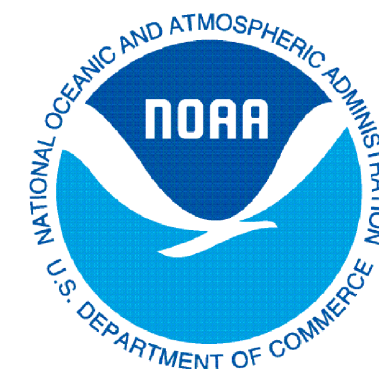




DETROIT RIVER AOC- STONY ISLAND HABITAT RESTORATION PROJECT



THE DETROIT RIVER, WAYNE COUNTY, MICHIGAN



GREAT LAKES RESTORATION INITIATIVE (GLRI)
PROJECT # NA15NMF4630293

FOR INFORMATION - JANUARY, 2016

PREPARED FOR FRIENDS
OF THE DETROIT RIVER BY:

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

WITH:



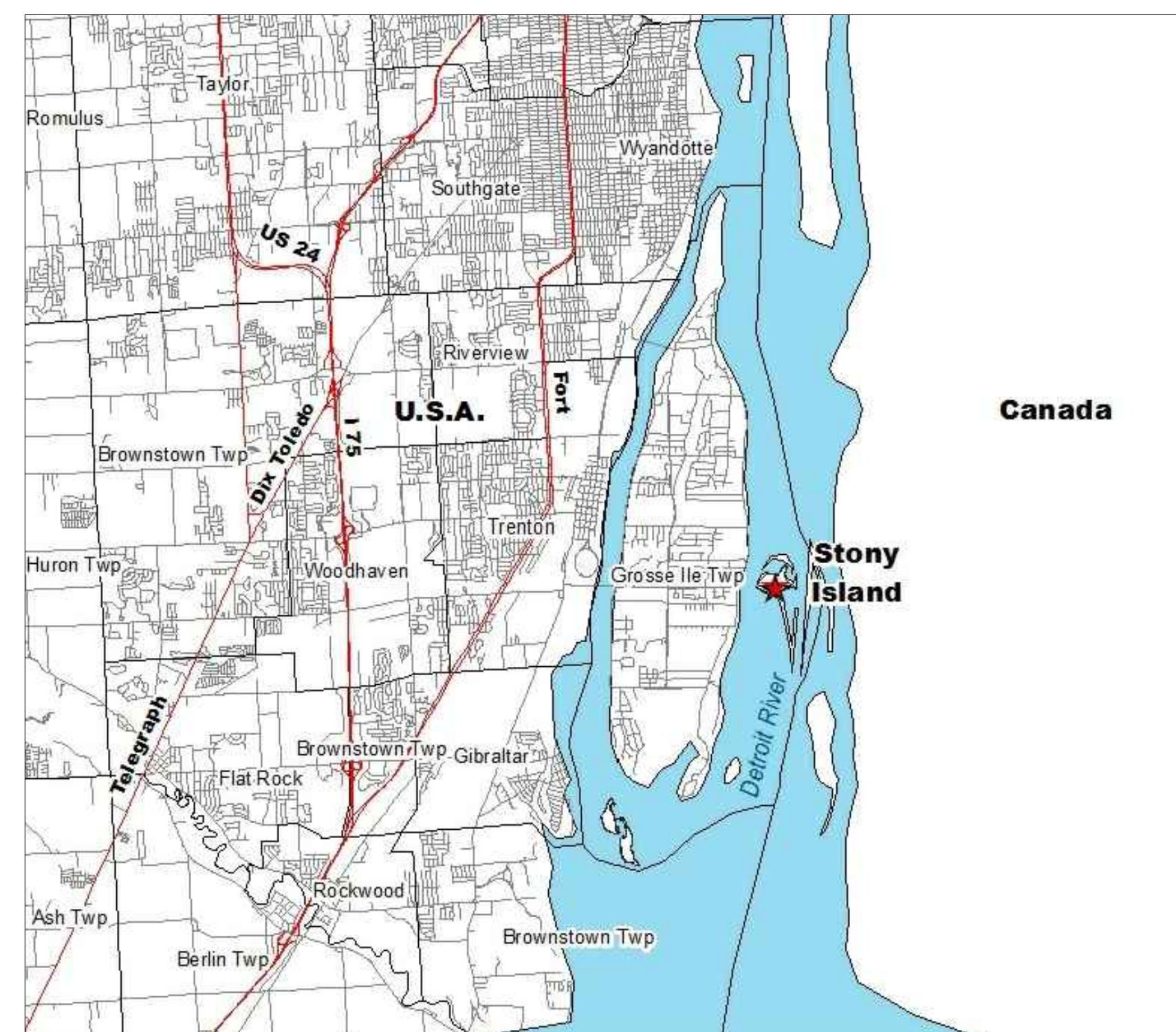
Herpetological Resource and Management



SMITHGROUP JJR



DETROIT RIVER
WAYNE COUNTY, MI
NOT TO SCALE



PROJECT VICINITY MAP
NOT TO SCALE

DRAWING INDEX

1. COVER SHEET
2. EXISTING CONDITIONS
3. SITE PLAN OVERVIEW
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9. SHOAL DETAILS - PROPOSED SOUTH SHOAL RESTORATION
10. HABITAT STRUCTURE DETAILS
11. HABITAT STRUCTURE DETAILS CONTINUED
12. PROJECT NOTES

EXISTING CONDITIONS NOTES:

1. THE CONTRACT DOCUMENTS REFLECT SURVEYS AND ELEVATIONS AT THE WORK AREA AS FOUND IN CONDITIONS SURVEYS MADE AS STATED ON THE DRAWINGS. THE CONDITIONS SHOWN ARE INDICATIVE OF THOSE THAT PREVAILED AT THE TIME OF THE SITE INVESTIGATIONS AND MAY BE DIFFERENT THAN THOSE AT THE TIME CONSTRUCTION. GENERAL LOCATIONS OF APPLICABLE EXISTING UTILITIES, VEGETATION, STRUCTURES, EQUIPMENT AND IMPROVEMENTS, BASED UPON LATEST INFORMATION AVAILABLE HAVE BEEN SHOWN ON THE DRAWINGS.
2. UTILITY LINES, VEGETATION, STRUCTURES, EQUIPMENT OR IMPROVEMENTS SHALL BE PROTECTED FROM DAMAGE, AND IF DAMAGED, SHALL BE REPAIRED BY THE CONTRACTOR AT ITS OWN EXPENSE.
3. THE WATER SURFACE ELEVATION AT THE TIME OF THE SURVEY IS SHOWN ON THE PROJECT DRAWINGS. WATER LEVELS HAVE FLUCTUATED SINCE THE SURVEY WAS CONDUCTED. CONTRACTOR TO USE BEST AVAILABLE INFORMATION TO UNDERSTAND THE CONDITIONS OF THE WATER LEVELS.



AERIAL PHOTO OF STONY ISLAND VIEW LOOKING NORTHEAST

SURVEY PROVIDED BY SMITHGROUP JJR, JANUARY 2014

SURVEY NOTES:

1. HORIZONTAL DATUM IS ACCORDING TO MICHIGAN STATE PLANE COORDINATES, SOUTH ZONE (2113), INTERNATIONAL FEET AS LINEAR UNIT OF MEASURE.
2. VERTICAL DATUM IS ACCORDING TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), WITH PRIMARY BENCHMARKS AND DATUM CONVERSIONS LISTED HEREON.
3. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY THE SURVEYOR. ALL INFORMATION REGARDING LAND BOUNDARY, EASEMENTS, AND OTHER INFORMATION THAT MAY AFFECT TITLE WAS GAINED FROM A CLIENT PROVIDED ALTA SURVEY, PROPERTY INFORMATION REFERENCE.
4. NO UNDERGROUND UTILITIES WERE RESEARCHED AS PART OF THIS EFFORT. NO EXCAVATIONS WERE MADE AS PART OF THIS SURVEY TO LOCATE BURIED STRUCTURES AND OR UTILITIES.
5. SUBSURFACE AND ENVIRONMENTAL CONDITIONS WERE NOT EXAMINED AND ARE NOT CONSIDERED A PART OF THIS SURVEY. NO STATEMENT IS MADE CONCERNING THE EXISTENCE OF UNDERGROUND OR OVERHEAD CONTAINERS OR FACILITIES THAT MAY AFFECT THE USE AND OR DEVELOPMENT OF THIS SITE.
6. SMITHGROUPJJR PERFORMED A BATHYMETRIC SURVEY OF A PORTION OF THE DETROIT RIVER, ADJACENT TO STONY ISLAND, AS ILLUSTRATED HEREON. THE RESULTANT ONE-FOOT CONTOURS ARE BASED ON SOUNDINGS, COMBINED WITH SHORE TOPOGRAPHY COLLECTED USING GLOBAL POSITIONING RECEIVERS REFERENCING THE MICHIGAN CONTINUOUSLY OPERATING REFERENCE SYSTEM (CORS) FOR PROJECT SITE CONTROL.

BENCHMARKS:

PRIMARY BENCHMARK NO. 82624 (NGS):

NATIONAL GEODETIC SURVEY PRIMARY BENCHMARK (NGS PID# D16435);
HEIGHT MODERNIZATION STATION ALUMINUM DISC, SET FLUSH ON A 16" DIAMETER CONC. CYLINDER, FLUSH WITH THE GROUND.

NORTHING = 223952.3878
EASTING = 13446899.6702
ELEVATION = 579.25 FEET (NAVD88)

PRIMARY BENCHMARK NO. H 115 X (NGS):

NATIONAL GEODETIC SURVEY PRIMARY BENCHMARK (NGS PID# NE0516);
HEIGHT MODERNIZATION STATION ALUMINUM DISC, SET FLUSH ON A 16" DIAMETER CONC. CYLINDER, FLUSH WITH THE GROUND.

NORTHING = 219063.3065
EASTING = 13442499.9723
ELEVATION = 581.68 FEET (NAVD88)

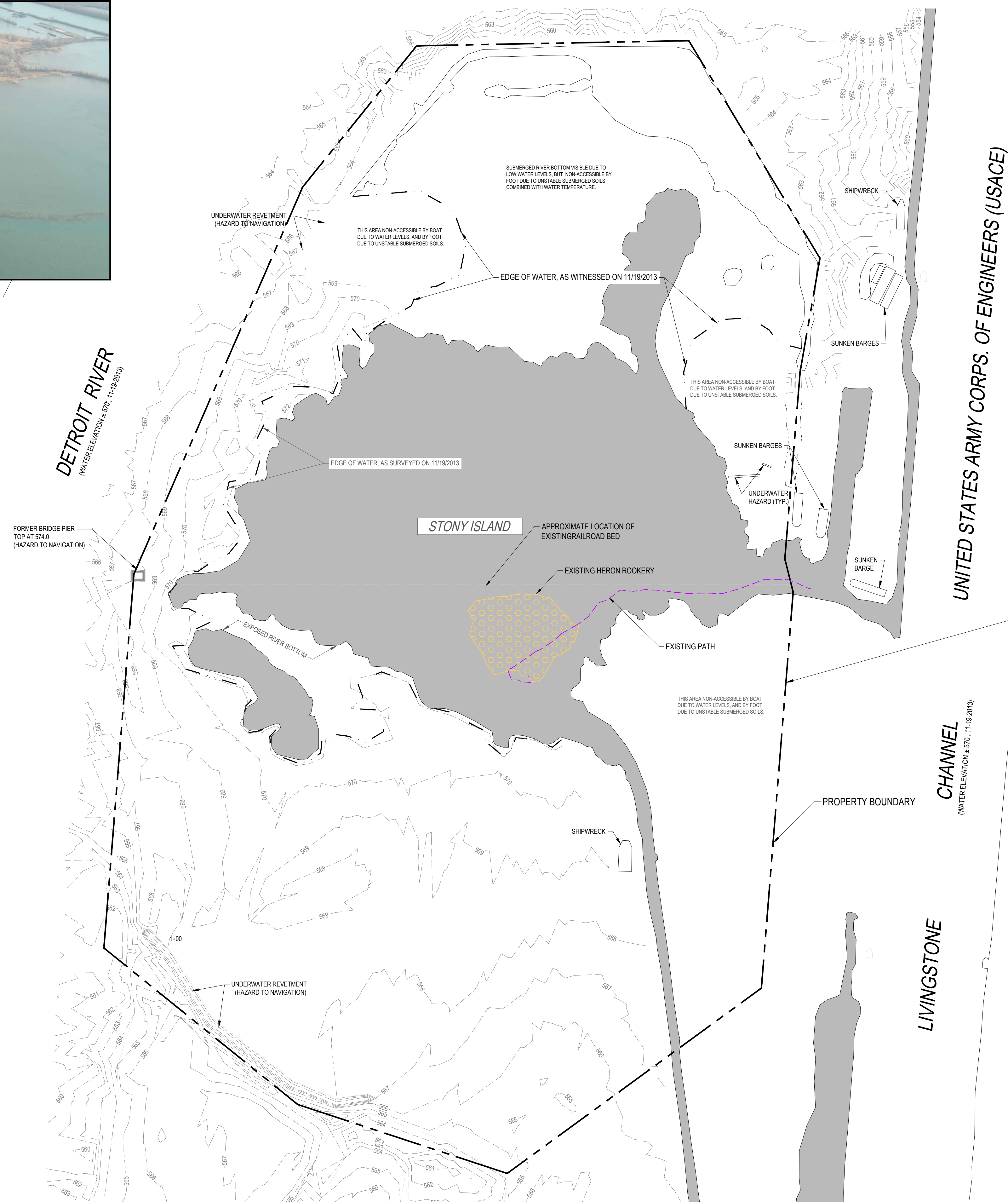
DATUM CONVERSIONS:

NAVD88 = IGLD85 + 0.27 FEET
NAVD88 = NGVD29 - 0.56 FEET

FLOODPLAIN NOTES:

THE ENTIRETY OF STONY ISLAND LIES WITHIN FEMA FIRM ZONE AE, ACCORDING TO FEMA FIRM MAPS 26163C0535E AND 26163C0420E. COMMUNITY 260227, PANELS NO. 420 & 535 OF 575, MAP(S) REVISED FEBRUARY 2, 2012. THE FOLLOWING STATEMENTS APPLY:

- ZONE AE IS DEFINED AS "BASE FLOOD ELEVATIONS DETERMINED."
- FLOODWAY AREAS IN ZONE AE MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS.



SURVEY LEGEND

- EDGE OF WATER
- - - EX. TOPO CONTOUR
- - - PROPERTY LINE
- HERON ROOKERY
- SHIPWRECK

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734.769.3004
734.769.3164 fax
www.ectinc.com



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SMITHGROUP JJR

FRIENDS of the DETROIT RIVER



DETROIT RIVER AOC-STONY ISLAND HABITAT RESTORATION PROJECT

FRIENDS OF THE DETROIT RIVER
WAYNE COUNTY, MICHIGAN

FOR INFORMATION	JAN 2016
100% DRAWINGS	11-03-14
PERMIT DRAWINGS	08-17-14
PRELIMINARY	03-11-14

130638	ECT PROJECT NUMBER
AB/EC	DESIGNED BY
JO	CHECKED BY
AB/EC	DRAWN BY
JO	APPROVED BY

SHEET TITLE

EXISTING CONDITIONS

SCALE: 1" = 250' @ 22" x 34"
0 125 250 500

NORTH SHEET NUMBER
2

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

GENERAL NOTES

1. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE MDEQ AND USACE PERMITS, AND ALL OTHER PERMITS ISSUED FOR THIS PROJECT.

STAGING AND ACCESS NOTES

1. CONTRACTOR TO COORDINATE WITH OWNER AND ENGINEER ON LOCATION OF STAGING AREAS.

2. CONTRACTOR TO COORDINATE WITH OWNER AND ENGINEER ON ACCESS TO WORK AREA.

3. THE CONTRACTOR MAY ACCESS THE WORK AREAS HE CHOOSES AS LONG AS HE ABIDES BY RESTRICTIONS AND REQUIREMENTS PRESENTED IN THESE CONTRACT DOCUMENTS.

