

Jellyfish[®] Filter

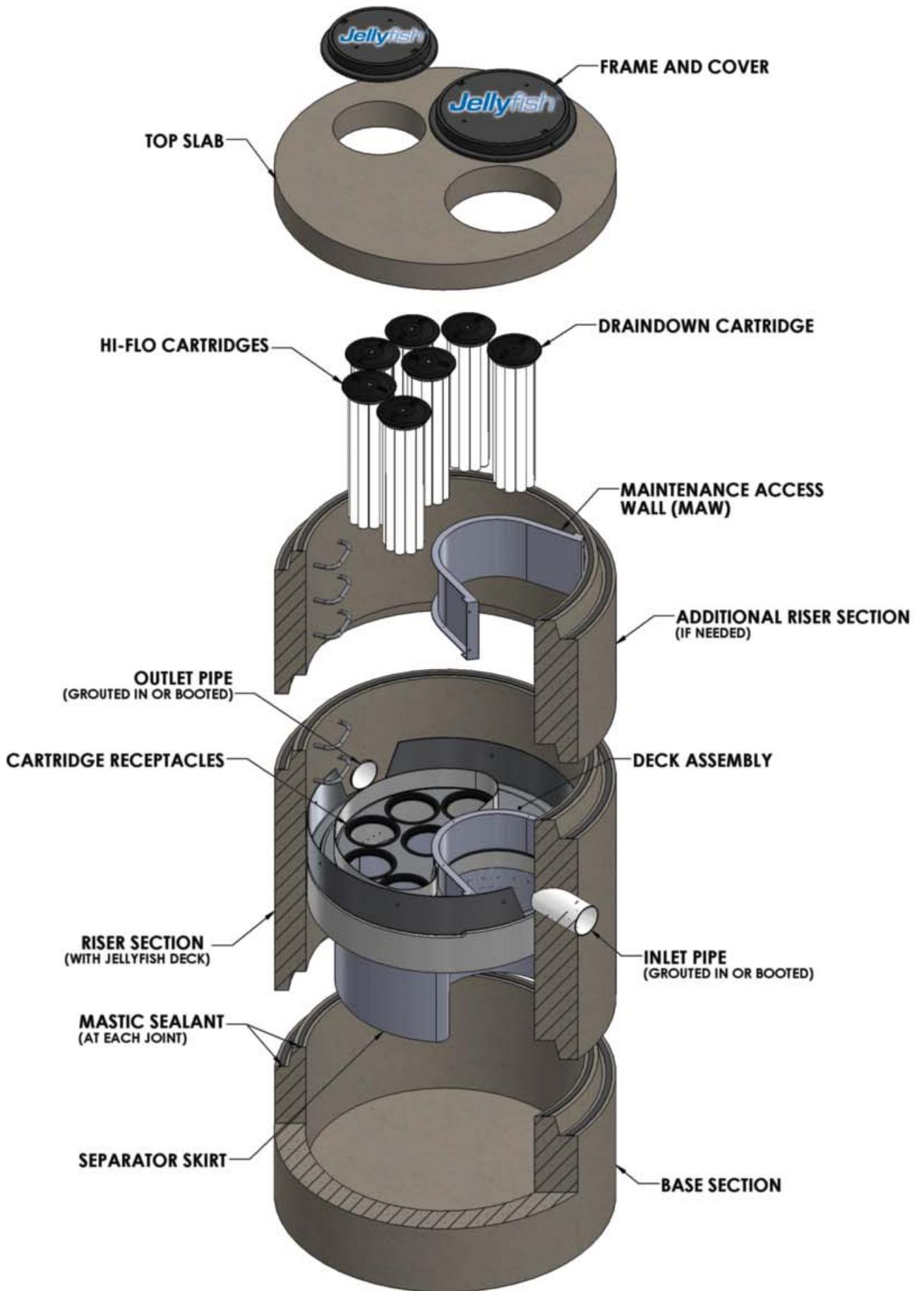
Manhole Installation Guideline



imbrium

Innovative Stormwater Treatment

Jellyfish® Filter



*WARNINGS / CAUTION

1. **FALL PROTECTION** may be required
2. **WATCH YOUR STEP** if standing on the Jellyfish Deck at any time; Great care and safety **must** be taken while walking or maneuvering on the Jellyfish Filter Deck. Attentive care must be taken while standing on the Jellyfish Deck at all times to prevent stepping into or through a cartridge hole or slipping.
3. The Jellyfish Deck can be **SLIPPERY WHEN WET**
4. If the Top Slab, Covers or Hatches have not yet been installed, or are removed for any reason, great care must be taken to **NOT DROP ANYTHING ONTO THE JELLYFISH FILTER DECK**. The Jellyfish Filter Deck and Cartridge Receptacle Rings may be damaged under high impact loads. This type of activity voids all warranties.

Fall Protection!



Watch Your Step!



Slippery When Wet!



No Dropping



Safety Notice*

Jobsite safety is a topic and a practice addressed comprehensively by others. The inclusions here are merely reminders to whole areas of Safety Practice that are the responsibility of the Owner(s), Manager(s) and Contractor(s). OSHA and Canadian OSH, and Federal, State/Provincial, and Local Jurisdiction Safety Standards apply on any given site or project. The knowledge and applicability of those responsibilities is the Contractor's responsibility and outside the scope of Imbrium® Systems.

Confined Space Entry

Secure all equipment and training to meet applicable local and OSHA regulations regarding confined space entry. It is the Contractor's or entry personnel's responsibility to proceed safely at all times.

Personal Safety Equipment

Contractor is responsible to provide and wear appropriate personal protection equipment as needed including, but not limited to safety boots, hard hat, reflective vest, protective eyewear, gloves and fall protection equipment as necessary. Make sure all equipment is **staffed with trained or certified personnel**, and all equipment is checked for proper operation and safety features prior to use.



- Fall protection equipment
- Safety boots
- Gloves
- Hard hat
- Eye protection
- Ear protection
- Ventilation and Respiratory protection
