPAIRED ONCE A WEEK AND AFTER EVERY RAIN. SEDIMENT SHALL BE REMOVED IF DEPOSITS REACH HALF THE FENCE HEIGHT.
7. CONTRACTOR WILL BE RESPONSIBLE FOR ALL TEMPORARY SOIL EROSION. OWNER WILL BE RESPONSIBLE FOR PERMANENT SOIL EROSION CONTROL.
8. DUST CONTROL SHALL BE PROVIDED BY MEANS OF WATER DISTRIBUTION ON A REGULAR BASIS OVER AREAS THAT COULD POTENTIALLY PRODUCE DUST CONDITIONS.



PLAN VIEW

SIDE ELEVATION

- NOTES:
1. SEE SPECIAL PROVISIONS; PAY ITEMS; 53d. TURBIDITY CURTAIN (3'-5' DEEP) FOR ADDITIONAL INFORMATION.
  2. JOINTS VARY DEPENDING ON TYPE OF WATERBODY AND VELOCITY OF WATERFLOW.



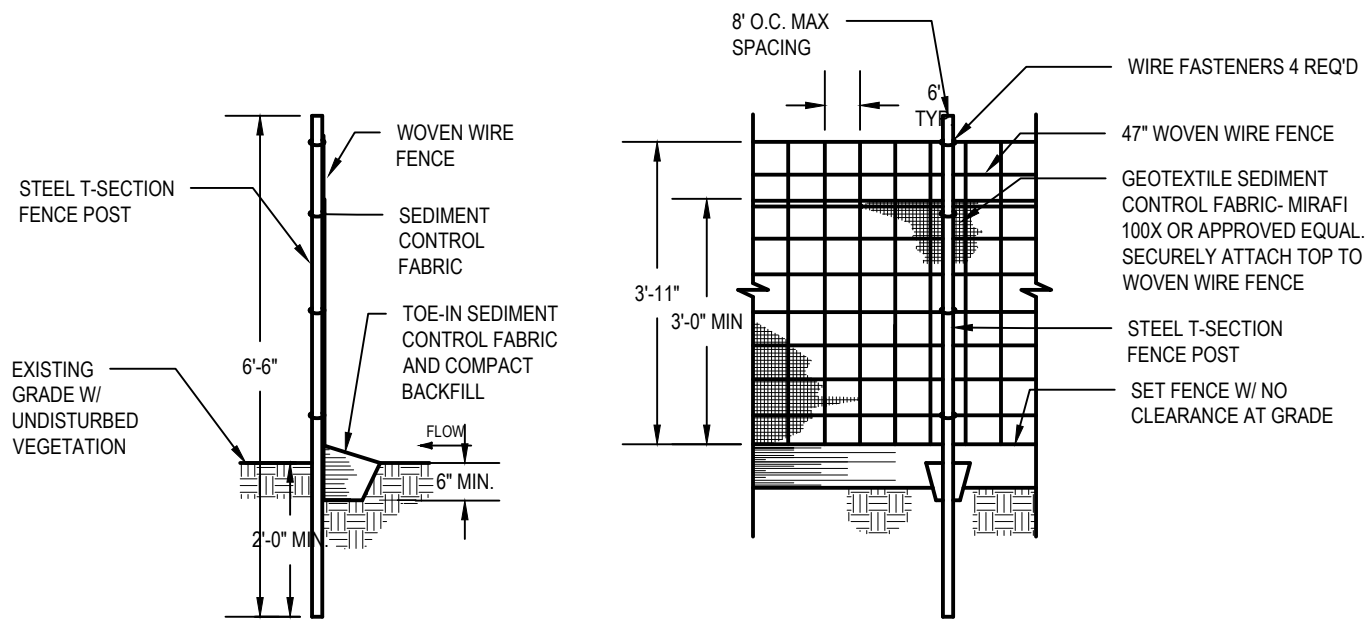
- NOTES:
1. FACTORY PREASSEMBLED SILT FENCED SYSTEMS MAY BE INSTALLED IN PLACE OF THE FIELD ASSEMBLED SILT FENCE DETAILED AFTER APPROVAL BY OWNER AND/OR CONSULTANT.

### 1 TURBIDITY CURTAIN DETAIL

NOT TO SCALE

### 2 SILT FENCE DETAIL

NOT TO SCALE



- NOTES:
1. FENCE TO BE USED AS AN ALTERNATIVE FOR WILDLIFE MANAGEMENT DURING ESTABLISHMENT PERIOD.
  2. FACTORY PREASSEMBLED SILT FENCED SYSTEMS MAY BE INSTALLED IN PLACE OF THE FIELD ASSEMBLED SILT FENCE DETAILED AFTER APPROVAL BY OWNER AND/OR CONSULTANT.

### 3 SILT FENCE WITH WOVEN WIRE DETAIL

NOT TO SCALE

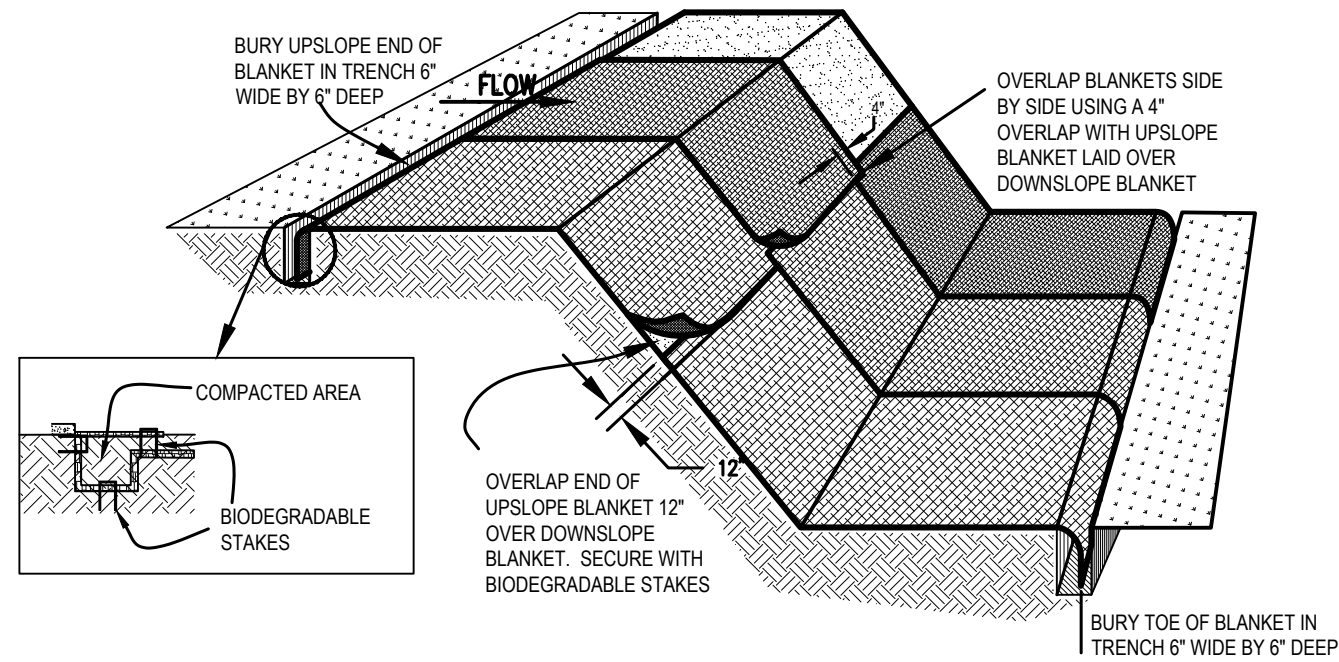
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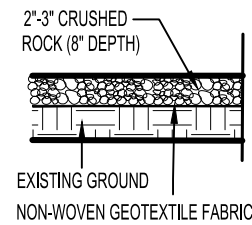
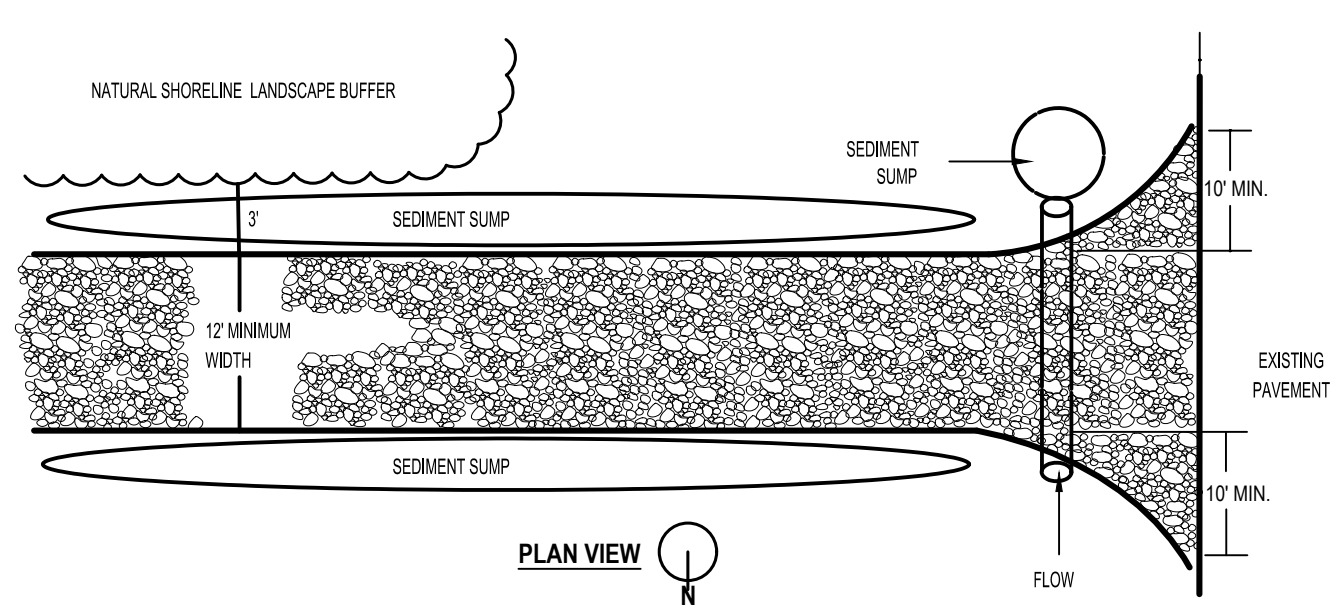
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NOTES:

1. PLACE MULCH BLANKET PARALLEL TO FLOW AND ANCHOR SECURELY.
2. STAKES INSTALLED/SECURED ACCORDING TO MANUFACTURER'S SPECIFICATIONS
3. USE BIODEGRADABLE MATERIAL FOR BLANKET AND STAKES.



