

JFNew
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 574-586-3400 fax 574-586-3446

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 3901 Industrial Boulevard
 Indianapolis, Indiana 46254
 317-388-1982 fax 317-388-1986

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 513-489-2402 fax 513-489-2404

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 605 S. Main Street, Suite 1
 Ann Arbor, MI 48104
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 West Olive, Michigan 49460
 616-847-1680 fax 616-847-9970

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 6605 Steger Road, Unit A
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 708-534-3450 fax 708-534-3480

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 403 Venture Ct Unit 7
 Verona, Wisconsin 53593
 608-848-1789 fax 608-848-3013

West Michigan Shoreline Regional Development Commission and the Muskegon Lake Watershed Partnership

Amoco Peninsula and Ruddiman Creek Mouth Restoration Sites

Muskegon County, Michigan

SEPTEMBER, 2013

AS-BUILT PLANS. APPROVED BY: SCOTT DIERKS, P.E.

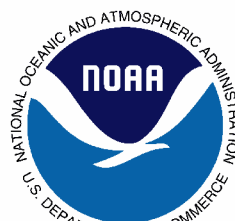
SHEET INDEX

SHEET	DESCRIPTION
1	Title Sheet and Sheet Index
2	Site Location Map
3	Existing Site Conditions
4	Existing Conditions - Sta. 0+00 to 9+00
5	Existing Conditions - Sta. 9+00 to 23+00
6	Access Plan
7	Demolition Plan - Sta. 0+00 to 9+00
8	Demolition Plan - Sta. 9+00 to 23+00
9	Grading Plan
10	Restoration Plan - Sta. 0+00 to 9+00
11	Restoration Plan - Sta. 9+00 to 23+00
12	Proposed Cross Sections A-A' thru C-C'
13	Proposed Cross Sections D-D' thru F-F'
14	Proposed Cross Sections G-G' and H-H'
15	Seawall Removal Plan
16	Details and Specifications
17	Plant Lists and Specifications



SITE MAP

NOT TO SCALE



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REVISION

West Michigan Shoreline Regional Development Commission and the Muskegon Lake Watershed Partnership
 Amoco / Ruddiman Properties
 Title Sheet and Sheet Index

DRAWN BY: RAB

DESIGNED BY: BM

DATE: 09/26/2013

JOB NO: 0902035



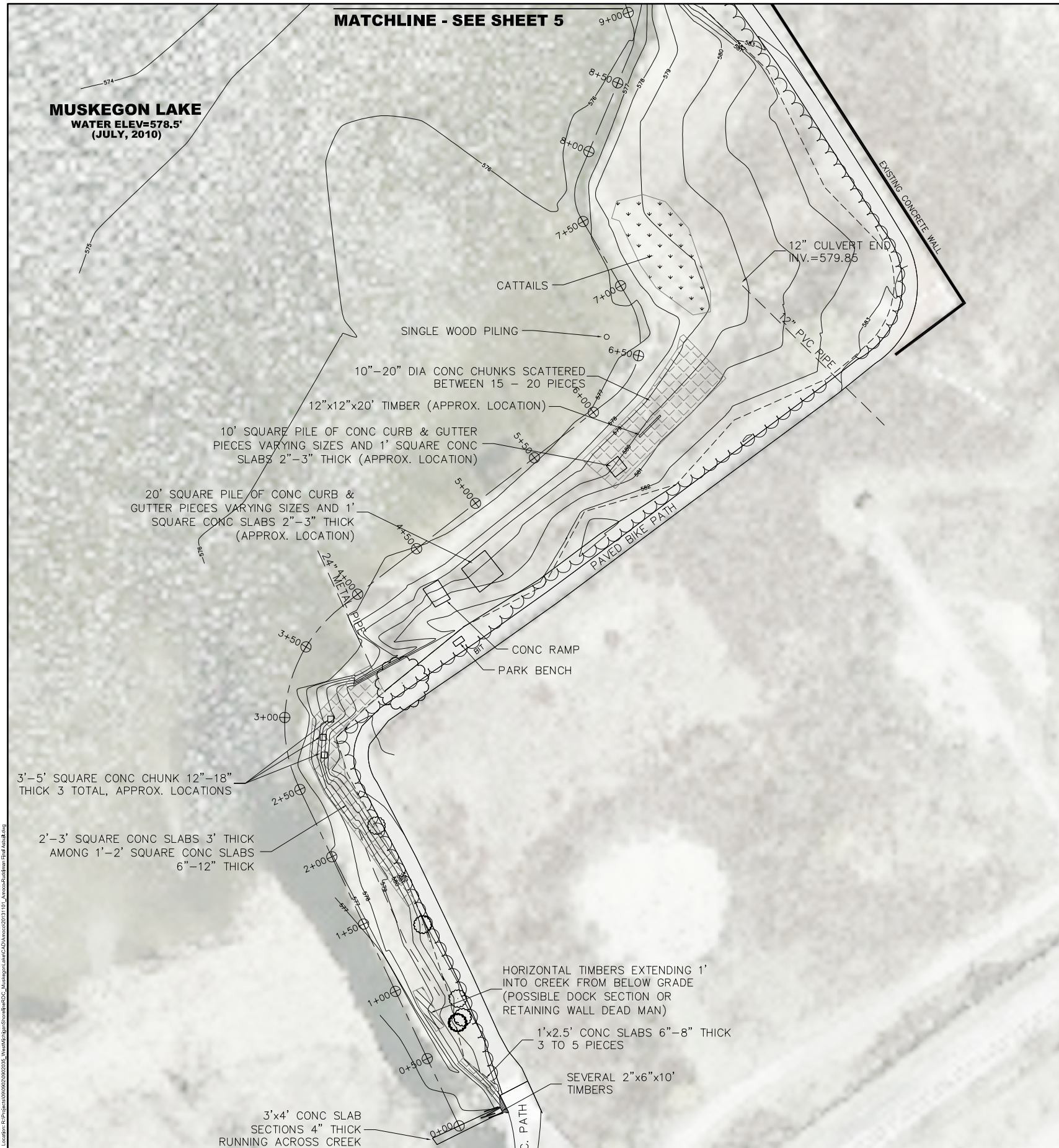
SHEET NO.