4. THE CONTRACTOR SHALL NOTE THAT A PORTION OF THE EAST SIDE OF THE ISLAND IS OWNED BY A PRIVATE ENTITY. CONTACT INFORMATION IS AS FOLLOWS: STONY ISLAND SALVAGE C/O VICTOR PONZIANO, 7800 PLATT AVE. CLEVELAND, OH 44104, (216) 496-7435.

5. THE OWNER, PROPERTY OWNER, AND ENGINEER WILL FREQUENTLY VISIT THE PROJECT VIA THEIR OWN BOATS. THERE MAY BE OCCURRENCES WHEN A MEMBER OR MEMBERS OF THE PROJECT TEAM WILL NOT BE ABLE TO PROVIDE THEIR OWN TRANSPORTATION TO THE PROJECT WORK. THE CONTRACTOR SHALL BE PREPARED TO PROVIDE TRAVEL TO THE WORK FOR THE OWNER, PROPERTY OWNER, AND OWNER'S REPRESENTATIVES AT A REASONABLE FREQUENCY THROUGHOUT THE DURATION OF THE PROJECT WORK.

TURBIDITY CONTROL NOTES

1. NO WORK OR DREDGING WITHIN THE WATER IS ALLOWED FROM MAY 1 THROUGH JULY 30 WITHOUT THE USE OF A TURBIDITY CURTAIN/CONTAINMENT. THIS RESTRICTION DOES NOT APPLY TO THE PLACEMENT OF CLEAN ROCK AND GRAVEL.

2. WHEN REQUIRED, TURBIDITY CURTAIN TO ENCLOSE THE WORK AREA ENTIRELY. CURTAIN TO BE INSTALLED TO EXTEND FROM THE BED OF THE WATERBODY TO A POINT ABOVE THE EXISTING WATER'S SURFACE.

3. WHEN USED, TURBIDITY CERTAIN TO BE MAINTAINED FOR THE DURATION OF THE PROJECT AND LEFT IN PLACE AFTER COMPLETION OF DREDGING UNTIL ALL DISTURBED SEDIMENTS HAVE SETTLED.

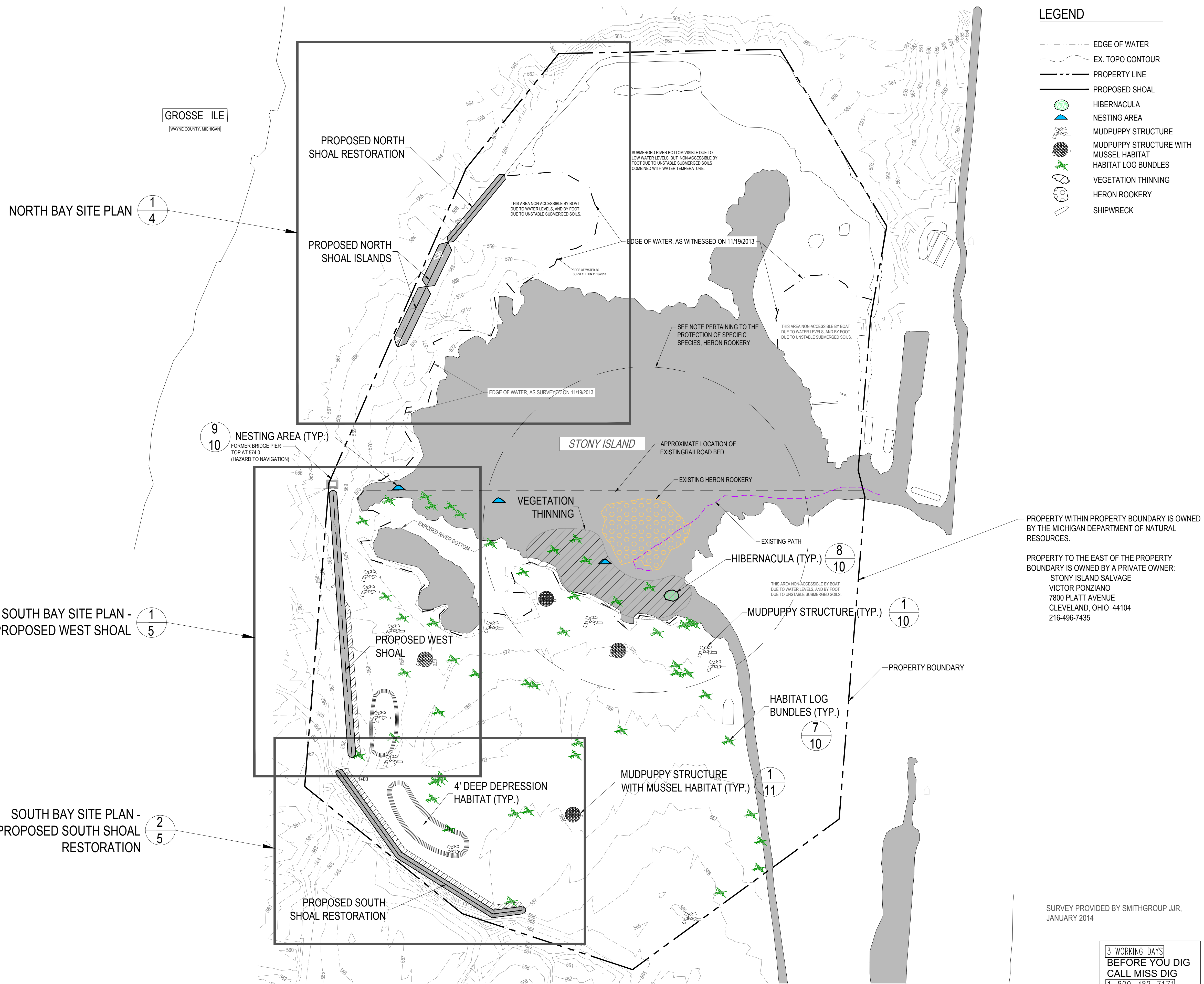
PROTECTION OF SPECIFIC SPECIES

HERON ROOKERY: THE HERON ROOKERY IS DELINEATED ON THE PROJECT DRAWINGS. THE ROOKERY IS PROTECTED UNDER THE MIGRATORY BIRD TREATY ACT. PROJECT WORK INVOLVING HEAVY MACHINERY WILL BE RESTRICTED WITHIN 660' OF THE ROOKERY FROM MARCH 15TH THROUGH SEPTEMBER 1ST. CONTRACTOR TO COORDINATE WITH ENGINEER ON PROTECTIVE MEASURES.

TRAILING WILD BEAN: THIS PLANT SPECIES IS CONSIDERED OF "SPECIAL CONCERN" AND WAS OBSERVED IN MULTIPLE CLUSTERS ON STONY ISLAND ON THE EASTERN SIDE OF THE OLD RAILROAD GRADE. SPECIAL CONCERN SPECIES DO NOT HAVE STATUTORY LEGAL PROTECTION REQUIREMENTS. HOWEVER, IF ON-ISLAND CONSTRUCTION ACTIVITIES THAT INVOLVE HEAVY EQUIPMENT IS TO OCCUR BETWEEN MAY 1ST AND NOVEMBER 1ST, THE CONTRACTOR TO NOTIFY THE ENGINEER. A PLAN TO PROTECT THE SPECIES WILL BE DEVELOPED BY THE ENGINEER, IF DEEMED NECESSARY.

EASTERN FOX SNAKE: EASTERN FOX SNAKE IS A STATE THREATENED SPECIES KNOWN TO OCCUR ON THE ISLAND. NO ISLAND WORK WILL BE ALLOWED DURING THE SNAKE'S ACTIVE PERIOD, FROM APRIL 1ST THROUGH NOVEMBER 1ST WITHOUT PROTECTION MEASURES IN PLACE. THIS ALSO APPLIES TO THE STORAGE OF CONSTRUCTION MATERIALS ON-ISLAND DURING THE SNAKE'S ACTIVE PERIOD, SO AS NOT TO CREATE TEMPORARY HIBERNACULA THAT MAY RESULT IN SPECIES DISTURBANCE AT A LATER DATE. CONTRACTOR TO WORK WITH ENGINEER ON PROTECTIVE MEASURES.

INDIANA BAT AND NORTHERN LONG-EARED BAT: INDIANA BAT IS A FEDERAL AND STATE LISTED ENDANGERED SPECIES, AND NORTHERN LONG-EARED BAT IS A FEDERAL PROPOSED ENDANGERED SPECIES. TREE CLEARING SHALL NOT OCCUR BETWEEN APRIL 1ST AND OCTOBER 15TH WITHOUT PROTECTION MEASURES. CONTRACTOR TO WORK WITH ENGINEER ON PROTECTIVE MEASURES.



LEGEND

- EDGE OF WATER
- - - EX. TOPO CONTOUR
- - - PROPERTY LINE
- PROPOSED SHOAL
- HIBERNACULA
- ▲ NESTING AREA
- MUDPUPPY STRUCTURE
- MUDPUPPY STRUCTURE WITH MUSSEL HABITAT
- HABITAT LOG BUNDLES
- VEGETATION THINNING
- HERON ROOKERY
- SHIPWRECK

NORTH BAY SITE PLAN 1/4

SOUTH BAY SITE PLAN - PROPOSED WEST SHOAL 1/5

SOUTH BAY SITE PLAN - PROPOSED SOUTH SHOAL RESTORATION 2/5

PROPERTY WITHIN PROPERTY BOUNDARY IS OWNED BY THE MICHIGAN DEPARTMENT OF NATURAL RESOURCES.

PROPERTY TO THE EAST OF THE PROPERTY BOUNDARY IS OWNED BY A PRIVATE OWNER: STONY ISLAND SALVAGE VICTOR PONZIANO 7800 PLATT AVENUE CLEVELAND, OHIO 44104 216-496-7435

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DETROIT RIVER AOC-STONY ISLAND HABITAT RESTORATION DESIGN

FRIENDS OF THE DETROIT RIVER

WAYNE COUNTY, MICHIGAN

FOR INFORMATION	JAN 2016
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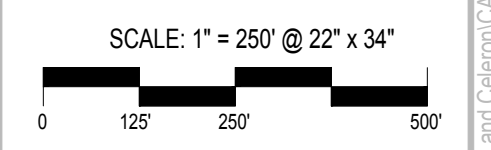
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AB/EC	DRAWN BY
JO	APPROVED BY

SHEET TITLE

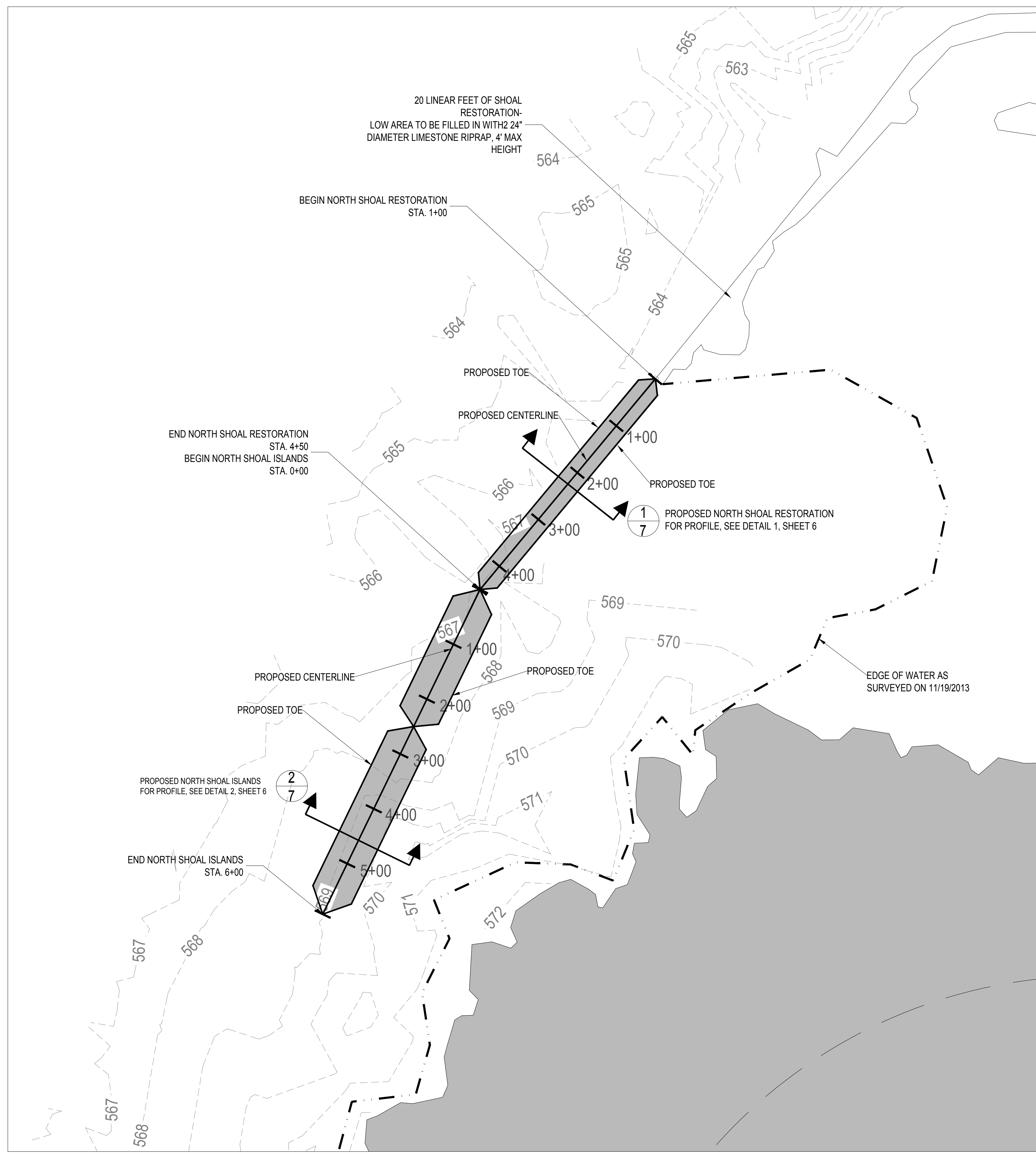
SITE PLAN OVERVIEW

SURVEY PROVIDED BY SMITHGROUP JJR, JANUARY 2014

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



NORTH SHEET NUMBER **3**



LEGEND

- EDGE OF WATER
- - - EX. TOPO CONTOUR
- PROPOSED SHOAL

1
4 NORTH BAY SITE PLAN

3 WORKING DAYS
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SURVEY PROVIDED BY SMITHGROUP JJR,
JANUARY 2014

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136638
ECT PROJECT NUMBER
AB/EC DESIGNED BY JO CHECKED BY
AB/EC DRAWN BY JO APPROVED BY

SHEET TITLE
NORTH BAY SITE PLAN

SCALE: 1" = 100' @ 22" x 34"
0 50 100 200

NORTH SHEET NUMBER
4

P:\Friends DR - Stony and Celeron\CAD\ECT\Stony_100%Drawings.dwg



**DETROIT RIVER
 AOC-
 STONY ISLAND
 HABITAT
 RESTORATION
 DESIGN**

FRIENDS OF THE
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WAYNE COUNTY,
 MICHIGAN

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AB/EC	DRAWN BY
JO	APPROVED BY

