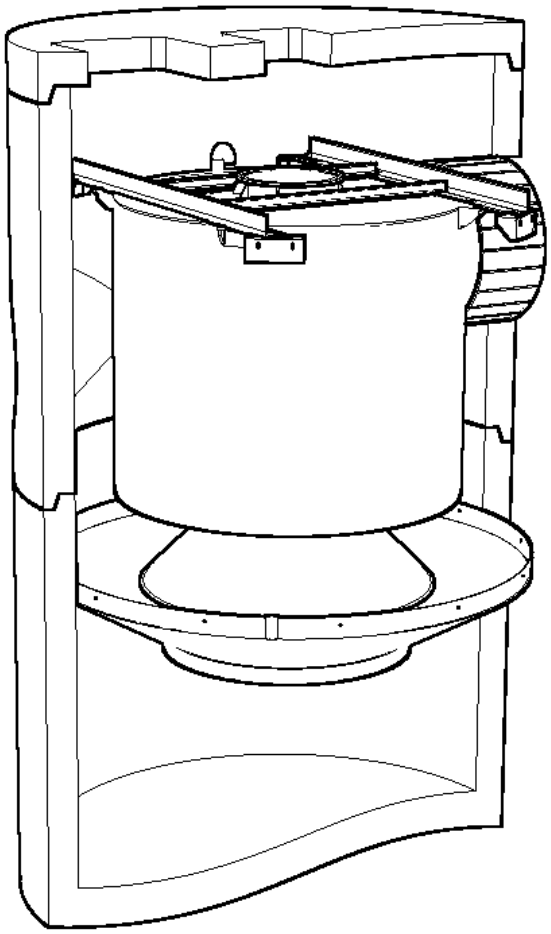
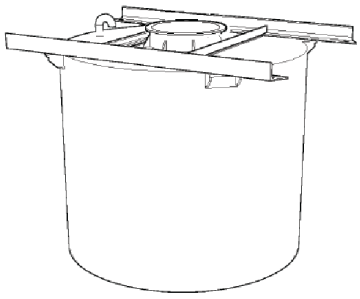
10 ft. Downstream Defender® Handling, Storage and Pre-Assembly Instructions



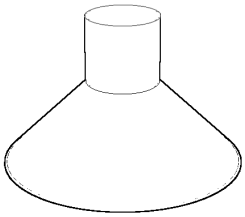
Hydro International, 94 Hutchins Drive, Portland, Maine 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

Before assembling the Downstream Defender® make sure you have the following items:

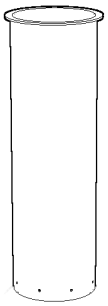
Materials Supplied By Hydro International



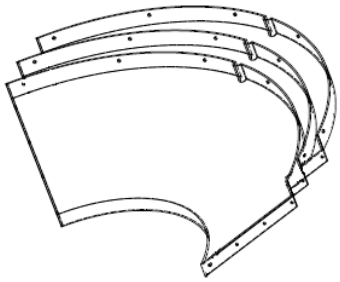
Downstream Defender Dip Plate, and Support Frame* Assembly



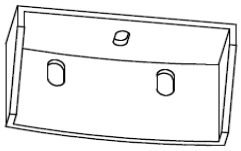
Downstream Defender Center Cone*



Downstream Defender Center Shaft*

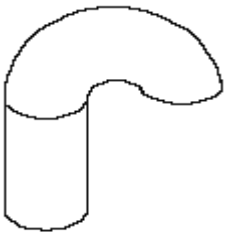


3 Piece Benching Skirt*



Ledger Angle (x4)

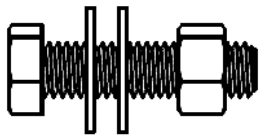
Stencil Kit



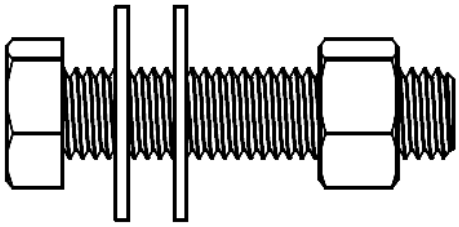
PVC Vent

***** All 10' Downstream Defender® plastic components are molded from white cross linked polyethylene for easy identification. 10 ft. Dip plate and support frame are shipped from manufacturer to precaster as a single assembly.

