



StormPod Arch Installation Guide



Foundation Bed Preparation

Use standard construction procedures for the construction of the bed for StormPod Modular Arch Systems. As with any construction project, take all standard safety precautions.

- **Sub-grade must meet or exceed StormPod Module design bearing pressure established by Rotondo Environmental Solutions (RES)!**
Prepare the sub-grade in accordance with the project specification and any available geotechnical report prepared for the project. Consult project geotechnical engineer when available.



- Follow the project plans for the foundation geometry dimensions, location and elevations. The bottom of the StormPod Module foundations must not vary in elevation from the plan dimensions more than 1/4 inch per 10 feet. Deviations in the top surface of the floor slab will make it more difficult to set the units and control width of joints.
- Use a small clean angular stone for the top two (2) inches under the StormPod Module bottom slab only to assist in meeting proper elevations. The horizontal alignment of the outside wall is critical when setting the units, particularly on longer structures.



- Consult project engineer for specific design requirements of material and its placement.
- A delivery sequence schedule should provide the order for delivery and installation of each StormPod Module.

Site Access

Prepare the site for easy access before delivery of the precast units or the arrival of the crane, and communicate the truck route to the Rotondo Environmental Solutions (RES) representative.

Delivery

Provide access for the trucks delivering the units to be unloaded next to the crane, and include a convenient turn around for the trucks to back into the unloading area. Expect rutting on non-paved surfaces due to the weight of the trucks, so a piece of equipment should be available to repair and level the surface.



Crane Selection

A representative from the crane company should visit the jobsite prior to the selections of the size crane. **The project SAFETY Inspector should provide the crane company representative with all job requirements prior to arrival so that onsite delays can be avoided!** The crane representative and/or contractor should determine the distance from center of the crane's position to the center of the final position of the precast units. The RES representative will provide the weights of the precast units. The weight and the distance from the center of the crane's position to the center of the final position of the precast units determines the crane size. The end units are typically the heaviest and also require the longest reach.

Locate the crane as close to the installation as possible. The staging area for the crane must be stabilized and crane supplier should be prepared to provide outrigger mats.

- The crane company must provide all rigging cables and shackles. **All cables should be adequately sized to pick the heaviest section! The cables should be free of any deformed kinks to insure full capacity is provided!**

Other Considerations

Other opportunities to improve site conditions before installation include the following precautions.

- Clear all tree branches and remove or shield overhead obstacles (i.e. wires, etc) that may interfere in any way during erection of the precast units.
- Dewater the site to a level below the bottom of the footing. A properly dewatered site will speed up the job and result in better workmanship.

StormPod Module Units

StormPod Module units have specific lift points based on the center of gravity. Four cables with a minimum length of 20' are needed. Coordinate the supply of these cables between the RES representative and the crane supplier. Coordinate the lifting mechanisms necessary to connect the cables to the unit (type and source) with your RES representative.



Setting StormPod Modules

The StormPod Modules are produced to a very tight tolerance which will contribute to a high quality installation. The StormPod Modules are designed to be drawn together tight and form a consistent joint that can be made watertight if desired. There are tongue and grooves located at all surfaces of the base slab to assist with quality of alignment and floor perfection:

1. Select a crew of five to seven depending on the size of the job and experience of the workers. Assign one as the leader (decision maker) to provide the signals to the crane operator. Have a short safety meeting between all crew members before beginning to set units.
2. Stay out from underneath the unit until the unit is set on the foundation bed. Start with setting at the corner of the outlet end unless site conditions dictate something else. The alignment of this first module is critical to the alignment of the rest of the modules. Continue to set a couple additional modules end to end along the critical line. The modules should be pulled together tightly using the come-a-longs. Verify that these modules form a straight line that is acceptable. If not, reset the modules before continuing with the additional modules. Once you are confident that the alignment and invert elevation are correct,

begin setting laterally to form the perpendicular line pulling modules together tightly using the come-a-longs.



