

Infrastructure
JENSEN

StormVault

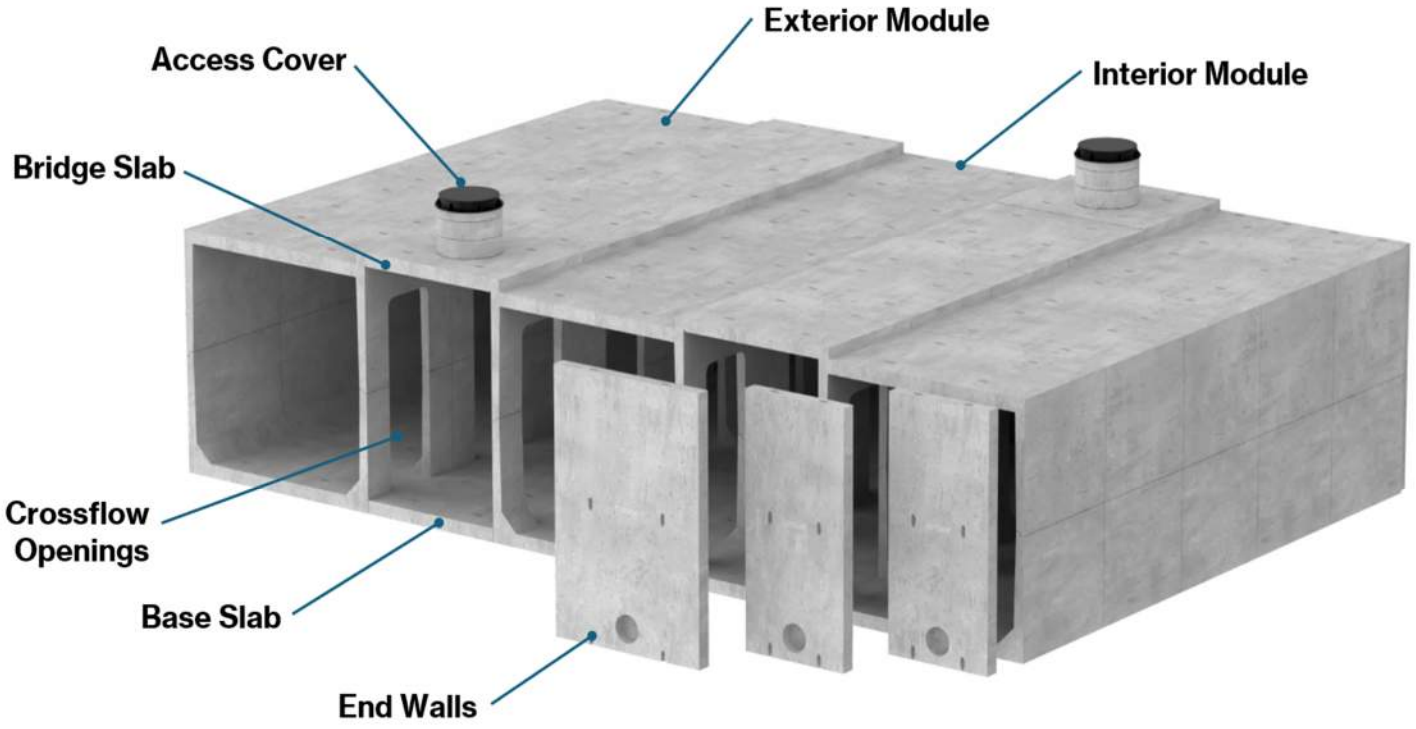
Installation Manual

Questions? Let's talk. Info@jensenprecast.com

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OVERVIEW

This manual provides installation guidelines for the Jensen StormVault, a modular box culvert underground detention system. Before beginning, please carefully review the instructions and equipment lists. Adherence to all relevant safety procedures in accordance with state and local regulations is crucial. For site-specific details, please contact Jensen Infrastructure.



NOTICE

Confined space entry may be necessary. The contractor must acquire all equipment and training to comply with local and OSHA regulations regarding confined space entry. It is the responsibility of the contractor or entry personnel to ensure safe procedures are followed at all times.