SHEET TITLE

**SOUTH BAY
 SITE PLAN**

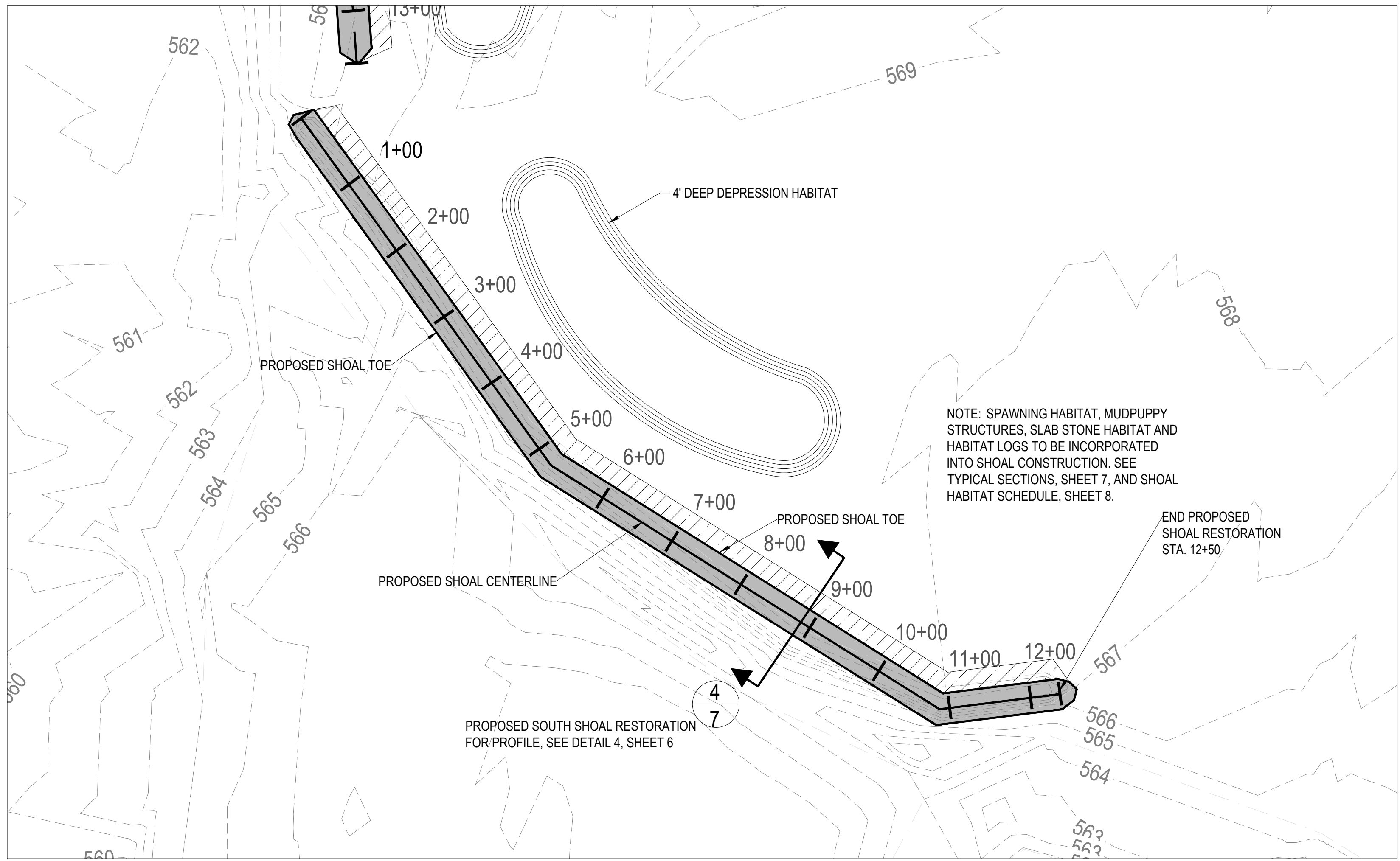
SCALE: 1" = 100' @ 22" x 34"
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NORTH

 SHEET NUMBER
5

**3 WORKING DAYS
 BEFORE YOU DIG
 CALL MISS DIG
 1-800-482-7171**

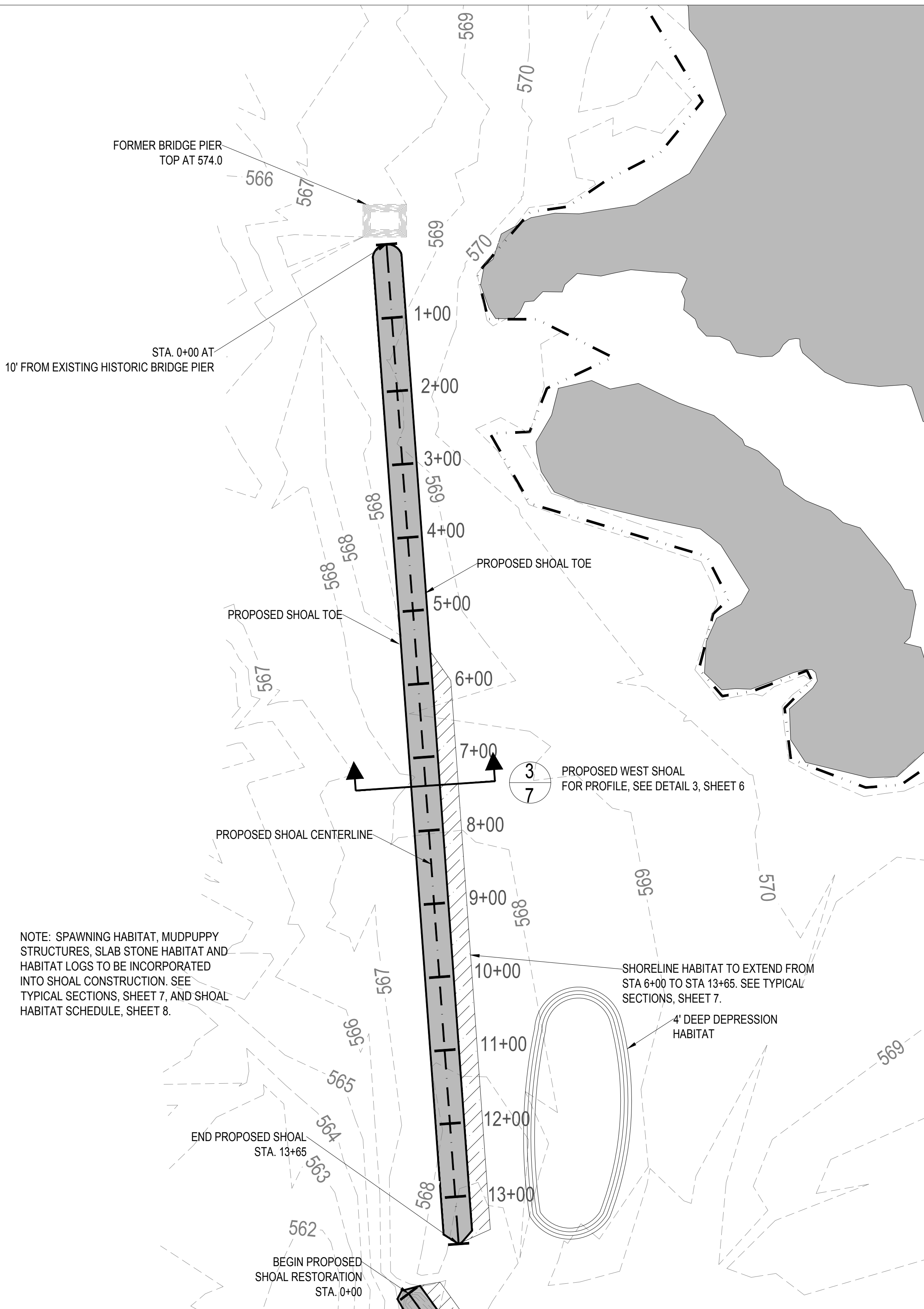
SURVEY PROVIDED BY SMITHGROUP JJR,
 JANUARY 2014



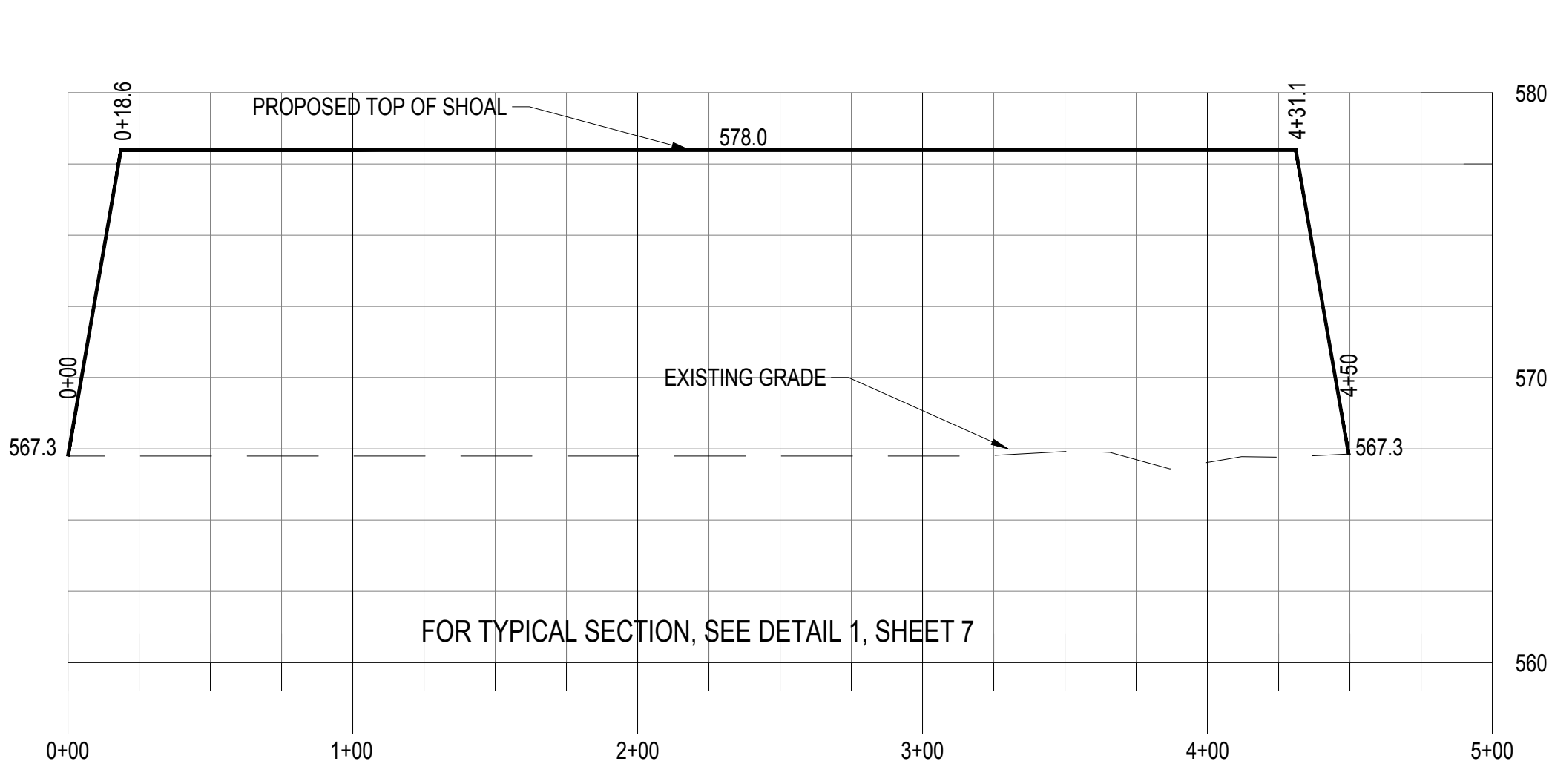
2 SOUTH BAY SITE PLAN - PROPOSED SOUTH SHOAL RESTORATION
 5 FOR PROFILE, SEE DETAIL 4, SHEET 6. FOR TYPICAL SECTION, SEE DETAIL 4, SHEET 7. FOR DETAILED SECTIONS, SEE SHEET 9.

LEGEND

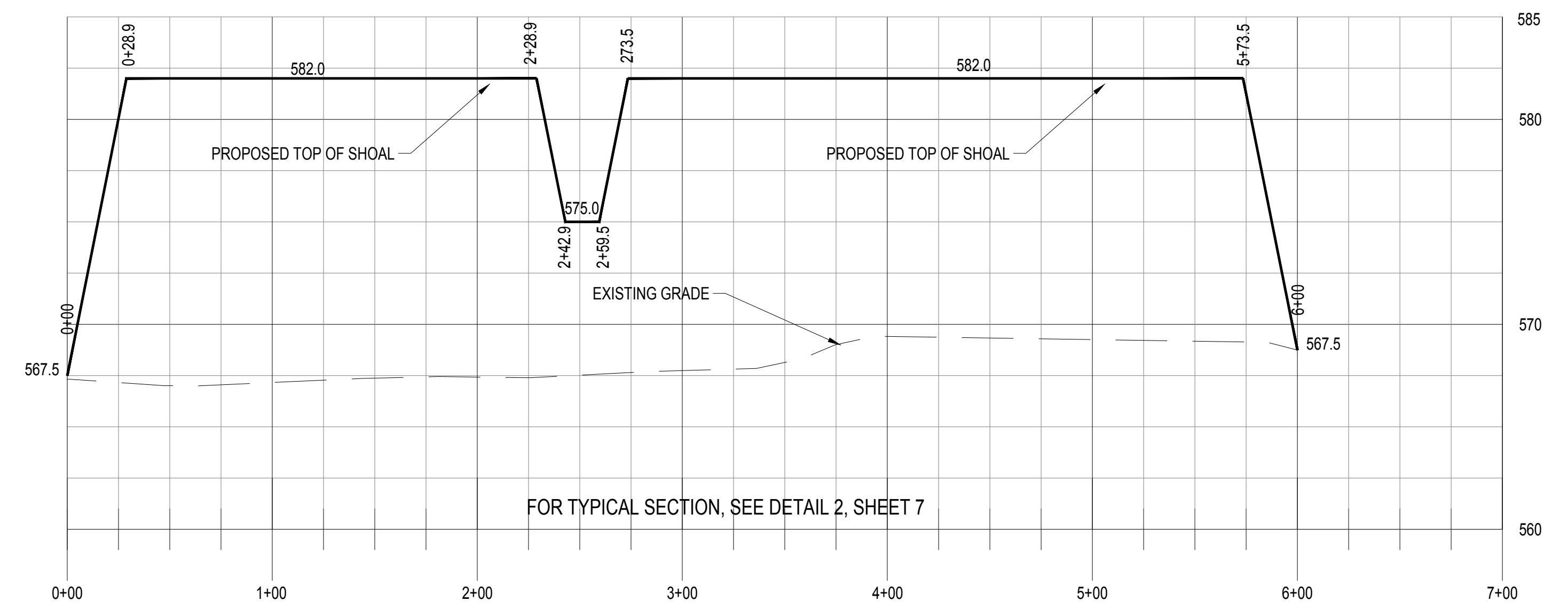
- EDGE OF WATER
- EX. TOPO CONTOUR
- PROPOSED SHOAL



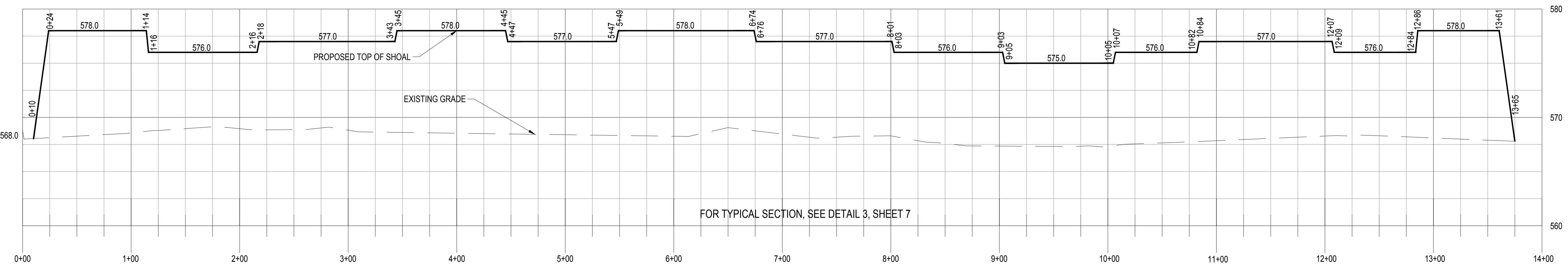
1 SOUTH BAY SITE PLAN - PROPOSED WEST SHOAL
 5



