

**TOWN OF PLYMOUTH CAPITAL IMPROVEMENT PLAN REQUEST
FY26 FALL TOWN MEETING**

Department: Energy and Environment	Priority #:	5
Project Title and Description: Great Herring Pond Water Quality Project	Total Project Cost:	\$61,655

Department/Division Head: David Gould/Michael Cahill

Check if project is: New ☒ Resubmitted ☐ **Cost estimate was developed:** Internally ☐ Externally ☒

For project re-submittals, list prior year(s):

List any funding sources and amounts already granted:

N/A. Application pending with Massachusetts Coastal Zone Management in the amount of \$50,655 with \$11,000 in town match to the state funding for a total project cost of \$61,655.

Basis of Estimated Costs (attach additional information if available)			If project has impact on 5 Year Plan and future operating budgets, insert estimated amounts.		
Capital:	Cost	Comments	Fiscal Year:	Capital	Operations & Maintenance
<i>Planning and Design</i>			FY27		
<i>Labor and Materials</i>	50,655	State grant request	FY28		
<i>Administration</i>			FY29		
<i>Land Acquisition</i>			FY30		
<i>Equipment</i>			FY31		
<i>Other</i>					
<i>Contingency</i>					
Total Capital	\$11,000	Match to State Grant			

Project Justification and Objective:

The project aims to reduce stormwater impacts to Great Herring Pond to improve water quality.

For Capital Project Requests:

Will this project be phased over more than one fiscal year? If yes, enter it on the 5 Year Plan Yes ☐ No ☒
Can this project be phased over more than one fiscal year? Yes ☐ No ☒

For Capital Equipment Requests:

☒ Check if equipment requested is replacement and enter the year, make & model, VIN and present condition of existing equipment

What is the expected lifespan of this new/replacement equipment: _____

Attach backup information, estimates, or justification to support this request.



Town of Plymouth
Department of Energy & Environment
26 Court Street, Plymouth, MA 02360



MEMO

To: Derek Brindisi, Town Manager
Lynne Barrett, Finance Director

From: Sarah McCormack, Natural Resources and Sustainability Specialist, Department of Energy and Environment

Re: Capital Request – Great Herring Pond Water Quality Improvement Project – Innovative Stormwater Filtration Pilot

Date: July 29, 2025

Great Herring Pond (GHP) is impaired by nutrient pollution, organic matter accumulation, and episodic blooms of cyanobacteria. These impairments can be exacerbated by untreated stormwater discharges, which can deliver high loads of organic debris, nutrients, and emerging contaminants (PFAs) into the pond. The excess organic input contributes to eutrophication, promoting harmful algal blooms (HABs) that threaten critical diadromous fish habitat, recreational use, and public health. Despite prior watershed planning efforts, there remains a gap in cost-effective, scalable infrastructure to mitigate these nonpoint source inputs. This pilot project proposes deployment of modular, full-capture filtration systems at key catch basins to address the root causes of cyanobacterial proliferation and broader pollutant loading, directly advancing recommendations from the GHP Management Plan and diagnostic assessment.

Within this project, Plymouth will partner with Kai Pono Solutions, a clean tech startup out of San Diego, CA, to pilot an innovative stormwater filtration device. This pilot aims to remove $\geq 50\%$ of phosphorous, $\geq 80\%$ of total suspended solids (TSS) and $\geq 20\%$ of nitrogen consistently over the course of a year. DEE staff will collaborate with TMDL Solutions and the Coastal Systems Program at the School of Marine Science and Technology at the University of Massachusetts – Dartmouth to conduct baseline and post-installation monitoring. Through this robust monitoring program, the Town and Kai Pono staff will be able to quantify the efficacy of the device and evaluate installation at other high-priority Plymouth catch basins.

The Town applied for \$61,655 in funding through the Coastal Zone Management (CZM) Coastal Habitat and Water Quality Grant Program. If awarded, the Town will be reimbursed \$50,655 through this grant. We are respectfully requesting the use of \$11,000 (18% of project cost) from the Environmental Affairs Revolving Fund for match funding.