1

OF 17



BEFORE YOU DIG
 CALL MISS DIG
 CALL 3 FULL WORKING DAYS
 811 OR 1-800-482-7171



NOTES:

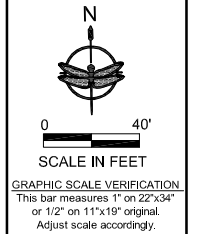
1. ALL ITEMS LISTED ON THE LEGEND MAY NOT BE PRESENT ON THE DRAWING.
2. ALL PROPERTY AND/OR RIGHT-OF-WAY LINES SHOWN ARE APPROXIMATE.
3. ALL UNDERGROUND UTILITIES ARE APPROXIMATE BASED ON UTILITY PLANS, AS-BUILT PLANS OR FIELD OBSERVATIONS.

LEGEND

- ⊕ TEMP. SURVEY POINT
- BM#1 BENCHMARK
- ⊕ SECTION CORNER
- ⊕ FIRE HYDRANT
- ⊕ WATER VALVE
- ⊕ CURB STOP & BOX
- ⊕ CABLE BOX
- ⊕ TELEPHONE RISER
- ⊕ TELEPHONE MANHOLE
- ⊕ ELECTRICAL RISER
- ⊕ ELECTRICAL MANHOLE
- POWER POLE
- ⊕ LIGHT POLE
- ⊕ YARD LIGHT
- ⊕ SIGN
- ⊕ GUARD POST
- ⊕ MONITORING WELL
- TREE (DECIDUOUS)
- ▨ CONCRETE CHUNKS, SLABS OF VARYING SIZES
- ▨ CATTAILS
- ▨ WOOD/NON-NATIVE DEBRIS
- ⊕ STATIONING MARKER
- x — x — x — x FENCE

BM #E1 EL. 584.26'
 12' W OF PARK BENCH
 (DATUM=NAVD88 VIA GPS & OPUS)

SURVEY DATA PREPARED BY FLEIS & VANDENBRINK ENGINEERING, INC. (DEC., 2009).



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REVISION	DATE	DESCRIPTION

West Michigan Shoreline Regional
 Development Commission and the
 Muskegon Lake Watershed Partnership
 Amoco / Ruddiman Properties
 Existing Conditions - 0+00 to 9+00

DRAWN BY: RB
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SHEET NO.
4
OF 17



MUSKEGON LAKE
WATER ELEV=578.5'
(JULY, 2010)

FROM STA. 14+00 TO 17+50 - REMOVE EXISTING CONCRETE PIECES, MOORINGS, PILINGS, AND NON-NATIVE DEBRIS LARGER THAN 4" DIA.,

REMOVE APPROX. 305 LINEAR FEET OF EXISTING STEEL SEAWALL AND ASSOCIATED MOORINGS, PILINGS, AND BOLLARDS (SEE SHEET 15)