- Maintenance and Protection of Traffic Plan

Unloading and Handling

Any unloading/handling guidance of the Jellyfish® Filter unit and precast sections is beyond the scope of work of Imbrium Systems, but can be obtained from the precast producer. Contact Imbrium Systems to obtain contact information from a precast producer. Handle all Jellyfish Filter components with care. Special lift gear and rigging may be necessary to unload and handle any precast components, which is the responsibility of the site Contractor.

Do not damage the parts in handling or unloading, and if parts are damaged prior to off-loading, please immediately call Imbrium Systems.



The Contractor is responsible for the inspection of all Jellyfish Filter unit components shipped and all components shall be inspected at time of delivery by the site Engineer/Inspector and the Contractor. Any nonconformance to approved drawings or damage to any part of the system shall be documented on the shipping ticket, and Imbrium should be contacted immediately. Damage to the unit during and after unloading shall be corrected at the expense of the Contractor. Any necessary repairs shall be made to the acceptance of the Engineer/Inspector.

Crane Selection

The Contractor is responsible for selecting the appropriate equipment to safely rig, lift, unload and set-in-place the Jellyfish Filter Manhole system, as well as provide a safe environment at the jobsite for the safe offloading and installation/assembly of the structure. Imbrium or the precast producer will provide the Contractor with the maximum lift weight of the heaviest precast component.

Safety considerations of crane size, placement, ground support, stability, distance to excavation, swing and lifting radius, overhead conflicts, permits, or traffic control and other items must be carefully addressed but are outside the responsibility of Imbrium Systems. We encourage the engagement of thoughtful professional, safe planning and procedures at every step.

Excavation Safety

Any site excavation and shoring is beyond the scope of work of Imbrium Systems. This is the responsibility of the Contractor, and all **OSHA, Canadian OSH, Federal, State/Provincial, and Local Jurisdiction Safety Standards** shall apply on all sites.