KAI PONO

Saving our waterways one storm drain at
a time





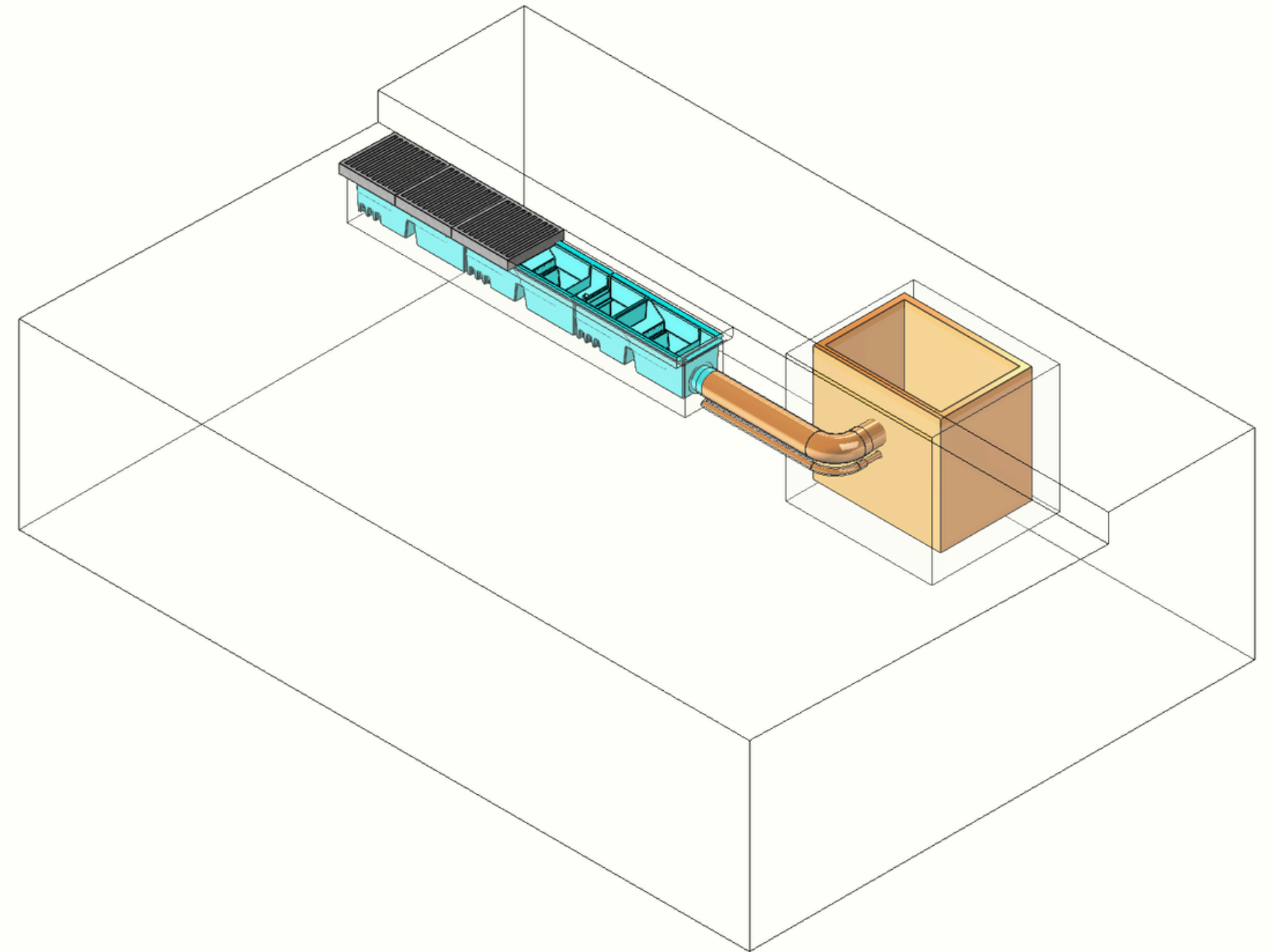
STORMWATER FILTRATION DEVICE

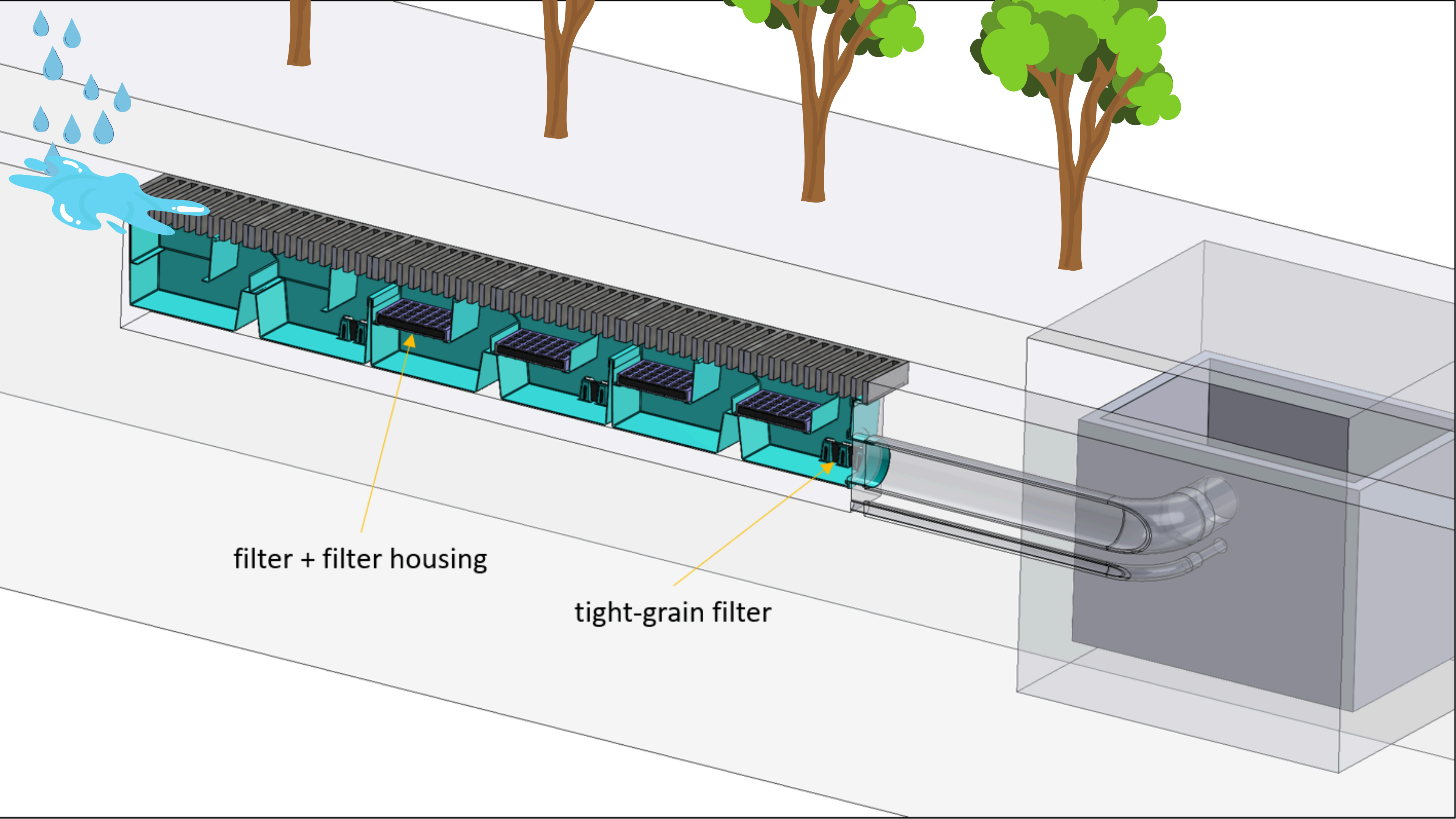
STORMWATER FILTRATION DEVICE

- Low footprint, flood proof, gravity fed and custom to site specific contaminants.
- Fits directly in the curb and gutter line at the street level
- Filters water in a patent pending sequence before reaching the nearest storm drain inlet
- Does not require a power source

ADAPTABLE

- Perfect solution for new or existing construction.
- Can be implemented at the infrastructure phase and left in place during all phases of construction.
- Permanent solution when install is completed.
- Never blocks the existing storm drain and a car can be parked over the entire system.