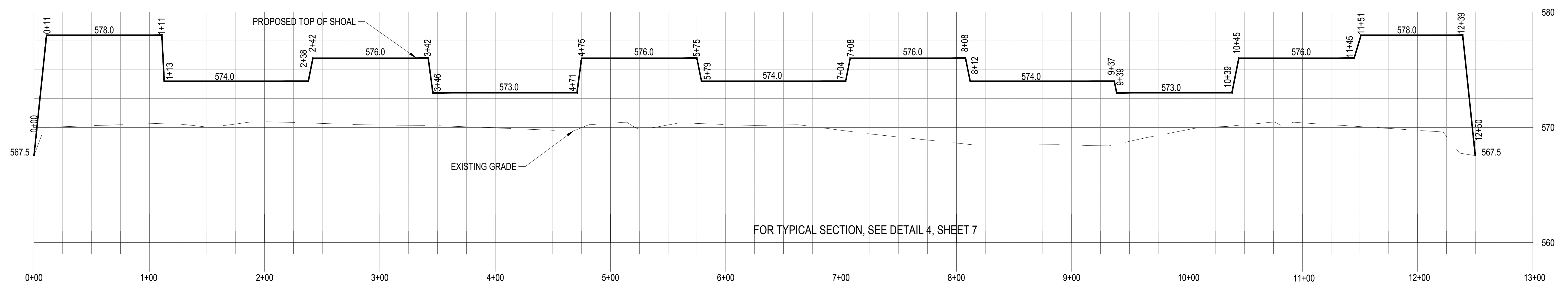
1 PROPOSED NORTH SHOAL RESTORATION - PROFILE
 6 SCALE: 1" = 50' HORIZONTAL, 1" = 5' VERTICAL



2 PROPOSED NORTH SHOAL ISLANDS - PROFILE
 6 SCALE: 1" = 50' HORIZONTAL, 1" = 5' VERTICAL



3 PROPOSED WEST SHOAL - PROFILE
 6 SCALE: 1" = 50' HORIZONTAL, 1" = 5' VERTICAL



4 PROPOSED SOUTH SHOAL RESTORATION - PROFILE
 6 SCALE: 1" = 50' HORIZONTAL, 1" = 5' VERTICAL

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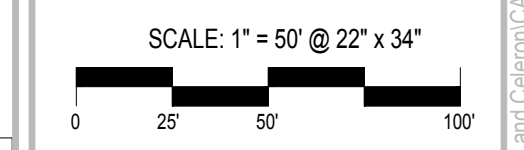
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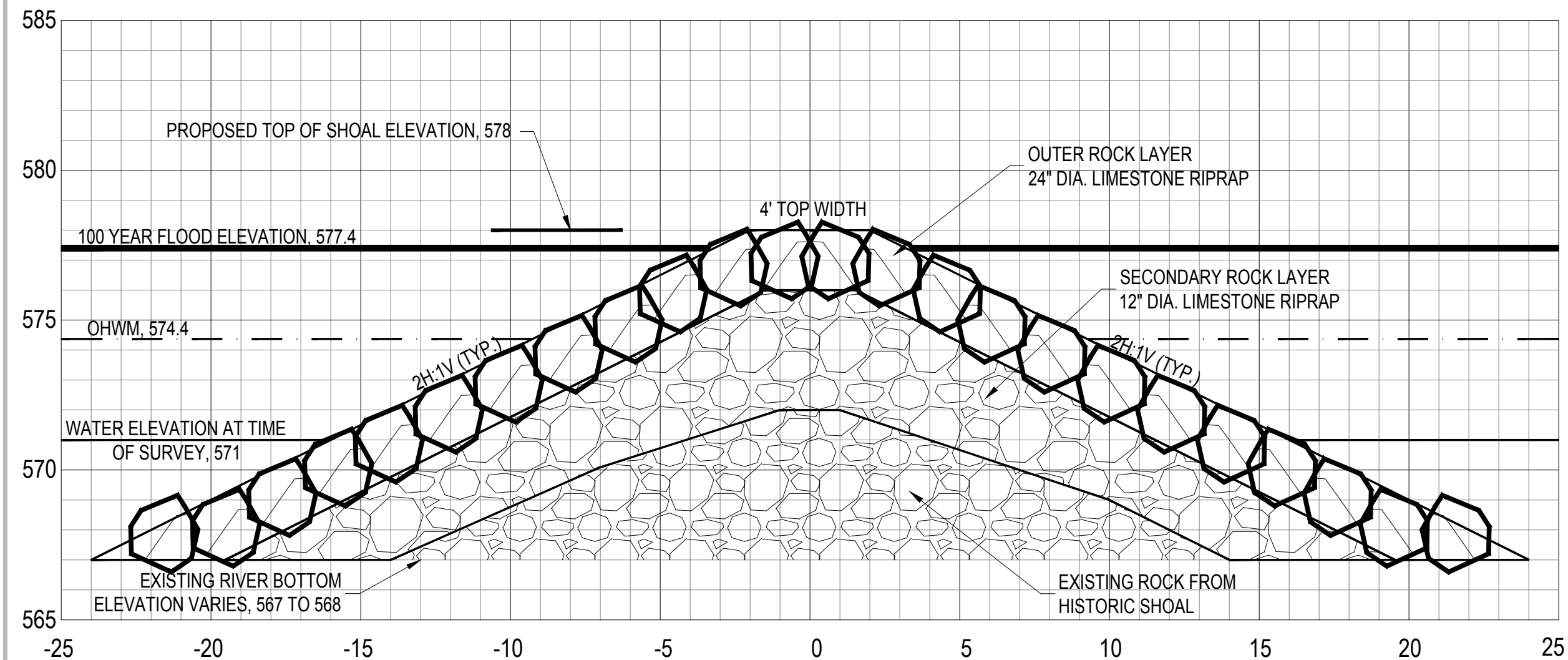
**SHOAL
 PROFILES**



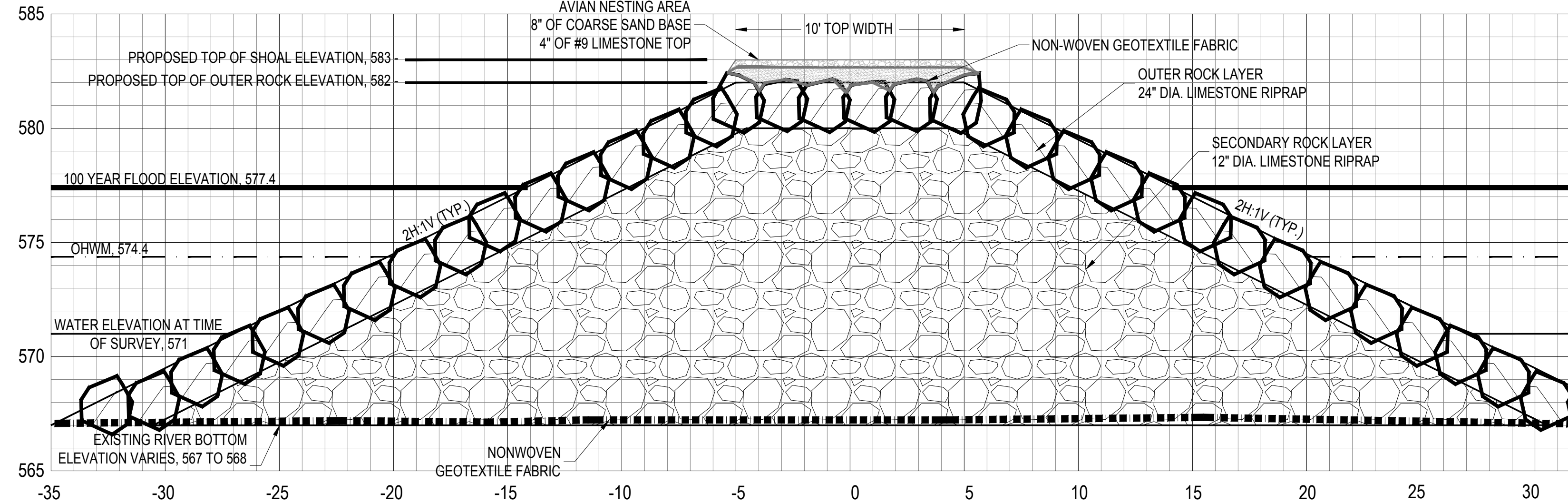
**3 WORKING DAYS
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NORTH SHEET NUMBER
6

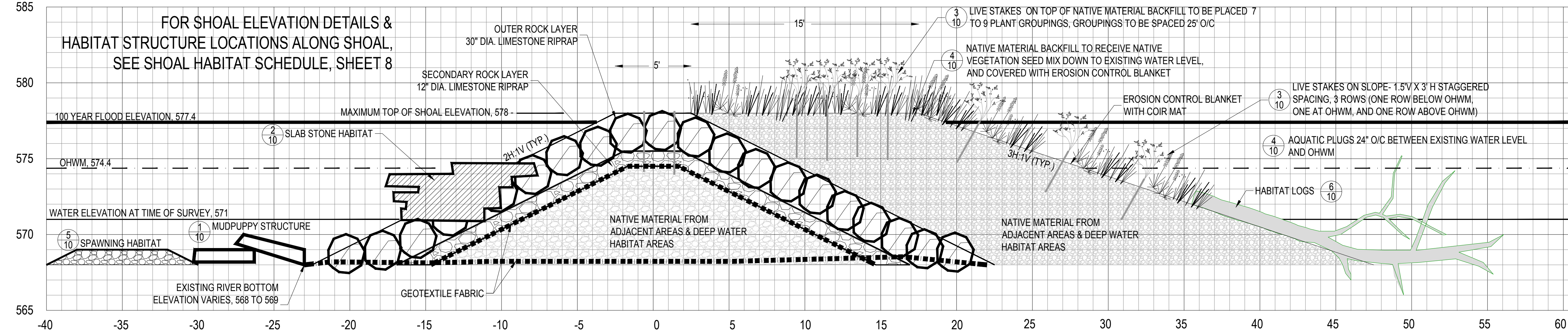
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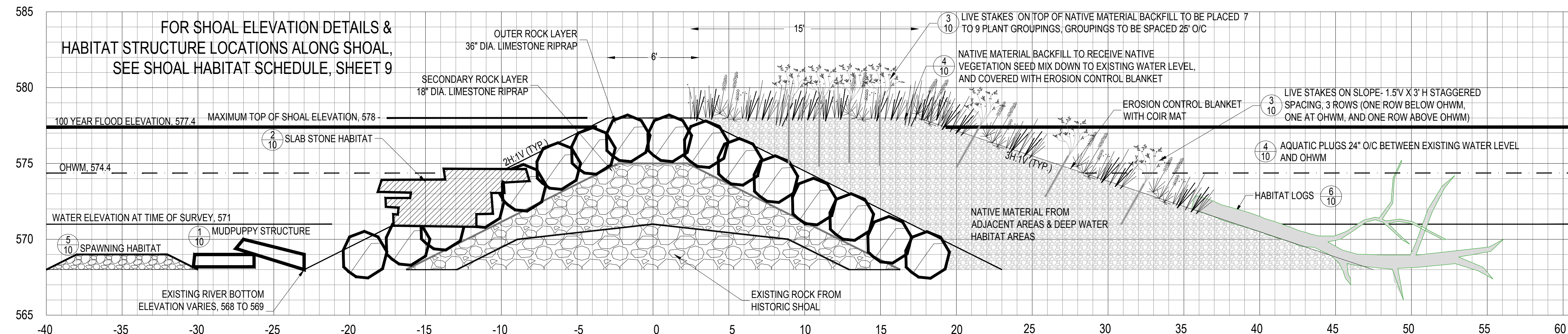
1 PROPOSED NORTH SHOAL RESTORATION



2 PROPOSED NORTH SHOAL ISLANDS



3 PROPOSED WEST SHOAL



4 PROPOSED SOUTH SHOAL RESTORATION

- NOTES:
- SHOAL RIP RAP MATERIALS TO BE VIBRATED INTO PLACE DURING CONSTRUCTION WITH A VIBRATING IMPACT COMPACTOR, SUCH AS A HOE-PAK TYPE PIECE OF EQUIPMENT, OR SEATED INTO PLACE BY MECHANICAL PUSH WITH AN EXCAVATOR BUCKET.
 - GEOTEXTILE FABRIC TO BE NON-WOVEN GEOTEXTILE SEPARATOR FABRIC US FABRICS, INC. PRODUCT US 205NW, OR APPROVED EQUAL.
 - EROSION CONTROL BLANKET TO BE NORTH AMERICAN GREEN C125BN OR APPROVED EQUAL. ALL EROSION CONTROL BLANKET TO BE COVERED WITH COIR MAT, ROLANKA COIR MAT 60, OR APPROVED EQUAL. BOTH PRODUCTS TO BE STAKED TOGETHER.



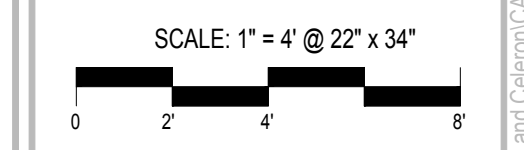
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FRIENDS OF THE DETROIT RIVER
 WAYNE COUNTY, MICHIGAN

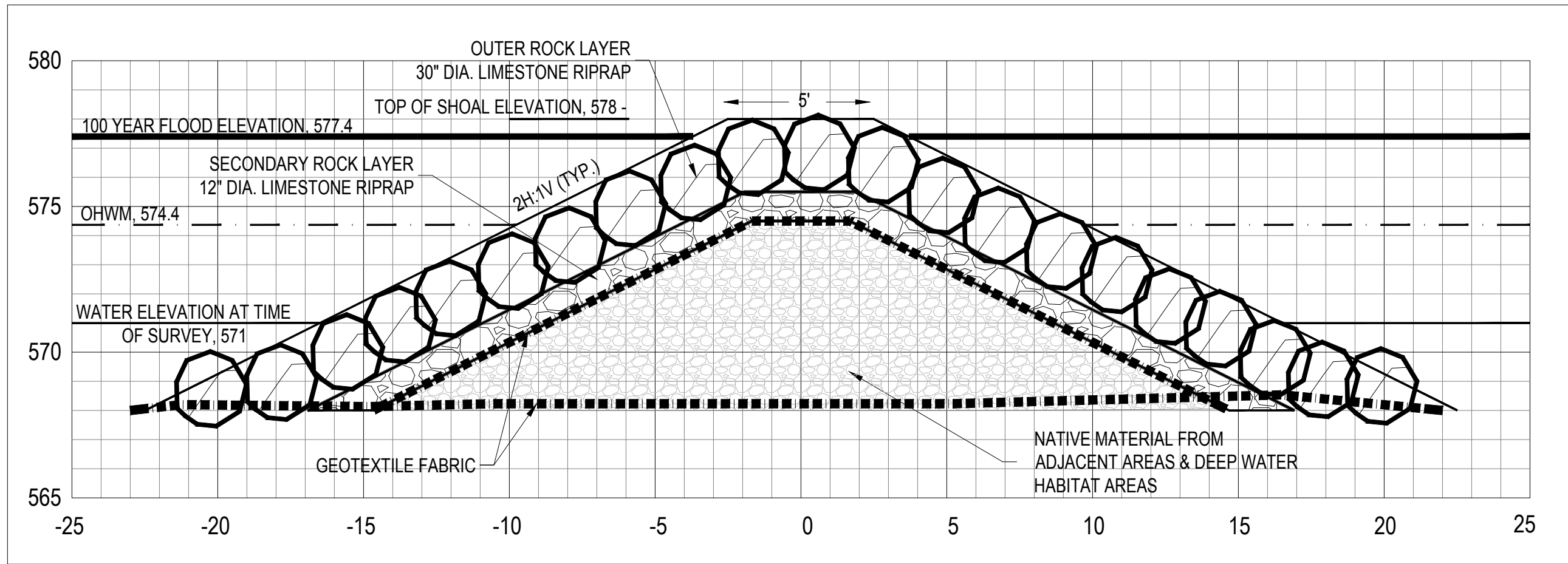
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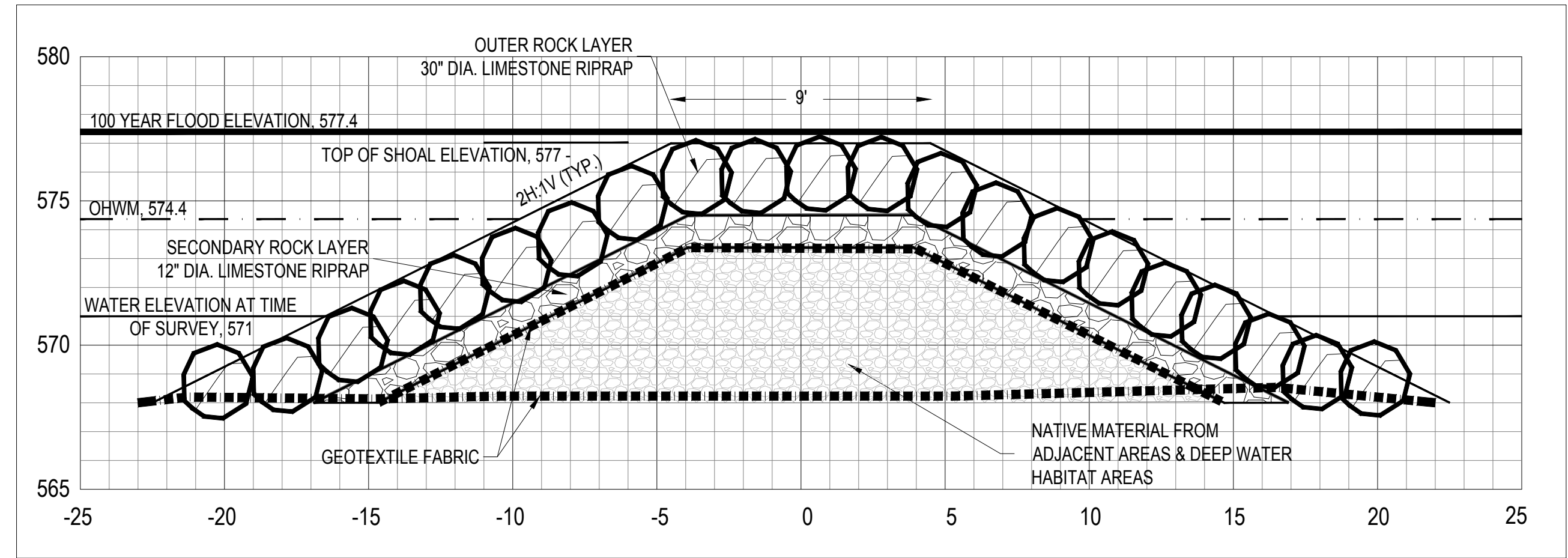
SHEET TITLE
TYPICAL SECTIONS