Hardware Supplied By Hydro International

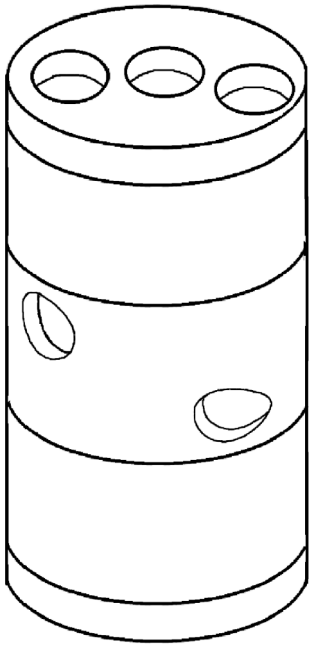


- A-304 SS 3/8 in.-16 UNC x 1 1/2 in. Fully Threaded Bolt
- A-304 SS 3/8 in. x 1-1/2 in. Flat/Fender Washer (x2)
- A-304 SS 3/8 in. Lock Washer
- A-304 SS 3/8 in.-16 UNC Hex Nut
- Pictured assembly x12 included for 3-piece benching skirt
- Pictured assembly x8 included for dip plate to center shaft connection
- Pictured assembly x8 included for center shaft to center cone connection



- A-304 SS 5/8 in.-11 UNC x 2 3/4 in. Fully Threaded Bolt
- A-304 SS 5/8 in. x 1-3/4 in. Flat/Fender Washer (x2)
- A-304 SS 5/8 in. Lock Washer
- A-304 SS 5/8 in.-11 UNC Hex Nut
- Pictured assembly x4 included for securing support frame to ledger angles

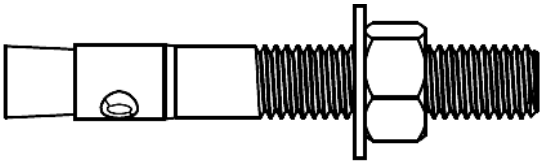
Materials Supplied By Precaster



10 ft. Diameter Precast Concrete Manhole:

- Top slab cored for corresponding frames and covers
- Bottom Slab
- Riser with cored inlet and outlet
- Other Riser sections as necessary
-

Hardware Supplied By Precaster



- A-304 SS 1/2 in.-13 UNC x 5 1/2 in. Expansion Anchor*
- A-304 SS 1/2 in. I.D. Flat Washer
- A-304 SS 1/2 in.-13 UNC Hex Nut
- Pictured assembly x8 required for ledger angles
- Pictured assembly x18 required for benching skirt

* Minimum embedment depth of the 5 1/2 in. expansion anchors is 3 1/2 in.

Required Tools and Equipment

- Measuring Tape
- Ladder
- Hammer
- Hammer Drill and Concrete Bits
- Adjustable Wrench or Ratchet with Deep Sockets
- Crane or Forklift with Lifting Gear
- Wood Blocking
- Large C-Clamps
- Approved Shop Drawings (Contact Hydro International)

