

# The Aquarium Renovation at the Toledo Zoo – Ohio Aquatic Invasive Species Committee Meeting July 30, 2015

Jay Hemdal



# The Toledo Zoo Aquarium - 1937



# The Toledo Zoo Aquarium - 2012





# The Toledo Zoo Aquarium - 2015



# The Toledo Zoo Aquarium - 2012





# The Toledo Zoo Aquarium - 2012

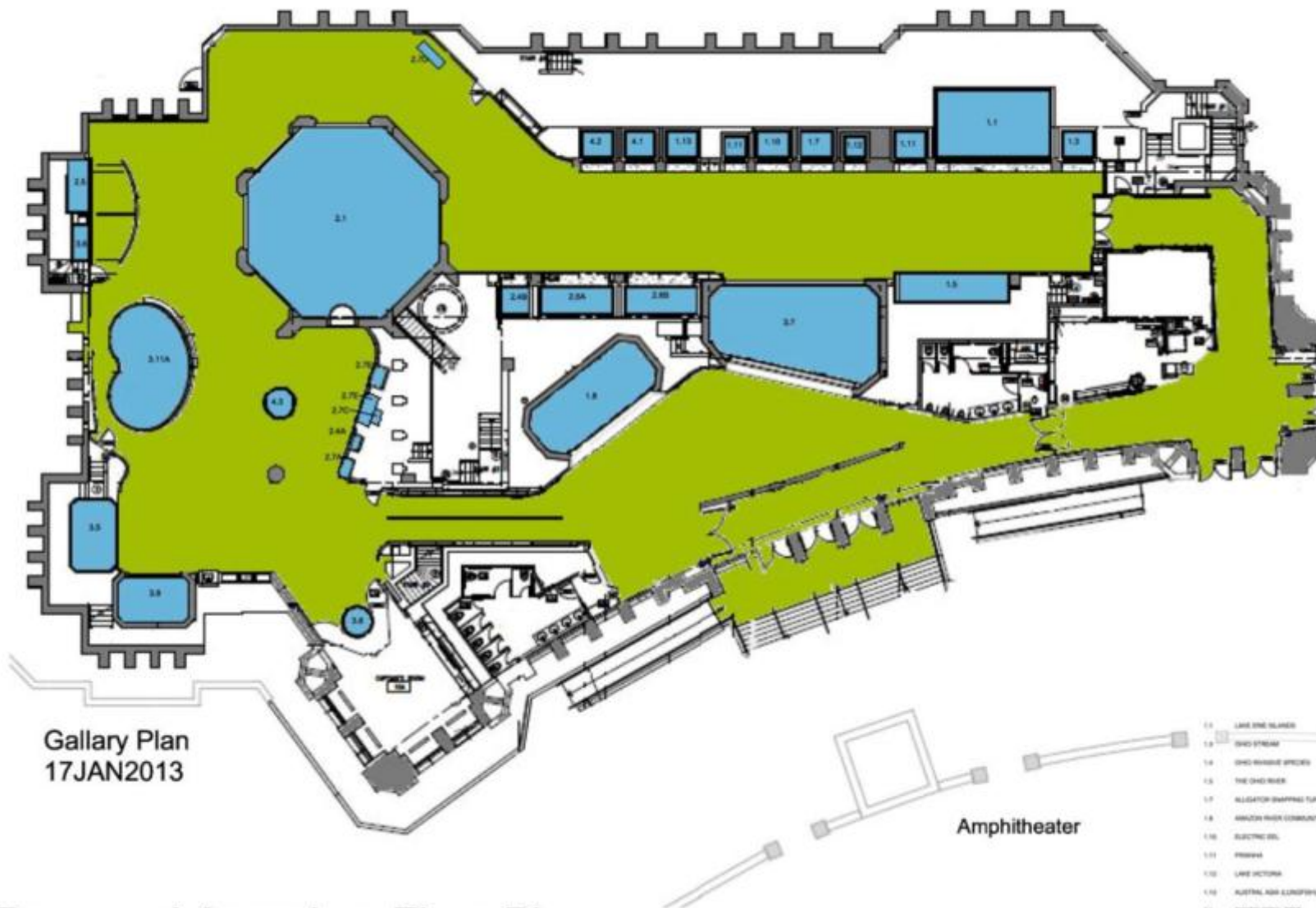
**Saltwater is very corrosive to concrete and steel....**