INTRODUCTION

StormVault is an underground modular storage system designed for stormwater detention and infiltration. Utilizing the strength and durability of precast concrete, StormVault offers an efficient and resilient stormwater management solution. Its modular design provides flexibility to meet a wide range of site requirements, with configurations ranging from 3' to 14' in height (custom heights and configurations available). Modules are delivered ready for installation, minimizing staging requirements and reducing installation times.

StormVault can be installed in various configurations and heights. Taller systems are assembled by stacking top and inverted bottom modules. Shorter systems consist of bottom modules with a top concrete bridge slab. Both configurations can be combined with a membrane liner for leak-resistant applications. The installation procedures for both configurations are detailed in this manual.

The Engineer of Record is responsible for approving the system design, layout, and storage volume, as well as conducting load calculations, determining cover depth, assessing water table elevation, reviewing the soils report, and specifying backfill requirements. This installation manual serves as a reference guide only.

DISCLAIMER

This Installation Manual is provided as a general overview of recommended installation practices for the StormVault system. It is not intended to replace project-specific engineering, geotechnical recommendations, or the judgment of the Engineer of Record. Final responsibility for design approval, installation methods, safety compliance, and performance lies solely with the contractor and/or Engineer of Record.

Jensen Infrastructure makes no representations or warranties, expressed or implied, regarding the completeness, accuracy, or suitability of this document for any particular project. Jensen Infrastructure expressly disclaims all liability for damages, losses, or claims arising out of or in connection with the improper use of this manual, faulty installation, site conditions, workmanship, or subsequent malfunction of the system. Use of this manual constitutes acceptance of these terms.

SAFETY ADVISORY AND PERSONAL PROTECTIVE GEAR

Job site safety is comprehensively addressed by various entities. The reminders included here highlight key areas of safety practice that fall under the responsibility of owners, managers, and service providers. OSHA, Canadian OSH, federal, state/provincial, and local jurisdiction safety standards apply to any site or project. Understanding and adhering to these responsibilities is the service provider's duty and is beyond the scope of Jensen Infrastructure.



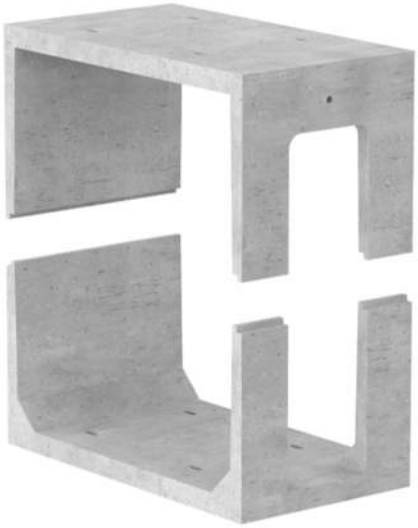
SAFETY PRECAUTIONS DURING INSTALLATION

1. Personal Protective Equipment (PPE): Ensure all personnel wear appropriate PPE, including hard hats, safety glasses, gloves, and steel-toed boots.
2. Site Safety: Maintain clear and safe access to the site. Ensure all equipment is operated by trained personnel.
3. Excavation Safety: Implement proper shoring and trenching techniques to prevent collapses. Monitor excavation for stability.
4. Handling and Lifting: Use appropriate lifting equipment and techniques to prevent injuries. Ensure all lifting operations are supervised by qualified personnel.
5. Module Inspection: Inspect modules for damage before offloading and installation. Do not install damaged modules.
6. Weather Conditions: Monitor weather conditions and halt installation during severe weather to ensure safety.
7. Communication: Maintain clear communication among all team members. Use radios or other communication devices to coordinate activities.
8. Emergency Procedures: Have emergency procedures in place, including first aid kits and emergency contact numbers.
9. Equipment Safety: Regularly inspect and maintain all equipment to ensure it is in safe working condition.
10. Environmental Protection: Implement measures to protect the environment, including proper disposal of waste materials and prevention of soil erosion.



SYSTEM COMPONENTS

The StormVault system is composed of multiple modules and end walls. The specific configuration will be detailed in project-specific submittals and plans, which may include various components.