Handling and Storage

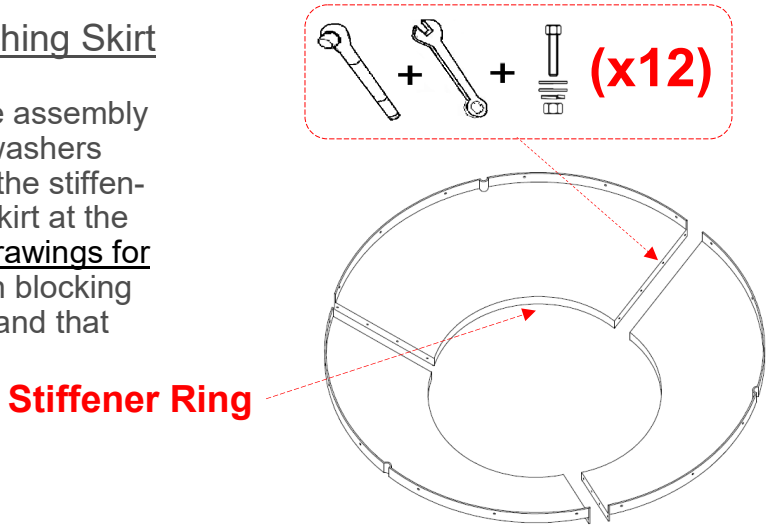
Hydro International's **Downstream Defender®** internal components are manufactured utilizing highly durable thermoplastics; however, improper handling can result in damage to components and accessories. Failure to comply with handling, storage, and pre-assembly instructions voids all warranties.

1. Upon delivery of the **Downstream Defender®** components, inspect immediately for defects or shipping damage. If any discrepancies or missing components are identified, notify Hydro International prior to unloading to initiate corrective action.
2. At all times, avoid unnecessary and extreme impacts to the internal components. At no time shall anyone step, stand, or otherwise place an unnecessary load, on the components.
3. The **Downstream Defender®** shall be pre-assembled inside and delivered as soon after as possible. Pending pre-assembly, the internal components shall be stored inside in an area protected from dirt, ultraviolet (uv) light, and impact. Post pre-assembly the unit may be stored outside providing unit is adequately protected from uv light, vandalism, and the elements until delivery.

Pre-Assembly

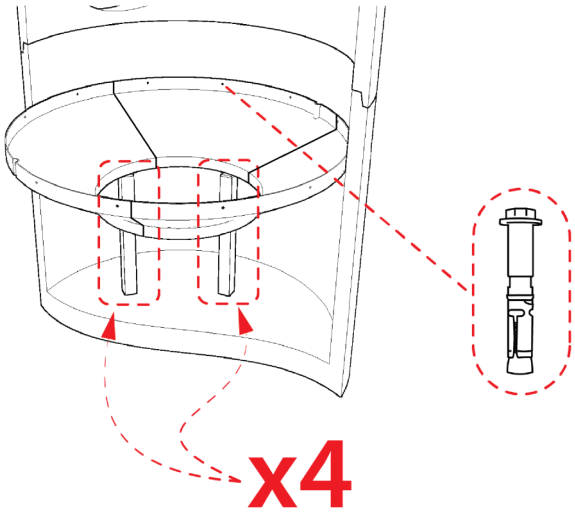
Step 1: Assembling the 3-Piece Benching Skirt

Assemble 3-piece benching skirt as a single assembly using provided 3/8 in. bolts, washers, lock washers and Hex nuts. Clamp sufficient blocking on the stiffener ring of the benching skirt to support the skirt at the correct elevation (refer to approved shop drawings for correct elevation). Place benching skirt with blocking into the precast base ensuring skirt is level and that mounting flange o.d. is equidistant from the pre-cast interior wall. Locate and drill expansion anchor holes through mounting flange.