EXISTING TANKS: 38

EXISTING TANK PLAN



## Proposed Aquarium Floor Plan

- |      |                                 |
|------|---------------------------------|
| 2.1A | PACIFIC REEF GREAT STONY CORALS |
| 2.1B | PACIFIC LAGOON SOFT CORALS      |
| 2.1A | TROPICAL FOCUS - DEEP REEF      |
| 2.1B | PACIFIC JEWEL - GARDEN ISLE     |
| 2.1C | PACIFIC JEWEL - CLUMPFISH       |
| 2.1D | PACIFIC JEWEL - LARVA MANGROVE  |
| 2.1E | SAINT JAPANESE SPIDER CRABS     |
| 2.1F | DEEP SEA FOCUS ON SEA DRAGON    |
| 2.1G | SHARKS AND TURTLES              |
| 2.1H | MOON JELLY                      |
| 2.1I | CALIFORNIA ADULT FOREST         |
| 2.1J | TOUCH TANK - SHARKS AND RAYS    |
| 2.1K | TOUCH TANK - ANTIPODARIAN       |
| 2.1L | NORTHEAST PACIFIC COMMUNITY     |
| 2.1M | SAINT PACIFIC OCTOPUS           |
| 2.1N | SCHOOLING FISH                  |
| 2.1O | PACIFIC SEA NETTLES             |



# Contrasting the old (2010) Aquarium to the new Aquarium (2015)

<u>Criteria</u>	<u>Old Value</u>	<u>New Value</u>
Number of exhibits	50	32
Water volume of exhibits	46,000 gallons	178,000 gallons
Percentage of marine ex.	37%	87%
Volume of holding tanks	7500 gallons (16% of the exhibit volume.)	24,000 (13% of ex. vol.)
Largest exhibit	7600 gallons	90,000 gallons
Number of species	227	200
Number of freshwater species/specimens	117/1743	50/1200
Number of marine species/specimens	110/432	150/2500
Curatorial FTE	(Full Time Equivalent) 1	1
Keeper FTE	4.14	5