DoubleVault Top & Bottom



SingleVault Top & Bottom



Base Slab



End Wall



Bridge Slab



Risers & Access Covers

EQUIPMENT INVENTORY

The following equipment is recommended to support the installation of the StormVault system. This list is not exhaustive and serves as a general guideline. A preconstruction meeting is recommended to discuss and coordinate site specific details to ensure a smooth and seamless delivery and installation process. The list below excludes heavy equipment required for excavation, setting, and backfilling. The submittal package provides specific pick points and weights for each piece. Factors such as installation depth, reach, and adjacent access to the installation area will all affect the size and type of crane required to install. Other lifting equipment can be used per the contractor's discretion.



Lifting Shackles or Hooks



Lifting Chain or Straps



Pry/Spud Bars



60-inch Level



Transit or Lazer Level



Chalk Line



Extension Ladders (8 to 16 ft)



Broom & Shovel



Spray Paint



Impact Driver or Ratchet w/ socket set



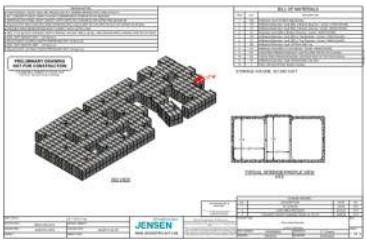
Rotary Hammer w/ 9/16" Dia. inch Concrete Bit



Small Sledgehammer

MATERIALS INVENTORY

The following materials are recommended for installation of the StormVault system. This list is not exhaustive and serves as a general guideline. It is recommended to coordinate who supplies the various materials during the preconstruction meeting. Please also reference the project specific contract provided by Jensen Infrastructure which outlines which materials are included and excluded.



Project Specific StormVault Drawings



Bedding Material



ConSeal CS-102 Butyl-Rubber Sealant



½" x 3" Diameter Tapcon Zinc Plated Concrete Screws



9/16" Diameter x 6" Carbide Hammer Drill Bit - Concrete



End Wall Mounting L Brackets (supplied by Jensen)



ConSeal CS-213 Geotextile Backed Exterior Joint Wrap



ASTM C1107 Non-Shrink Grout



Non-Woven 8oz Geotextile Fabric (watertight applications)



40 Mil Reinforced HDPE Liner (watertight applications)



HDPE Liner Welding Kit



Sikaflex 1A or Equivalent Elastomeric Concrete Sealant

StormVault Preconstruction Checklist

- Field Contact and Phone: _____
- Plant Contact and Phone: _____
- Contractor Contact and Phone: _____
- Project Name: _____
- Site Address: _____
- Pre-con Attendees: _____
- Topics to Review:
  - ☐ System layout and shop drawing review.
  - ☐ Accessories and components supplied by Jensen.
  - ☐ Equipment and materials needed by Contractor for installation.
  - ☐ Site access and storage options.
  - ☐ Crane or lifting equipment positioning, access, reach, weights, and mapping of module positions as it pertains to crane position(s) and capacity/reach restrictions.
  - ☐ Delivery preparation – number of loads, pieces per load, and sequencing of loads.
  - ☐ Offloading – rigging, lifting, handling, and safety requirements.
  - ☐ Bedding and backfill review – ASTM D2487 acceptable soil groups, 90% compaction, placement strategy.
  - ☐ Placement and setting of modules, which piece to start with, and pipe connections. Numbering system and sequence of delivery.
  - ☐ Spacing and alignment of modules, +/- 3/4” acceptable tolerance.
  - ☐ Wall panel installation and joint review.
  - ☐ Watertight liner and wrapping procedure including liner welding requirements.



PREPARE FOR INSTALLATION

Installation for the StormVault must be carried out in accordance with the Project Plans and Specifications. The excavation process should take into account key factors such as the system's length, width, depth, and type, as well as site-specific constraints including access, groundwater levels, stockpile and borrow areas, and locations for unit staging and placement.