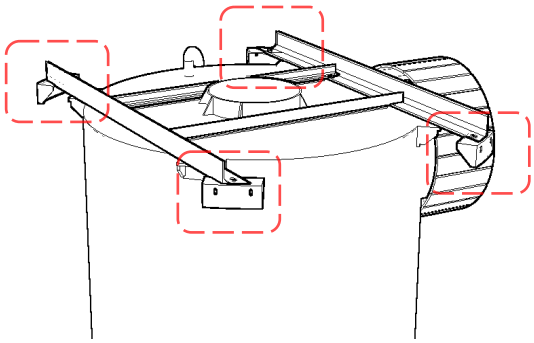
Step 2: Installing the Benching Skirt

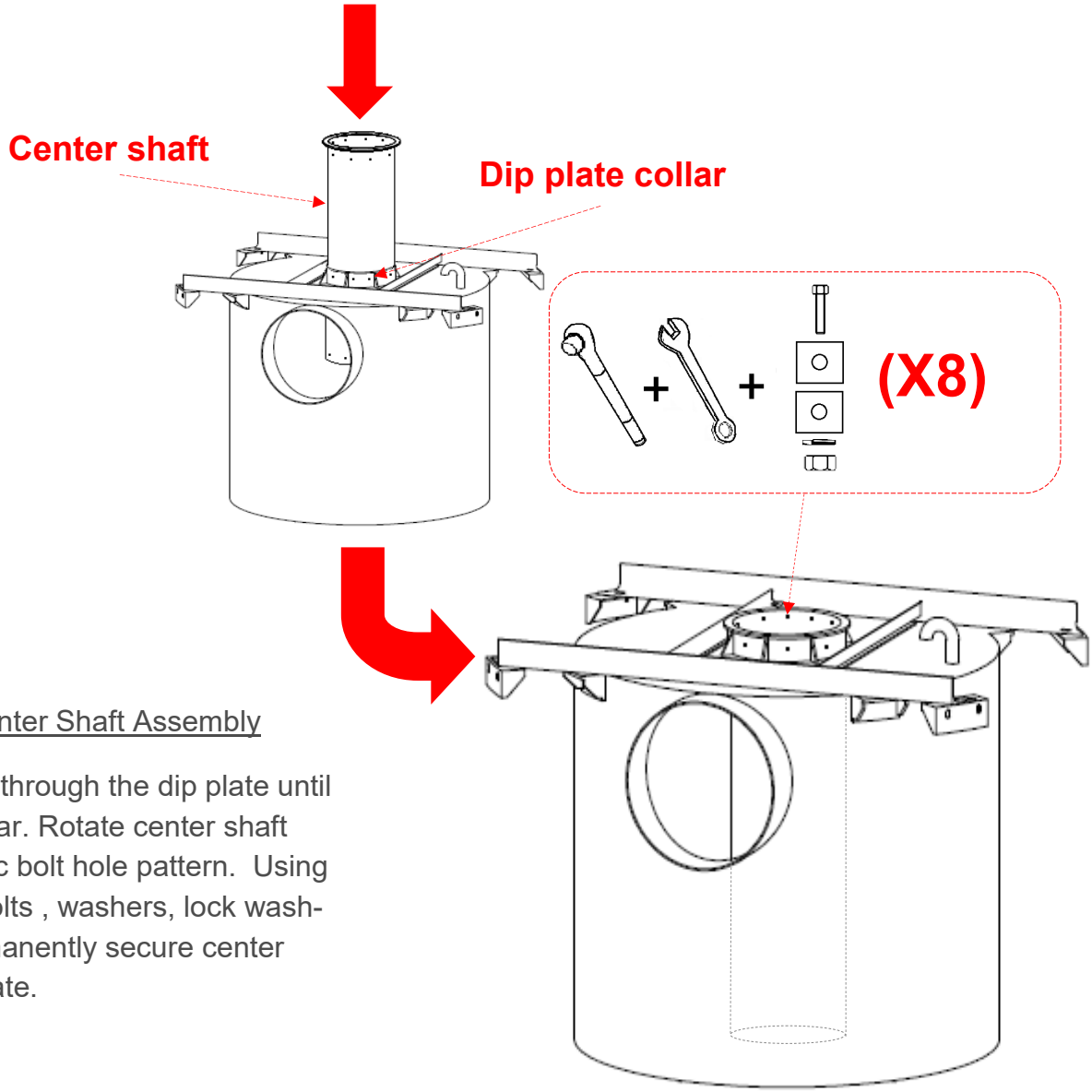
Permanently install benching skirt using the required number of 304 stainless steel (304ss) expansion anchors. Tighten nuts alternately (in a “star” pattern) around the benching skirt perimeter maintaining an even space between the mounting flange o.d. and the pre-cast interior wall.