## Exhibit: **Gulf of Mexico – Sharks, Rays and Turtles**

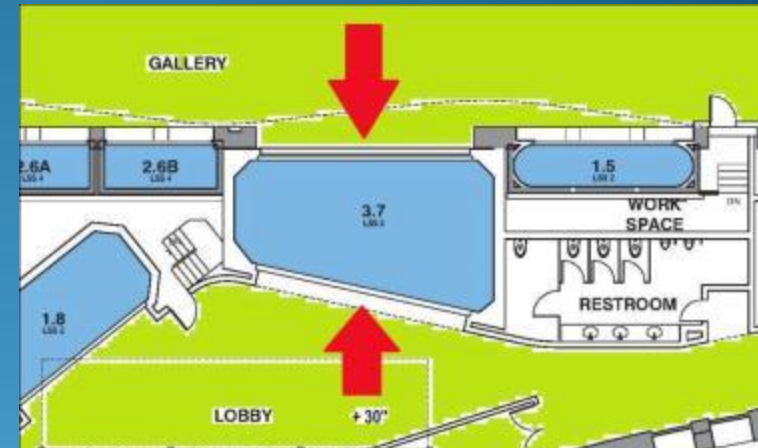
Exhibit number: 3.7

Water type: Temperate marine

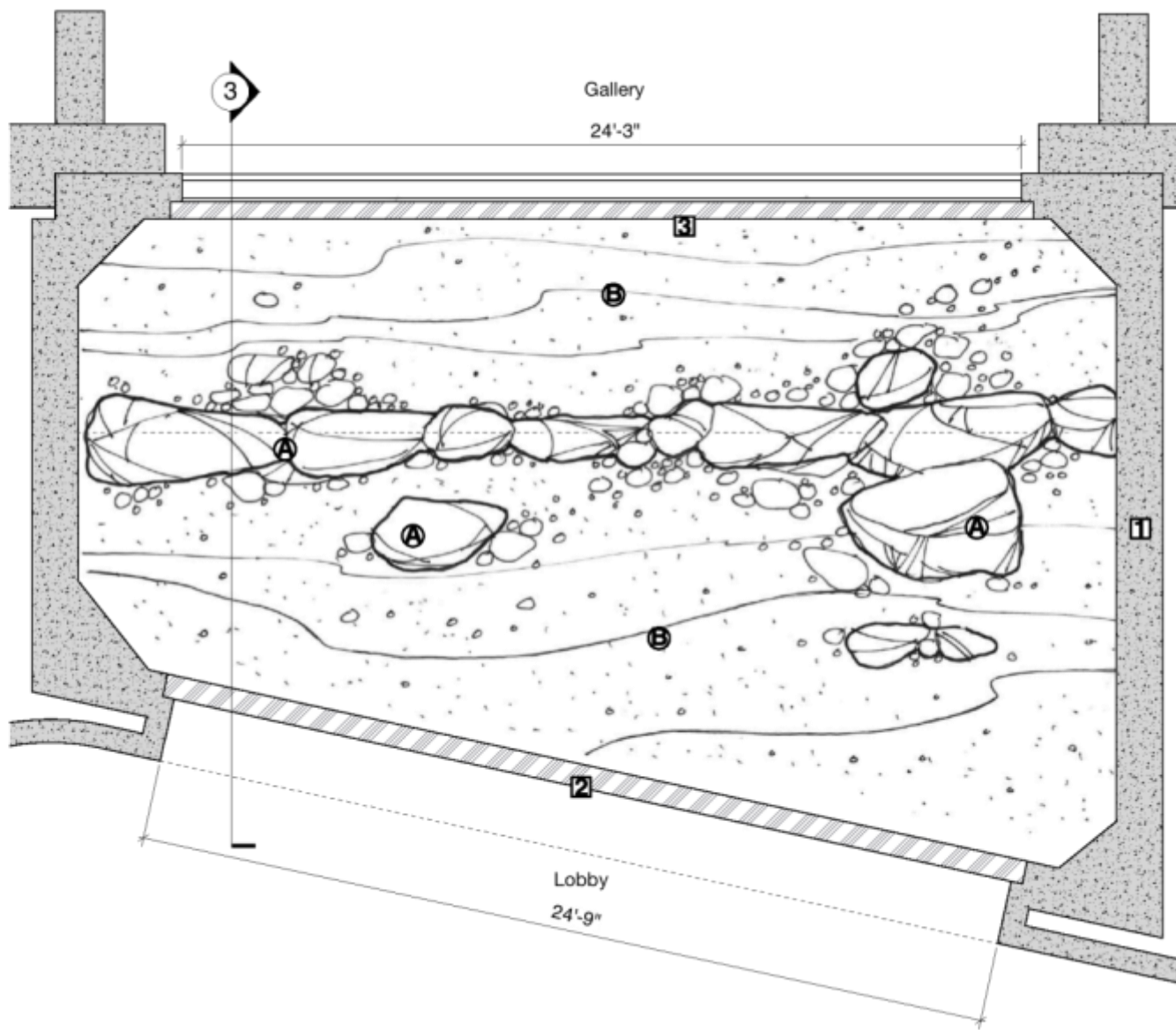
Tank volume: 35,000 gallons

Description: This exhibit would be the second largest of the project. Sharks would include bonnethead, a small species of hammerhead. Other fish may include schooling jacks and possibly a sea turtle. This exhibit would be viewable from two locations.

Stories: Top predators, sea turtle conservation, pelagic swimmers.







Tank Legend	
1	Cast in Place Tank*
2	Acrylic Tank Window*
3	Titled Acrylic Window* Top of window tilted 8 degrees into tank
*Tank and Tank Window Shown for Reference Only. Refer to Architectural and Structural drawings for details.	
Habitat Feature Legend	
A	Fabricated Rock Features
B	Natural Sand Bottom
Special Features Legend	
AA	Under Gravel Filter**
**Under Gravel Filter for Reference Only. Refer to LSS Drawings for Details	

## 3.7 Gulf of Mexico - Sharks, Rays & Turtles



Artist's conception – shark/ray touch pool





Touch Tank in operation in July, 2015 – on a slow afternoon!