**1 SOIL EROSION CONTROL BLANKET**  
 NOT TO SCALE



**PROFILE**

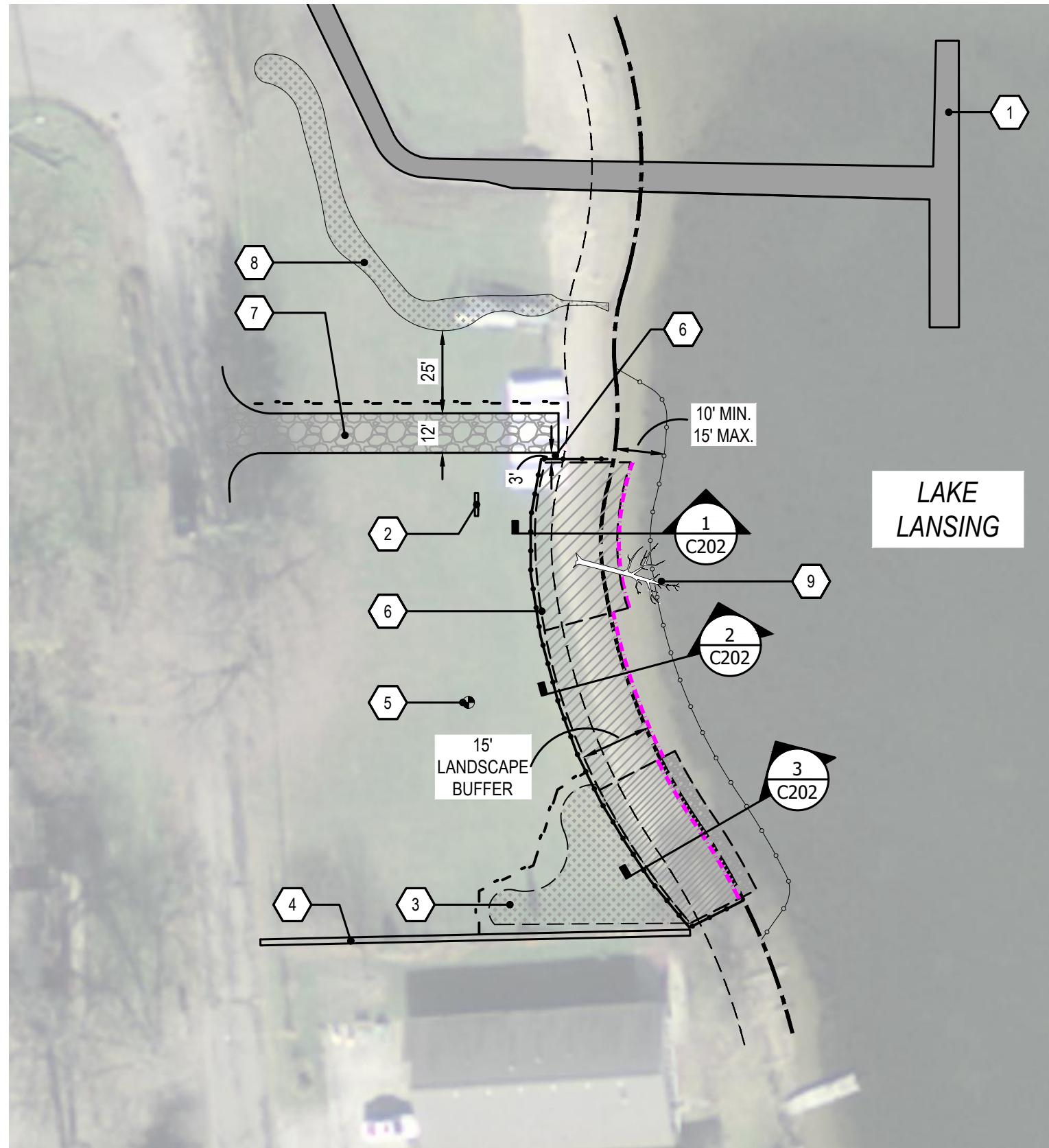
NOTES:

1. ESTABLISH GRAVEL MAINTENANCE DRIVE PRIOR TO THE INITIATION OF SITE CONSTRUCTION ACTIVITIES.
2. CARE SHOULD BE TAKEN TO PREVENT MATERIAL MOVEMENT INTO ADJACENT WETLANDS/WATERBODIES.
3. CARE SHOULD BE TAKEN TO MAINTAIN EXISTING ROADSIDE DRAINAGE VIA CULVERT INSTALLATION, WITH SEDIMENT SUMP PLACED DOWNFLOW OF CULVERT.
4. SEE SPECIAL PROVISIONS; PAY ITEMS; 53b. - GRAVEL MAINTENANCE DRIVE FOR ADDITIONAL INFORMATION REGARDING THE SEDIMENT SUMPS AND CULVERT.

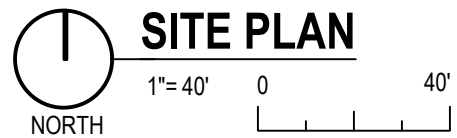
**2 GRAVEL MAINTENANCE DRIVE**  
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SEE SHEET C201B - PLANTING PLAN FOR PLANTING ZONE LOCATIONS



### GRAPHIC LEGEND

- 100-YEAR FLOODPLAIN - 852.7' ELEVATION
- LEGAL LAKE LEVEL O.H.W.M. - 852.29'  
O.H.W.M. = ORDINARY HIGH WATER MARK
- - - SILT FENCE - *DETAIL 2/C103*
- SILT FENCE WITH WOVEN WIRE - *DETAIL 3/C103*
- COIR LOG
- TURBIDITY CURTAIN - *DETAIL 1/C103*
- [Hatched Box] LOW ENERGY NATURAL SHORELINE SITE
- [Hatched Box] INTERMEDIATE ENERGY SHORELINE SITE
- [Hatched Box] HIGH ENERGY NATURAL SHORELINE SITE

### KEY NOTES

1. EXISTING DOCK LOCATION.
2. FUTURE EDUCATIONAL SIGN - NOT IN CONTRACT.
3. EXISTING NATURAL AREA.
4. EXISTING FENCE.
5. BENCH MARK AT TOP OF WELL HEAD - 854.08' ELEVATION.
6. NATURAL SHORELINE RESTORATION LOCATION, OFFSET 3 FEET FROM GRAVEL MAINTENANCE DRIVE. APPROXIMATE OVERALL LENGTH OF SHORELINE IS 140 FEET.
7. TEMPORARY GRAVEL MAINTENANCE DRIVE.
8. EXISTING DRAINAGE SWALE.
9. FALLEN TREE, SEE DETAILS 2/C203 AND 3/C203.