Step 3: Ledger Angle Assembly

Attach the four 304ss ledger angles to the stainless steel support frame hand tight and slide towards the center of the unit.



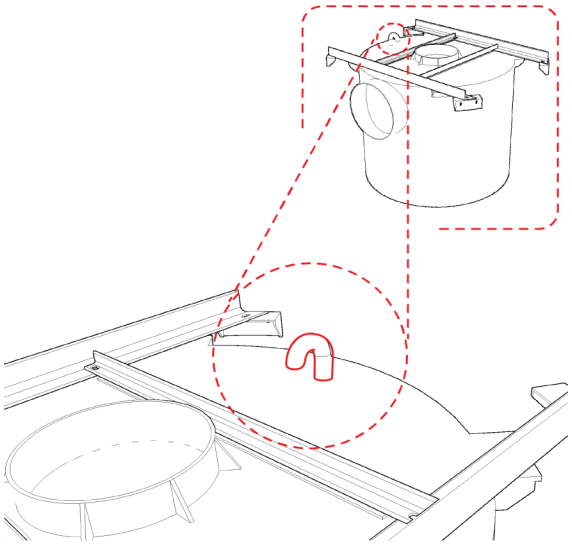


Step 4: Center Shaft Assembly

Slide center shaft through the dip plate until resting on the collar. Rotate center shaft aligning concentric bolt hole pattern. Using supplied 3/8 in. bolts , washers, lock washers and nuts permanently secure center shaft to the dip plate.

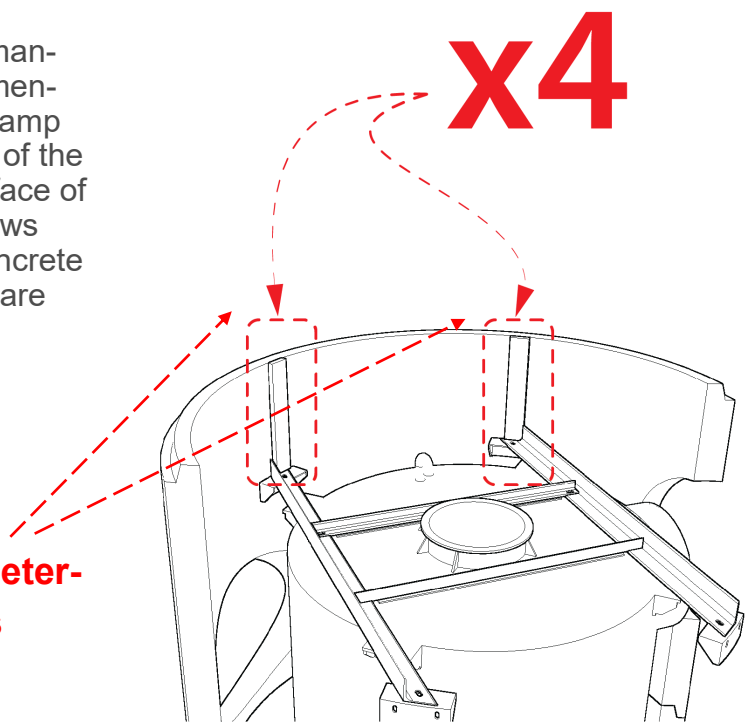
Step 5: Vent Pipe Assembly

Install the included 2 in. PVC vent by threading into bulkhead fitting installed through the top surface of the dip plate.