filter + filter housing

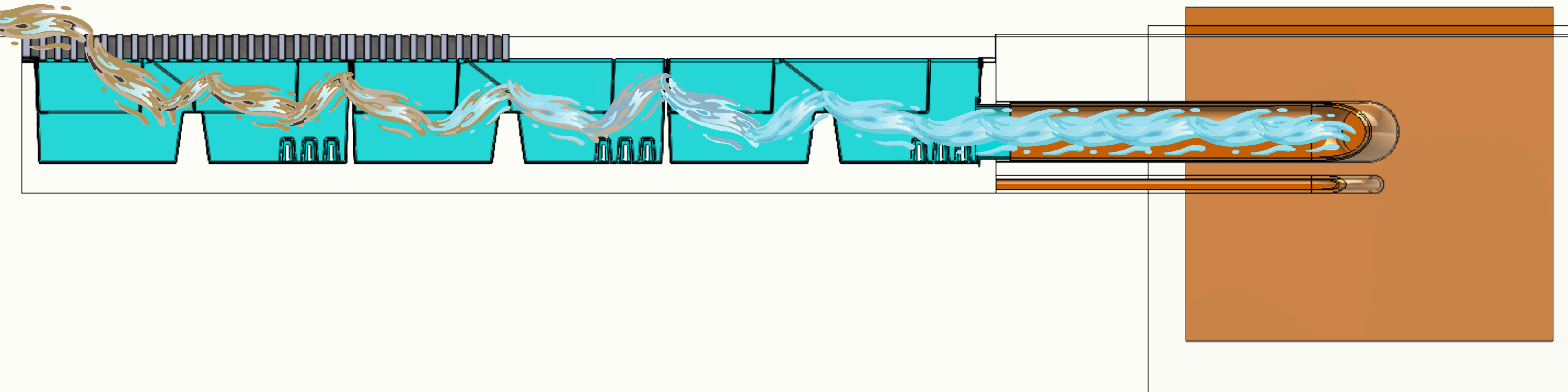
tight-grain filter

SMALL SPATIAL FOOTPRINT

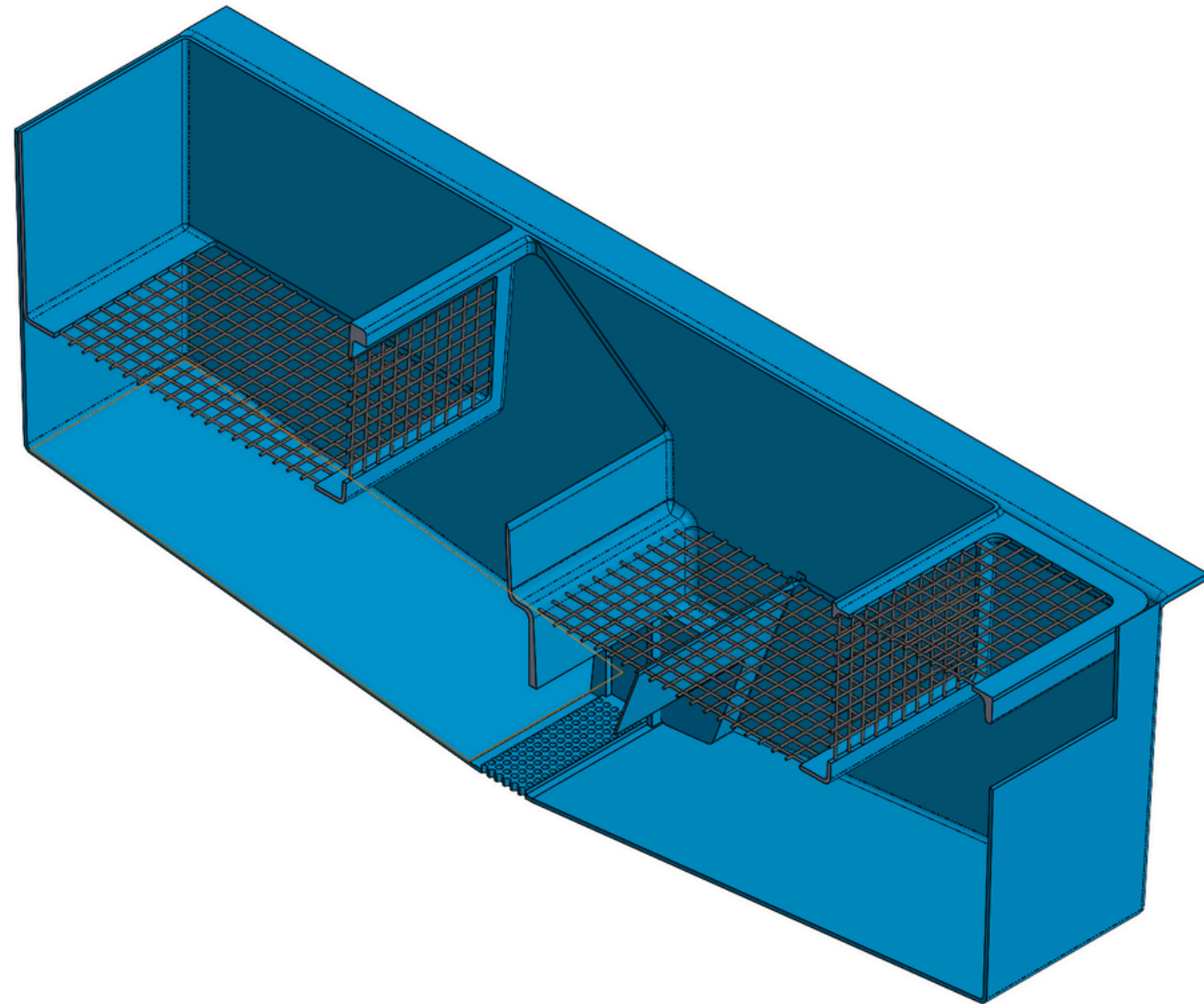


Requires 1.1 cubic yards of excavation
18" from finished grade to excavation subgrade

ASSISTED FLOW



THE LEGO OF STORMWATER FILTRATION



✓ 80% LOWER RETROFIT COSTS

Our shallow, low-impact design saves cities and contractors \$80,000 per project compared to deep excavation alternatives.

✓ FASTER INSTALLATION, FASTER REVENUE

1-day installation vs. competitors' 1-week+ processes, reducing labor costs.

✓ REGULATORY COMPLIANCE WITHOUT THE HASSLE

Meets all stormwater compliance requirements, including the California State Waterboard Trash Provisions.