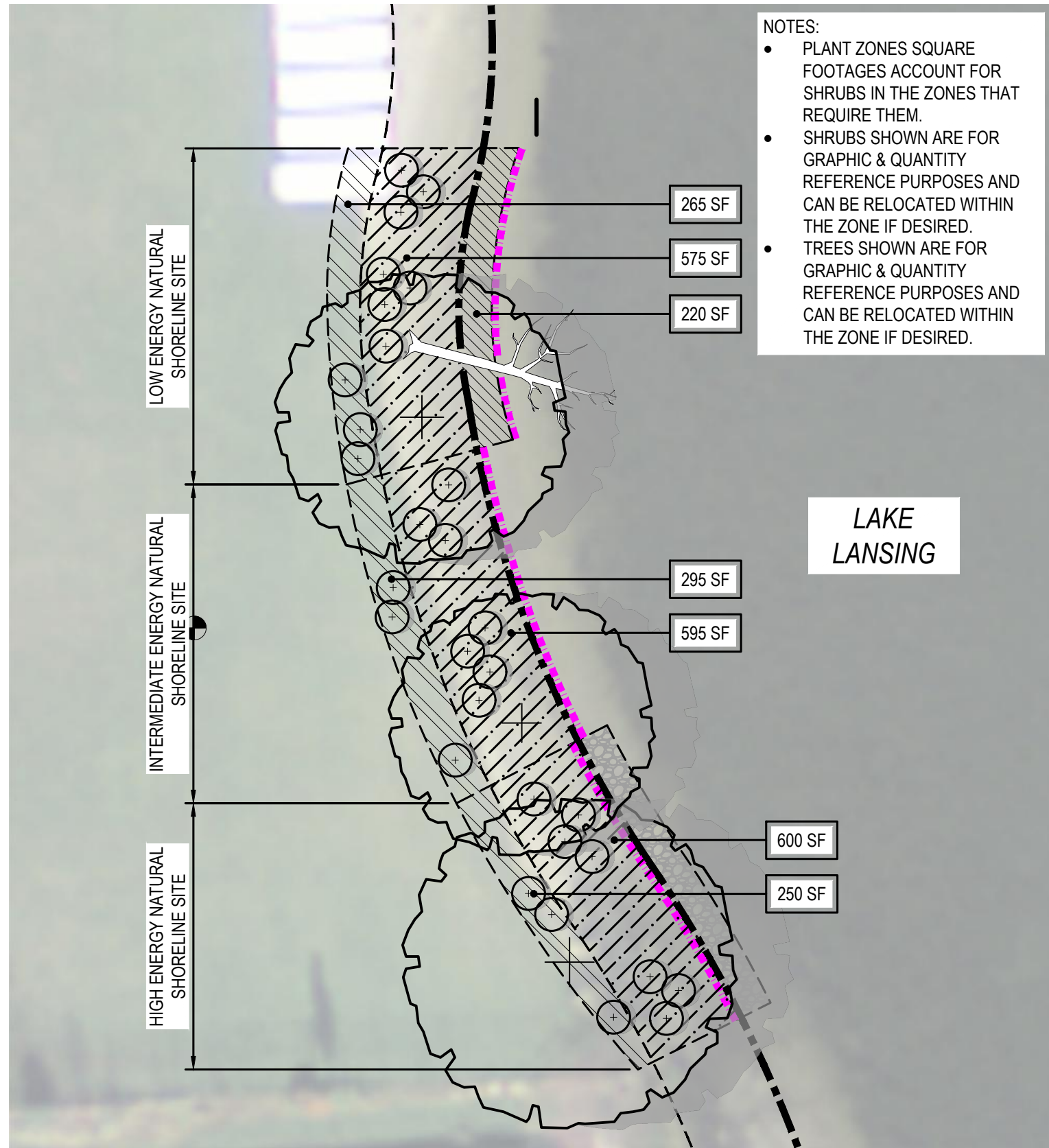
### GENERAL NOTES

1. APPROXIMATELY +/-140' LF OF SHORELINE TO BE RESTORED. STAKE EXTENTS FOR VERIFICATION AND APPROVAL OWNER.
2. SITE TO BE USED AS A DEMONSTRATION AREA FOR NATURAL SHORELINE IMPLEMENTATION. A LOW ENERGY, INTERMEDIATE ENERGY, AND HIGH ENERGY SHORELINE RESTORATION ARE TO BE CONSTRUCTED. EACH DEMONSTRATION AREA TO BE +/- 46 LF ALONG THE SHORELINE. SEE SKETCH PLAN FOR PROPOSED LOCATIONS.
3. SHORELINE / AQUATIC PLANT RESTORATION TO EXTEND A MAX OF 5' INTO LAKE. MINIMUM OF 15' LANDSCAPE BUFFER ALONG SHORELINE. UPLAND TREES AND NATIVE UPLAND PLANTINGS ARE ALSO RECOMMENDED FOR ENHANCED SHORELINE STABILITY AND ANIMAL HABITAT CREATION.
4. STORM WAVE ENERGY FOR DESIGN TO BE CALCULATED IN REFERENCE TO CHAPTER NR 328 FROM THE (\*WISCONSIN) SHORE EROSION CONTROL STRUCTURES IN NAVIGABLE WATERWAYS. STORM WAVE HEIGHT WAVE ENERGY TYPES IS DEFINED AS:

LOW ENERGY SITE:	STORM WAVE HEIGHT LESS THAN 1' OR WHERE EROSION INTENSITY SCORE IS LESS THAN 47
MODERATE ENERGY SITE:	STORM WAVE HEIGHT BETWEEN 1' TO 2.3' OR WHERE EROSION INTENSITY SCORE IS BETWEEN 48 TO 67
HIGH ENERGY SITE:	STORM WAVE HEIGHT GREATER THAN 2.3' OR WHERE EROSION INTENSITY SCORE IS GREATER THAN 67

**progressive ae**  
 LAKE LANSING NATURAL SHORELINE DEMONSTRATION PROJECT - 2022  
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 330 South Tryon St. Suite 600 | Charlotte, NC 28202 | 704.731.8080 www.progressiveae.com  
 ISSUANCE BIDS AND PERMITS 12/14/2022  
 FILE NUMBER 53260102  
 PROJECT MANAGER P. HAUSLER  
 PROFESSIONAL C. MARKHAM  
 DRAWN BY S. VANDYKE  
 CHECKED BY R. JOHNSON  
 SITE PLAN C201A

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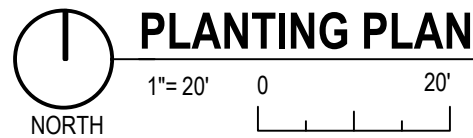


**NOTES:**

- PLANT ZONES SQUARE FOOTAGES ACCOUNT FOR SHRUBS IN THE ZONES THAT REQUIRE THEM.
- SHRUBS SHOWN ARE FOR GRAPHIC & QUANTITY REFERENCE PURPOSES AND CAN BE RELOCATED WITHIN THE ZONE IF DESIRED.
- TREES SHOWN ARE FOR GRAPHIC & QUANTITY REFERENCE PURPOSES AND CAN BE RELOCATED WITHIN THE ZONE IF DESIRED.

**LAKE LANSING**

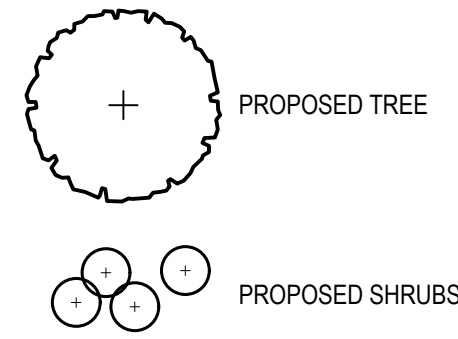
SEE SHEET C201A - SITE PLAN FOR ADDITIONAL INFORMATION



**GRAPHIC LEGEND**

**PLANTING ZONE TYPE**

- BELOW WATER
- BETWEEN WATER LEVEL AND O.H.W.M.
- ABOVE O.H.W.M.
- LEGAL LAKE LEVEL O.H.W.M. - 852.29'
- 100-YEAR FLOODPLAIN - 852.7' ELEVATION
- COIR LOG



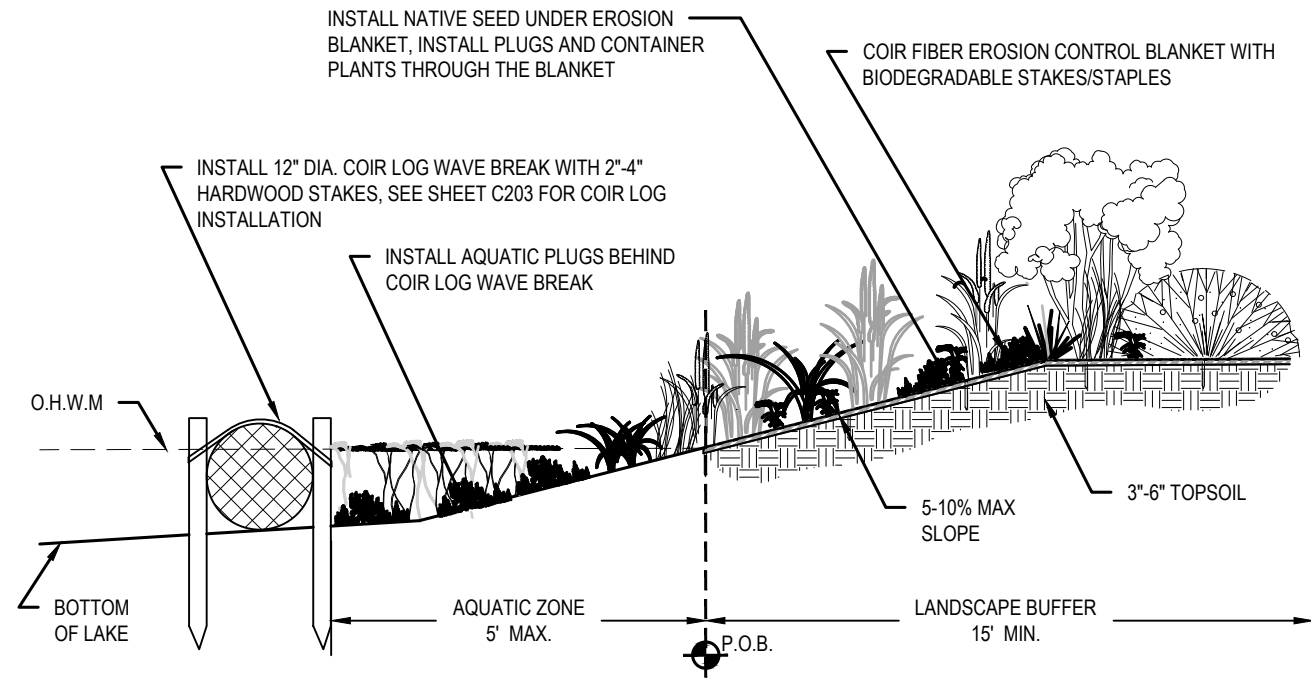
**NOTE:**

- SEE SHEET C302, C303, AND C304 FOR ACCEPTABLE PLANT SPECIES LISTS FOR EACH PLANTING ZONE TYPE.
- SF = SQUARE FEET
- O.H.W.M. = ORDINARY HIGH WATER MARK

LOW ENERGY NATURAL SHORELINE SITE			INTERMEDIATE ENERGY NATURAL SHORELINE SITE			HIGH ENERGY NATURAL SHORELINE SITE		
<b>BELOW WATER PLANT ZONE</b>								
AREA	PLANT TYPE	QTY.	NOT APPLICABLE			NOT APPLICABLE		
60%	FORBES	46						
40%	GRASSES	31						
<b>BETWEEN WATER LEVEL &amp; O.H.W.M. PLANT ZONE</b>								
AREA	PLANT TYPE	QTY.	AREA	PLANT TYPE	QTY.	AREA	PLANT TYPE	QTY.
44%	FORBES	73	44%	FORBES	76	44%	FORBES	76
55%	GRASSES	91	55%	GRASSES	96	55%	GRASSES	97
1%	SHRUBS	7	1%	SHRUBS	7	1%	SHRUBS	7
N/A	TREE	1	N/A	TREE	1	N/A	TREE	0
<b>ABOVE O.H.W.M. PLANT ZONE</b>								
AREA	PLANT TYPE	QTY.	AREA	PLANT TYPE	QTY.	AREA	PLANT TYPE	QTY.
43.75%	FORBES	33	43.75%	FORBES	37	43.75%	FORBES	31
56.25%	GRASSES	43	56.25%	GRASSES	48	56.25%	GRASSES	41
1.25%	SHRUBS	3	1.25%	SHRUBS	3	1.25%	SHRUBS	3
N/A	TREE	0	N/A	TREE	0	N/A	TREE	1