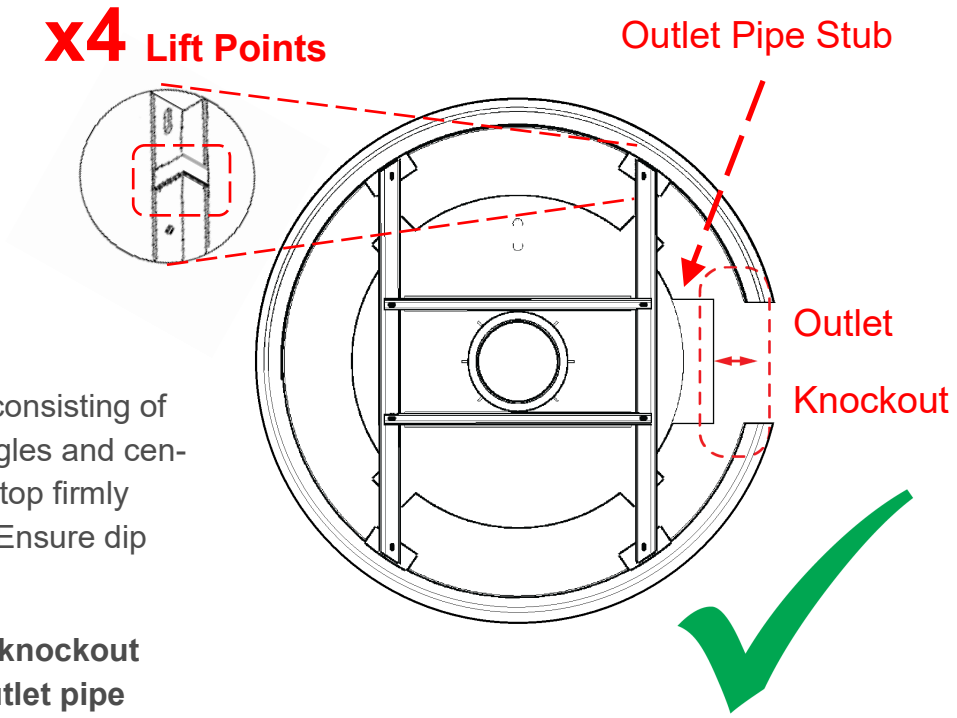


Step 6: Locate Ledger Angle Positions

Locate top of ledger angle elevations in the manhole at several locations by laying out the dimension shown on production detail drawings. Clamp four boards to the precast so that the bottom of the boards align with the elevation of the top surface of the ledger angles. Self-tapping masonry screws may also be used to secure boards to the concrete wall at the correct elevation provided boards are removed upon completion of pre-assembly.



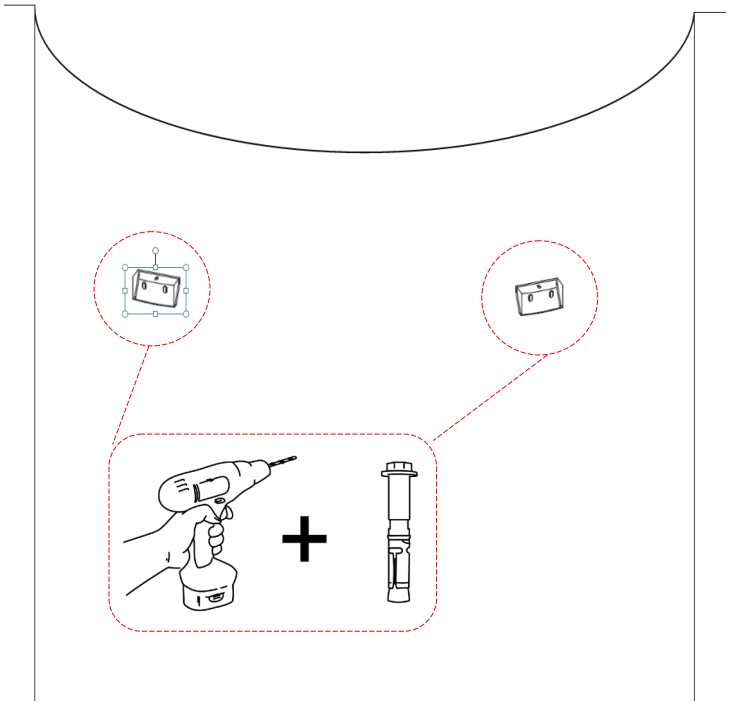
***Refer to drawings to determine lengths of boards**