Exhibit name: **The Reef**

Exhibit number: 2.1

Water type: Tropical marine

Tank volume: 90,000 gallons

Description: This 30 foot long, 16 feet deep exhibit showcases colorful tropical Pacific reef fishes + reef sharks and a zebra shark. This would be the site for diver feeding demonstrations – with microphone in mask. A web cam (possibly interactive) could be installed here. Corals will be artificial, due to the predatory nature of some fish species.

Stories: Colorful, diverse shapes, myriad of adaptations, human interaction in the aquatic environment, busybodies, our fish are safe: husbandry requirements







Exhibit name: **Alligator snapping turtle**

Exhibit number: 1.7

Water type: Tropical freshwater

Tank volume: 854 gallons

Description: This 5 foot long exhibit showcase some of our more popular animals – our alligator snapping turtle.

Stories: Unusual tongue adaptation, over-harvesting for food

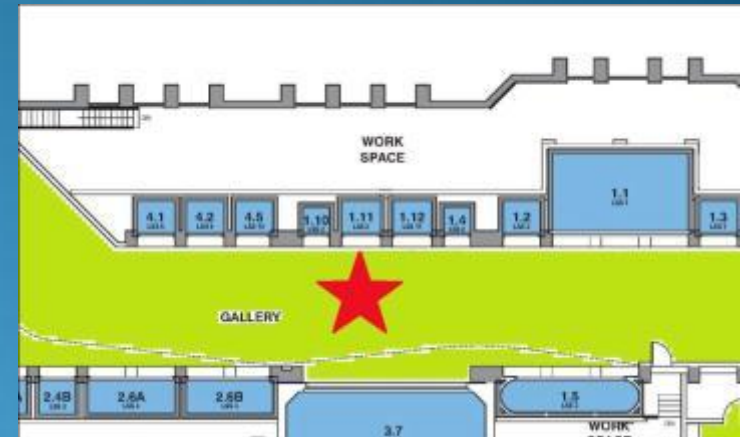




Exhibit name: **Ohio invasive species**

Exhibit number: 1.4

Water type: Temperate freshwater

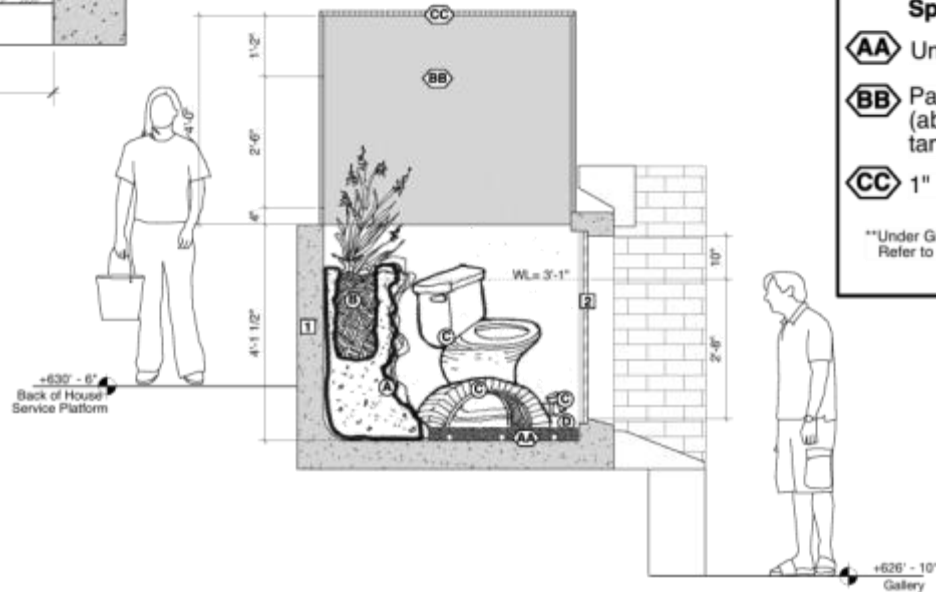
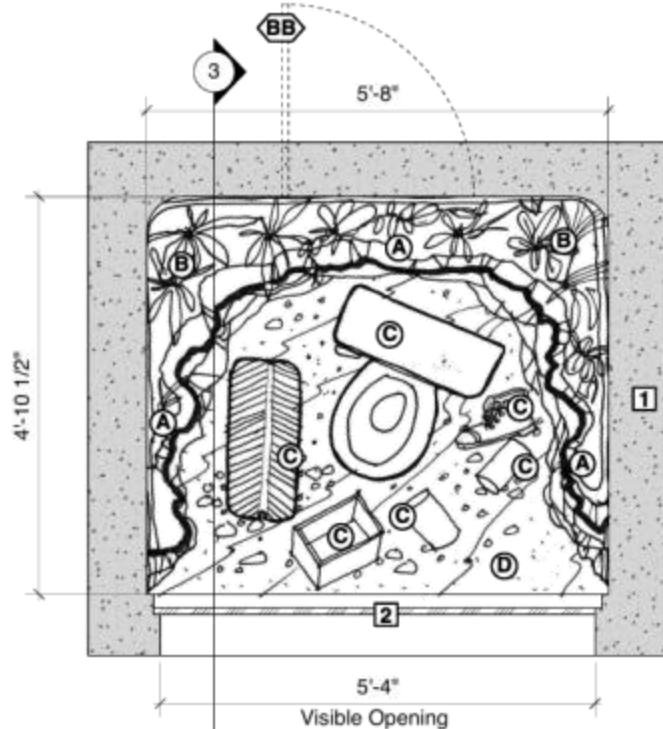
Tank volume: 542 gallons