✓ SEAMLESS INTEGRATION

Works with existing filtration systems, reducing additional infrastructure costs.

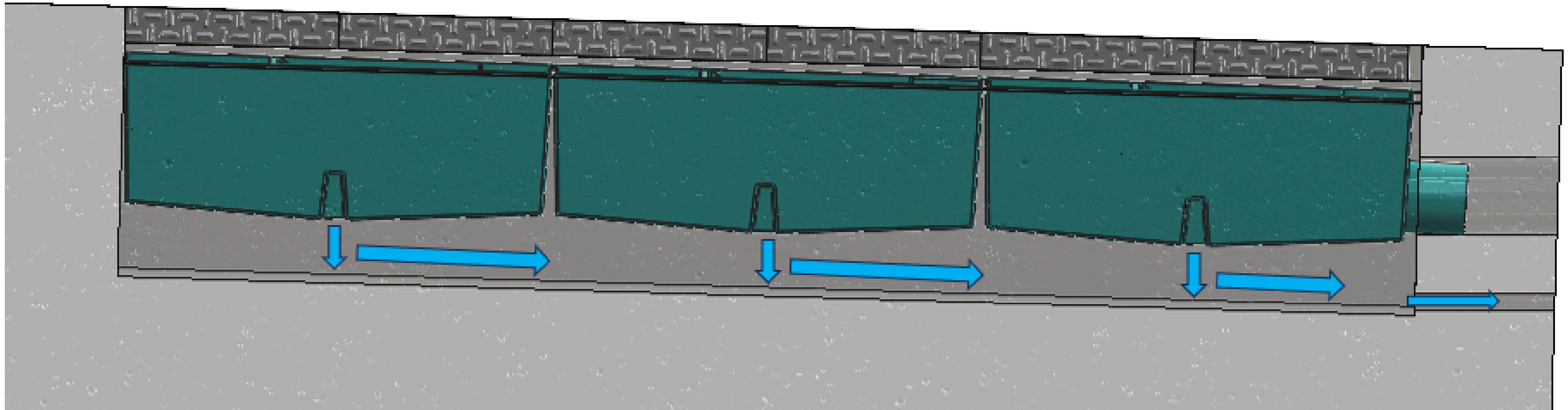
✓ FLOOD PROOF DESIGN

Unlike competitors, our system maintains efficient water flow under all conditions, preventing citywide flooding risks. Equipped with overflow capabilities, it ensures uninterrupted performance even in extreme weather.

✓ MODULAR & SCALABLE

Our system's plug-and-play modular design gives engineers total flexibility to scale pre-treatment coverage as needed. Whether it's a tight retrofit or a large-scale installation, our units snap together seamlessly to fit where competitors can't.