Step 7: Positioning the Dip Plate Assembly

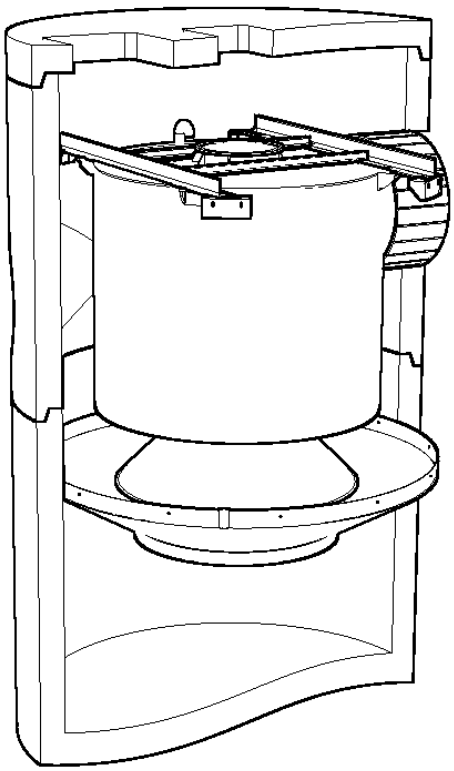
Using the support frame lift points lower the dip plate assembly into the precast riser and rotate until the outlet pipe stub is oriented facing the outlet knockout. Lift the dip plate assembly (consisting of the dip plate, support frame, ledger angles and center shaft) until the four ledger angles stop firmly against the bottom of the four boards. Ensure dip plate assembly is level and centered.

Note: Measurements and not outlet knockout determine vertical location of the outlet pipe stub. Verify locations of all internal components,



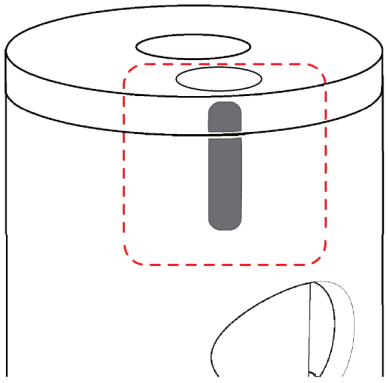
Step 8: Installing the Ledger Angles

With the outlet pipe stub aligned with the outlet knockout, trace the location of the 304ss ledger angles on the concrete wall. Mark the anchor bolt locations on the concrete wall through the corresponding holes on the ledger angle. Remove the dip plate assembly then remove the 304ss ledger angles from the support frame. Permanently mount ledger angles to the interior wall of the riser at correct location using the required number of expansion anchors.



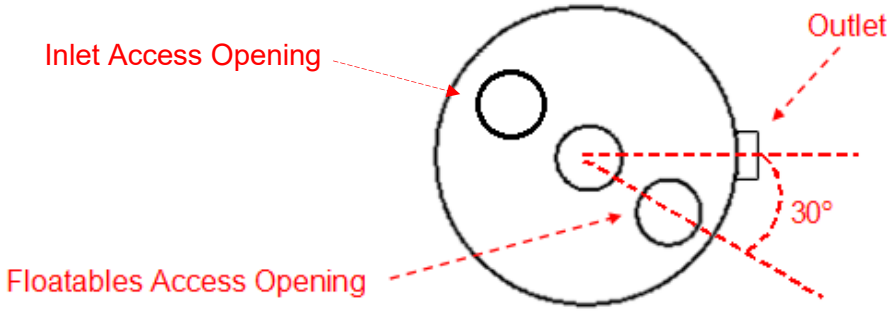
Step 9: Verify Positions of Internal Components

Verify orientations and elevations of installed components are correct by replacing assembly. Confirm that assembly is level, and that outlet knockout aligns vertically and horizontally with outlet pipe stub. Ensure there is adequate clearance for outlet pipe wall thickness through outlet knockout.