Description: This 4 foot long tank will exhibit local Ohio invasive species; round gobies, goldfish, zebra mussels. In the background of the tank would be invasive plant species such as purple loosestrife and Phragmites. Funded by ODNR - DOW

Stories: All drains lead to the ocean, “living pollution” – invasive species





### Tank Legend

**1** Existing Concrete Tank\*

**2** Tank Window\*

\*Tank and Tank Window Shown for Reference Only.  
Refer to Architectural and Structural drawings for details.

### Habitat Feature Legend

**(A)** Fabricated Mudbank (3 Walls)

**(B)** Planter Pockets  
(Live Plants to Grow Past  
Water Level)

**(C)** Lost / Abandoned Items  
Boot  
Tire  
Toilet  
Tacklebox  
Styrofoam cup

**(D)** Sand Bed or Gravel Bed

### Special Features Legend

**AA** Under Gravel Filter\*\*

**BB** Painted Mural Enclosure  
(above tank - with door for  
tank access)

**CC** 1" Eggcrate Cap

\*\*Under Gravel Filter for Reference Only.  
Refer to LSS Drawings for Details

## 1.4 Ohio Invasive Species



Jan. 2015 - Invasive species exhibit, no fish added yet.





May 2015 - Invasive species exhibit, after fish added.



May 2015 - Invasive species exhibit, after fish added.





May 2015 - Invasive species exhibit, topside view.



May 2015 - Invasive species exhibit, workspace view.



## **Invasive species are like living pollution**

An invasive species is a plant or animal that is not native to its ecosystem and whose presence can cause economic, human health or environmental problems.

**Ohio Invaders**

*This exhibit supported by the Ohio Division of Wildlife, Wildlife Diversity Fund and USFWS Great Lakes Restoration Initiative, Aquatic Invasive Species*



**Grass carp**



**Goldfish**



**Round Goby**

May 2015 - Invasive species exhibit, graphics copy.