Jellyfish Filter Manhole System Components List

The Jellyfish Filter Manhole system will arrive on-site with the internal Jellyfish Filter Deck pre-installed, and secured and sealed to a precast riser.

The components per the shop drawings (plans) typically include;

- Manhole Base Slab or Monolithic Section (dimensions per plans)
- Manhole Riser section with Jellyfish Filter Deck, pre-installed (per plans)
- Maintenance Access Wall (MAW) Extension (as needed, per plans)
- Pressure Relief Pipe (PRP) (as needed, per plans)
- Manhole Riser sections (as needed, per plans)
- Manhole Top Slab/Cone (per plans)
- Risers to grade (per plans)
- Rubber connecting boots for inlet/outlet pipes (per plans)
- Frame(s) and Cover(s), or Hatch (per plans)
- ASTM C443 rubber gaskets, or R-4 "O" ring gaskets, or R-3 profile gaskets, or Butyl mastic sealant

Contractor Supplied Material

- All Personal Safety Equipment
- Crane, and Structure Lifting and Rigging Gear for off-loading and setting
- Grout — Non-shrink grout to connect the inlet/outlet pipe
- Grout — Non-shrink grout to fill all entry and exit points and any holes for lift points
- Inlet and Outlet pipe plugs

General

Installing the Jellyfish Filter precast structure is in many ways the same as installing a manhole structure like a precast pump station, and should conform in general to state highway, provincial or local specifications.

Excavation

Excavation, shoring and general site preparation for the installation of the Jellyfish Filter system is the responsibility of the Contractor and should conform to state highway, provincial or local specifications.

- Verify the soil bearing capacity is adequate for the required load.
- Topsoil removed during the excavation should be stockpiled in designated areas and should not be mixed with subsoil or other materials.
- The Jellyfish Filter should not be installed on frozen ground.
- Excavation should extend a minimum of twelve-inches (300mm) from the precast concrete surfaces plus an allowance for shoring and bracing where required.
- If the bottom of the excavation provides an unsuitable foundation additional excavation may be required. In areas with a high water table, continuous dewatering may be required to ensure that the excavation is stable and free of water.

Base Preparation

Base preparation is the responsibility of the Contractor. Compact undisturbed sub-grade materials to 95% of maximum density at +/-2% of optimum moisture content prior to placement of crushed rock. Place granular sub-base and compact to State/Provincial and local standards as per the Engineers requirements to a depth of 12-inches (300mm). Unsuitable material below sub-grade shall be replaced per site engineer's approval.

Level the sub-grade to the proper elevation. Verify the elevation against the Jellyfish precast structure dimensions, the invert elevations, and the site plans. Adjust the base aggregate, if necessary.

Setting the Jellyfish Filter Manhole*

Contractor is responsible to safely rig and unload the Jellyfish Filter structure and associated components.

Note: All Jellyfish Filter elevations are based on the **outlet** pipe invert elevation (assuming the **outlet** pipe is centered in the hole provided). The Jellyfish Filter was designed and fabricated around the **outlet** elevation, unless otherwise stated. Elevations shall be verified by the Contractor using precise survey techniques.

1. Obtain a copy of the final approved shop drawing and site plan to orient and verify all component and their correct placement. Ensure the inlet(s) and outlet are oriented per the plans.

Step 2



Step 3



Step 4



2. Set the base section of the Jellyfish Filter on solid sub-grade.
3. Add watertight seal (either mastic rope or rubber gasket) to each of the precast sections.
4. **Verify the level and elevation** of the base section before adding any additional precast riser sections. Manhole floor shall slope $\frac{1}{4}$ inch (6mm) maximum across the "width" and slope downstream 1-inch (25mm) per 12-foot (3.7m) of "length" ("Length" is defined by a line running from the invert of the outlet through the center of the manhole and "width" is the perpendicular to the "length").