**NOTE:**

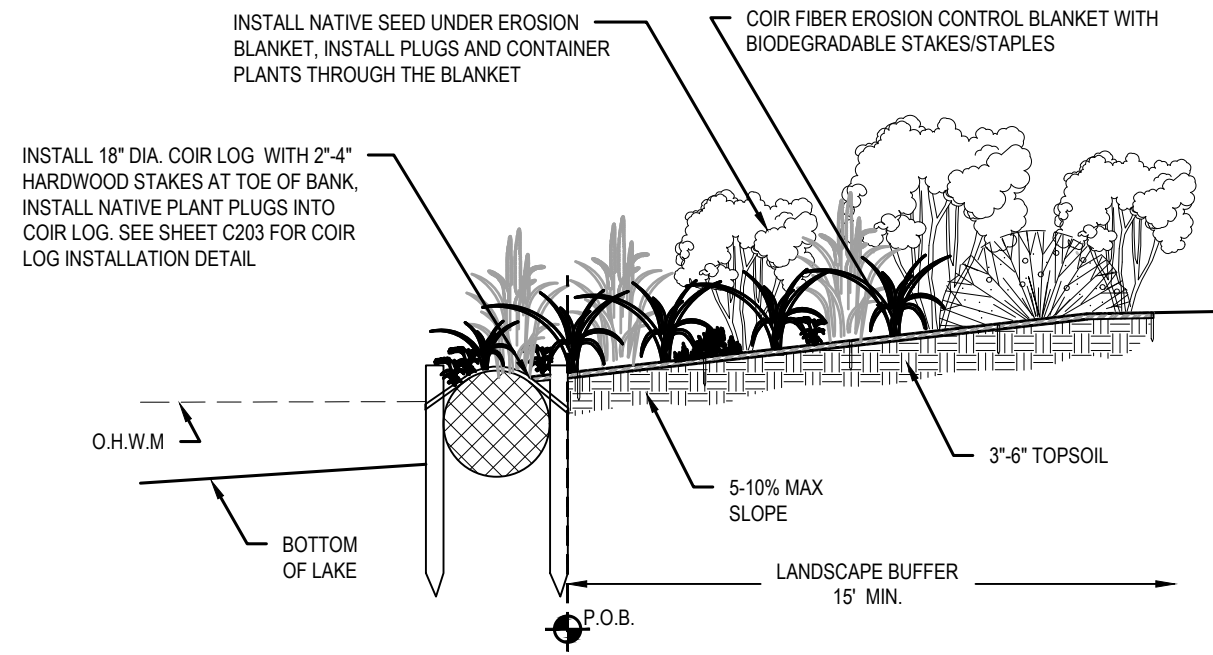
- PLANT LAYOUT WILL UTILIZE TRIANGULAR SPACING AND PLANTS WILL BE SET 6 INCHES FROM THE PERIMETER EDGE OF A SPECIFIC ENERGY SITE TYPE.
- PLANT & CONTAINER SIZES:
  - FORBES & GRASSES: #1 POT
  - SHRUBS: #5 POT
  - TREES: 2 1/2 CAL., B&B



NOTES:

1. LOW ENERGY SHORELINE TO BE USED FOR SHORES WITH < 1' TYPICAL STORM WAVES AND LOW ICE PUSH. INSTALLATION TO BE USED TO SECURE ERODING SHORELINES IN MODERATE ENERGY INSTANCES.
2. SHORE SLOPE TO BE TO 5% - 10% MAX.
3. COIR LOG DIA. TO BE GREATER THAN THE HIGHEST TYPICAL EXPECTED WAVE HEIGHT. COIR LOG DENSITY TO BE 7LBS/FT<sup>3</sup>.
4. PROVIDE WILD LIFE CONTROL MEASURES AND FENCING DURING THE WARRANTY PERIOD.
5. P.O.B. = POINT OF BEGINNING. THE INSTANCE WHERE THE ORDINARY HIGH WATER MARK INTERFACES WITH THE EARTHEN SHORELINE.
6. O.H.W.M. = ORDINARY HIGH WATER MARK

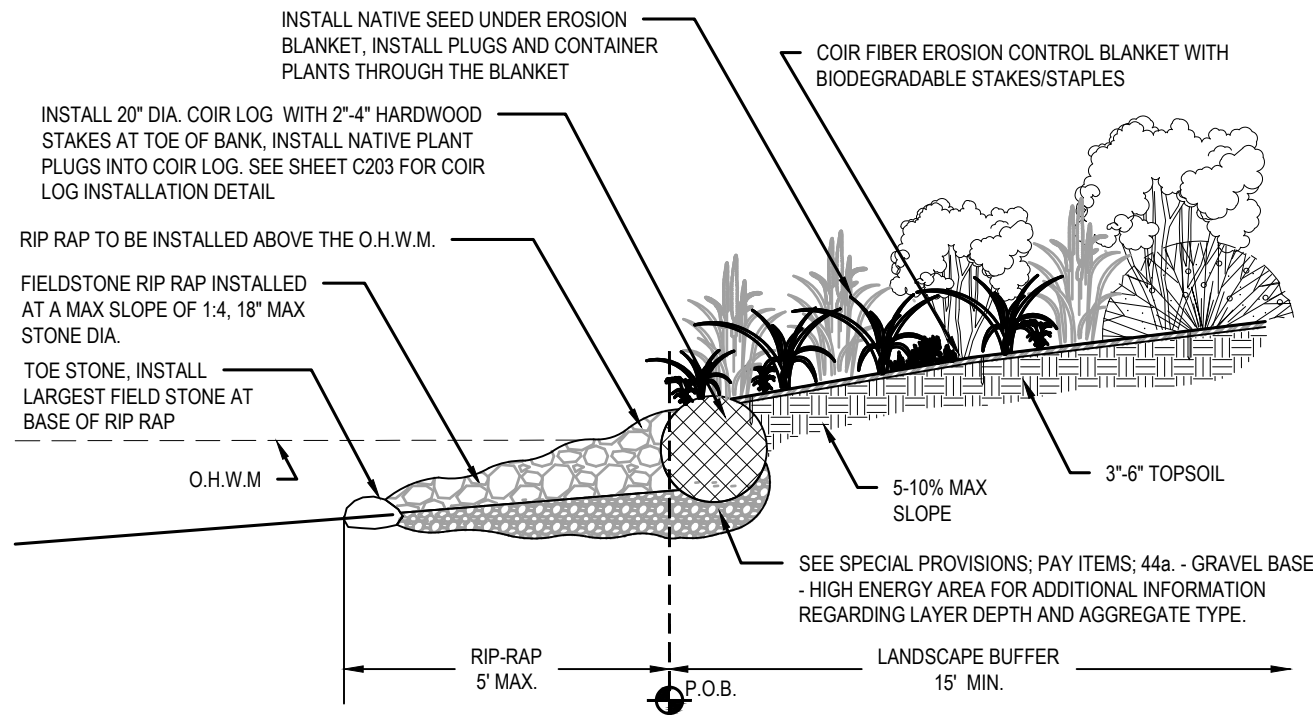
**1 LOW ENERGY NATURAL SHORELINE DETAIL**  
NOT TO SCALE



NOTES:

1. MODERATE ENERGY SHORELINE TO BE USED FOR SHORES WITH 1'-2.3' TYPICAL STORM WAVES AND MODERATE ICE PUSH.
2. INSTALLATION TO BE USED TO SECURE ERODING SHORELINES IN MODERATE ENERGY INSTANCES.
3. SHORE SLOPE TO BE TO 5% - 10% MAX.
4. COIR LOG DIA. TO BE GREATER THAN THE HIGHEST TYPICAL EXPECTED WAVE HEIGHT. COIR LOG DENSITY TO BE 7LBS/FT<sup>3</sup>.
5. PROVIDE WILD LIFE CONTROL MEASURES AND FENCING DURING THE WARRANTY PERIOD.
6. P.O.B. = POINT OF BEGINNING. THE INSTANCE WHERE THE ORDINARY HIGH WATER MARK INTERFACES WITH THE EARTHEN SHORELINE.
7. O.H.W.M. = ORDINARY HIGH WATER MARK.