3. Once the perpendicular line is fully created with tight joints and proper invert elevation, continue setting laterally across from the original starting point. Continue the installation process going across one row at a time.



4. Before each piece is set, verify subgrade elevation with laser measurements. Fine tune final elevation with additional stone before placing each module.

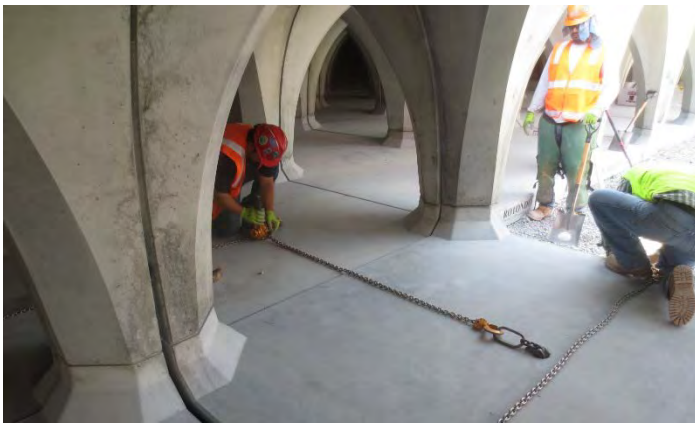


5. Locate module into position approximately 1" to 2" above stone. DO NOT allow module to bump up against existing previously set pieces! Bumping product will cause spalling that may cause

concern depending on the ruling agency! Spalling can also compromise the water tightness if not addressed properly!



- 6. While the module is still suspended in the air, connect come-a-longs (do not draw sections together!).



- 7. The installation will require a minimum of three (3) 1.5-ton come-a-longs with 16' to 20' of chain length (provided by others) to draw sections together. Connect each 1.5-ton come-a-long to the connection points indicated in the photo below. Connect the other end of each come-a-long two sections back to common points on previously set modules. Tighten each of the come-a-longs before lowering module. Once set on ground, retighten the come-a-longs. Once tightened, slightly lift the module so that it may shift against preset modules. Retighten each come-a-long and then lower module until total weight is relieved from the crane.



- 8. Check the joint width on each side at the floor to verify that the product is generally touching below the caulk joint. Verify that the floor elevation at the remote edge is correct and the vertical surface is plumb! **If the joints are wider than what is shown, the chances are that the module isn't level and the top of the arch is touching!**



- 9. Joints should be consistent as indicated below.



- 10. The outside corners should look as indicated below.



11. With proper care during the installation, the result will be a well aligned smooth floor transition system similar to the photo below.



2. StormPod Modules that include an outfall manhole are installed similar to other standard modules as described above.

Sealing Joints {External}

The exterior joint is wrapped as shown below. The wrap must start and end at the V shaped corner chamfer. The chamfer forms a drain port which is critical for allowing a passage way for the water collected in the cavity stone.



3. Once the StormPod Module has been installed, the exterior closure wall panels that includes opening for the pipe can be bolted to the exterior surface. There are typically three (3) 5/8" bolts that attach the wall panel to the face of the arch. There is 1 bolt at top and 2 at the bottom of the panel. The slabs are shown below.

Pipe Connection Details

Openings for pipes will be cast into precast units. Holes oversized to accommodate piping without a pipe boot should be grouted with non-shrink grout prior to backfilling.

1. StormPod Modules that have an internal outfall manhole will typically be preinstalled at the production facility. Modules that include an outfall manhole will look similar to the following photo.





4. Install exterior piping as shown below.



5. Grout around pipe and preformed openings on the interior and exterior surfaces as shown below.



Backfill Material

The backfill of a StormPod Modular Arch structure is an important element of the overall structure. Not only is it important to provide the

necessary support for the structure, it is also important to support any roadway approaches above the installation.

Backfill Procedure

Review and follow the backfilling procedures on the approved project drawings. The following are provided to assist with understanding the backfilling approach.