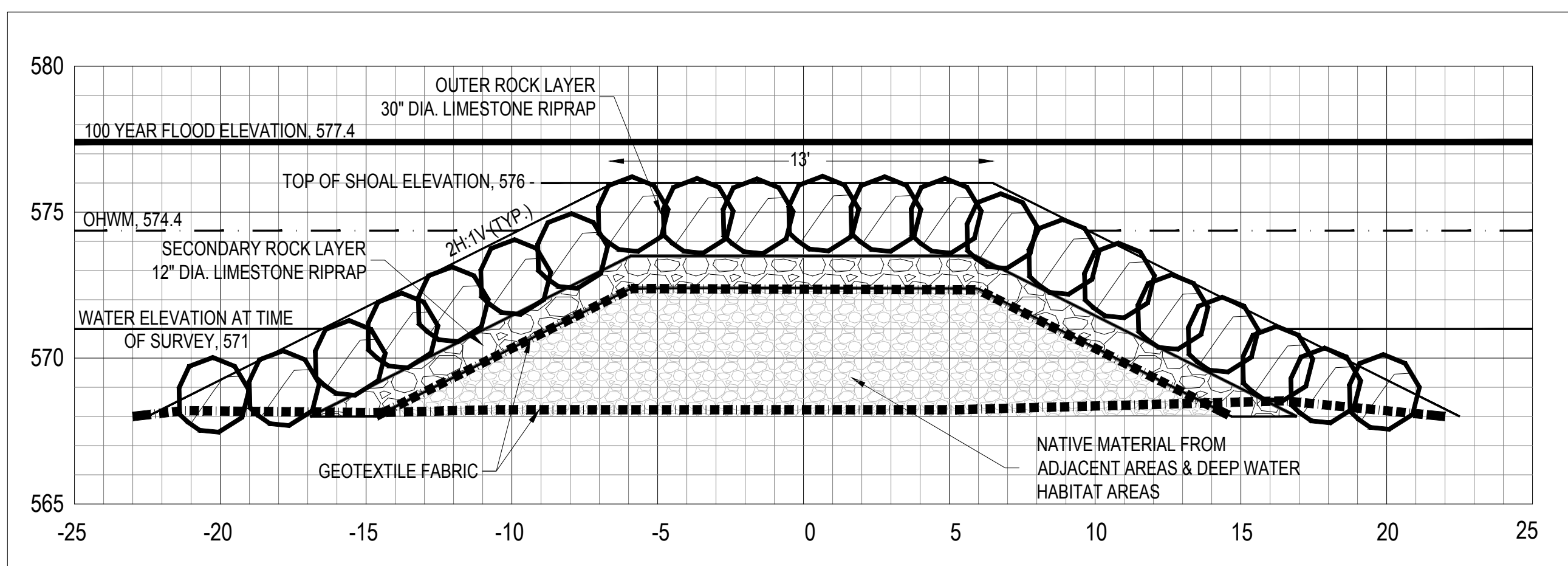
3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171



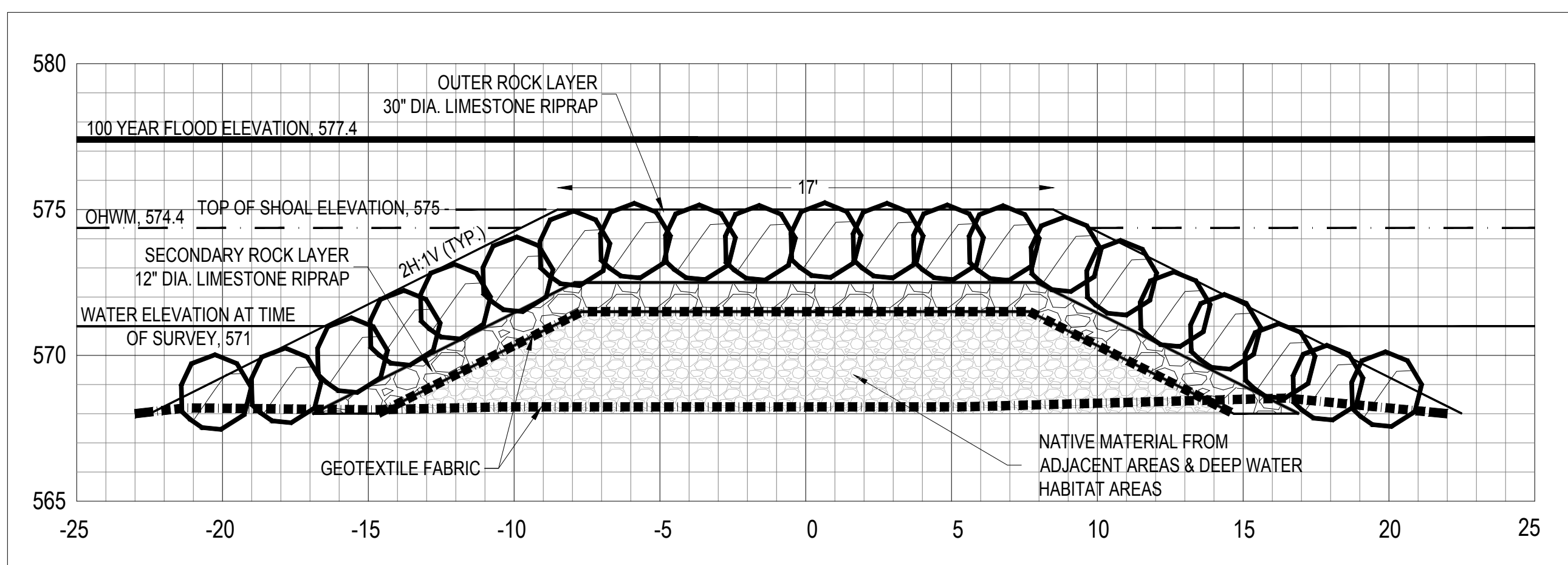
1
8 PROPOSED WEST SHOAL - SHOAL ELEVATION 578'



2
8 PROPOSED WEST SHOAL - SHOAL ELEVATION 577'



3
8 PROPOSED WEST SHOAL - SHOAL ELEVATION 576'



4
8 PROPOSED WEST SHOAL - SHOAL ELEVATION 575'

- NOTES:
- SHOAL RIP RAP MATERIALS TO BE VIBRATED INTO PLACE DURING CONSTRUCTION WITH A VIBRATING IMPACT COMPACTOR, SUCH AS A HOE-PAK TYPE PIECE OF EQUIPMENT, OR SEATED INTO PLACE BY MECHANICAL PUSH WITH AN EXCAVATOR BUCKET.
 - GEOTEXTILE FABRIC TO BE NON-WOVEN GEOTEXTILE SEPARATOR FABRIC US FABRICS, INC. PRODUCT US 205NW, OR APPROVED EQUAL.
 - EROSION CONTROL BLANKET TO BE NORTH AMERICAN GREEN C125BN OR APPROVED EQUAL.

SHOAL HABITAT SCHEDULE

	SPAWNING HABITAT	MUDPUPPY STRUCTURE AT	SLAB STONE HABITAT	HABITAT LOGS AT SHOALS
	6+00	6+10	6+15	6+25
	6+60	6+60	6+35	6+75
	7+20	7+10	6+55	7+25
	7+80	7+60	6+75	7+75
	8+40	8+10	6+95	8+25
	9+00	8+60	7+15	8+75
	9+60	9+10	7+35	9+25
	10+20	9+60	7+55	9+75
	10+80	10+10	7+75	10+25
	11+40	10+60	7+95	10+75
	12+00	11+10	8+15	11+25
	12+60	11+60	8+35	11+75
	13+20	12+10	8+55	12+25
		12+60	8+75	12+75
		13+10	8+95	13+25
		13+60	9+15	13+75
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			13+35	
			13+55	
			13+75	



DETROIT RIVER AOC-STONY ISLAND HABITAT RESTORATION PROJECT

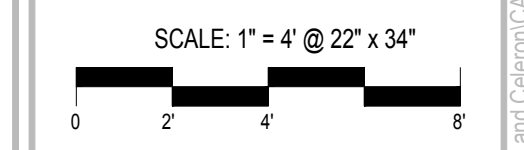
FRIENDS OF THE DETROIT RIVER

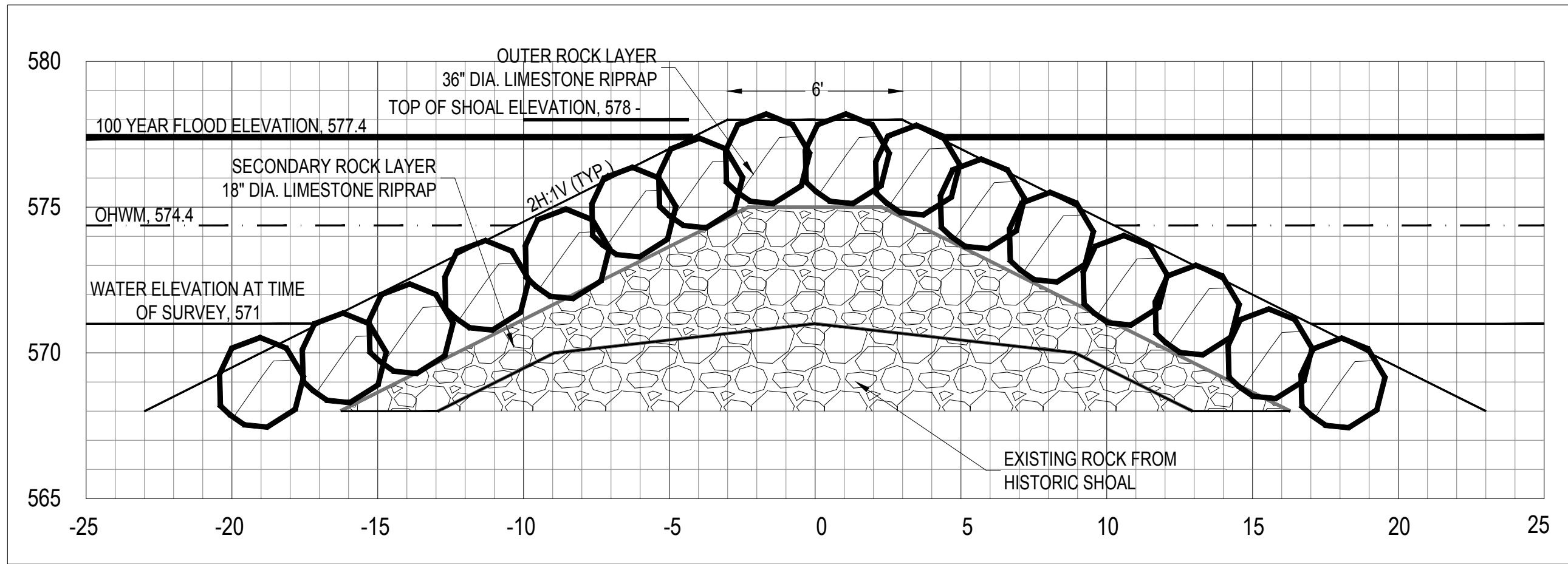
WAYNE COUNTY, MICHIGAN

FOR INFORMATION	JAN 2016
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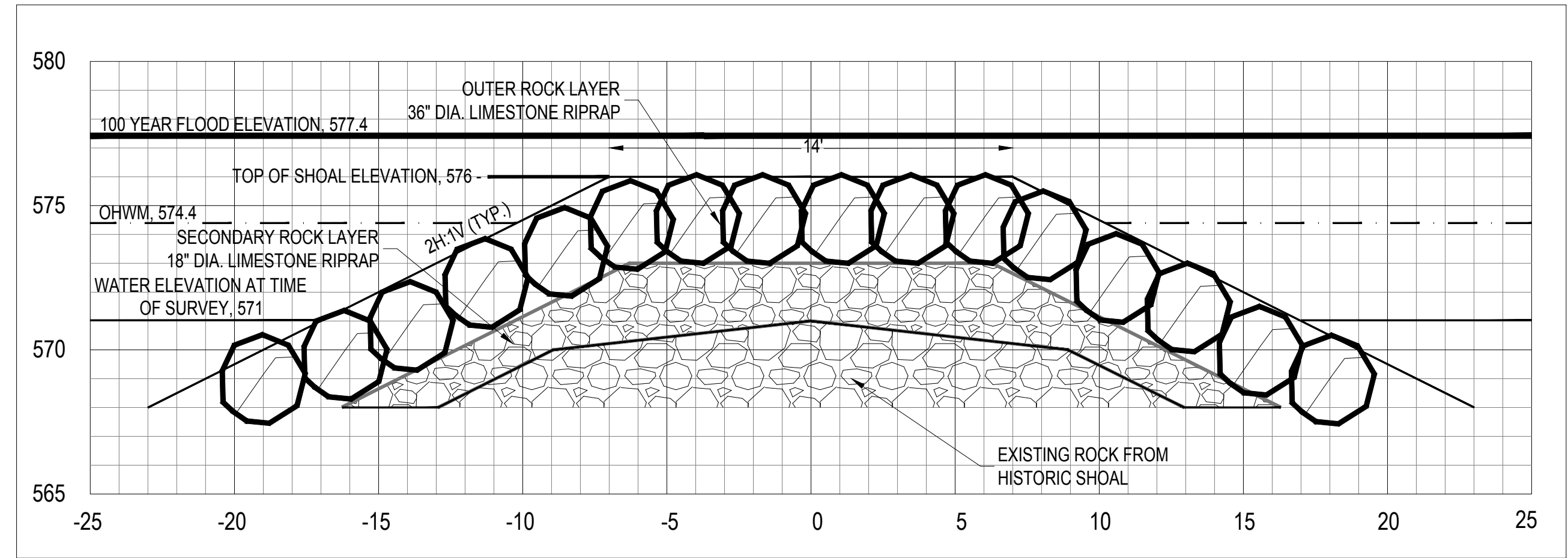
130638
 ECT PROJECT NUMBER
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 AB/EC DRAWN BY JO
 APPROVED BY