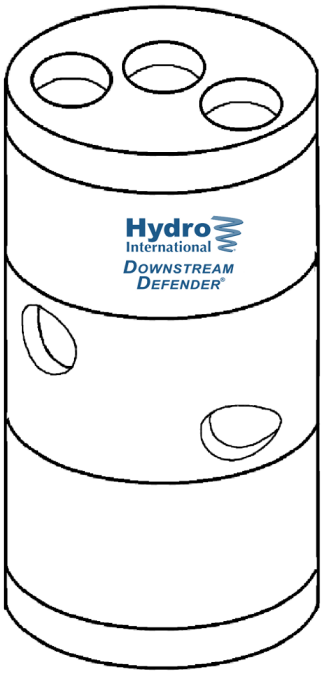
Step 10: Positioning Top Slab

Position the top slab on the manhole so that floatables access opening is 30° upstream (relative to flow rotation initiated by the tangential inlet) from the outlet and inlet access port is over the inlet as shown in the diagram below (and as specified in approved shop drawings) . Paint a vertical match line on the side of the top slab and on the side of the uppermost riser/barrel where the eccentric floatables access is to be oriented in the field.



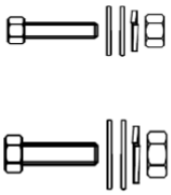
Step 11: Labeling Structure

Stencil precast with “Hydro International” and “Downstream Defender” logos using navy blue spray paint.

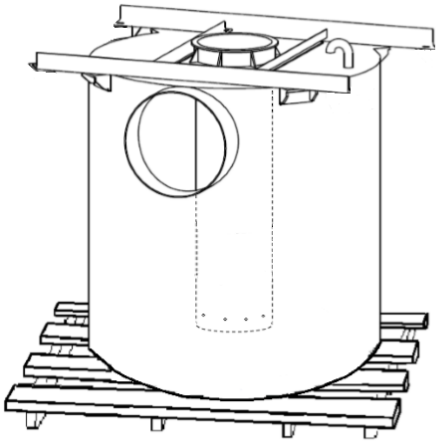


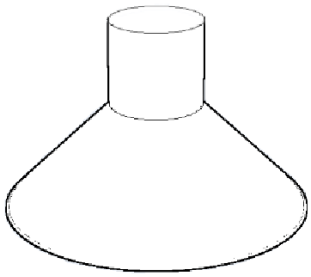
Step 12: Preparing for Shipment

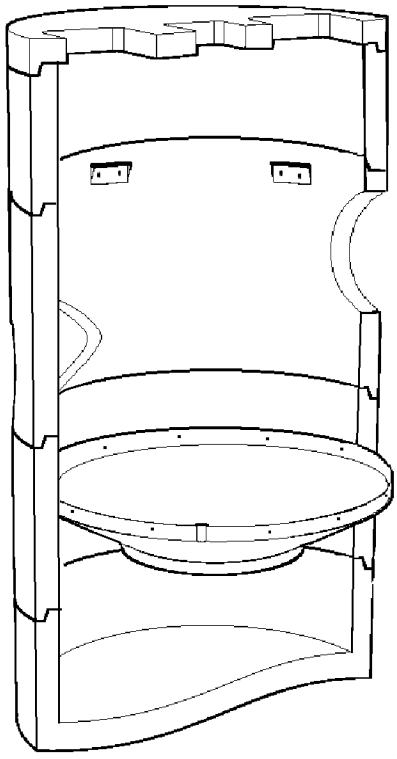
Ship unit with benching skirt and ledger angles installed in corresponding sections. Ensure center shaft, dip plate and support frame are secured to a pallet and shipped as a single assembly. The Center cone may be loosely housed in the dip plate and shipped on the same pallet. Remaining hardware should be packaged separately and labeled by connection. Hardware, joint sealant and all rims and covers shall accompany the Downstream Defender in Shipment to the jobsite



Joint Sealant







Step 13

Take pictures of:

- Center shaft & cone, dip plate and support frame assembly
- Installed benching skirt
- Installed ledger angles
- Riser section with center shaft & cone, dip plate and support frame assembly blocked on top as shipped

Pictures shall be e-mailed to astevens@hydro-int.com prior to shipping with reference to the product and job name.