FROM STA. 9+00 TO 14+00 - REMOVE EXISTING CONCRETE CHUNKS, PIECES, AND NON-NATIVE DEBRIS LARGER THAN 4" DIA.,

REMOVE TREES AND SHRUBS AS NEEDED TO FACILITATE CONSTRUCTION

REMOVE APPROX. 35 L.F. OF EXISTING CONCRETE WALL FOR SITE ACCESS

MATCHLINE - SEE SHEET 7

DEMOLITION SUMMARY: AMOCO / RUDDIMAN

ITEM	UNIT	QTY.
CLEARING AND GRUBBING	LS	1
PILINGS, MOORINGS, AND BOLLARD REMOVAL	LS	1
STEEL SEAWALL REMOVAL	LS	1
CONCRETE REMOVAL AND RECYCLING	CY	3,690
MISC. FOUNDRY, METAL, AND DEBRIS REMOVAL	CY	120

NOTES:

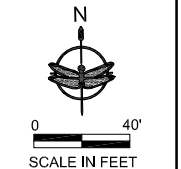
1. ALL ITEMS LISTED ON THE LEGEND MAY NOT BE PRESENT ON THE DRAWING.
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3. ALL UNDERGROUND UTILITIES ARE APPROXIMATE BASED ON UTILITY PLANS, AS-BUILT PLANS, OR FIELD OBSERVATIONS.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING DAMAGE TO EXISTING STRUCTURES, PAVED BIKE PATH, OR TURF GRASS.
5. ALL DAMAGED TURF GRASS SHALL BE REPAIRED BY RE-SEEDING. CONTRACTOR SHALL PROVIDE A COST FOR SOD INSTALLATION AS A BID ALTERNATE.
6. MONITORING WELLS WITHIN GRADING LIMITS SHALL BE ABANDONED IN-PLACE.
7. TREES TO BE PRESERVED SHALL BE MARKED BY ENGINEER. CONTRACTOR SHALL IDENTIFY THESE TREES PRIOR TO INITIATION OF CONSTRUCTION.
8. THE BELOW-GROUND PORTION OF THE CONCRETE WALL REMOVAL MUST REMAIN IN-PLACE AND BE PROTECTED FROM DAMAGE THAT MAY RESULT FROM CONSTRUCTION ACTIVITIES.
9. REMOVED PORTION OF SEAWALL SHALL BE TRANSPORTED TO MICHIGAN STEEL FOR RECYCLING BY THE CONTRACTOR. THE CITY OF MUSKEGON SHALL RECEIVE ANY PROCEEDS RESULTING FROM THE RECYCLING OF THE WALL.

LEGEND

- TEMP. SURVEY POINT
- BENCHMARK
- SECTION CORNER
- FIRE HYDRANT
- WATER VALVE
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- CABLE BOX
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- TELEPHONE MANHOLE
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- CONCRETE CHUNKS, SLABS OF VARYING SIZES
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REVISION	DATE	DESCRIPTION

West Michigan Shoreline Regional
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 Amoco / Ruddiman Properties
 Demolition Plan - Sta. 9+00 to 23+00

DRAWN BY: RB
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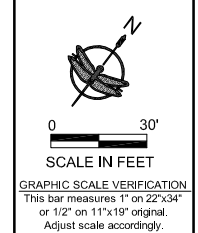
SHEET NO.

8
 OF 17



QUANTITY SUMMARY: AMOCO / RUDDIMAN

ITEM	UNIT	QTY.
ROCK TOE INSTALLATION - 8-18" STONE	CY	2,412
SHORELINE NATIVE SEED MIX "A"	AC	0.9
SHORELINE NATIVE SEED MIX "B"	AC	1.3
NATIVE PLANTS	EA	14,232
TREE INSTALL	EA	39
NAG C-125BN INSTALL	SY	6,357
NAG SC-250 INSTALL	SY	11,360
7 oz. NONWOVEN GEOTEXTILE	SY	1,672
16" COIR BioD-BLOCK INSTALL	LF	1,300
LIFT BACKFILL/LEVELLING FILL	CY	1,163
PRE-VEGETATED COCONUT PILLOW	SY	773
3" ARMOR STONE INSTALLATION	CY	14
KEYED-IN TREE STRUCTURE INSTALL	EA	15
MISC. REPAIR-RESTORATION	LS	1
ARRA SIGNAGE INSTALLATION	LS	1
CONCRETE WALL RESTORATION	LS	1
STEEL SEAWALL REMOVAL/RECYCLING	LS	1
3" MINUS LIMESTONE, INSTALLED	TON	192
IMPERMEABLE GEOMEMBRANE, INSTALLED	SY	291
3" RELOCATED WHITE PINE, INSTALLED	EA	1
WOODY DEBRIS STOCKPILE RELOCATION	LS	1