TIGHT GRAIN FILTER



FLOW RATE CAPACITY

1% GRADE

.35cfs

9% GRADE

.35cfs

19% GRADE

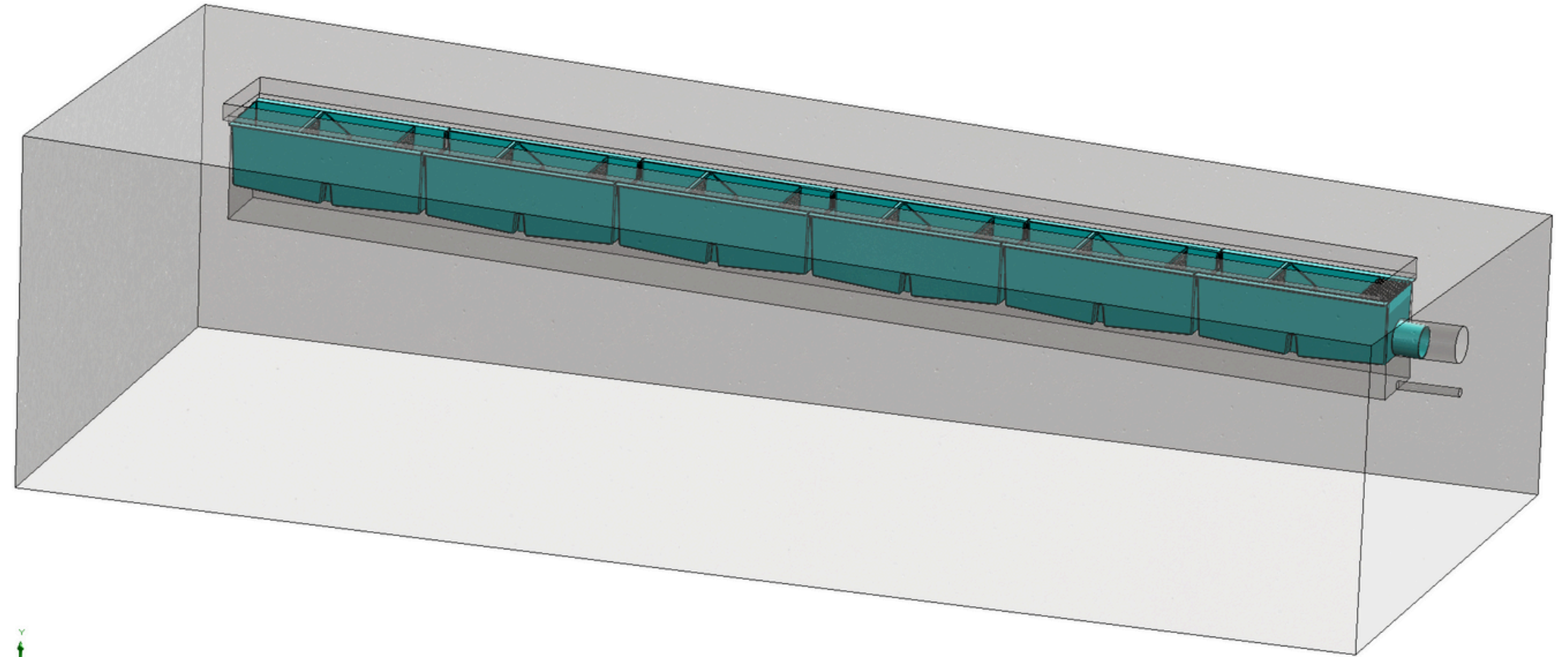
.35cfs

CONFIGURATIONS

CUSTOM

Puzzle Piece Basins

Site Specific Contaminant Filters



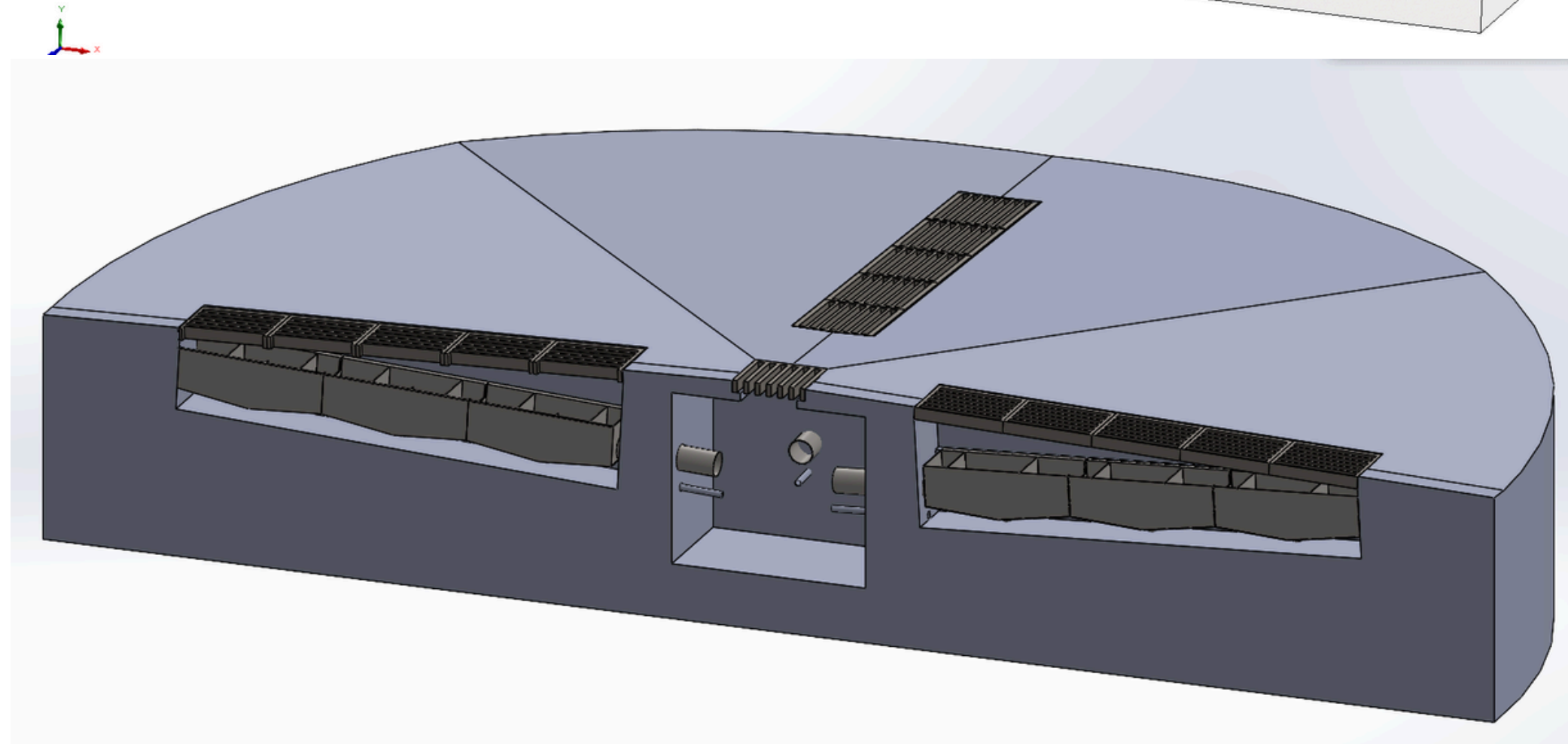
ADAPTABLE

Multiple Applications

New or Existing Infrastructure