1. Verify with the site Geotechnical Engineer that backfill material gradations are within the acceptable range specified on the approved drawings.
2. Place and compact backfill in layers until the density is not less than 95% of the maximum dry density. All material outside the Critical Backfill Zone must be good quality well-compacted embankment or in situ soil.
3. Do not place backfill against any structural element until approved by the engineer. Avoid damage to waterproofed surface.
4. Use mechanical tampers or approved compacting equipment to compact all backfill and embankment immediately adjacent to each side of the installation and over the top of the installation to a minimum of 1'.



5. Place backfill within 4' of each side of the units in lifts of eight inches or less (loose depth). Do not use heavy compaction in this area or over the installation. Lightweight dozers and graders may be operated over units having one foot of compacted cover. But heavy earthmoving equipment (larger than a D-4 Dozer weighing in excess of 12 tons and having track pressure of 8 psi or greater) requires 2'. As a precaution against introducing unbalanced stresses in the vault units, place and compact the backfill to within 2' of the same elevation on both sides of the installation before proceeding to the next layer.

6. Filling of the center voides can start once the perimeter backfill process is within 18" of the top surface. The stone filling should be placed and leveled out slightly higher than the top concrete surface.





7. Place and secure filter cloth over the stone filled cavities. Once filter cloth is secured, start spreading approximately 12" of backfill material over the filter cloth with a small rubber track machine as shown below.



8. Large system installations may require other equipment such as small rubber track machine as shown below or stone shooter equipment. If a stone shooter is preferred, adequate notice must be given in order to assure its availability.





9. Continue to add additional layers as specified.





Note: No equipment in excess of the design load noted on the approved manufacturers shop drawings is permitted over the Structure.

Riser Installation

Review and follow the riser installation procedures on the approved project drawings. The following are provided to assist with understanding the riser installation approach.

1. The riser is designed to rest on the stone surface and transfer vertical loads down through the stone to the structure membrane.



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caulking process should start a day after the product installation has begun to reduce the completion period.

3. Prime interior preformed joint in accordance to the material specifications. Allow primer to dry approximately one (1) hour before applying caulk.



4. Caulk each vertical and horizontal preformed interior joint with Sikaflex 1a or approved equal as shown below. The sealant must be continuous in all directions to assure that a water-tight seal is achieved.

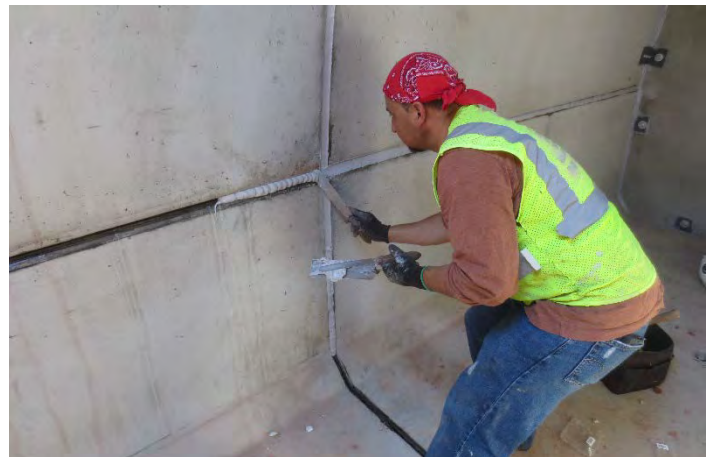
Sealing Joints {Internal}

Water-tight joints require the addition of a polyurethane sealant on the interior joints. This treatment is typically required for sand-filters, cisterns and other water quality vaults that are require to retain water.

1. Protect interior floor surface and joints from being contaminated as shown below. Areas contaminated must be completely cleaned and dried before the sealing process can begin!



2. The preformed caulk joint surface must be free of dirt and standing water before applying primer and caulk materials. One or more wall panels must be left off to avoid a confined space condition! The





Placing Medias

1. Filter Medias can be placed in a non-confined space by leaving off a wall panel during the installation process. Once the work has been completed install the wall panel.



Note: The surface must be free of dirt before applying primer and caulk materials.