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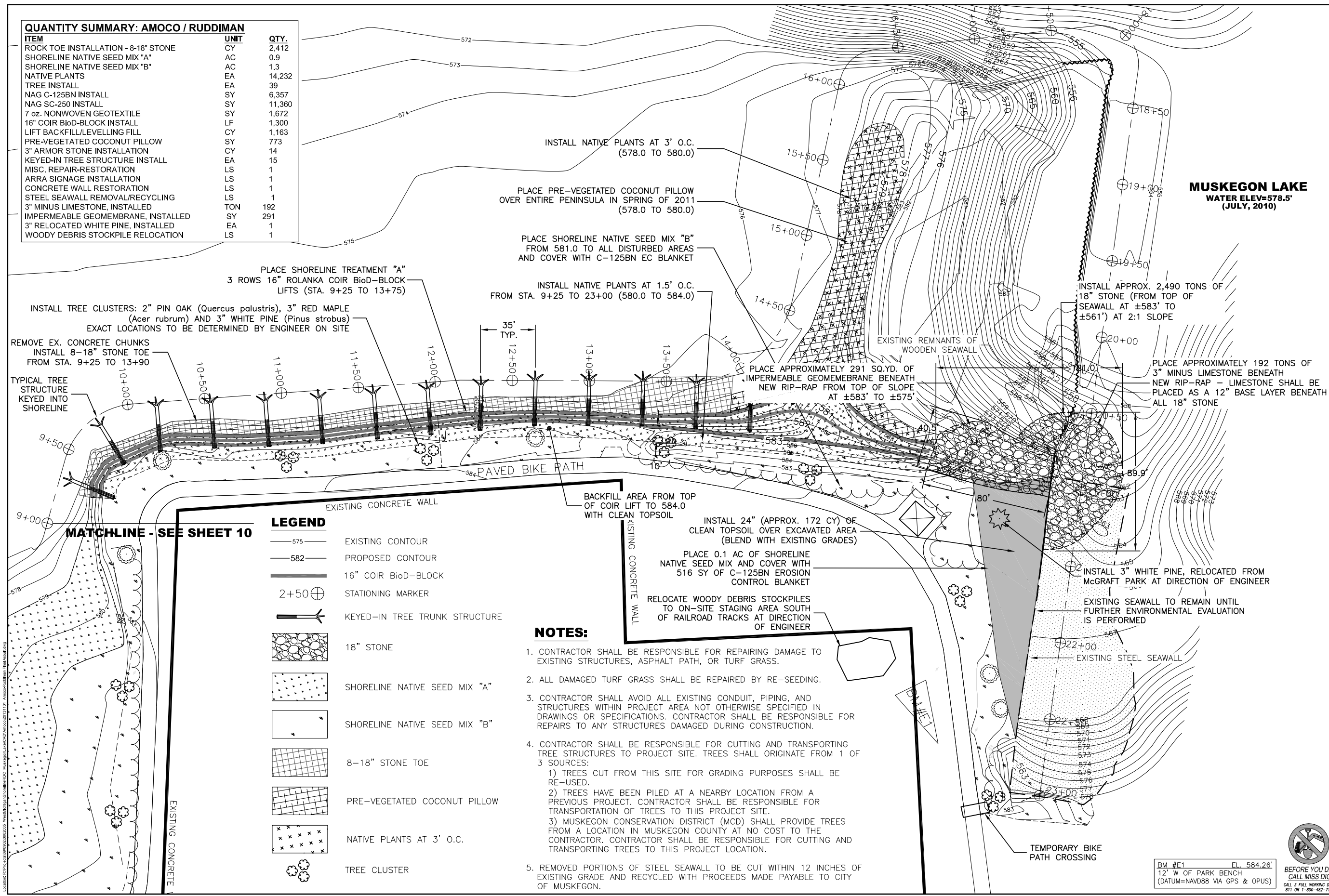
NO.	DATE	REVISION

West Michigan Shoreline Regional
 Development Commission and the
 Muskegon Lake Watershed Partnership
 Amoco / Ruddiman Properties
 Restoration Plan - Sta. 9+00 to 23+00

DRAWN BY: RB
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SHEET NO.
11
 OF 17