Compatible with any flow of water

Gravity Fed





THE DETAILS



Pilot: Makena, Maui



1.1 cubic yards of excavation



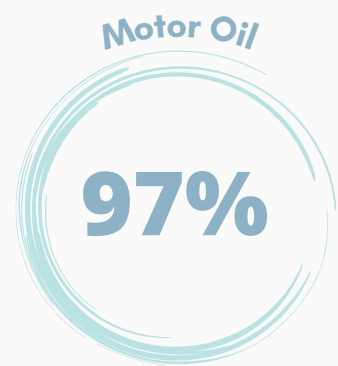
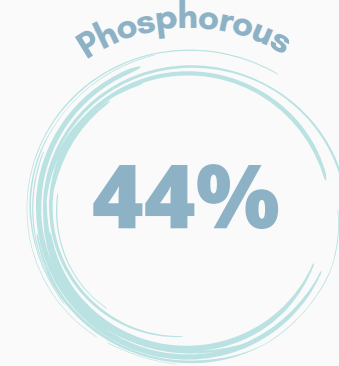
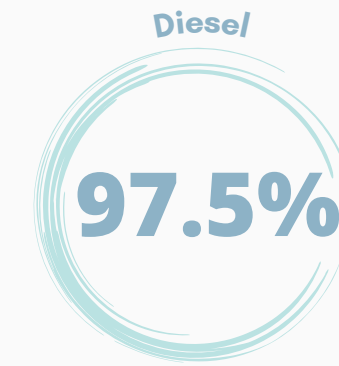
Flow rates > .35 cfs



1 person x 1 day x 1 install



Liquid Mold Injected with pDCPD
(Osborne Industries)