1. **Site Accessibility:** The excavation process will generate a significant volume of material that must either be stored on-site or transported off-site. Proper planning and preparation are essential to manage this material efficiently. The excavation bottom must remain accessible to allow for bedding preparation and the movement and placement of system modules. This often necessitates constructing a ramp into the excavation or shaping the cut to provide access from grade level on at least one side. Modules may be installed directly from delivery trucks or staged on-site prior to placement. In either scenario, sufficient space must be allocated for large truck access, crane positioning, and module staging to ensure smooth and safe installation operations.

2. **Excavation:** Excavate the installation area in a manner that ensures trench wall stability under all working conditions. To achieve this, trench walls may need to be sloped, benched, or supported with temporary or permanent shoring systems. All excavation and wall preparation must comply with applicable federal, state, and local safety regulations. Only excavate as much area as can be safely supported and maintained with the available equipment. Excavation dimensions must align with the Project Plans and Specifications, as well as any approved submittal drawings provided by Jensen. The length and width of the excavation should accommodate sufficient space for backfill material and the operation of compaction equipment. Where trench walls are stable or properly supported, the excavation width should be limited to what is necessary to allow safe and effective placement and compaction of embedment materials – typically 18 to 24 inches, though this may vary based on the type of backfill and equipment used. The clearance between the StormVault assembly and the excavation wall must exceed the width of the compaction equipment to ensure proper compaction.

3. **Dewatering (if applicable):** Precast modules and concrete slab foundations must not be placed or poured in the presence of standing or flowing water. Groundwater must be effectively controlled, and surface runoff should be prevented from entering the excavation at all times. If water is present in the work area, the excavation must be dewatered to maintain the stability of both in-situ and imported materials. The water level should be kept below the bedding and foundation elevation of the stormwater storage system to ensure a stable excavation bottom. Appropriate dewatering methods – such as sump pumps, well points, deep wells, geotextiles, perforated underdrains, or stone blankets of adequate thickness – should be used to remove and control water within the excavation. When excavating below the groundwater table, ensure the water level remains below the bottom of the cut at all times to prevent washout behind sheeting or sloughing of exposed excavation walls. Water control must be maintained before, during, and after installation of the stormwater storage system, and continued until embedment is complete and sufficient backfill is in place to prevent flotation of the system, connected piping, or accessory drainage structures.

4. **Removal of Unsuitable Materials:** Rock must be removed and replaced with suitable material to create a compacted earth cushion. This cushion should provide a minimum of 12 inches of separation between the exposed rock and the stormwater storage system. If wet or otherwise unstable soil is encountered at the bottom of the excavation and is deemed unsuitable for supporting the stormwater storage system by the Engineer, it must be removed to a depth of at least 24 inches below the system's base. The excavated area should then be brought back to grade using select granular material, compacted in accordance with the Engineer's direction.

5. **Subgrade:** The StormVault system requires a foundation that is stable, uniform, and either level or slightly sloped. This begins with proper subgrade preparation in accordance with the Project Plans and Specifications. The subgrade should be graded to a consistent surface with a slope of less than 1%. If the subgrade consists of clay or other relatively impermeable materials, and the construction timeline is extended, it is recommended to slope the subgrade toward one end of the system. This facilitates drainage of excess water and helps prevent subgrade saturation.

6. **Bedding:** Verify specifications and thickness of bedding material based on site specific recommendations from EOR and geotechnical report. Ensuring the bedding is properly compacted and level within allowable tolerances (1/4" of plan grade). The bedding layer for the StormVault system serves as both a structural and hydraulic interface with the subgrade. The type and placement of bedding material are critical to the overall performance of the system. Bedding requirements vary depending on whether the system is designed for detention or infiltration. The thickness and material type of the bedding layer are determined by factors such as subgrade conditions, system type, and required soil bearing capacity. Refer to the project-specific plans and drawings for detailed requirements.

   In cases where higher bearing pressures are needed, this must be confirmed prior to selecting the bedding material. Infiltration systems require bedding materials to facilitate water flow into the subgrade and surrounding soils. Suitable materials typically include washed granular products such as 3/4" rock or washed sand, conforming to ASTM D2487 soil classifications GP (poorly graded gravel) or SP (poorly graded sand).