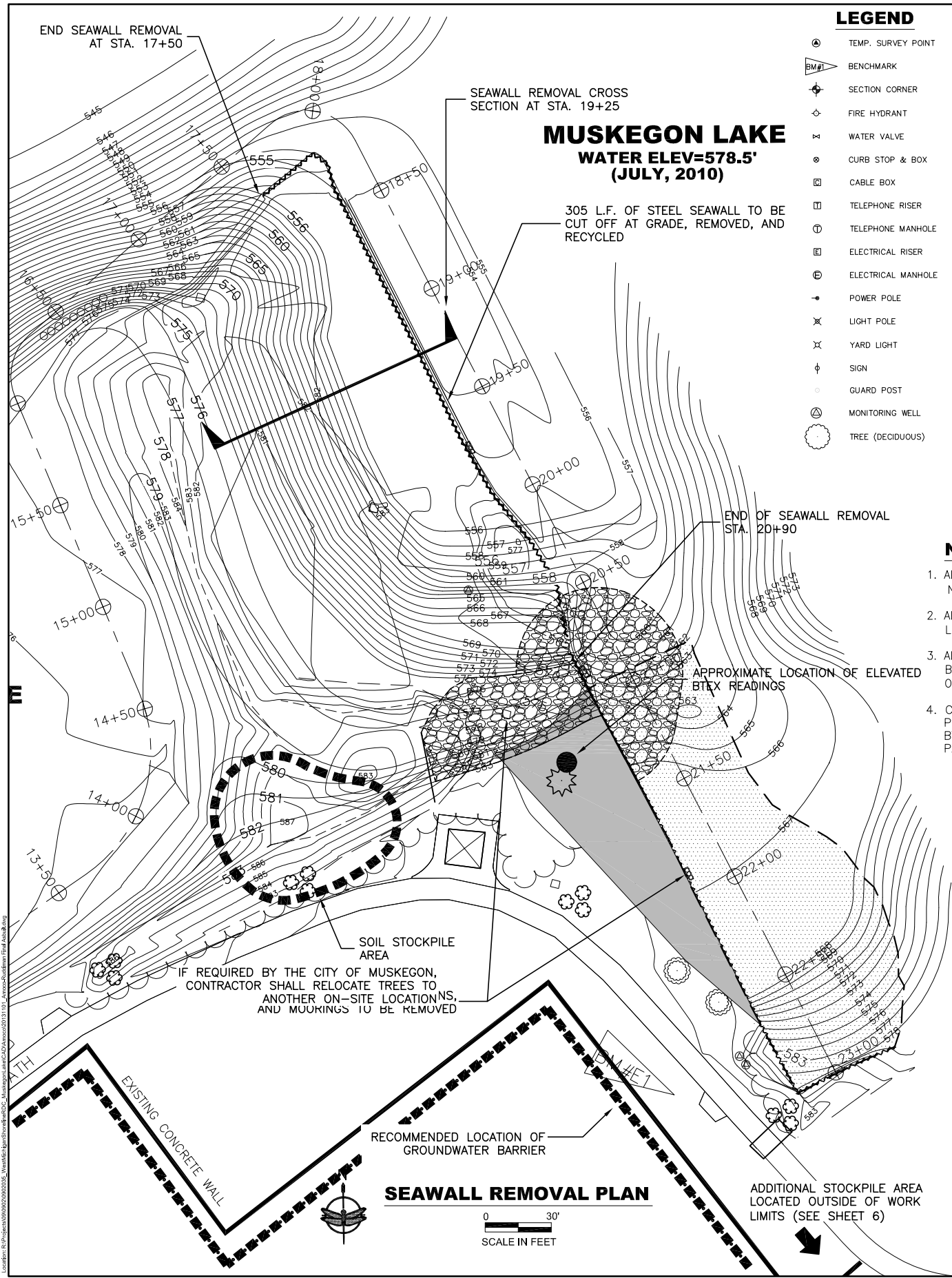


LEGEND

	EXISTING CONTOUR
	PROPOSED CONTOUR
	16" COIR BioD-BLOCK
	STATIONING MARKER
	KEYED-IN TREE TRUNK STRUCTURE
	18" STONE
	SHORELINE NATIVE SEED MIX "A"
	SHORELINE NATIVE SEED MIX "B"
	8-18" STONE TOE
	PRE-VEGETATED COCONUT PILLOW
	NATIVE PLANTS AT 3' O.C.
	TREE CLUSTER