Step 5



Step 7



Step 9



5. Set riser section(s) on the base section. Set the riser section that contains the Jellyfish Filter Deck. **Use caution and care to protect the flexible separator skirt** that will be hanging down from the Deck, as this precast section is placed.
6. **Verify the outlet pipe invert elevation. Note: All Jellyfish Filter elevations are based on the outlet pipe invert elevation (assuming the outlet pipe is centered in the hole provided). The Jellyfish Filter was designed and fabricated around the outlet elevation, unless otherwise stated. Elevations shall be verified by the Contractor using precise survey techniques.**
7. Once the riser section with the Jellyfish Filter Deck has been installed, place the sealant or gasket material and place the next section, checking to be sure any steps present are correctly aligned. If a Maintenance Access Wall (MAW) Extension(s) are required, they should be added at this stage, prior to placing the Top Slab.
8. Set Top Slab. Note the Top Slab's orientation. The manhole access opening **must** be oriented over both the Maintenance Access Wall (MAW) and steps (if provided) according to the approved shop drawing. Manhole top finish grade shall be even with surrounding finish grade surface per the plans and approved shop drawing top elevation unless otherwise directed by the site engineer.
9. Install the inlet and outlet pipes. Once the pipes are connected with a water tight connection, carefully backfill around them, compacting in "lifts" that will not deflect, disturb or damage the pipes in accordance with the site plans and specifications.
10. Contractor is responsible for sealing and making all joints, line entry and exit points watertight, and for sealing any holes used for lift points.



Internal Components*

In most cases, the complete Jellyfish Filter Deck component has been assembled inside the manhole before shipment and will arrive on site pre-installed. Prior to offloading, the Contractor should confirm the quality and condition of the Jellyfish Filter Deck, and if there is any reason for concern, contact Imbrium Systems immediately.

NOTE: *In some cases, the Jellyfish Filter is designed with additional Maintenance Access Wall (MAW) Extensions, or a Pressure Relief Pipe (PRP). In these instances, these additional internal components may need to be installed in the field.*

For MAW extensions, the MAW extension is to be bolted to the precast wall and screwed into the lower portion of the pre-existing MAW lip attached to the Jellyfish Deck and then sealed to be water tight to both the precast wall and pre-existing MAW section.

No Dropping



WARNING: If the Top Slab, Covers or Hatches have not yet been installed, or are removed for any reason, great care must be taken to **NOT DROP ANYTHING ONTO THE JELLYFISH FILTER DECK**. The Jellyfish Filter Deck and Cartridge Receptacle Rings may be damaged under high impact loads. This type of activity voids all warranties.

Pipe Connections

Most Jellyfish Filter units have an **above deck** inlet pipe. If the Inlet Pipe has a **below deck** entry, this watertight step becomes even more important and is complicated by the Deflector Plate location. In the case of a **below deck** inlet pipe, the connection to the Jellyfish unit and the pipe connection to the upstream structure must all be watertight. In effect, the inlet pipe and the upstream structure become a part of this standing wet-pool that confines and contains the pollutants trapped in the system.

Pipe material selection should be indicated on the Site Plan. Connect the pipe using a Kor-N-Seal, Press Seal, Fernco, or other approved watertight boot connection. In the case of concrete pipes, grout the connection watertight with non-shrink grout.

- **Inlet pipe(s)** shall be stubbed in and connected to precast manhole according to Engineer's requirements and specifications. The Contractor is to grout all inlet pipes flush with or protruding up to 2-inches (50mm) into the interior wall of the structure per the plans and specifications.
- **Outlet Pipe** stub shall be connected to the outlet pipe with a watertight connection. It is critical for proper operation that the invert of the outlet pipe remain at or below the Jellyfish Filter Deck at ½ inch (12mm) maximum.
- For illustration a BAD example of an outlet pipe installation is included here. The outlet pipe is off-center, deflected by poor bedding and backfill procedures, and the outlet pipe invert is above not below the top of the deck. This site was corrected by re-excavating to correct these issues.



Once the pipes are connected, carefully backfill around them, compacting in "lifts" that will not deflect, disturb or damage the pipes.