**2 MODERATE ENERGY SHORELINE DETAIL**  
NOT TO SCALE



**3 HIGH ENERGY NATURAL SHORELINE DETAIL**  
NOT TO SCALE

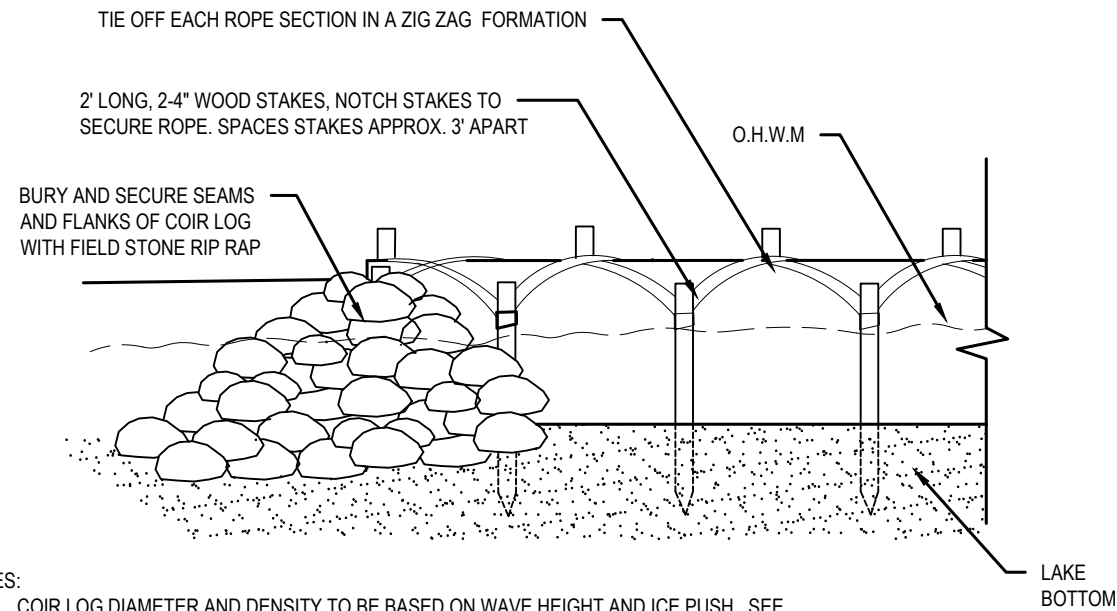
NOTES:

1. HIGH SHORELINE TO BE USED FOR SHORES WITH > 2.3' TYPICAL STORM WAVES AND HIGH ICE PUSH.
2. SHORE SLOPE TO BE TO 5% - 10% MAX.
3. COIR LOG DIAMETER TO BE GREATER THAN THE HIGHEST TYPICAL EXPECTED WAVE HEIGHT. COIR LOG DENSITY TO BE 9LBS/FT<sup>3</sup>.
4. STONE SIZE TO VARY WITH A MAXIMUM OF 18" IN DIAMETER.
5. FIELD STONE SIZE TO BE SELECTED TO ACCOMMODATE WAVE ENERGY AND ICE PUSH. FIELD STONE SIZE RATIOS TO BE 50% STONE SIZE FOR AVERAGE WAVE HEIGHT, 25% STONE SIZE FOR HIGHEST TYPICAL WAVE HEIGHT, AND 25% FOR LOWEST TYPICAL WAVE HEIGHT. REFER TO ARMY CORE OF ENGINEERS GUIDE FOR SHORELINE ENGINEERING AND STONE SIZE/ WEIGHT SELECTION.
6. TOE STONE TO BE SELECTED TO ACCOMMODATE HIGHEST EXPECTED WAVE HEIGHT AND ICE PUSH.
7. PROVIDE WILD LIFE CONTROL MEASURES AND FENCING DURING THE WARRANTY PERIOD.
8. P.O.B. = POINT OF BEGINNING. THE INSTANCE WHERE THE ORDINARY HIGH WATER MARK INTERFACES WITH THE EARTHEN SHORELINE.
9. O.H.W.M. = ORDINARY HIGH WATER MARK.

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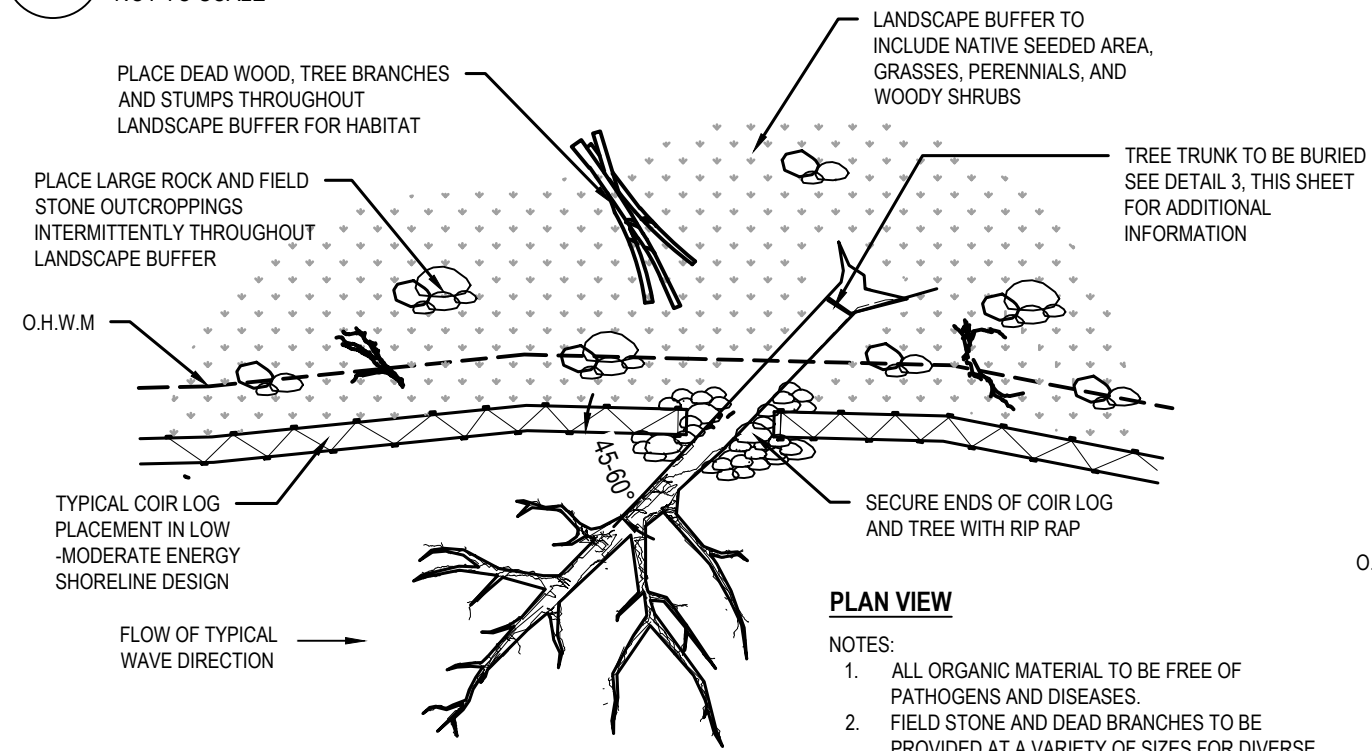




- NOTES:
1. COIR LOG DIAMETER AND DENSITY TO BE BASED ON WAVE HEIGHT AND ICE PUSH. SEE DETAILS THIS SHEET.
  2. COIR LOG TO BE 1/3RD ABOVE THE O.H.W.M AND 2/3RD BELOW THE O.H.W.M.
  3. WOOD STAKES TO BE SPACED APART 3' O.C.

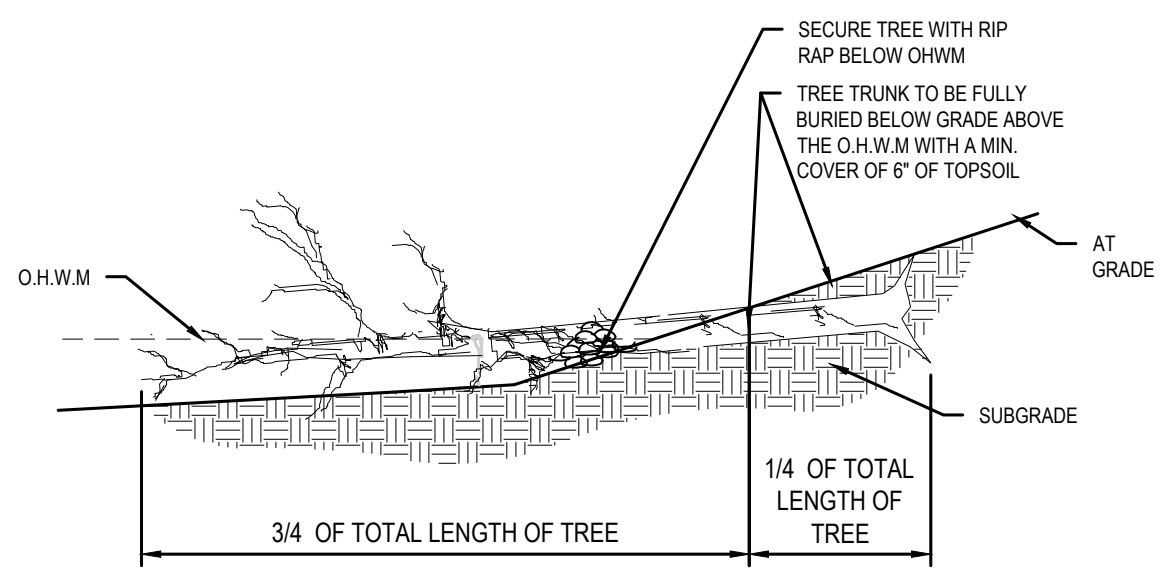
## 1 COIR LOG INSTALLATION DETAIL

NOT TO SCALE



## 2 FALLEN TREE AND FIELD STONE HABITAT DETAIL

NOT TO SCALE



## 3 BURIED FALLEN TREE HABITAT DETAIL

NOT TO SCALE

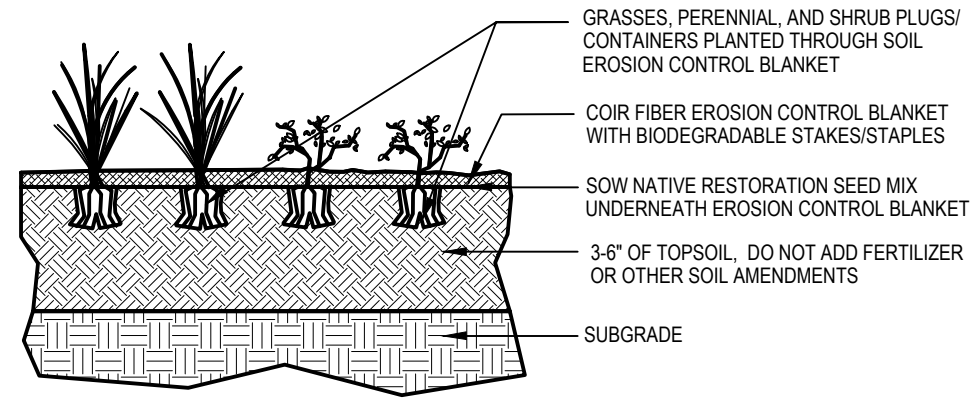
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## PLANTING DESIGN CRITERIA