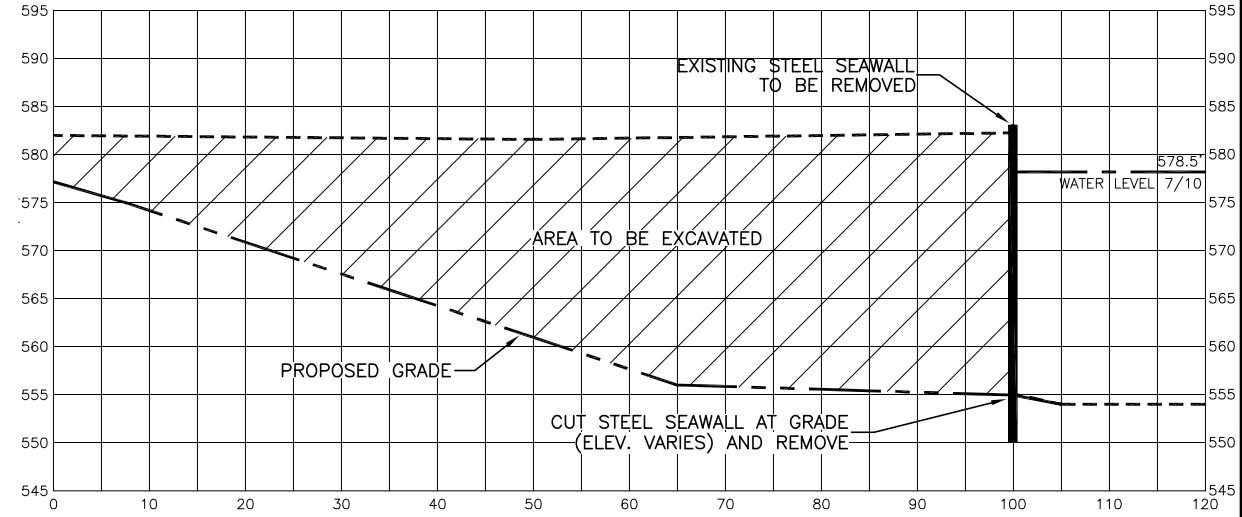
- NOTES:**
- CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING DAMAGE TO EXISTING STRUCTURES, ASPHALT PATH, OR TURF GRASS.
 - ALL DAMAGED TURF GRASS SHALL BE REPAIRED BY RE-SEEDING.
 - CONTRACTOR SHALL AVOID ALL EXISTING CONDUIT, PIPING, AND STRUCTURES WITHIN PROJECT AREA NOT OTHERWISE SPECIFIED IN DRAWINGS OR SPECIFICATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRS TO ANY STRUCTURES DAMAGED DURING CONSTRUCTION.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING AND TRANSPORTING TREE STRUCTURES TO PROJECT SITE. TREES SHALL ORIGINATE FROM 1 OF 3 SOURCES:
 - TREES CUT FROM THIS SITE FOR GRADING PURPOSES SHALL BE RE-USED.
 - TREES HAVE BEEN PILED AT A NEARBY LOCATION FROM A PREVIOUS PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR TRANSPORTATION OF TREES TO THIS PROJECT SITE.
 - MUSKEGON CONSERVATION DISTRICT (MCD) SHALL PROVIDE TREES FROM A LOCATION IN MUSKEGON COUNTY AT NO COST TO THE CONTRACTOR. CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING AND TRANSPORTING TREES TO THIS PROJECT LOCATION.
 - REMOVED PORTIONS OF STEEL SEAWALL TO BE CUT WITHIN 12 INCHES OF EXISTING GRADE AND RECYCLED WITH PROCEEDS MADE PAYABLE TO CITY OF MUSKEGON.

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 12' W OF PARK BENCH
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 811 OR 1-800-482-7191



LEGEND

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- ⊕ FIRE HYDRANT
- ⊕ WATER VALVE
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- ⊕ MONITORING WELL
- ⊕ TREE (DECIDUOUS)



SEAWALL REMOVAL CROSS SECTION - STA. 19+25

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4. CONTRACTOR'S DETAILED SEAWALL REMOVAL PROCESS SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEER, CITY, AND OTHER CONSULTING PARTIES PRIOR TO BEGINNING WORK.



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West Michigan Shoreline Regional
Development Commission and the
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Amoco / Ruddiman Properties
Seawall Removal Plan

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15

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SHORELINE SEED MIX "A"

Scientific Name	Common Name	PLS Oz Per Acre
<i>Acorus calamus</i>	Sweet flag	2
<i>Alisma subcordatum</i>	Common water plantain	2
<i>Asclepias incarnata</i>	Swamp milkweed	4
<i>Aster novae-angliae</i>	New England aster	2
<i>Avena sativa</i>	Seed oats	840
<i>Calamagrostis canadensis</i>	Blue joint grass	2
<i>Carex comosa</i>	Bristly sedge	4
<i>Carex hystericina</i>	Porcupine sedge	4
<i>Carex lurida</i>	Bottlebrush sedge	4
<i>Carex vulpinoidea</i>	Brown fox sedge	4
<i>Elymus virginicus</i>	Virginia wild rye	16
<i>Eupatorium maculatum</i>	Spotted joe-pye weed	1
<i>Eupatorium perfoliatum</i>	Common boneset	1
<i>Glyceria striata</i>	Fowl manna grass	2
<i>Iris virginica shrevei</i>	Blue flag iris	8
<i>Juncus effusus</i>	Common rush	4
<i>Lolium multiflorum</i>	Annual rye	160
<i>Mimulus ringens</i>	Monkey flower	3
<i>Monarda fistulosa</i>	Wild bergamot	2
<i>Panicum virgatum</i>	Switch grass	8
<i>Sagittaria latifolia</i>	Common arrowhead	8
<i>Scirpus acutus</i>	Hard-stemmed bulrush	6
<i>Scirpus atrovirens</i>	Dark green rush	3
<i>Scirpus cyperinus</i>	Wool grass	2
<i>Scirpus fluviatilis</i>	River bulrush	4
<i>Scirpus pungens</i>	Chairmaker's rush	4
<i>Scirpus validus creber</i>	Great bulrush	8
<i>Sparganium eurycarpum</i>	Common bur reed	8
<i>Spartina pectinata</i>	Prairie cord grass	8
Total PLS Ounces		1124.00
Total PLS Pounds		70.25