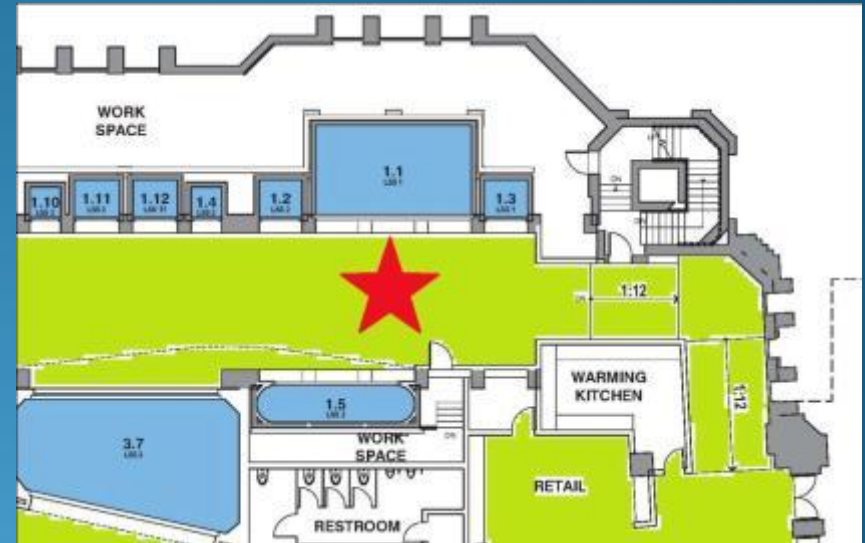


Exhibit name: **Lake Erie Islands**

Exhibit number: 1.1

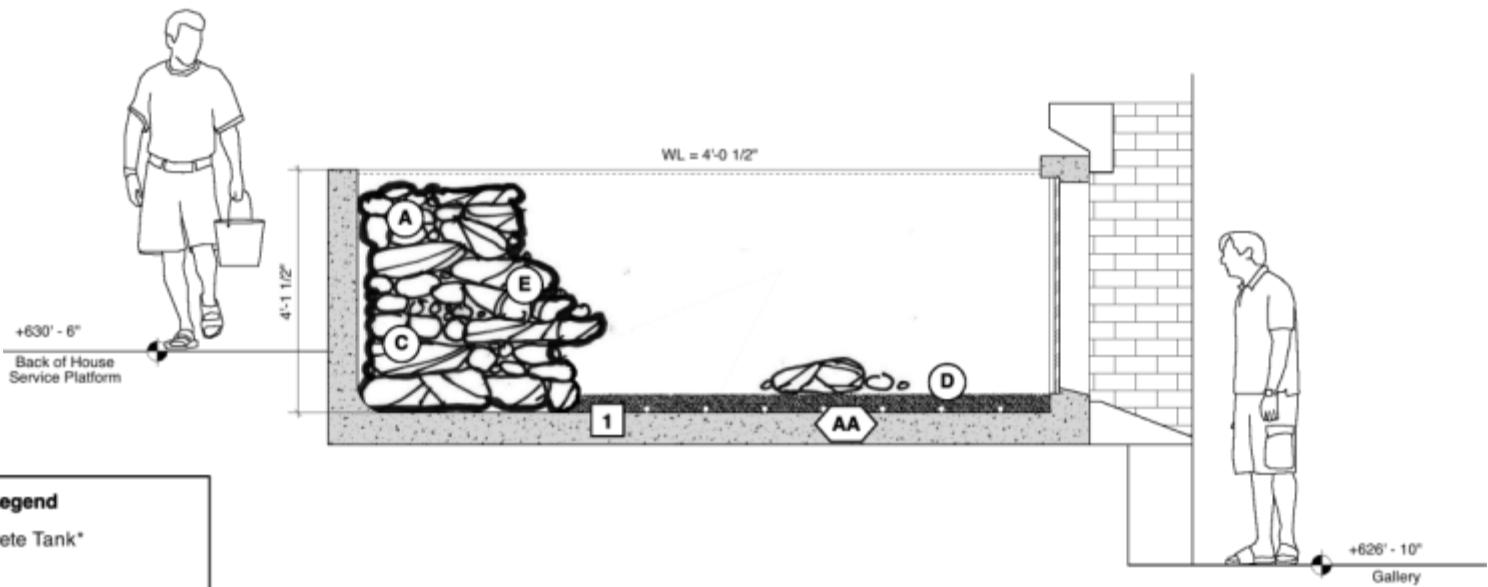
Water type: Temperate freshwater

Tank volume: 7243 gallons



Description: This 20 foot long tank will exhibit Lake Erie fishes, primarily those with a conservation concern – Lake sturgeon and possibly ciscoes. We would also display walleye in this exhibit.