Ballast

When required, the Contractor shall place ballast to the dimensions specified by the Engineer and noted on the plans. Ballast shall not encase the inlet and/or outlet piping and 12-inches (300mm) of clearance should be provided between the ballast and the inlet/outlet pipes.

Risers, Covers and Closing the System*

The Jellyfish Filter is delivered with the necessary risers and covers to bring the unit to grade. It is the Contractor's responsibility to assemble the Jellyfish Filter per the plans and as directed by the Engineer.

- The top slab's Manhole access opening **must** be oriented over both the Maintenance Access Wall (MAW) and steps (if provided) according to the shop drawing.

Backfill

Backfill material and placement method should be performed in accordance with the construction plans and specifications and as directed by the Engineer.

Construction Run-off

The Jellyfish Filter is a Post-Construction Best Management Practice for stormwater treatment, and was selected by the Engineer for post-construction stormwater quality treatment. It is the responsibility of the Contractor to ensure appropriate erosion and sediment control (ESC) measures and construction BMPs are in place to protect the Jellyfish Filter from construction runoff, sediment and other debris until the site is fully stabilized post-construction. Methods to assist in maintaining cleanliness of the Jellyfish Filter during construction:

1. Plug the inlet and outlet of an upstream flow splitter or bypass structure and downstream junction manhole to prevent construction run-off from reaching the Jellyfish Filter.
2. Cartridges shall not be installed until the unit has been fully cleaned, post-construction and the site stabilized.

The method ultimately selected shall be at the Contractor's discretion and the Contractor's risk, knowing the Jellyfish Filter shall be clean and free of sediment and debris prior to cartridge installation.

Activating the System*

Once construction is complete and the site has been fully stabilized (i.e. landscaping is in place, grass growing and top course of pavement laid), the Jellyfish Filter system can be activated.

Contractor is responsible to inspect and clean the Jellyfish Filter system to keep it clean and free of debris and sediment prior to cartridge installation. **The site shall be stabilized (non erodible soil surfaces) and unit been confirmed to be clean and free of debris prior to cartridge installation and being placed in service for proper operation and performance.** This delay avoids the potential of a large rainfall/runoff event that could load (and/or overload) the filters prematurely and shorten the service life for the owner.

See warning/caution statement listed on top of page 1*

Even so, care should be taken in project site-maintenance of erosion control practices and barriers to prevent an influx of sediment that would require vacuum truck maintenance costs prior to commissioning a new system. **Even with care, some jobsite debris can enter the Jellyfish Filter system. All debris MUST be cleaned from both the top of the Jellyfish Deck and from the sump inside the system PRIOR to Cartridge installation. Keeping the system clean is the Contractor's responsibility.**

Depending on the methods used to protect the Jellyfish Filter from construction runoff, the Contractor should:

1. Inspect the system to ensure maintenance is not required (refer to the **Jellyfish Filter Owner's Manual**)
2. Remove all upstream and downstream pipe plugs that were used to prevent construction runoff from reaching the structure. (Standing water should be pumped out and the Contractor shall conform with all confined space requirements prior to entering any underground structure).

Support

For general support, or site-specific design support, please contact Imbrium Systems at:

USA: 888-279-8826 or 301-279-8827
CAD: 800-565-4801 or 416-960-9900
INT'L: +1. 416.960.9900

info@imbriumsystems.com
imbriumsystems.com

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USA: 888.279.8826 | CAD: 800.565.4801 | INT'L: +1.416.960.9900

- The Jellyfish Filter is protected by one of more of the following US patent(s): 8,287,726; 8,221,618; 8,123,935; related foreign patents or other patents pending.
- Nothing in this catalog should be construed as an expressed warranty or implied warranties, including the warranties of merchantability and of fitness for any particular purpose. See Imbrium Systems standard Conditions and Terms of Sale for more information, and web site: www.imbriumsystems.com for the most up to date information.
- For more complete information for installing the Jellyfish Filter precast unit, refer to ASTM C891, C478 & C443.

Changing the World...One Watershed at a Time!

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