   Detention systems can accommodate a wider range of bedding materials, including both poorly and well-graded options. The bedding material for a StormVault detention system should consist of native soil or borrow material that conforms to ASTM D2487, excluding soil groups OL, CH, MH, OH, and PT. Excavated material may be reused as bedding if it meets these classification requirements.

   The bedding layer must be a minimum of 6 inches thick and graded to within 1/4 inch of the design elevation specified in the Plans. It should extend at least 12 inches beyond the outer dimensions of the StormVault system, as shown in the Plans or Shop Drawings. Bedding must be compacted to at least 90% of the maximum dry density in accordance with AASHTO T99, or as otherwise specified in the Plans, using equipment and methods appropriate for the selected material. When open-graded materials are used for bedding, they must be separated from the in-situ soil with a non-woven geotextile fabric meeting AASHTO M288, Class 2 requirements.

NOTE: A skid steer with laser grader can be used to simplify the grading process of both the subgrade and bedding material.



DELIVERY AND INSPECTION

A preconstruction meeting will be conducted prior to the delivery of any materials for the StormVault system installation. During this meeting, the shipping and delivery plan will be finalized, including the sequencing of module delivery and placement. Proper sequence should account for both direct installation from the delivery truck into the excavation and installation from on-site staging or storage areas.

An effective shipping plan minimizes the need for multiple handling of modules, thereby reducing installation time and labor. It also ensures efficient use of installation equipment, such as cranes, and helps to minimize congestion on the construction site. The finalized shipping plan will be submitted to the Contractor for review and approval prior to the shipment of any materials to the site.

1. **Component Verification:** Request for a module check from the plant to ensure all modules, slabs, and accessories are built and ready for delivery. As part of the verification process, request the order/sequence in which the modules are delivered to coincide with the predetermined installation sequence that was established during the preconstruction meeting.
2. **Visual Inspection:** Inspect each module for any visible damage or defects prior to offloading. Specifically, look for cracks, variances in wall thickness, straightness of walls and foundation, and any exposed rebar.
3. **Dimensional Check:** Verify the dimensions of each module to ensure they meet project specifications and approved shop drawings. Specifically, make sure the height of top and bottom modules and the ship lap joints for top and bottom modules are correct to ensure proper mating.
4. **Documentation:** Record any issues and report them immediately to the supplier prior to setting the units into place.

GENERAL PLACEMENT PROCEDURE

The optimal sequence for installing individual StormVault pieces depends heavily on site-specific constraints and conditions. Key factors include the surrounding area, the feasibility of over-excavation, shoring requirements, excavation depth, and crane positioning and accessibility.

To plan effectively, it is recommended to use a to-scale plan view of the StormVault assembly and its surroundings. This will help determine the crane's maximum required reach and identify ways to minimize or eliminate the need for repositioning the crane during installation.

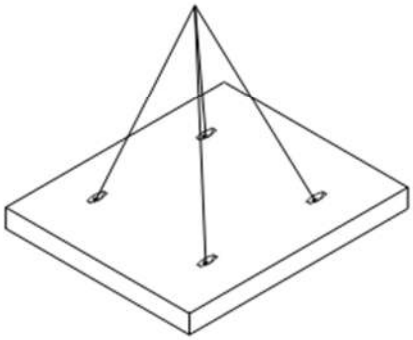
Ideally, if over-excavation is possible, a ramp should be constructed to allow the crane to access the bottom of the excavation and set up adjacent to the installation site. If this is not feasible, the crane must be positioned at grade level, safely distanced from any hillside or shoring. This distance must account for the full footprint of the crane's outriggers.

Share the heaviest pick weight and maximum reach requirements with the crane company to determine the most suitable crane size. While larger cranes typically incur higher hourly costs, they can reduce or eliminate the need for repositioning, potentially saving time and labor.

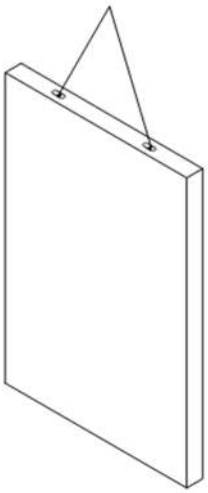
Use the preconstruction meeting and consult Jensen resources to help develop a successful installation plan tailored to your site.

