

Materials List for:

A Flow-through Exposure System for Evaluating Suspended Sediments Effects on Aquatic Life

Burton C. Suedel¹, Justin L. Wilkens¹

¹Environmental Laboratory, Engineer Research and Development Center, U.S. Army Corps of Engineers

Correspondence to: Burton C. Suedel at burton.suedel@usace.army.mil

URL: <https://www.jove.com/video/54937>

DOI: [doi:10.3791/54937](https://doi.org/10.3791/54937)

Materials

| Name | Company | Catalog Number | Comments |
|--|--|-----------------|--|
| Parts List for One FLEES Module, Water Bath, and Aquarium | | | |
| post, wood - used to build module (cut to 78 in) | Local vendor | N/A | Quantity: 4 Size: 4 in x 4 in x 8 ft |
| plywood, marine grade - fastened to wooden posts about 18 in off ground - for holding water bath (60 in x 42 in) | Local vendor | N/A | Quantity: 1 Size: 3/4 in x 4 ft x 8 ft |
| plywood - fastened on top of wooden posts - for holding pipes, solenoids and electrical (60 in x 42 in) | Local vendor | N/A | Quantity: 1 Size: 1/4 in x 4 ft x 8 ft |
| stud, wood - used to brace plywood and wooden posts (cut to fit) | Local vendor | N/A | Quantity: 4 Size: 2 in x 4 in x 96 in |
| tank, fiberglass - water bath with two drains: 1) to supply chiller; and 2) to drain water | Hydro Composites, LLC, Stockdale, TX, USA | FBT-226 | Quantity: 1 Size: 150-gal |
| chiller, water with self contained pump - for water bath; chiller sits under module | Remcor Products Co., Glendale Heights, IL, USA | CFF-500 | Quantity: 1 Size: 1/2 hp |
| tank, domed bottom - FLEES aquaria - sit inside water bath | United States Plastic Corp, Lima, OH, USA | 5197 | Quantity: 5 Size: 19 L |
| tank, stand - acrylic stand, 12 in x 12 in x 6 in - to hold aquaria | custom built by ERDC shops | N/A | Quantity: 5 Size: custom |
| pump, magnetic drive - to suspend sediment in each aquarium | March Manufacturing Inc., Glenview, IL, USA | MDX-3-1/2 115 v | Quantity: 5 Size: 28 liter per min |
| light, LED - installed over water bath | C2 Development, Inc., Ames, IA, USA | Hydra 26 | Quantity: 2 Size: based on area to light |
| pipe, PVC schedule 40 - installed in drain of water bath to control water level | Local vendor | N/A | Quantity: - Size: 1 in |
| fittings, bulkhead - for aquaria/ water bath connections to pumps, drains, water and slurry lines | Lifeguard Aquatics, Cerritos, CA, USA | R270900 | Quantity: 30 Size: 1/2 in FPT x FPT |
| fittings, quick-disconnect, male pipe threaded inserts - insert in tank bulkhead | Cole-Parmer, Vernon Hills, IL, USA | EW-31303-36 | Quantity: 10 Size: 1/2 in MPT |
| fittings, quick-disconnect, valved hose barbs - connection between aquarium and insert in tank bulkhead | Cole-Parmer, Vernon Hills, IL, USA | EW-31303-11 | Quantity: 10 Size: 1/2 in |
| fittings, black HDPE threaded elbow - for aquaria vinyl tube | United States Plastic Corp, Lima, OH, USA | 62043 | Quantity: 20 Size: 1/2 NPT x 1/2 in Hose ID |

| | | | |
|--|---|-------|--|
| connections to slurry/water line and pump | | | |
| fittings, black HDPE threaded adapter - for connections between pump and tank bulkhead | United States Plastic Corp, Lima, OH, USA | 62017 | Quantity: 10 Size: 1/2 NPT x 1/2 in Hose ID |
| tube, vinyl - connect slurry/water line to aquaria and to connect pumps to aquaria | Local vendor | N/A | Quantity: 25 ft Size: 1/2 in ID |
| tube, vinyl - connect to aquaria drains inserts and water bath drain | Local vendor | N/A | Quantity: 25 ft Size: 5/8 in ID |
| clamp, hose, stainless steel - to clamp vinyl tube to hose barbs | Local vendor | N/A | Quantity: 40 Size: #8 |