SHORELINE SEED MIX "B"

Scientific Name	Common Name	PLS Oz Per Acre
<i>Agastache scrophulariaefolia</i>	Purple giant hyssop	4
<i>Andropogon gerardii</i>	Big bluestem grass	32
<i>Aquilegia canadensis</i>	Wild columbine	0.5
<i>Asclepias tuberosa</i>	Butterfly weed	3
<i>Asclepias verticillata</i>	Whorled milkweed	1
<i>Aster laevis</i>	Smooth blue aster	2
<i>Aster novae-angliae</i>	New England aster	2
<i>Aster umbellatus</i>	Flat-top aster	2
<i>Avena sativa</i>	Seed oats	512
<i>Cinna arundinacea</i>	Common wood reed	2
<i>Coreopsis lanceolata</i>	Sand coreopsis	6
<i>Coreopsis tripteris</i>	Tall coreopsis	2
<i>Echinacea pallida</i>	Purple coneflower	4
<i>Elymus canadensis</i>	Canada wild rye	8
<i>Elymus virginicus</i>	Virginia wild rye	8
<i>Eupatorium maculatum</i>	Spotted joe-pye weed	1
<i>Helenium autumnale</i>	Sneezeweed	2
<i>Helianthus giganteus</i>	Tall sunflower	2
<i>Helianthus grosseserratus</i>	Sawtooth sunflower	2
<i>Liatris aspera</i>	Rough blazing star	1
<i>Liatris spicata</i>	Marsh blazing star	2
<i>Lobelia siphilitica</i>	Great blue lobelia	2
<i>Monarda fistulosa</i>	Wild bergamot	4
<i>Monarda punctata</i>	Horse mint	2
<i>Panicum virgatum</i>	Switch grass	4
<i>Penstemon digitalis</i>	Foxglove beard tongue	4
<i>Penstemon hirsutus</i>	Hairy beard tongue	2
<i>Physostegia virginiana</i>	Obedient plant	1
<i>Pycnanthemum virginianum</i>	Common mountain mint	1
<i>Ratibida pinnata</i>	Yellow coneflower	6
<i>Rudbeckia hiita</i>	Black-eyed Susan	2
<i>Rudbeckia subtomentosa</i>	Sweet black-eyed Susan	2
<i>Schizachyrium scoparium</i>	Little bluestem grass	48
<i>Solidago speciosa</i>	Showy goldenrod	2
<i>Spartina pectinata</i>	Prairie cord grass	8
<i>Tradescantia ohioensis</i>	Common spiderwort	4
<i>Verbena hastata</i>	Blue vervain	3
<i>Verbesina alternifolia</i>	Wingstem	4
<i>Vernonia missurica</i>	Missouri ironweed	2
<i>Veronicastrum virginicum</i>	Culver's root	1
<i>Zizia aurea</i>	Golden Alexanders	4
Total PLS Ounces		704.50
Total PLS Pounds		44.03

NATIVE PLANT LIST (EMERGENT)

Scientific Name	Common Name	Quantity (EA)
<i>Iris virginica shrevei</i>	Blue flag iris	128
<i>Nuphar advena</i>	Spatterdock	1000
<i>Peltandra virginica</i>	Arrow arum	1000
<i>Pontederia cordata</i>	Pickerel weed	1000
<i>Sagittaria latifolia</i>	Arrowhead	128
<i>Scirpus acutus</i>	Hardstem bulrush	1500
<i>Vallisneria americana</i>	Wild celery	2500

NATIVE TREE LIST

Scientific Name	Common Name	Quantity (EA)
<i>Pinus strobus</i>	White Pine	13
<i>Acer rubrum</i>	Red Maple	13
<i>Quercus palustris</i>	Pin Oak	13