RIGGING AND OFFLOADING

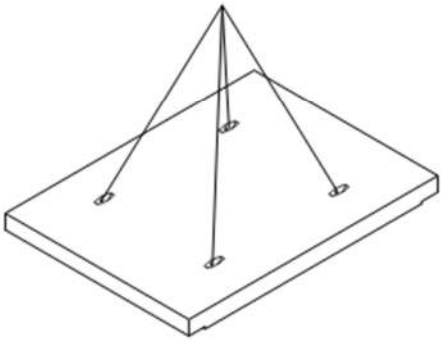
Lifting equipment must be rated for the heaviest pick and longest reach to ensure safe handling. Using undersized equipment or rigging poses risks and may damage the product. Each StormVault component is labeled with its unit weight, and proper rigging is essential for safe and efficient installation. Most StormVault components include **A-anchor inserts** for easy lifting, though lifting hardware may vary by manufacturing location. Consult project-specific component drawings or verify required lifting hardware with a Jensen Infrastructure representative before scheduling product delivery. The recommended lifting configuration is illustrated below.



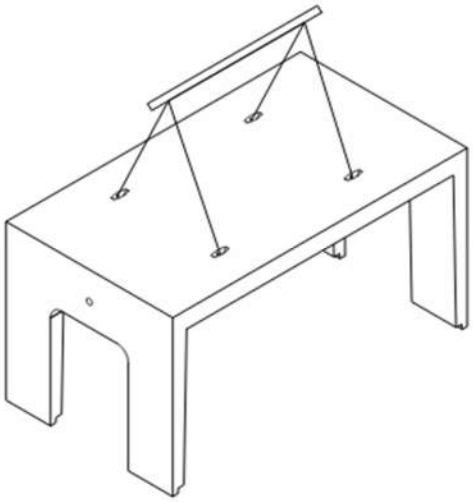
Top Slab (SingleVault only)