SHEET TITLE
SHOAL DETAILS - PROPOSED WEST SHOAL

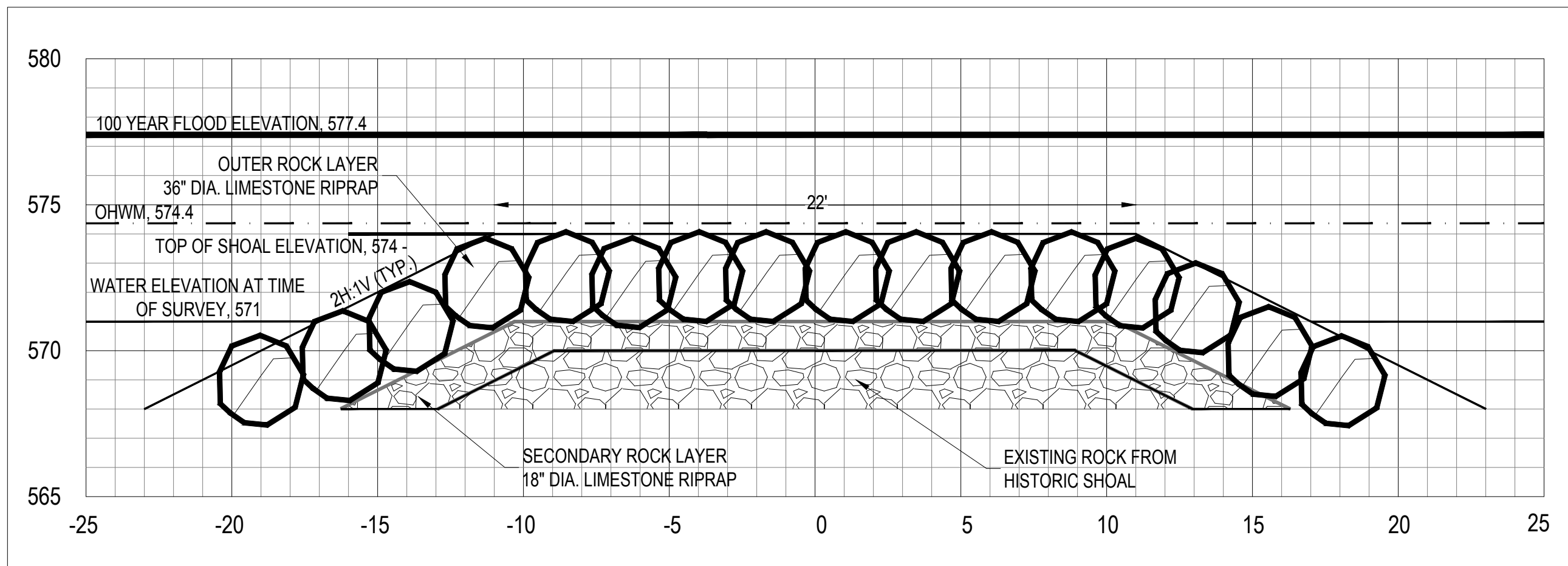




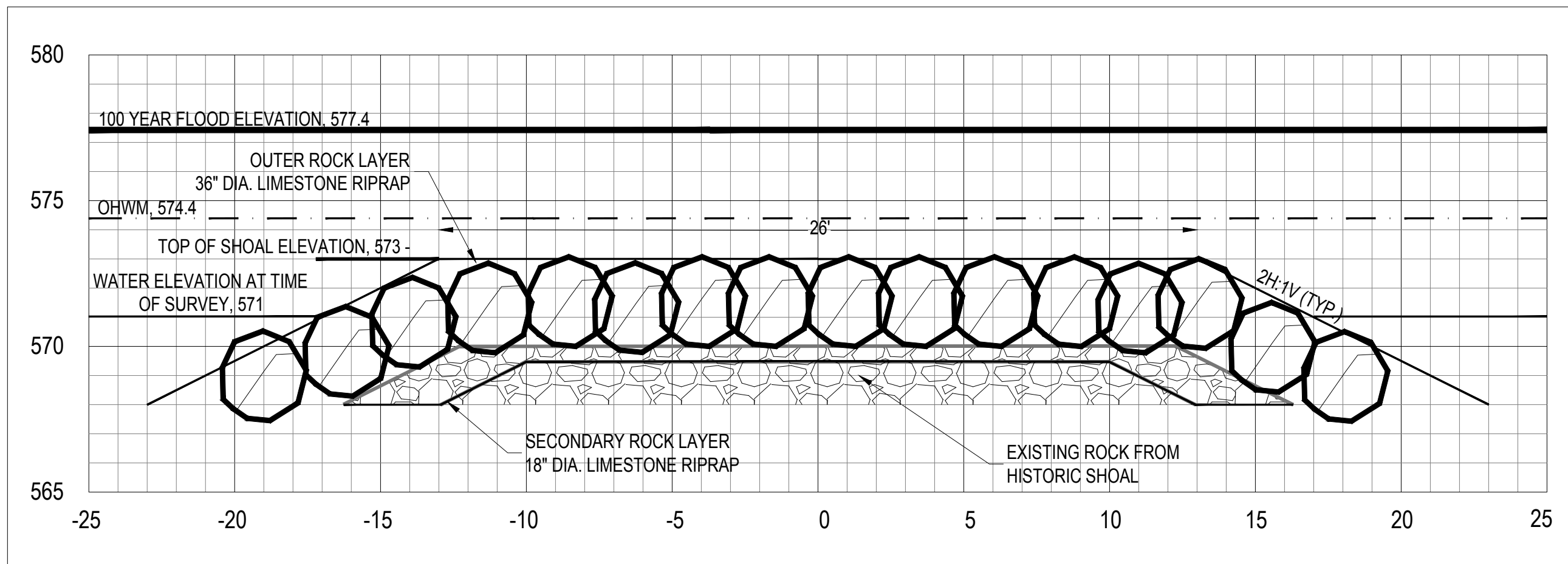
1 PROPOSED SOUTH SHOAL RESTORATION - SHOAL ELEVATION 578'



2 PROPOSED SOUTH SHOAL RESTORATION - SHOAL ELEVATION 576'



3 PROPOSED SOUTH SHOAL RESTORATION - SHOAL ELEVATION 574'



4 PROPOSED SOUTH SHOAL RESTORATION - SHOAL ELEVATION 573'

SHOAL HABITAT SCHEDULE

	PROPOSED SOUTH SHOAL RESTORATION			
	SPAWNING HABITAT	MUDPUPPY STRUCTURE	SLAB STONE HABITAT	BASKING LOGS
	0+00	0+10	0+15	0+25
	0+60	0+60	0+35	0+75
	1+20	1+10	0+55	1+25
	1+80	1+60	0+75	1+75
	2+40	2+10	0+95	2+25
	3+00	2+60	1+15	2+75
	3+60	3+10	1+35	3+25
	4+20	3+60	1+55	3+75
	4+80	4+10	1+75	4+25
	5+40	4+60	1+95	4+75
	6+00	5+10	2+15	5+25
	6+60	5+60	2+35	5+75
	7+20	6+10	2+55	6+25
	7+80	6+60	2+75	6+75
	8+40	7+10	2+95	7+25
	9+00	7+60	3+15	7+75
	9+60	8+10	3+35	8+25
	10+20	8+60	3+55	8+75
	10+80	9+10	3+75	9+25
	11+40	9+60	3+95	9+75
	12+00	10+10	4+15	10+25
		10+60	4+35	10+75
		11+10	4+55	11+25
		11+60	4+75	11+75
		12+10	4+95	12+25
		5+15		
		5+35		
		5+55		
		5+75		
		5+95		
		6+15		
		6+35		
		6+55		
		6+75		
		6+95		
		7+15		
		7+35		
		7+55		
		7+75		

- NOTES:
- SHOAL RIP RAP MATERIALS TO BE VIBRATED INTO PLACE DURING CONSTRUCTION WITH A VIBRATING IMPACT COMPACTOR, SUCH AS A HOE-PAK TYPE PIECE OF EQUIPMENT, OR SEATED INTO PLACE BY MECHANICAL PUSH WITH AN EXCAVATOR BUCKET.
 - GEOTEXTILE FABRIC TO BE NON-WOVEN GEOTEXTILE SEPARATOR FABRIC US FABRICS, INC. PRODUCT US 205NW, OR APPROVED EQUAL.
 - EROSION CONTROL BLANKET TO BE NORTH AMERICAN GREEN C125BN OR APPROVED EQUAL.



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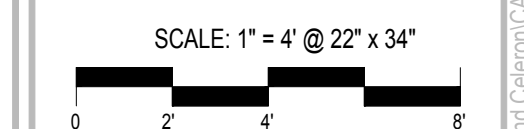
DETROIT RIVER AOC-STONY ISLAND HABITAT RESTORATION PROJECT

FRIENDS OF THE DETROIT RIVER
 WAYNE COUNTY, MICHIGAN

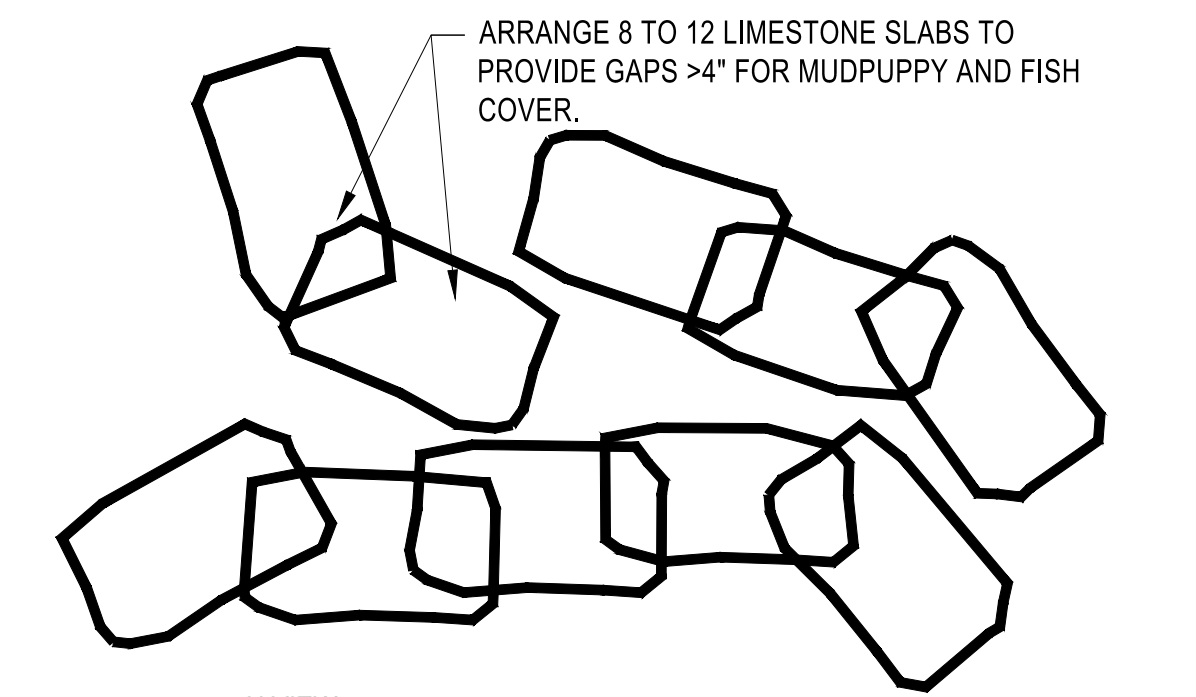
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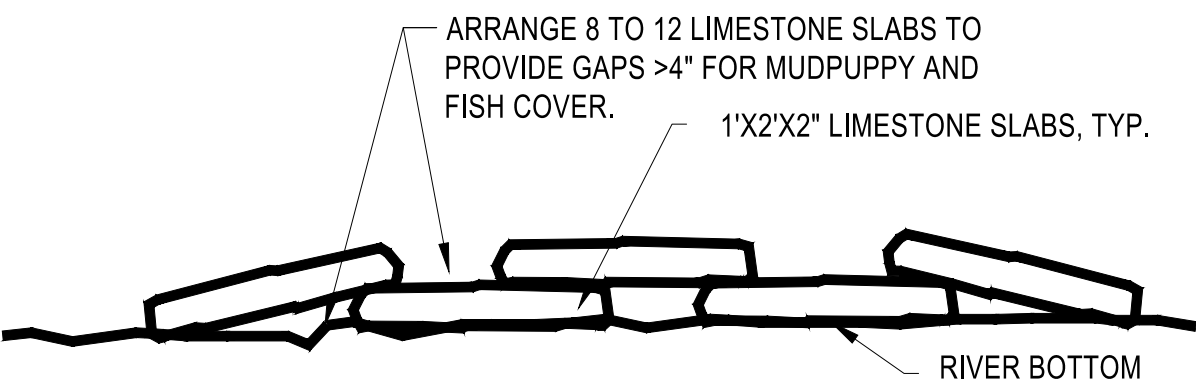
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SHOAL DETAILS - PROPOSED SOUTH SHOAL RESTORATION



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PLAN VIEW



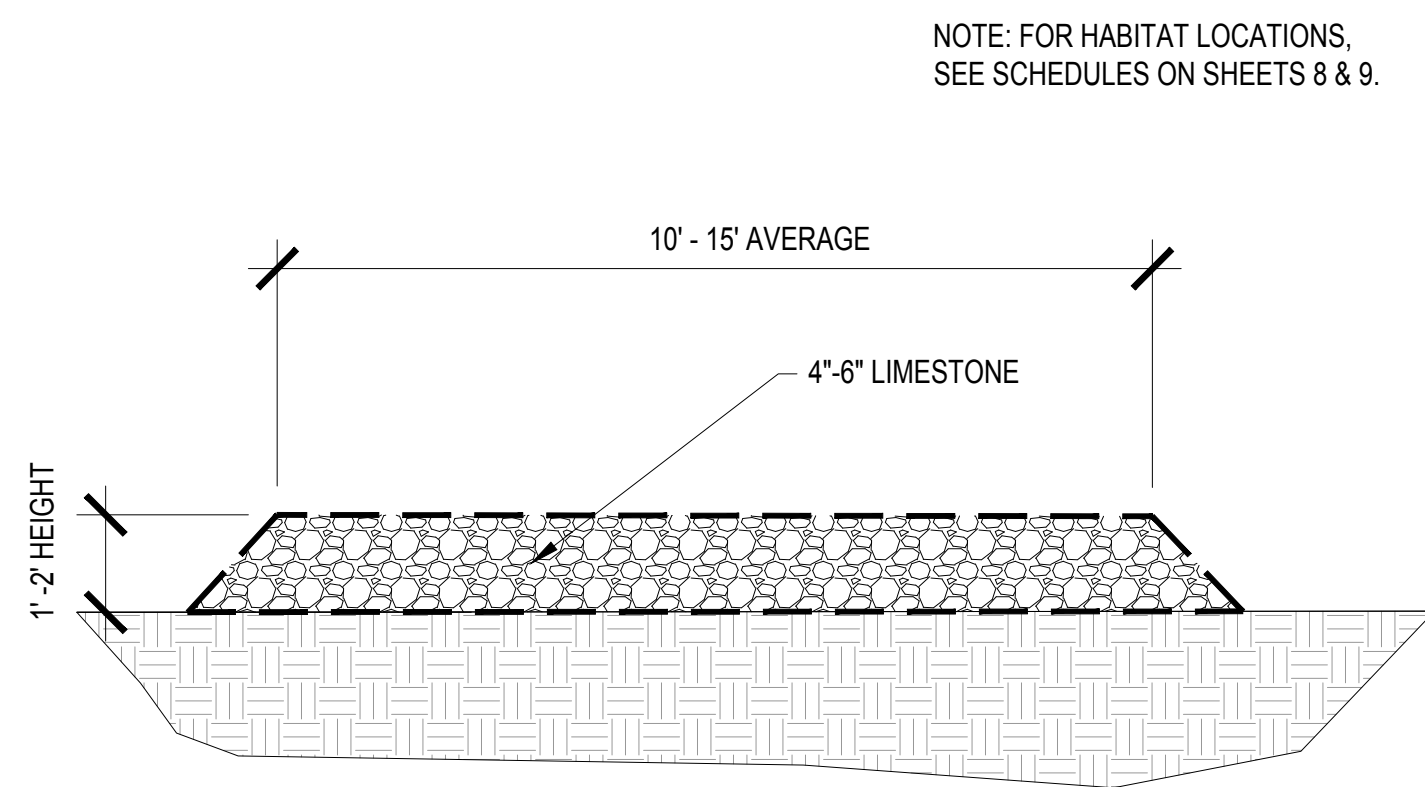
SECTION VIEW

NOTES

- GROUPINGS OF 8 TO 12 STONE SLABS SHOULD BE PLACED PER HABITAT STRUCTURE.
- PLACEMENT OF MUDPUPPY AND FISH COVER STRUCTURE TO BE AS SHOWN ON PLAN AND VERIFIED BY ENGINEER.
- CARE SHALL BE TAKEN DURING PLACEMENT TO AVOID HIGH QUALITY AQUATIC VEGETATION.
- MUDPUPPY AND FISH COVER STRUCTURES SHOULD BE PLACED IN NEARSHORE.
- DO NOT STACK STONES MORE THAN 2 HIGH.