Stories: Responsible fishing, Microcystis algae, Big Bruisers, unique habitat in our backyard



### Tank Legend

- 1 Existing Concrete Tank\*
- 2 Tank Window\*

\*Tank and Tank Window Shown for Reference Only.  
Refer to Architectural and Structural drawings for details.

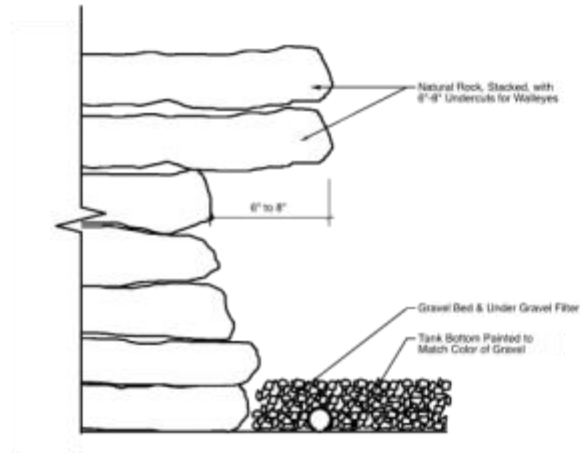
### Habitat Feature Legend

- (A) Natural Boulders of Various Sizes
- (B) Undercuts Created by Natural Boulders (for Walleyes)
- (C) Fallen Tree Trunks and Branches
- (D) Gravel Bed  
(Tank Bottom Painted to Match Gravel Color)

### Special Feature Legend

- (AA) Under Gravel Filter\*\*
- (BB) Skimmer

\*\*Under Gravel Filter for Reference Only.  
Refer to LSS Drawings for Details



## 1.1 Lake Erie Islands



## Construction of the new Aquarium:



July 2014: Lake Erie Islands exhibit being test-filled for the first time after the rockwork was placed.



Dec. 2014 - Some of the 75 fish we acquired from a fish farm in Missouri being quarantined in the Lake Erie Islands exhibit