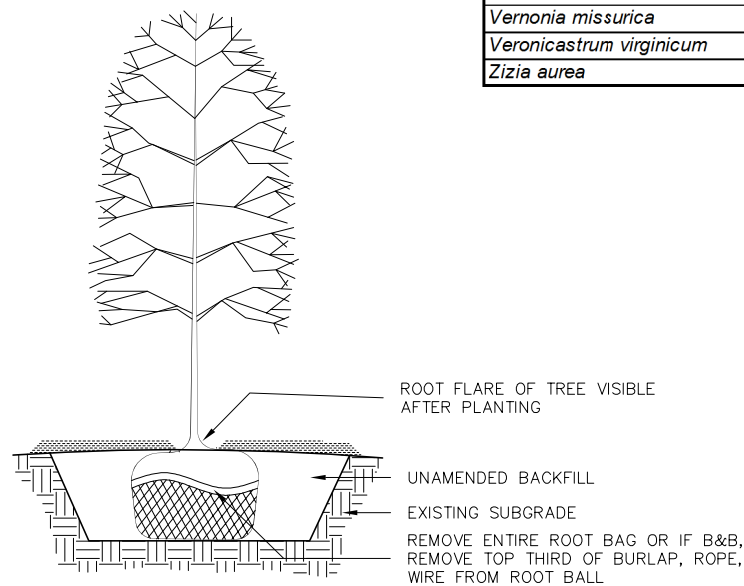
NOTE: TREES SHALL BE 3" DBH UNLESS OTHERWISE NOTED.

NATIVE PLANT LIST (BioD-BLOCK SYSTEM) ABOVE 581.0'

Scientific Name	Common Name	Quantity (EA)
<i>Schizachyrium scoparium</i>	Little bluestem	1,744
<i>Panicum virgatum</i>	Switch grass	1,744

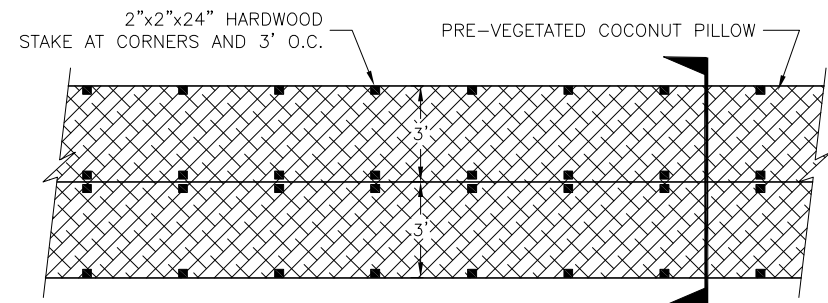
NATIVE PLANT LIST (BioD-BLOCK SYSTEM) BELOW 581.0'

Scientific Name	Common Name	Quantity (EA)
<i>Carex vulpinoidea</i>	Brown fox sedge	872
<i>Iris virginica shrevei</i>	Blue flag iris	872
<i>Asclepias incarnata</i>	Swamp milkweed	872
<i>Juncus effusus</i>	Soft rush	872



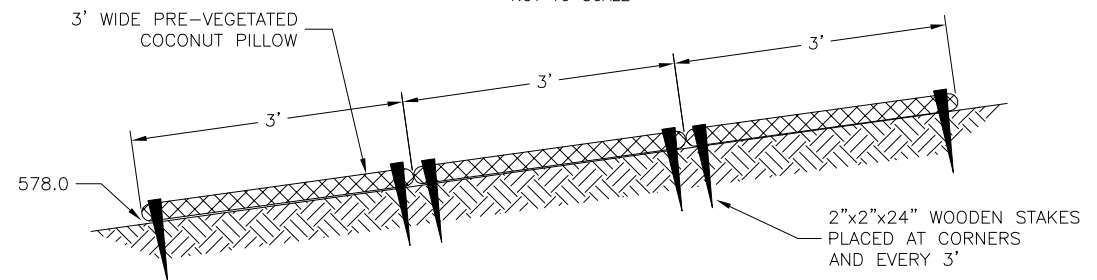
TREE PLANTING DETAIL

NOT TO SCALE



PLAN VIEW

NOT TO SCALE



SECTION

NOT TO SCALE

PRE-VEGETATED COCONUT PILLOW INSTALLATION

NOT TO SCALE

NOTE:

- COCONUT PILLOWS SHALL BE PRE-VEGETATED WITH NATIVE PLANTS 1' O.C. WITH: SOFTSTEM BULRUSH (SCIRPUS VALIDUS), HARDSTEM BULRUSH (SCIRPUS ACUTUS), CHAIRMAKER'S RUSH (SCIRPUS PUNGENS), BUR REED (SPARGANIUM EURYCARPUM)
- COCONUT PILLOWS SHALL BE PRE-PLANTED AT LEAST 4 WEEKS PRIOR TO INSTALLATION.
- COCONUT PILLOWS SHALL BE APPROXIMATELY 2"x3'x20' AND CONSTRUCTED OF 100% COCONUT FIBER MATERIAL



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