1 MUDPUPPY STRUCTURE DETAIL

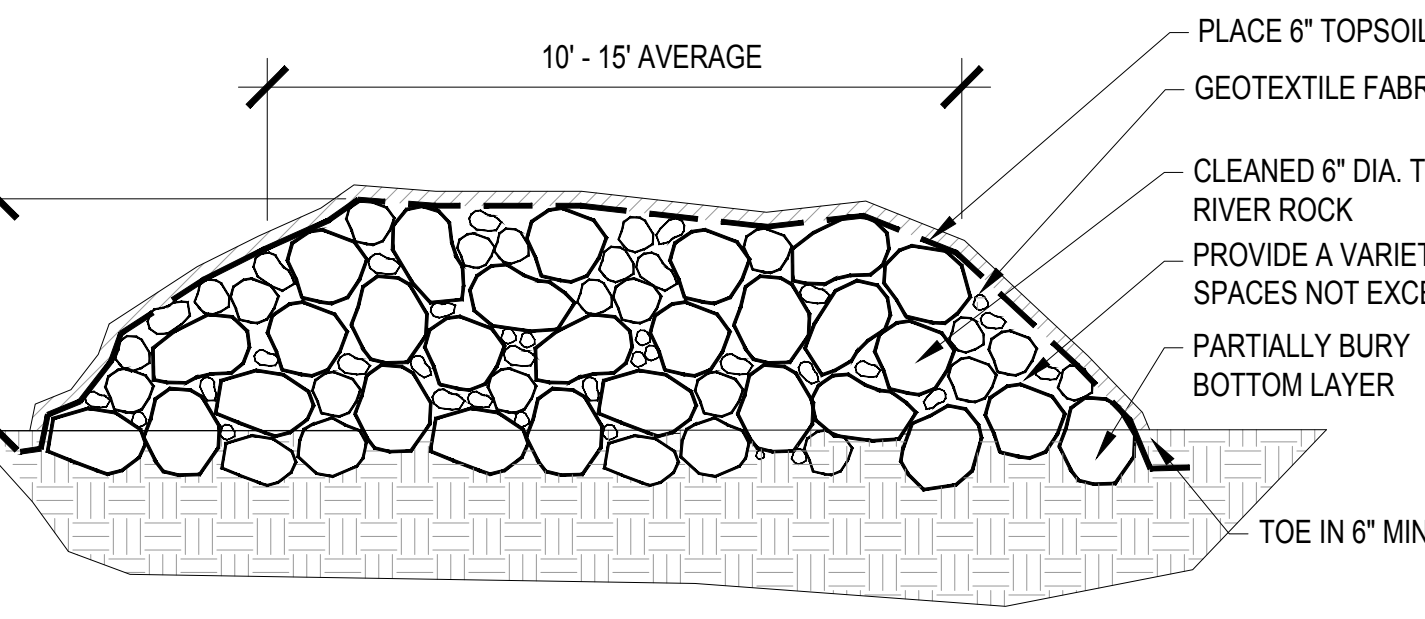
10 NOT TO SCALE



SECTION

5 SPAWNING HABITAT DETAIL

10 NOT TO SCALE



SECTION

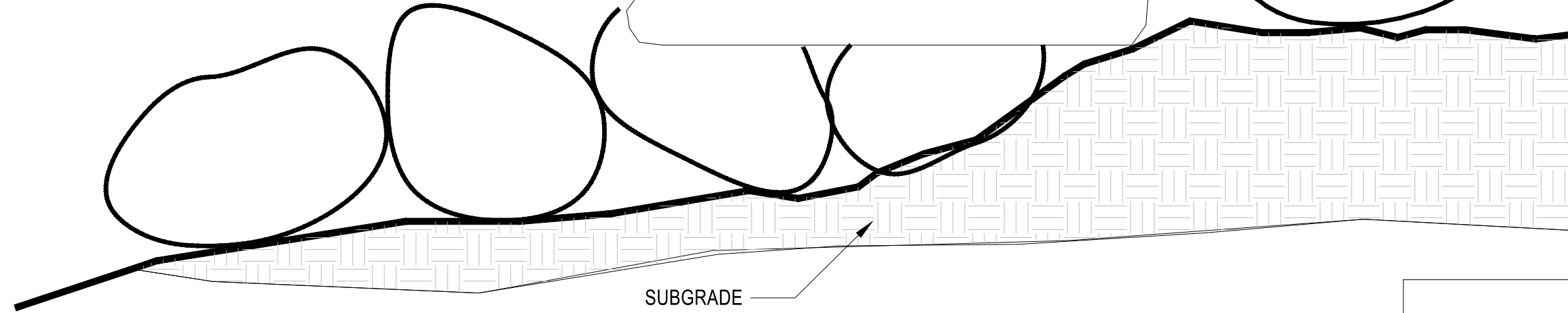
8 HIBERNACULA DETAIL

10 NOT TO SCALE

ARRANGE LIMESTONE SLABS TO PROVIDE GAPS >4" IN HEIGHT AND >2" INTO THE ROCK FILLED AREA

NOTES

- FOR HABITAT LOCATIONS, SEE SCHEDULES ON SHEETS 8 & 9.
- SLAB STONE HABITAT WILL EXTEND FROM EXISTING WATER SURFACE ELEVATION TO OHWM.
- ARRANGE SLABS SO THAT HABITAT EXTENDS APPROXIMATELY 6 TO 10 FEET ALONG FACE OF SHOAL.

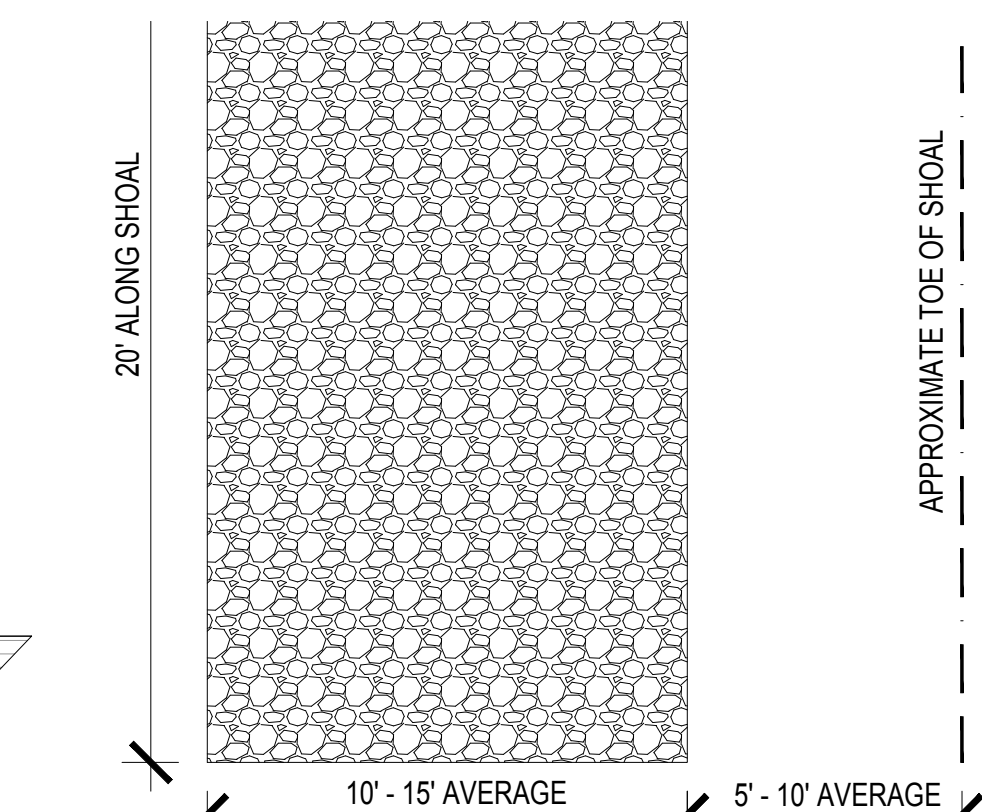


NOTES

- PHYSICAL DIMENSIONS OF STRUCTURE VARY DEPENDING ON AVAILABLE AREA AND TOPOGRAPHY.
- STRUCTURE TO BE PLACED ALONG THE SHOAL FACING THE RIVER WITH PLENTY OF DIRECT SUNLIGHT.
- PLACEMENT OF STRUCTURE TO BE DETERMINED BASED ON PLAN AND AS VERIFIED ON SITE BY ENGINEER.

2 SLAB STONE HABITAT DETAIL

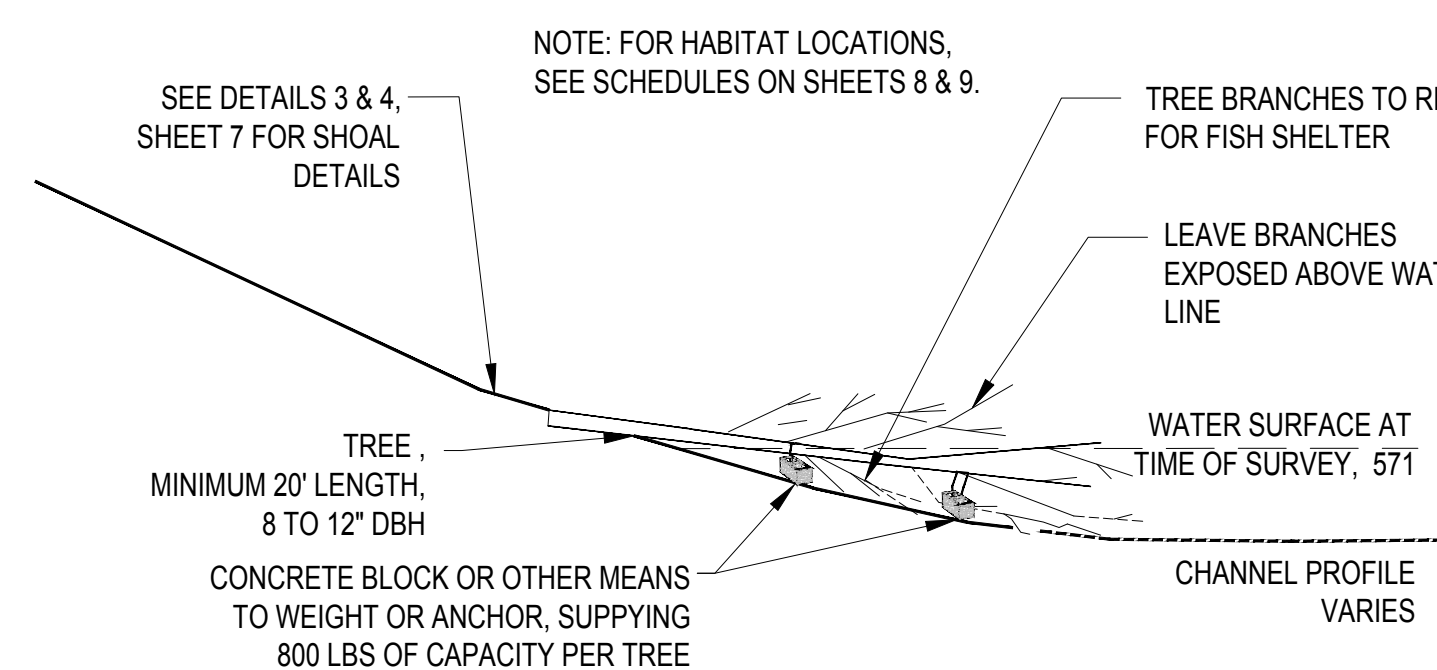
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PLAN

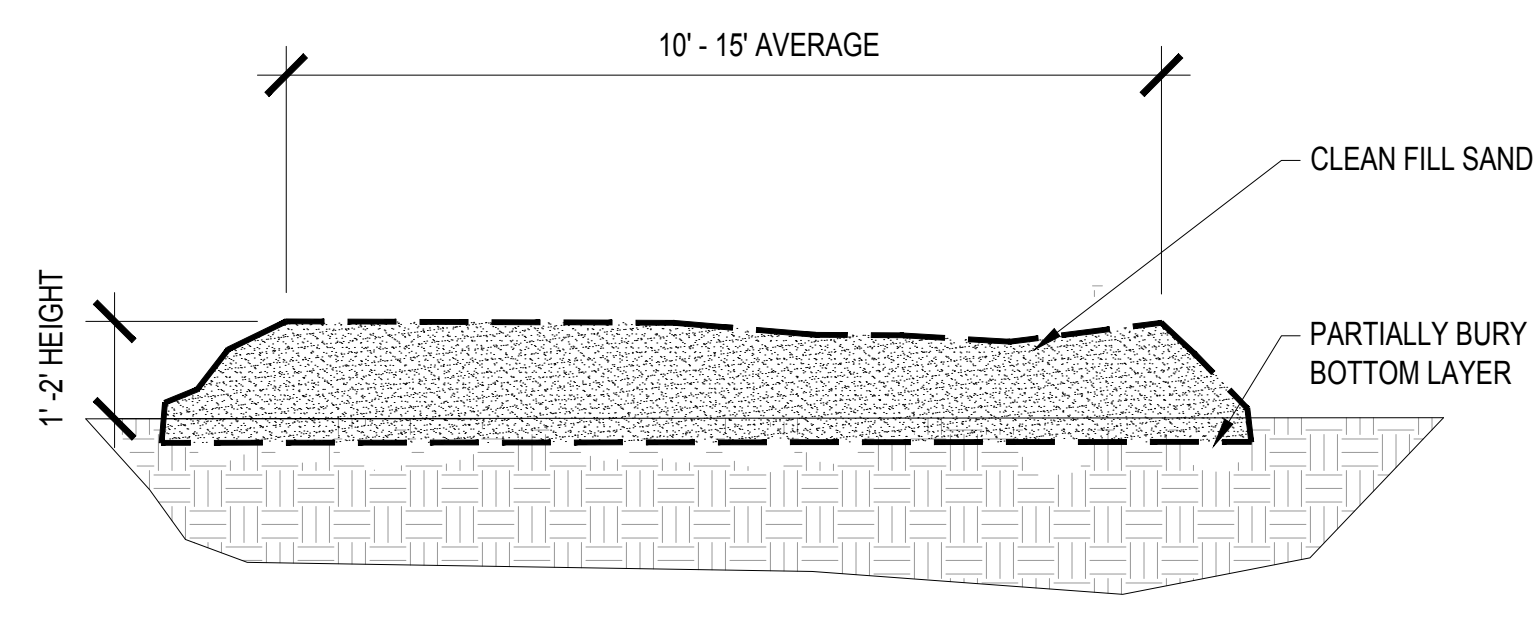
PLAN

NOTE: SOUTH FACING SIDE OF ROCK MOUND SHALL REMAIN UNCOVERED BY FABRIC AND SOIL.