Exhibit name: **Ohio stream**

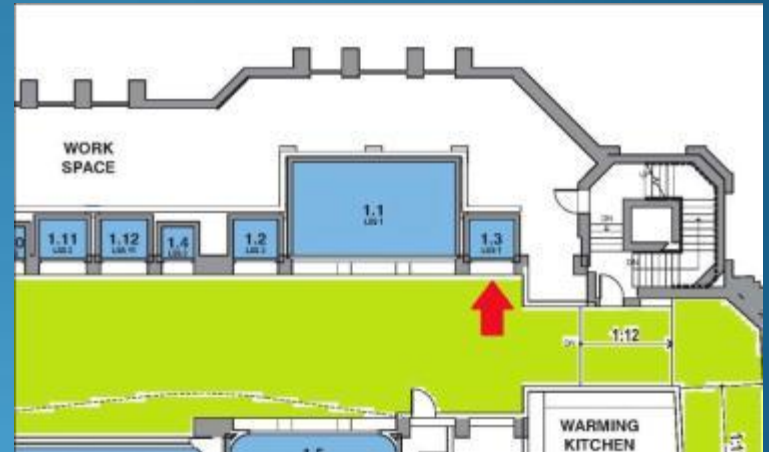
Exhibit number: 1.3

Water type: Temperate freshwater

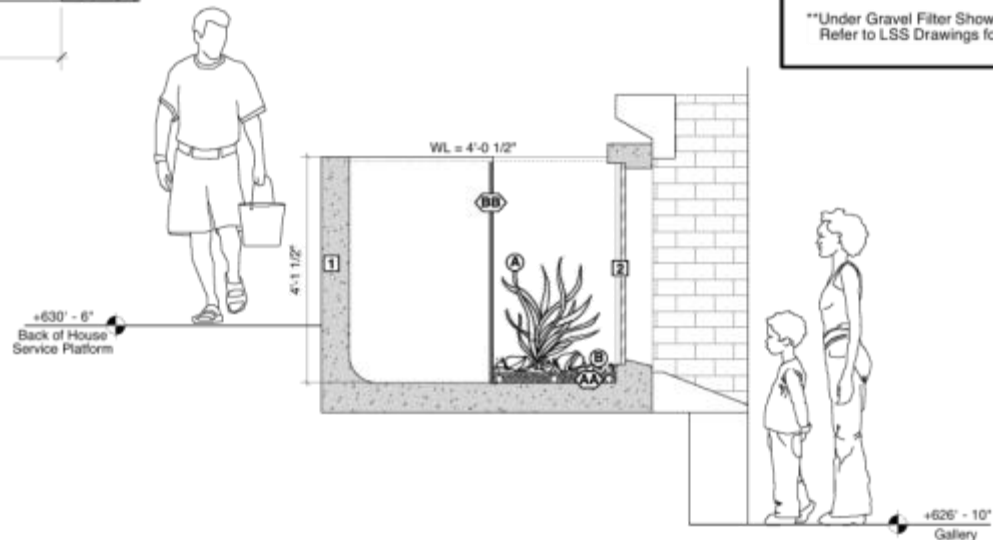
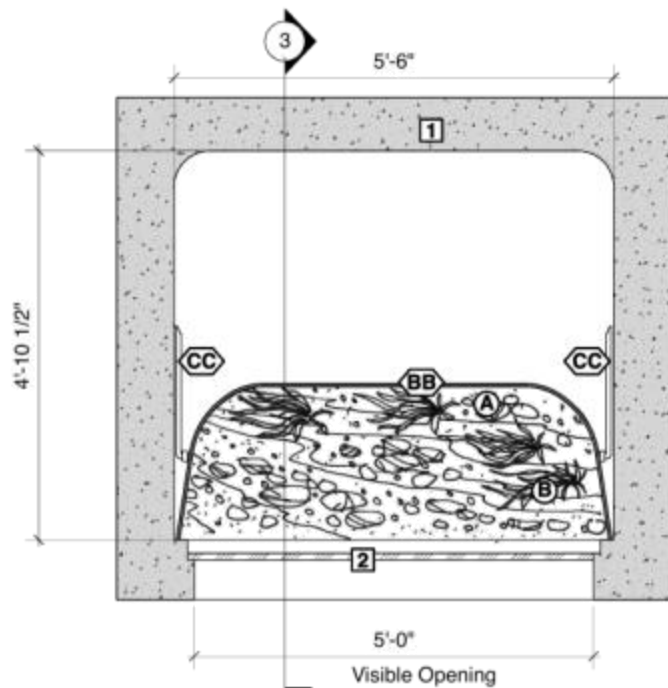
Tank volume: 801 gallons

Description: This 4 foot long tank exhibits local Ohio stream species; darters, small minnows, aquatic plants.

Stories: Freshwater mussels, siltation, how fish react to water currents.







### Tank Legend

- 1** Existing Concrete Tank\*
- 2** Tank Window\*

\*Tank and Tank Window Shown for Reference Only.  
Refer to Architectural and Structural Drawings for Details.

### Habitat Feature Legend

- A** Artificial Plants
- B** Gravel Bottom

### Special Features Legend

- AA** Under Gravel Filter\*\*
- BB** Curved FRP Insert
- CC** Water Jets  
(to demonstrate rheotaxis)

\*\*Under Gravel Filter Shown for Reference Only.  
Refer to LSS Drawings for Details

## 1.3 Ohio Stream



Layout for Native Exhibits: L to R; Invasive Species, Lake Erie Islands, and Ohio Stream.



## Off Site Holding Facility at the Toledo Zoo's Storage Warehouse:



The facility was built as a room inside our long-term storage warehouse. It holds about 500 fish plus over 1000 invertebrates

## Demolition of the interior of the old Aquarium:



**Side 2: Looking through scaffolding into the basement**



## Mid May 2013: Construction of the new Aquarium:



Side walls for Pacific Reef Exhibit support structure being formed

## Construction of the new Aquarium:



July 2014: pumps installed in what was a water reservoir in the old Aquarium.





Bonnethead shark



Spotted Eagle Ray



Bar jacks

Jan. 2015 – Shipment Arrived from Dynasty Marine



Tink the sea turtle





Many new animals  
are now on exhibit



The End