1. PLANT MATERIAL TO BE NATIVE TO SOUTHERN MICHIGAN/ NORTHERN INDIANA DRIFT PLAIN ECO REGION (56) WITH ZONE 5 COLD HARDINESS. PROPOSED PLANT SELECTION TO BE NATIVE/SIMILAR TO THE SURROUNDING PLANT COMMUNITY AND ECO REGION. PLANTS TO BE SELECTED FOR ENHANCED SURVIVABILITY IN DISTURBED SITES.
2. CONTRACTOR TO WORK WITH MICHIGAN WILDFLOWER FARMS (517-647-6010), OR APPROVED EQUAL, FOR PLANT SELECTION AND AVAILABILITY.
3. PLANT SELECTION AND INSTALLATION TYPE/SIZES TO BE APPROVED BY THE OWNER AND CONSULTANT. PLANT MATERIAL SELECTION TO INCLUDE A MIXTURE OF SHRUBS, PERENNIALS, GRASSES, AND AQUATIC PLANTS. UPLAND LANDSCAPE BUFFERS OF SHRUB PLANTINGS IS RECOMMENDED FOR FURTHER SHORELINE STABILITY AND HABITAT CREATION.
4. THE NATURAL SHORELINE LANDSCAPE BUFFER SHALL BE A MINIMUM OF 15' WIDE FROM THE O.H.W.M. A WIDER LANDSCAPE BUFFER WITH UPLAND PLANTINGS OF TREES AND SHRUBS IS RECOMMENDED. THE NATURAL SHORELINE SHALL EXTEND INTO THE LAKE AT A MAXIMUM OF 5' FROM THE O.H.W.M.

## GENERAL LANDSCAPE NOTES

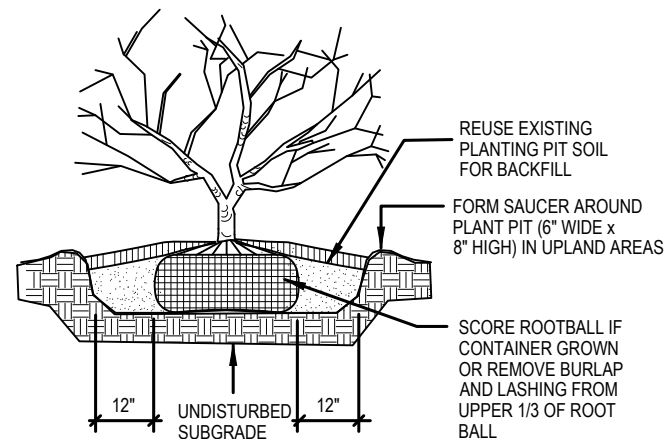
1. CONTRACTOR IS RESPONSIBLE FOR UNDERSTANDING PROJECT CONDITIONS AND VERIFYING PLANT QUANTITIES. NOTIFY DESIGNER AND CONSULTANT OF PLAN DISCREPANCIES.
2. CONTRACTOR SHALL COMPLY WITH WITH THE MERIDIAN TOWNSHIP (INGHAM COUNTY), MICHIGAN CODE OF ORDINANCES INCLUDING BUT NOT LIMITED TO PROCEDURES, INSPECTIONS, AND MAINTENANCE.
3. PLANT LOCATIONS AND PLANT SELECTION TO BE APPROVED BY CONSULTANT AND OWNER. CONTRACTOR WILL BE RESPONSIBLE FOR VERIFYING ALL EXISTING UNDERGROUND UTILITIES AND CONDITIONS. CONTACT THE APPROPRIATE UTILITY COMPANY FOR FIELD STAKING ALL LINES.
4. TREE AND SHRUB DELIVERY SHALL BE THE SAME DAY AS PLANTING. NO PLANTS SHALL BE STORED A THE SITE WITHOUT PERMISSION OF THE OWNER'S REPRESENTATIVE. PLANTS SHALL BE CAREFULLY LOADED AND UNLOADED SO AS NOT THE DAMAGE BRANCHING OR ROOT MASS. DROPPING OF MATERIAL WILL NOT BE ALLOWED. PLANTS IN FULL LEAF SHALL BE THOROUGHLY WETTED DOWN AND COMPLETELY COVER WITH A WET TARP DURING TRANSPORTATION. ALL PLANT ROOTS MUST BE KEPT IN A MOIST CONDITION.
5. ALL AREAS DISTURBED BY CONSTRUCTION TO BE TOPSOILED AND SEEDED WITH TURF GRASS OR NATIVE RESTORATION SEED MIX.
6. CONTRACTOR TO CONTACT MISS DIG AT PHONE NUMBER 811 AT LEAST 3 WORKING DAYS PRIOR TO CONSTRUCTION TO CONFIRM LOCATION OF EXISTING UTILITIES.
7. CONTRACTOR SHALL PROVIDE SPECIFIED SHRUBS, GROUND COVERS, AND OTHER PLANT MATERIALS THAT COMPLY WITH ALL RECOMMENDATIONS AND REQUIREMENTS OF ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK". PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS STOCK, GROWN WITH GOOD HORTICULTURAL PRACTICE AND INSTALLED IN ACCORDANCE WITH METHODS ESTABLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
8. NOTIFY CONSULTANT AND OWNER (3 DAYS MIN. NOTICE) TO INSPECT AND TAG PLANT MATERIAL IN THE NURSERY PRIOR TO JOBSITE DELIVERY AND INSTALLATION.
4. NATIVE RESTORATION SEED MIXES TO BE INSTALLED UNDERNEATH SOIL EROSION CONTROL BLANKETS. PLUGS AND CONTAINER PLANTS TO BE INSTALLED THROUGH EROSION CONTROL BLANKETS AND COIR LOGS. AQUATIC PLANTS TO BE INSTALLED PER NURSERY RECOMMENDATIONS.
10. COMPLETE ALL WOODY PLANTINGS BETWEEN MARCH 1 - MAY 30 OR OCTOBER 15- DECEMBER 15 OR AS CONDITIONS PERMIT WHEN PLANTS ARE DORMANT AND SOIL IS NOT FROZEN. CONTRACTOR SHALL NOTIFY CONSULTANT FOR THE TIMING OF SEED AND PLUG INSTALLATION.



1

## PERENNIAL & GROUNDCOVER PLANTING DETAIL

NOT TO SCALE



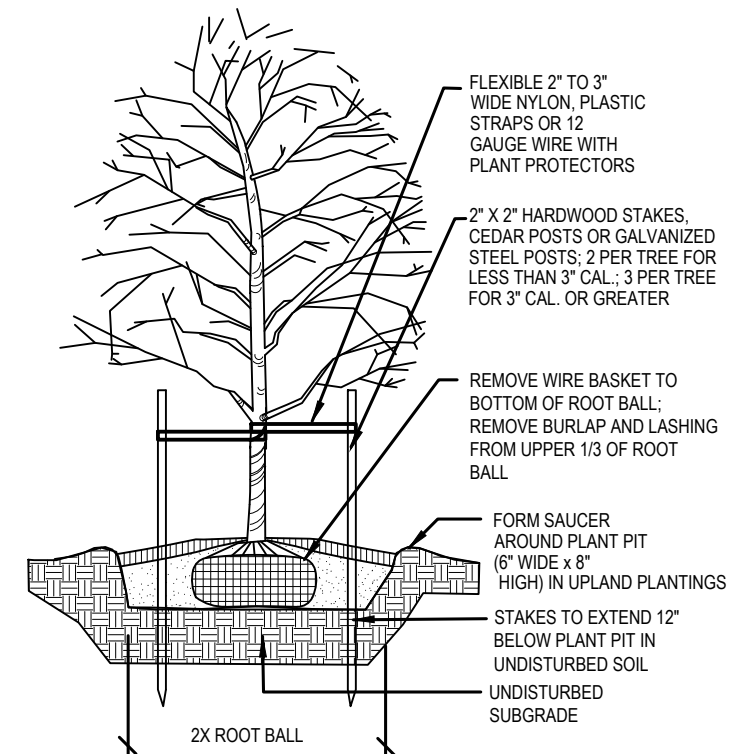
### NOTES

1. PLANT SHRUB THROUGH SESC CONTROL BLANKET IN SHORELINE LANDSCAPE BUFFER.
2. ALL PLANTS TO BE NURSERY GROWN STOCK IN SOIL SIMILAR TO SITE CONDITIONS.

2

## SHRUB PLANTING DETAIL

NOT TO SCALE



3

## TREE PLANTING DETAIL

NOT TO SCALE

LAKE LANSING NATURAL SHORELINE  
**DEMONSTRATION**  
**PROJECT - 2022**  
 1621 PIKE ST., HASLETT, MI 48840

ISSUANCE  
 BIDS AND PERMITS

12/14/2022

FILE NUMBER 53260102  
 PROJECT MANAGER P. HAUSLER  
 PROFESSIONAL C. MARKHAM  
 DRAWN BY S. VANDYKE  
 CHECKED BY R. JOHNSON

PLANTING DESIGN  
 CRITERIA AND  
 DETAILS  
**C301**

progressive|ae

1811 4 Mile Rd NE | Grand Rapids, MI 49525 | 616.361.2664  
 330 South Tryon St., Suite 500 | Charlotte, NC 28202 | 704.731.8080  
 www.progressiveae.com

# PLANTING ZONE = BELOW WATER LEVEL

SUGGESTED NATIVE MICHIGAN SHORELINE PLANT LIST FOR REFERENCE ONLY.