California State Waterboard
Trash Capture Certified

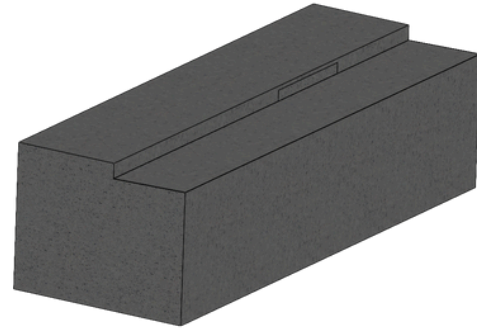


Mosquito Vector Association
Control Certified



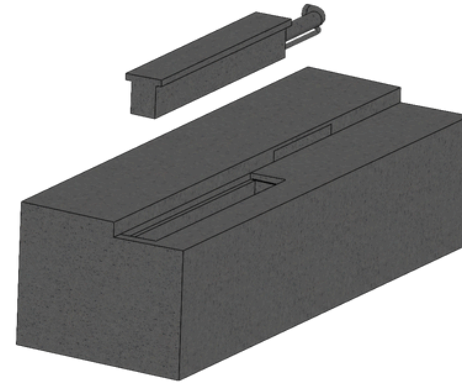
INSTALLATION

1



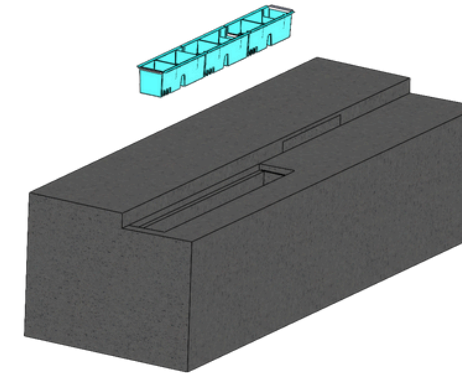
Start with existing curb and gutter

2



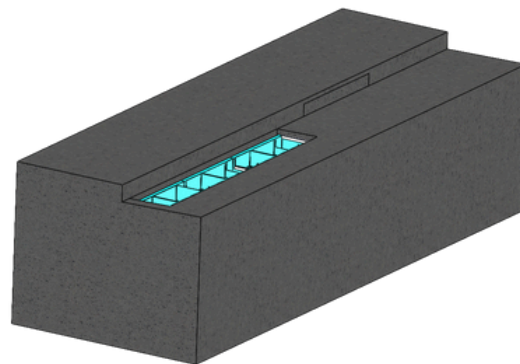
Remove 9 feet of curb and gutter material

3



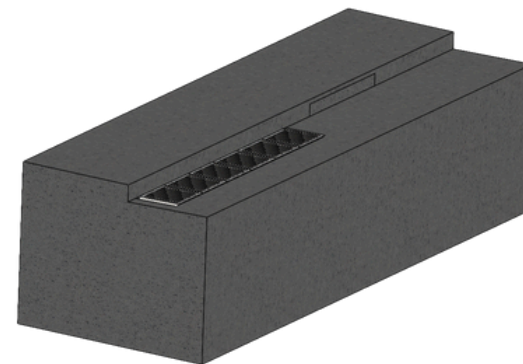
Drop in Kai Pono System

4



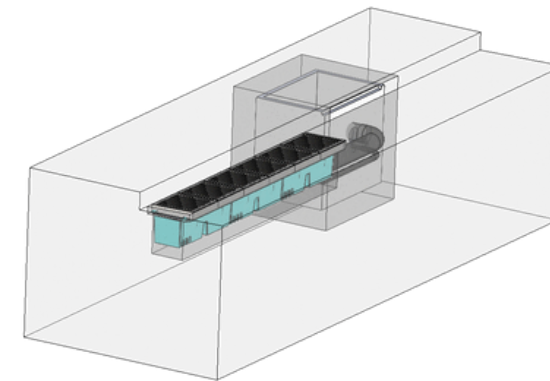
Pour back concrete

5



Place in grates

6



Assembled System

REQUIRES ABSOLUTELY NO SMALL PARTS OR SCREWS.
HARDWARE IS LIMITED FOR SIMPLE INSTALLATION

MAINTENANCE

**Basin 3:
access for visual
inspection and
treatment**

**Basin 2:
access for visual
inspection and
treatment**

**Basin 1:
access for visual
inspection and
treatment**



**Basin 3:
access for visual inspection
and treatment once horizontal
mesh is removed***

COMPETITIVE ADVANTAGES

TRASH & SEDIMENT PRE TREATMENT

Many devices are just trash, or just pre treatment. Our device happens to cover both, which sets us apart and categorizes us as a 2 in 1 device. Helping meet regulation on both ends.

MID IMPACT

We take a Mid Impact approach, we have high filtration rates similar to the “high impact” devices, and low costs and spatial footprints similar to the “low impact” devices.


FLOW ASSISTANCE

Many consumers are worried about flooding and clogging. This is a common question and we fully combat it since our device ASSISTS with flooding and monitors flows through IOT.

MAHALO!


KAI PONO

(kye-poh-noh)
righteous ocean

 @kaiponosolutions

 kaiponosolutions.com

 navy@kaiponosolutions.com

 808-896-9392





Centerville, MA 02632
Tel: 508-737-5991

Scope of Work

Technical Support of the Town of Plymouth Stormwater Technology Assessment

June 5, 2025

Overview

The Town of Plymouth is planning to evaluate a stormwater treatment technology and has asked TMDL Solutions to assist with the assessment. The technology will be installed at the stormwater outlet at the end of Eagle Hill Drive. Stormwater at this outlet was previously measured in 2015, as part of the Great Herring Pond/Little Herring Pond Management Plan¹, and in 2019 to assess the impact of changes in the road.² The Town has requested baseline and post-installation monitoring. TMDL Solutions staff will complete the monitoring and review monitoring results in a summary technical memorandum in the following tasks:

Task 1: Baseline/Pre-Installation and Post-Installation Stormwater Monitoring

TMDL Solutions staff will collect stormwater runoff flow measurements and samples from the outfall pipe at the end of Eagle Hill Drive during three storms prior to the installation of the treatment technology and during three storms after the installation of the treatment technology. Runoff samples will be collected using standard techniques, including “first flush” samples and samples during the course of the storm (3-5 samples/measurements per storm). Runoff samples, including sufficient QA samples, will be assayed at the Coastal Systems Program at the School of Marine Science and Technology (CSP/SMASST), University of Massachusetts Dartmouth for a variety of constituents, including, at a minimum: total phosphorus, ortho-phosphorus, total nitrogen, and total suspended solids (TSS).

TASK 1 Cost: \$8,700

Task 2: Reporting

TMDL Solutions staff will prepare a brief Technical Memorandum summarizing the monitoring results. A draft Technical Memorandum will be submitted to Town staff by April 2026. A Final Technical Memorandum will be submitted two weeks after receipt of comments on the draft Technical Memorandum. No presentation is included.