Parts List for Slurry System

| | | | |
|---|--|-----------------------|---|
| chiller, water with self contained pump - sits off to side of slurry tank | Remcor Products Co., Glendale Heights, IL, USA | CFF-500 | Quantity: 1 Size: 1/2 hp |
| 125 gallon open top cone bottom tank w/Stand - 42 in x 35 in - contains the water and sediment to make slurry | United States Plastic Corp, Lima, OH, USA | 8586 | Quantity: 1 Size: 125 gal |
| Cover for 125 gallon tank | United States Plastic Corp, Lima, OH, USA | 8935 | Quantity: 1 Size: 42 in x 35 in |
| valve, PVC - connect tank drain to pump - isolate for maintenance | local plumbing vendor | N/A | Quantity: 2 Size: 1-1/2 in |
| pump, double diaphragm mounted on stand - used to recirculate slurry | Wilden-pumps.co.uk & Air Pumping Ltd., Essex, UK | P2/PPPP/WF/WF/PTV/400 | Quantity: 1 contact distributor |
| sensor, optical backscatter - measure NTU in slurry tank | Campbell Scientific, Logan, UT, USA | OBS-3+ | Quantity: 1 Size: 0-1,000 NTU |
| pipe, PVC Schedule 40 - to recirculate slurry | local plumbing vendor | N/A | Quantity: 20 ft Size: 1 in |
| pipe, flexible PVC - fitted with union and used to connect to next module | local plumbing vendor | N/A | Quantity: 10 ft Size: 1 in |
| union, PVC Schedle 80 Socket - connect slurry line with next module | local plumbing vendor | N/A | Quantity: 8 Size: 1/2 in |
| solenoid, plastomatic (normally closed) - introduce slurry | Plast-O-Matic Valves, Inc., Cedar Grove, NJ, USA | EASYMT4V12R24-PV | Quantity: 5 Size: 1/2 in NPT threaded, 24 VAC contact distributor |
| fitting, PVC tee - connect slurry pipe with solenoid | local plumbing vendor | N/A | Quantity: 5 Size: 1 in x 1 in x 1 in slip x slip x FIPT |
| fittings, 1 in PVC ball valve threaded - shut off for slurry delivery to solenoid/water lines | local plumbing vendor | N/A | Quantity: 7 Size: 1/2 in |
| fittings, 1 in PVC union threaded - connect slurry solenoid to shut off valve | local plumbing vendor | N/A | Quantity: 5 Size: 1/2 in |
| tube, vinyl - connection between water solenoid and slurry solenoid | Local vendor | N/A | Quantity: 50 ft Size: 1/4" ID |

Parts List for Water System

| | | | |
|---|--|---------|------------------------------|
| chiller, water with self contained pump - sits off to side of reservoir | Remcor Products Co., Glendale Heights, IL, USA | CFF-500 | Quantity: 1 Size: 1/2 hp |
| 125 gallon open top cone bottom tank w/Stand - 42 in x 35 in - contains the water and sediment to make slurry | United States Plastic Corp, Lima, OH, USA | 8586 | Quantity: 1 Size: 125 gal |

| | | | |
|--|---|-------------------|---|
| Cover for 125 gallon tank | United States Plastic Corp, Lima, OH, USA | 8935 | Quantity: 1 Size: 42 in x 35 in |
| valve, PVC - connect tank drain to water pump | local plumbing vendor | N/A | Quantity: 2 Size: 1 in |
| pump, magnetic drive, in-line use - used to recirculate water to aquaria and chiller | Little Giant, Fort Wayne, IN, USA | 3-MD-SC | Quantity: 1 Size: 1/12 hp |
| solenoid, alco - introduce water | discontinued; ASCO, Florham Park, NJ, USA for similar | N/A | Quantity: 5 Size: 24 v, 1/4 in NIPT |
| fittings, black HDPE reducer connector - connect 1/4 in hose water line from solenoid to 1/2 in hose | local plumbing vendor | N/A | Quantity: 5 Size: 1/2 in hose ID x 1/4 in hose ID |
| fittings, black HDPE tee - connect 1/2 in hose water line and slurry to aquaria | local plumbing vendor | N/A | Quantity: 5 Size: 1/2 in NPT x 1/2 in hose ID x 1/2 in hose ID |
| fittings, street elbow | local plumbing vendor | N/A | Quantity: 5 Size: 1/2 in 90° MIPT x FIPT |
| fittings, PVC threaded pipe nipples - connect union fittings with solenoids and other connections | local plumbing vendor | N/A | Quantity: 12 Size: 1/2 in |
| fittings, union threaded - connect slurry/water lines with next module | local plumbing vendor | N/A | Quantity: 6 Size: 1 in PVC |
| fittings, reducer bushing - connect to reducer tee in water line | local plumbing vendor | N/A | Quantity: 5 Size: 1/2 in male by 1/4 in female FIPT |
| fittings, threaded pipe nipples - connection between bushing and water solenoid | local plumbing vendor | N/A | Quantity: 5 Size: 4 in long x 1/4 in |
| pipe, PVC - make connections between tank, pump and chiller | local plumbing vendor | N/A | Quantity: 5 ft Size: Schedule 40 |
| Parts List for Sensors, Data Acquisition Device, and Computer Software | | | |
| software, LabView | National Instruments, Austin, Texas, USA | LabView 2015 Base | Quantity: 1 Size: N/A |
| SCXI-1001 12-Slot Chassis, U.S. 120 VAC | National Instruments, Austin, Texas, USA | 776571-01 | Quantity: 1 Size: N/A |
| SCXI 1100 - 32-Channel, ±10 V Analog Input Module | National Instruments, Austin, Texas, USA | 776572-00 | Quantity: 1 Size: N/A |
| SCXI 1303 - Terminal block designed for high-accuracy thermocouple measurements | National Instruments, Austin, Texas, USA | 777687-03 | Quantity: 2 Size: N/A |
| SCXI 1102B - 32-Channel Thermocouple/Voltage Input Module | National Instruments, Austin, Texas, USA | 776572-02B | Quantity: 1 Size: N/A |
| SCXI 1161 - General-Purpose Relay Module | National Instruments, Austin, Texas, USA | 776572-61 | Quantity: 6 Size: N/A |
| SCXI 1300 - General-Purpose Voltage Module | National Instruments, Austin, Texas, USA | 777687-00 | Quantity: 1 Size: N/A |
| PCMCIA Card DAQCARD-AI-16E-4 | National Instruments, Austin, Texas, USA | N/A - legacy | Quantity: 1 Size: N/A used cards available online |
| sensor, optical backscatter - measure NTU in each aquarium | Campbell Scientific Inc., Logan, UT, USA | OBS-3+ | Quantity: 5 Size: 0-1,000 NTU |