SPACING	BOTANICAL NAME	COMMON NAME	SUN	HEIGHT	BLOOM TIME	COLOR	SILTATION	ADAPTIVE FEATURES
FORBS 60% of Total Area 24" On-Center Plant Spacing	Acorus calamus	Sweet Flag	f/p	1'-4'	May-Jun	Green	Low	Aromatic leaves, clump forming; wildlife food and cover .
	Alisma plantago-aquatica	Water Plantain	f	2'-4'	Jul-Sept	White	High	Tolerates water fluctuation: wildlife food and cover.
	Iris versicolor	Blue Flag (Wild Iris)	f/p	2-3'	May-Jul	Blue	Medium	Tuberous roots send out fibrous masses
	Iris virginica	Blue Flag (Wild Iris)	f/p/s	2'-3'	May-Jul	Purple	Medium	Tuberous roots send out fibrous masses.
	Nuphar advana	Yellow Pond Lily	f/p	1'	May-Sept	Yellow	High	Breaks up wave action; deep water plant
	Nymphaea odorata(N. tuberosa)	White Water Lily	f/p	1'	May-Sept	White	High	Breaks up wave action; deep water plant..
	Peltandra virginica	Arrow Arum	f/p/s	2'-5'	June-July	Green	High	Massive root system; forms clumps; breaks up wave action
	Pontederia cordata	Pickerelweed	f/p	1'-3'	June-Sept	Violet	Med./high	Thick, spreading rhizomes, forms colonies
	Sagittaria latifolia	Arrowhead	f/p	1'-4'	June-Sept	White	Med	Drought Tolerant. Wildlife food and cover -
	Sagittaria rigida	Stiff arrowhead	f/p	1-3'	July-Sept	White	Med/high	Wildlife food and cover
GRASSES 40% of Total Area 24" On-Center Plant Spacing	Schoenoplectus acutus	Hard-stem bulrush	f	3-9'	May-Sept	Brown	Medium	Spreads opportunistically by rhizomes
	Schoenoplectus pungens	Three square bulrush	f/p	3-5'	Jul-Sept	Brown	Medium	Spreads opportunistically by rhizomes
	Schoenoplectus tabernaemontani	Soft-stem bulrush	f/p	3-9'	Jun-Sept	Brown	Medium	Spreads opportunistically by rhizomes
	Sparganium eurycarpum	Common bur-reed	f	2'-6'	May-Aug	Green	High	Wave buffer. Spreads readily from rhizomes; can be opportunistic

# PLANTING ZONE - BETWEEN WATER LEVEL AND O.H.W.M

SUGGESTED NATIVE MICHIGAN SHORELINE PLANT LIST FOR REFERENCE ONLY.

SPACING	BOTANICAL NAME	COMMON NAME	SUN	HEIGHT	BLOOM TIME	COLOR	SILTATION	ADAPTIVE FEATURES
FORBS 44% of Total Area 24" On-Center Plant Spacing	Asclepias incarnata	Marsh Milkweed	f/p	3'-5'	June-Sept	Pink	Medium	Monarch host; rhizomes form single plants
	Aster puniceus	Swamp aster	f/p	3'-6'	Aug-Oct	Lav/white	Med high	Spreads opportunistically from rhizomes
	Decodon verticillatus	Swamp Loosestrife	f/p	2'-4'	July-Sept	Magenta		Often colonizes in monotypic stands
	Eupatorium maculatum	Joe-Pye Weed	f/p	4'-7'	June-Oct	Pink	Low	Shallow fibrous roots; butterflies
	Eupatorium perfoliatum	Boneset	f/p	3'-5'	July-Oct	White	Low	Shallow fibrous roots; butterflies
	Eupatorium purpureum	Purple Joe-Pye Weed	p/s	3'-6'	July-Sept	Pink	Low	Shallow fibrous roots; butterflies
	Lobelia cardinalis	Cardinal flower	f/p	2-4'	July-Sept	Red		Shallow roots, short-lived; butterflies and hummingbirds
	Lobelia siphilitica	Great Blue Lobelia	f/p	1-3'	July-Sept	Blue		Shallow, fibrous roots
	Mimulus ringens	Monkeyflower	f/p	1-3'	July-Sept	Blue		Pretty flower
	Myrica gale	Sweet Gale	f/p	2-6'	May-June	Yellow		
	Penthorum sedoides	Ditch stonecrop	f/p	1'-3'	June-Oct	Green	Medium	Fibrous, shallow root system; can be opportunistic
	Polygonum amphibium	Water smartweed	f/p	1'-2'	June-Oct	Rose	Med. high	Spreads by rhizomes
	Saururus cernuus	Lizard's Tail	p/s	2'-4'	June-Aug	White	Med. high	Spreads by rhizomes
GRASSES 55% of Total Area 24" On-Center Plant Spacing	Carex aquatilis	Water sedge	f/p	2'-3'	Apr-June	Green	High	Spreads opportunistically by rhizomes
	Carex comosa	Bristly sedge	f/p	2'-3'	May-June	Green	High	Rhizomes form dense clumps
	Carex hystericina	Porcupine sedge	f/p/s	2'-3'	May-June	Green	Med/high	Rhizomes form dense clumps
	Carex lacustris	Lake sedge	f/p/s	2'-4'	May-June	Green	Medium	Spreads opportunistically by rhizomes
	Carex stricta	Tussock sedge	f/p	2'-3'	Apr-June	Brown	Med/high	Forms hummocks, slow spreading with dense roots
	Elymus virginicus	Virginia Wild Rye	f/p	2'-4'	June	Green	med	Bunching, cool season, short-lived
	Juncus balticus	Baltic rush	f/p	1-2'	May-Aug	Brown	High	Spreads by rhizomes, forming clumps, prefers sandy shores
	Juncus effusus	Soft rush	f/p	1'-4'	July	Brown	High	Spreads opportunistically by rhizomes
	Scirpus fluviatilis	River bulrush	f	3'-7'	May-July	Green	High	Spreads opportunistically by rhizomes
	Scirpus cyperinus	Wool grass	f	3'-5'	June-Sept	Tan	High	Strong fibrous roots form clumps in high water
SHRUBS 1% of Total Area	Betula pumila	Bog Birch	f/p	3-7'	Apr-May	Yellow		
	Cornus amomum	Silky dogwood	f/p	10'	May-July	White	Low	Wildlife, fibrous roots, can be opportunistic: live stakes
	Cornus sericea	Red-osier dogwood	f/p	10'	May-Sept	White	Med/High	Wildlife, fibrous roots, can be opportunistic: live stakes
	Rosa palustris	Swamp Rose	f/p/s	2'-7'	June-Aug	Pink		
	Salix exigua (S. interior)	Sandbar willow	f	6-20'	Apr-May	Yellow	High	Commonly used as live stakes
TREES See Plan for Locations	Alnus incana	Speckled alder	f/p/s	25'	Mar-May	Brown	Medium	Shallow rooted, but can be opportunistic
	Populus deltoides	Eastern Cottonwood	f	75-100'	Apr-May	Brown	High	Commonly used as live stakes
	Salix discolor	Pussy willow	f/p	15-25'	May	Silver	Medium	Wildlife, fibrous roots, can be opportunistic: live stakes
	Salix nigra	Black willow	f/p	35-50'	Apr-May	Yellow	Med	Commonly used as live stakes, shallow roots

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LAKE LANSING NATURAL SHORELINE  
DEMONSTRATION  
PROJECT - 2022  
1621 PIKE ST., HASLETT, MI 48840

ISSUANCE  
BIDS AND PERMITS  
12/14/2022

FILE NUMBER 53260102  
PROJECT MANAGER P. HAUSLER  
PROFESSIONAL C. MARKHAM  
DRAWN BY S. VANDYKE  
CHECKED BY R. JOHNSON

PLANT LIST  
C302

# PLANTING ZONE - ABOVE O.H.W.M

SUGGESTED NATIVE MICHIGAN SHORELINE PLANT LIST FOR REFERENCE ONLY.