TASK 2 Cost: \$2,700

TOTAL PROJECT COST (Tasks 1-2): \$11,400

¹ Eichner, E., B. Howes, and D. Schlezinger. 2022. Great Herring and Little Herring Ponds Management Plan and Diagnostic Assessment. Town of Plymouth, Massachusetts. TMDL Solutions LLC and Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. Centerville, MA and New Bedford, MA. 136 pp.

² TMDL Solutions Technical Memorandum. February 4, 2020. Eagle Hill 2019 Stormwater Monitoring Results. From: E. Eichner. To: K. Tower, Town of Plymouth. 9 pp.

FY26 Coastal Habitat and Water Quality Grants Scope/Budget Template
Town of Plymouth - Great Herring Pond Water Quality Improvement Project

Directions: Please complete this table with your projects scope of work and budget as part of your Coastal Habitat and Water Quality Grants application. Use this as a template to fill in as much information as possible about your projects proposed tasks, timeline, deliverables, and budget by task. If you are applying for a two year project timeline, please separate your proposed tasks by fiscal year. You can add any additional information such as hourly rate, salary, estimate of probable costs, and/or direct costs in a new tab within this document or upload them in the Grant Management System online portal.

Project Tasks	Task Description	Deliverables	Deliverable Due Date	Total Grant	Total Match	Total Task
Task 1: Kai Pono System Package						
Sub-task 1.1 - Makena filtration basin	Procurement of Makena filtration basin	Supply eight Makena reflow basins for two	Dec-25	\$ -	\$ 8,000.00	\$ 8,000.00
Sub-task 1.2 - Matala Filter Matting	Procurement of Matala Filter Matting	Deliver sixteen matala mat filters to enhance	Dec-25	\$ -	\$ 480.00	\$ 480.00
Sub-task 1.3 - SmartSponge Filters	Procurement of SmartSponge Filters	Provide sixteen SmartSponge hydrocarbon	Dec-25	\$ -	\$ 520.00	\$ 520.00
Total Task 1 Cost				\$ -	\$ 9,000.00	\$ 9,000.00
Task 2: Field Installation						
Sub-task 2.1 - Mobilization & Compliance	SWPPP plan approved; traffic control in place; site mobilized/demobilized	Project installation	Jan-26		\$ 2,000.00	\$ 2,000.00
Sub-task 2.2 - Earthwork & Disposal	Excavation to design depth; concrete & soil hauled off with dump tickets	Project installation	Jan-26	\$ 1,500.00	\$ -	\$ 1,500.00
Sub-task 2.3 - Materials	Concrete placed & cured; frames, grates, mats, pipes, fittings installed	Project installation	Jan-26	\$ 6,700.00	\$ -	\$ 6,700.00
Sub-task 2.4 - Equipment Costs	Trucks, excavator, compressor, saws, small tools on-site with daily logs	Project installation	Jan-26	\$ 6,400.00	\$ -	\$ 6,400.00
Sub-task 2.5 - Labor	Crew completes demo, form, pour/finish, cleanup on schedule	Project installation	Jan-26	\$ 11,700.00	\$ -	\$ 11,700.00
Sub-task 2.6 - 10% Contingency	Budget reserve for unforeseen conditions	Project installation	Jan-26	\$ 2,830.00	\$ -	\$ 2,830.00
Total Task 2 Cost				\$ 29,130.00	\$ 2,000.00	\$ 31,130.00
Task 3: Outreach, Engagement & Close-Out Roadmap						
Sub-task 3.1 - Engagement Plan	Support Town of Plymouth in developing an outreach & engagement	Outreach & engagement roadmap—	May-26	\$ 2,025.00	\$ -	\$ 2,025.00
Sub-task 3.2 - Community Meetings	Provide technical support for Town-related off and on-site meetings (traffic control, street	Community meeting support	May-26	\$ 900.00	\$ -	\$ 900.00
Sub-task 3.3 - Event Materials	Obtain all permits for 2024/2025 beach, hydrocarbon, and surveys to support Town	Event materials	May-26	\$ 1,800.00	\$ -	\$ 1,800.00
Sub-task 3.4 - Consultation	One-on-one consultation and coordination to resolve technical issues and keep the	Consultation services	May-26	\$ 900.00	\$ -	\$ 900.00
Sub-task 3.5 - Close-Out Report	Prepare a comprehensive close-out report summarizing engagement activities; record	Comprehensive close-out report	May-26	\$ 4,500.00	\$ -	\$ 4,500.00
Total Task 3 Cost				\$ 10,125.00	\$ -	\$ 10,125.00
Task 4: Stormwater Monitoring						
Sub-task 4.1 - Data Collection	Stormwater runoff flow measurements and samples from the ocean pipe at the end of	Water quality data	Mar-26	\$ 8,700.00	\$ -	\$ 8,700.00
Sub-task 4.2 - Reporting	Prepare a technical report summarizing the monitoring results	Technical Report	Apr-26	\$ 2,700.00	\$ -	\$ 2,700.00
Total Task 4 Cost				\$ 11,400.00	\$ -	\$ 11,400.00
END OF FY26 (JUNE 30, 2026) TOTAL				\$ 50,655.00	\$ 11,000.00	\$ 61,655.00
TOTAL PROJECT COSTS				\$ 50,655.00	\$ 11,000.00	\$ 61,655.00