6 HABITAT LOGS AT SHOAL DETAIL

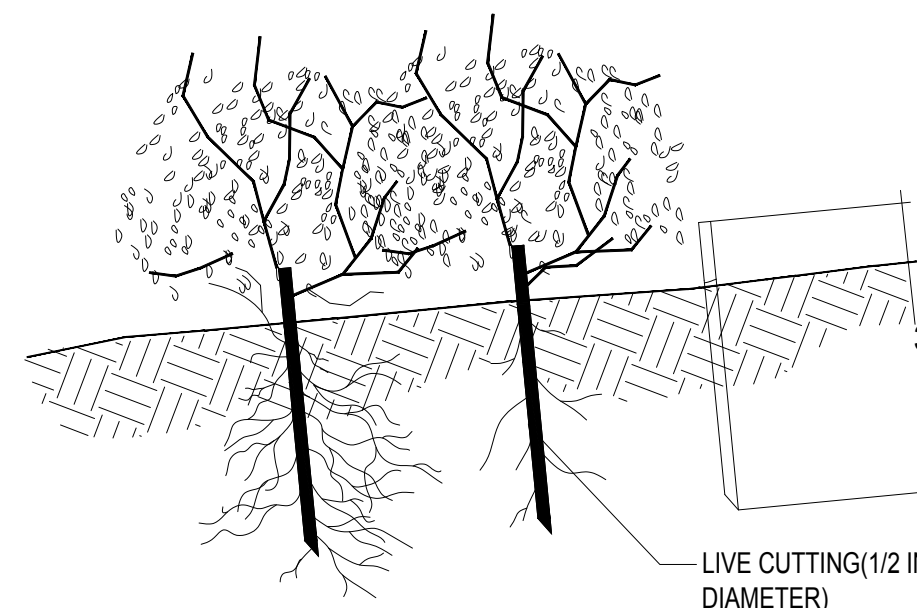
10 NOT TO SCALE



SECTION

9 NESTING AREA DETAIL

10 NOT TO SCALE



LIVE STAKE 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

NOTES

- INSTALL AS DIRECTED BY ENGINEER, DURING FIRST DORMANT SEASON FOLLOWING SEEDING
- ROOTED/LEAFED CONDITION OF THE LIVING PLANT MATERIAL IS NOT REPRESENTED AT THE TIME OF INSTALLATION.
- INSTALL LIVE STAKES AT RIGHT ANGLES PUSH INTO THE GROUND BY HAND. USE DEAD BLOW HAMMER AS NEEDED.
- BURY FOUR-FIFTHS OF THE STAKE IN THE GROUND, AND FIRMLY PACK SOIL AROUND IT. ORIENT THE BUDS UP.
- INSTALL STAKE ROWS APPROX. 1.5' APART AND INSTALL LIVE STAKES AT APPROX. 3' SPACING ALONG ROWS. STAGGER ROWS TO CREATE TRIANGULAR SPACING PATTERN.
- SPECIES LIST ON THIS SHEET

3 LIVE STAKE DETAIL

10 NOT TO SCALE

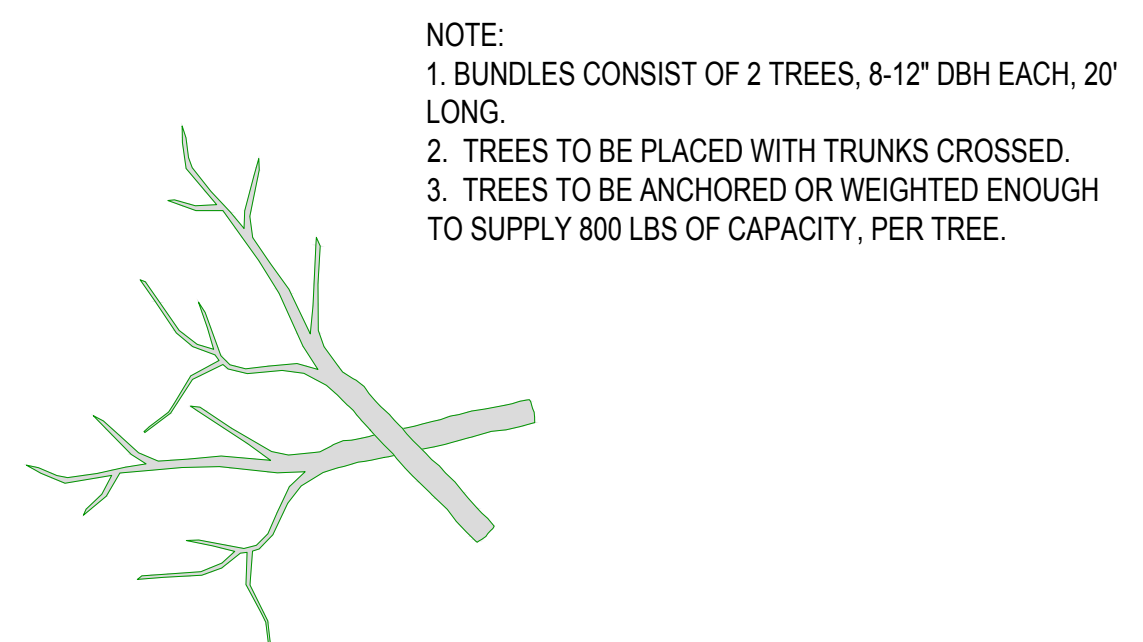
SEED MIX		
SCIENTIFIC NAME	COMMON NAME	LBS/AC
ANDROPOGON GERARDII	BIG BLUESTEM	5.000
ANDROPOGON SCOPARIUS	LITTLE BLUESTEM	5.000
BOUTELOUA CURTIPENDULA	SIDEOATS GRAMMA	5.000
ELYMUS CANADENSIS	CANADA WILD RYE	8.000
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	8.000
GLYCERIA STRIATA	FOWL MANNA GRASS	1.000
PANICUM VIRGATUM	SWITCH GRASS	1.000
SORGHASTRUM NUTANS	INDIAN GRASS	10.00
SPARTINA PECTINATA	PRAIRIE CORD GRASS	0.500
SPOROBOLUS HETEROLEPIS	DROPSEED	0.500
AVENA SATIVA	SEED OATS	20.00
LOLIUM MULTIFLORUM	ANNUAL RYE	5.000
TOTAL		69.00

EMERGENT PLUGS

SCIENTIFIC NAME	COMMON NAME
ASCLEPIAS INCARNATA	SWAMP MILKWEED
CAREX COMOSA	BRISTLY SEDGE
CAREX LACUSTRIS	LAKE SEDGE
CAREX VULPINOIDEA	FOX SEDGE
EUPATORIUM MACULATUM	SPOTTED JOE PYE WEED
JUNCUS EFFUSUS	COMMON RUSH
IRIS VIRGINICA	BLUE FLAG IRIS
LEERSIA ORYZOIDES	RICE CUT GRASS
MIMULUS RUNGENS	MONKEY FLOWER
PONTEDARIA CORDATA	PICKERELWEED
SAGITTARIA LATIFOLIA	COMMON ARROWHEAD
SCIRPUS ACUTUS	HARD-STEMMED BULRUSH
SCIRPUS ATROVIRENS	DARK GREEN RUSH
SCIRPUS VALIDUS	GREAT BULRUSH
SPARGANIUM AMERICANUM	AMERICAN BUR REED
SPARGANIUM EURYCARPUM	COMMON BUR REED

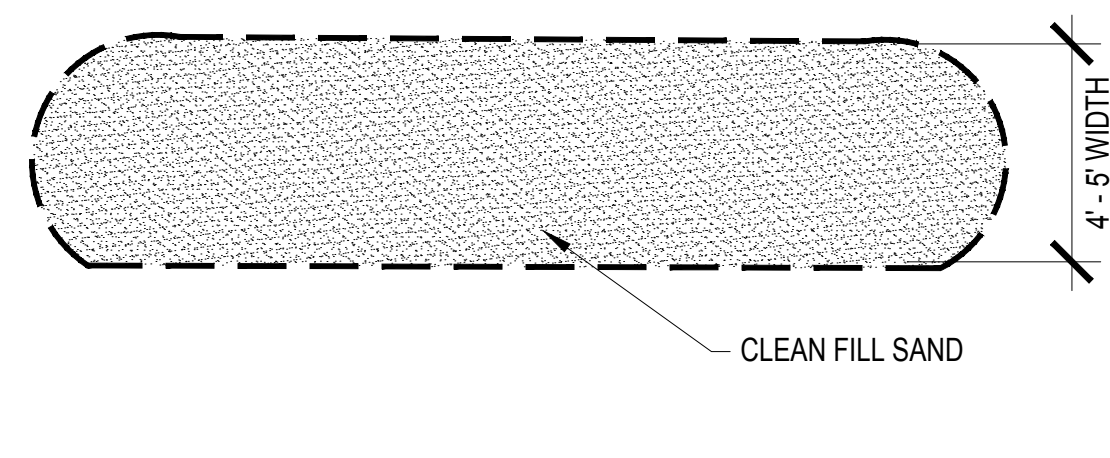
4 NATIVE VEGETATION SPECIES

10 NOT TO SCALE



7 HABITAT LOG BUNDLE DETAIL

10 NOT TO SCALE



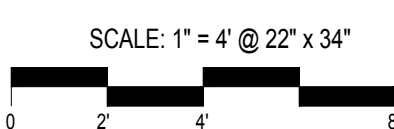
PLAN

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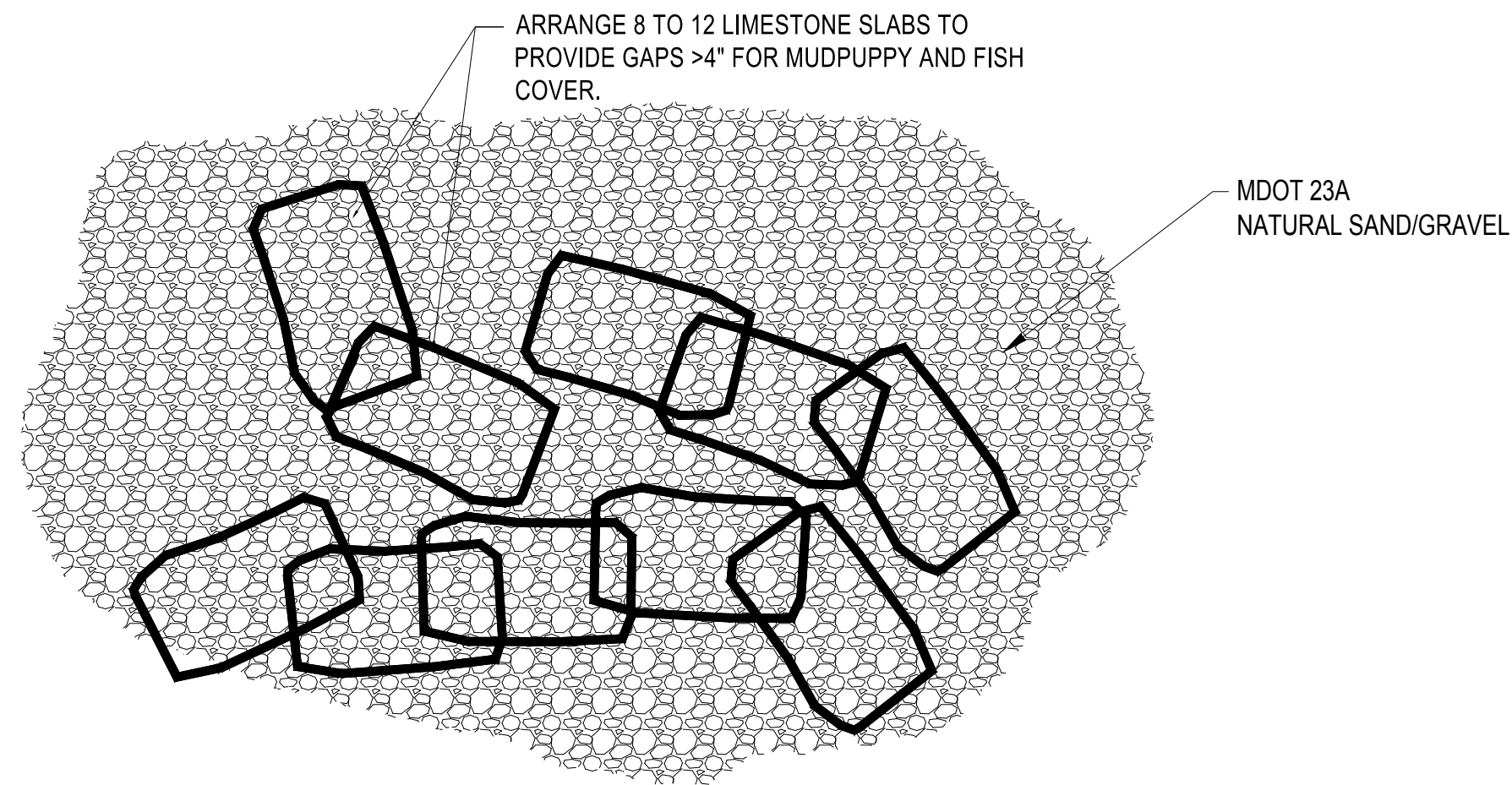
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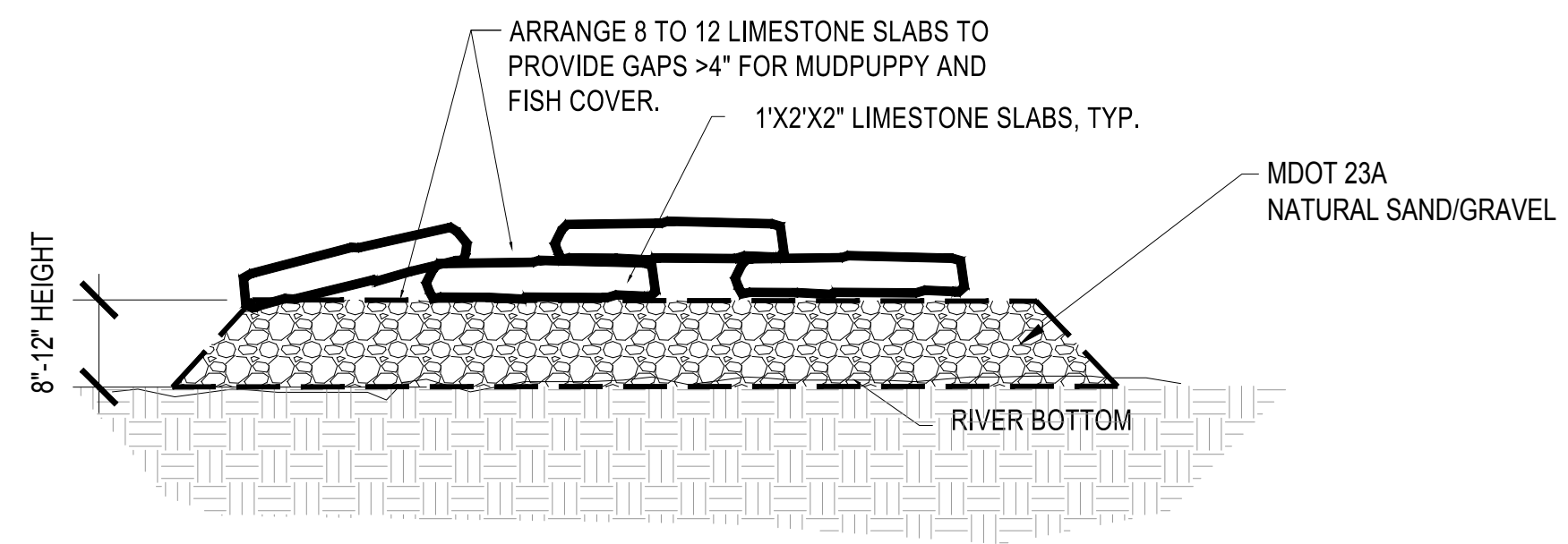
HABITAT STRUCTURE DETAILS



SHEET NUMBER
10



PLAN VIEW



SECTION VIEW

NOTES

- ① GROUPINGS OF 8 TO 12 STONE SLABS SHOULD BE PLACED.
- ② PLACEMENT OF MUDPUPPY AND FISH COVER STRUCTURE TO BE DETERMINED ON SITE BY WILDLIFE BIOLOGIST.
- ③ CARE SHALL BE TAKEN DURING PLACEMENT TO AVOID HIGH QUALITY AQUATIC VEGETATION.
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1 MUDPUPPY STRUCTURE WITH MUSSEL HABITAT DETAIL
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DETROIT RIVER AOC-STONY ISLAND HABITAT RESTORATION PROJECT

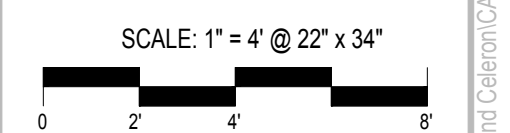
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WAYNE COUNTY, MICHIGAN

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HABITAT STRUCTURE DETAILS CONTINUED



NORTH

 SHEET NUMBER
11