SPACING	BOTANICAL NAME	COMMON NAME	SUN	HEIGHT	BLOOM TIME	COLOR	SILTATION	ADAPTIVE FEATURES
FORBS 43% of Total Area 24" On-Center Plant Spacing	Anemone canadensis	Canada Anemone	f/p	1'-2'	May-Sept	White	Medium	Rhizomes spread readily with some stabilization of soils
	Aster novae-angliae	New England Aster	f/p	3'-6'	Jul-Oct	Violet	High	Short rhizomes, readily reseeds on disturbed soils; butterflies
	Aster umbellatus	Tall White Aster	f/p	1'-4'	Jul-Oct	White	Medium	Fibrous roots; butterflies
	Chelone glabra	Turtlehead	f/p/s	2'-4'	Aug-Sep	Cream	Low	Deep fibrous roots
	Coreopsis tripteris	Tall Tickseed	f/p	4-8'	Aug-Sep	Yellow	Low	
	Euthamia graminifolia	Grass-leaved goldenrod	f/p	1'-4'	Jul-Sept	Yellow	Low	Spreads opportunistically from rhizomes
	Helenium autumnale	Sneezeweed	f/p	3'-5'	Jul-Nov	Yellow	Low	Fibrous, shallow root system; can be opportunistic
	Helianthus giganteus	Tall Sunflower	f/p	5'-12'	Jul-Sept	Yellow	Medium	Spreads from rhizomes
	Liatris spicata	Dense Blazing Star	f	3-5'	Jul-sept	Pink	Low	Nectar source
	Physotegia virginiana	Obedient plant	f/p	2'-5'	Aug-Oct	Pink	Low	Nectar source; spreads by small rhizomes to carpet area
	Pycnanthemum virginianum	Virginia Mountainmint	f/p	1-3'	July-Sept	White	Low-med	Stoloniferous rhizomes, aromatic
	Rudbeckia laciniata	Cut-Leaved Coneflower	f/p/s	3'-10'	July-Sept	Yellow		
	Solidago ohioensis	Ohio Goldenrod	f/p	2-4'	July-Oct	Yellow		
	Solidago patula	Roundleaf Goldenrod	f/p/s	3-6'	Aug-Oct	Yellow		Rhizomatous root growth. Drought tolerance is low.
	Solidago riddellii	Riddell's Goldenrod	f	2-3'	Sept-Nov	Yellow	Medium	
	Spiraea alba	Meadowsweet	f/p	3'-6'	June-Aug	White	Low-Med	Dense, fibrous roots, can be opportunistic, suckering, shallow
	Thalictrum dasycarpum	Purple Meadow Rue	f/p	3'-6'	May-July	Cream	Med. high	Fibrous, shallow root system; can be opportunistic
	Verbena hastata	Blue Vervain	f/p	3'-6'	June-Sept	Violet	Med. high	Short spreading tough roots; any soils; opportunistic; short lived
Vernonia missurica	Missouri Ironweed	f	3'-5'	July-Sept	Purple	Med. high	Nectar source; thick root system	
Veronicastrum virginicum	Culver's Root	f/p	2'-6'	June-Sept	White	Low	Nectar source; thick root system; likes alkaline soils	
Zizia aurea	Golden Alexander's	f/p/s	1'-3'	Apr-June	Yellow	Med. high	Nectar source; thick root system	
GRASSES 55% of Total Area 24" On-Center Plant Spacing	Calamagrostis canadensis	Canada blue-joint grass	f/p	2'-4'	June	Brown	Medium	Spreads opportunistically by rhizomes
	Carex crinita	Fringed sedge	f/p/s	2'-5'	May-June	Green	Med. high	Likes semi-shade; forms dense clumps
	Carex stipata	Awl-fruited sedge	f/p/s	1'-3'	Apr-May	Brown	High	Prefers calcareous soils; fibrous roots form clumps
	Carex vulpinoidea	Fox sedge	f/p	2'-3'	May-June	Brown	Med. high	Rhizomes form dense clumps
	Cinna arundinacea	Sweet Woodreed	f/p/s	3-4'	Aug-Sept	Green		Roots are fibrous and rhizomatous; usually deer resistant
	Elymus riparius	Riverbank Wild Rye	p/s	2'-4'	Jul-Aug	Green		Good for erosion control; deer resistant
	Glyceria canadensis	Rattlesnake grass	f/p	2'-5'	June	Green	High	Bunching, cool season grass with dense roots
	Glyceria striata	Fowl manna grass	f/p/s	1'-5'	May-June	Green	High	Bunching, cool season grass with dense roots
	Juncus torreyi	Torrey rush	f	1'-2'	Jun-Sept	Brown	High	Spreads opportunistically by rhizomes
	Onoclea sensibilis	Sensitive Fern	p/s	1-2'		Green	Low	Branching rhizomes
	Osmunda regalis	Royal Fern	f/p/s	3-6'		Green	Low-med	Stout rhizomes, fibrous roots, spreads slowly
	Panicum virgatum	Switchgrass	f/p	4'-6'	Aug-Oct	Green	Med. Low	Bunching, cool season grass with dense roots; excellent soil stabilizer
	Scirpus atrovirens	Green bulrush	f	3'-5'	Jun-Aug	Brown	High	Strong fibrous roots form clumps in high water
	Spartina pectinata	Prairie cord grass	f	3'-7'	Jul-Aug	Green	High	Spreads opportunistically by rhizomes
SHRUBS 1.25% of Total Area	Ilex verticillata	Michigan Holly	f/p/s	6-12'	May-June	White		Male & female plants, prefers acidic soil, shall fibrous roots
	Physocarpus opulifolius	Ninebark	f/p	10'	May-June	White		Commonly used as live stakes
	Sambucus canadensis	American Elderberry	f/p/s	5-12'	June-Aug	White		Spreads by rhizomes
	Viburnum dentatum	Arrow Wood	f/p/s	15'	May-June	White	Low	Suckering
	Viburnum lentago	Nannyberry	p/s	20'	Apr-June	White	Low	Suckering, shallow, fibrous roots
TREES See Plan for Locations	Acer rubrum	Red Maple	f/p/s	75-100'	Mar-May	Green/red		Provides food for squirrels and some birds; typically deer resistant
	Acer saccharinum	Silver Maple	f/p	75-100'	Mar-Apr	Red		Shallow, wide spread fibrous roots
	Betula alleghaniensis	Yellow Birch	p/s	60-80'	Apr-May	Purple/		Good edge tree; food for birds and other wildlife
	Celtis occidentalis	Hackberry	f/p	50-75'	Apr-May	Yellow	Low med.	Deep spreading roots, medium to fast growing, long-lived
	Gleditsia triacanthos	Honey Locust	f/p	30-75'	May-June	Yellow		Used extensively by wildlife; open canopy and small leaves; has thorns
	Platanus occidentalis	Sycamore	f/p/s	100'	Apr-June	Green		Fast growing tree; great for rehabilitation of sites with saturated soils
	Populus balsamifera	Balsam Poplar	f	60-80'	Apr-May	Yellow		Clonal, propogate by stem cuttings
	Quercus bicolor	Swamp White Oak	f/p/s	70'	May	Green/	Medium	Shallow, fibrous roots, prefers acidic soil
Quercus rubra	Red Oak	f/p/s	90'	May	Green/		Fast growing	
	Tilia americana	Basswood	f/p	60-100'	June-July	Yellow		Excellent for a large variety of wildlife; nectar excellent for honeybees

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LAKE LANSING NATURAL SHORELINE  
DEMONSTRATION  
PROJECT - 2022  
1621 PIKE ST., HASLETT, MI 48840

ISSUANCE  
BIDS AND PERMITS  
12/14/2022

FILE NUMBER 53260102  
PROJECT MANAGER P. HAUSLER  
PROFESSIONAL C. MARKHAM  
DRAWN BY S. VANDYKE  
CHECKED BY R. JOHNSON

PLANT LIST  
C303

## MAINTENANCE AND WARRANTY NOTES

- PLANT MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER EACH PLANT IS INSTALLED AND SHALL CONTINUE AS REQUIRED UNTIL THE END OF THE WARRANTY PERIOD. MAINTENANCE WILL INCLUDE BUT NOT LIMITED TO WATERING, CULTIVATION, WEEDING, MONITORING INVASIVE SPECIES, MOWING, PRUNING/CUTTING BACK, WILDLIFE AND PEST MANAGEMENT, WINTER CLEAN UP, RE SECURING SESC CONTROL MEASURES AND RESTORATION MATERIALS, AND REPLACEMENT DEAD, DAMAGED, OR MISSING PLANT MATERIAL IN ACCORDANCE WITH SPECIFICATIONS.
- THE WARRANTY PERIOD SHALL BE 2 YEARS AFTER THE POST CONSTRUCTION REVIEW AND WALK THROUGH AND INCLUDE 2 FULL GROWING SEASONS. A FULL GROWING SEASON IS DEFINED AS THE BEGINNING OF MAY THROUGH THE END OF OCTOBER OF THE SAME YEAR. IF INSTALLATION OCCURS AFTER JUNE 15, THE WARRANTY PERIOD SHALL BE EXTENDED THROUGH THE END OF OCTOBER OF THE NEXT YEAR AS TO ACHIEVE A FULL GROWING SEASON. SEE GENERAL CONDITIONS, GC.1 - CONTRACT SECURITY FOR ADDITIONAL INFORMATION.
- THE ESTABLISHMENT PERIOD FOR THE NATURAL SHORELINE RESTORATION SHALL BE A MINIMUM 3 YEARS TO A MAXIMUM OF 5 YEARS. AT THE END OF THE SECOND YEAR THE OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND MONITORING OF THE SHORELINE. A MAINTENANCE AGREEMENT MAY BE MADE WITH THE CONTRACTOR TO MAINTAIN THE SHORELINE AFTER THE WARRANTY PERIOD TILL THE POINT OF ESTABLISHMENT.
- THE WARRANTY SHALL INCLUDE:
  - A 95% SURVIVAL RATE FOR EACH TREE & WOODY SHRUB SPECIES BY THE END OF THE WARRANTY PERIOD.
  - A 95% SURVIVAL RATE FOR ALL PLANT MATERIAL WITHIN THE SHORELINE LANDSCAPE BUFFER BY THE END OF THE WARRANTY PERIOD.

## SUBMITTALS

- CONTRACTOR SHALL PROVIDE TO THE OWNER & CONSULTANT THE FOLLOWING SUBMITTALS
  - SHORELINE RESTORATION DESIGN AND METHODS OF IMPLEMENTATION SHOP DRAWINGS IF APPLICABLE.
  - AQUATIC PLANT SELECTION, ORDER, AND RECEIPT.
  - FORBES AND GRASS SELECTION, ORDER, AND RECEIPT.
  - WOODY PLANT MATERIAL AND TREE SELECTION, ORDER, AND RECEIPT.
  - SESC AND WILDLIFE CONTROL MATERIALS AND METHODS.
  - SHORELINE RESTORATION MATERIALS INCLUDING BUT NOT LIMITED TO COIR LOGS, EROSION. BLANKET, TIES, STAKES, AND STAPLES.
  - MAINTENANCE SCHEDULE DURING WARRANTY PERIOD.
  - MAINTENANCE AGREEMENT AFTER WARRANTY PERIOD IF APPLICABLE.
  - POST CONSTRUCTION REVIEW AND WALK THROUGH WITH OWNER AND CONSULTANT.

## LANDSCAPE MAINTENANCE SCHEDULE

TASK	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
CARE OF PLANTS												
MONITORING												
PRUNING (AS NEEDED)												
CUT BACK (AS NEEDED)												
WATERING AS NEEDED												
MONITORING INVASIVE'S												
WEEDING AS NEEDED												
PEST MANAGEMENT												
MONITORING												
WINTER CLEAN UP												
SECURING SESC / MATERIALS												

THE SCHEDULE SHOWN ABOVE IS FOR GUIDANCE ONLY. SCHEDULING OF MAINTENANCE ACTIVITY SHOULD BE COORDINATED WITH SEASONAL WEATHER CONDITIONS.