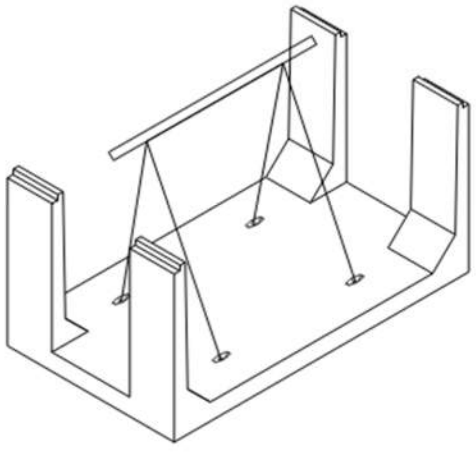
End Wall



Bridge Slab (notched



Top Module



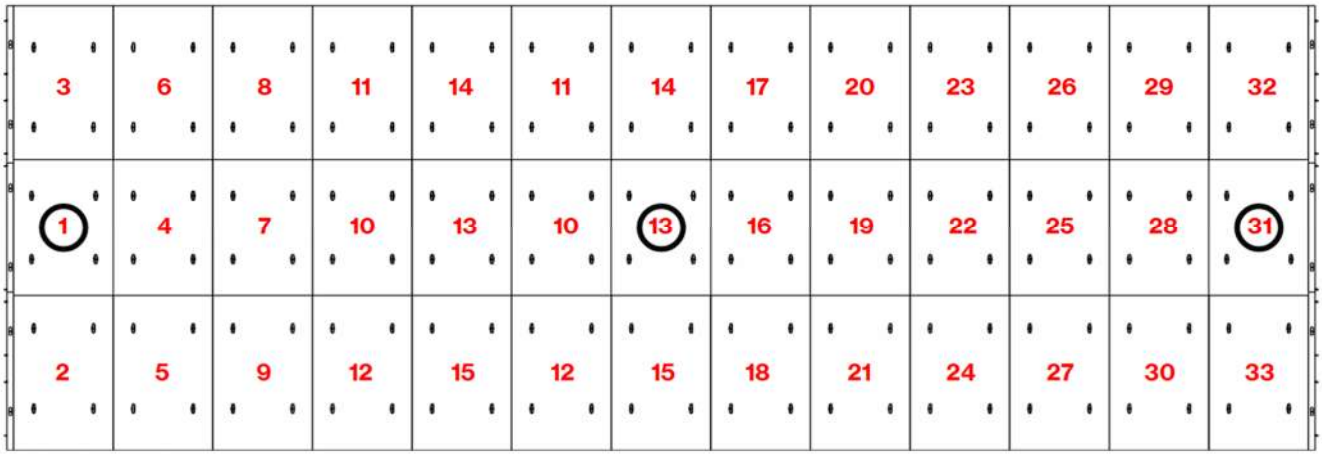
Bottom Module

Component Weights: Confirm all StormVault component weights per the submittal package and shop drawings. Request details related to the lifting points and required rigging equipment prior to taking delivery.

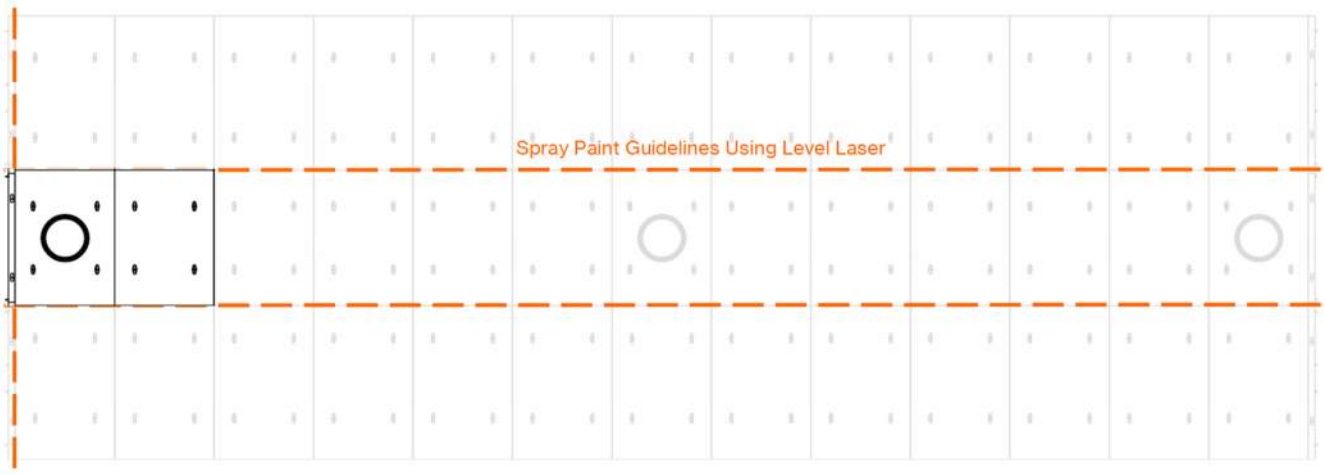
BASE SLAB & BOTTOM MODULE PLACEMENT

1. **Bedding Double Check:** Ensure the bedding is level, compact, and stable, and at correct elevation per the project plans. Use leveling tools to check for evenness. Remove any large protruding rocks or materials that may create a high point.

2. **First Module Placement & Sequence:** Place the base slab on the prepared bedding, ensuring it is level and aligned. **This is the most important part of the installation process**. Exact and precise position and alignment of this module will predicate the position of all other modules and final position of the assembly. NOTE: Site specific variables will dictate the most efficient sequence. Jensen will provide project specific placement and sequence details to assist in the process.



3. **Alignment and Spacing:** Align the module according to the project plans, maintaining the specified spacing and tolerance. Gaps between modules and base slabs should be no greater than 3/4" in all directions. It is recommended that guidelines should be drawn on the base material with a laser level in combination with a chalk line and/or spray paint. Specifically, guidelines should be drawn for the first row of base slabs set, to ensure proper installation specifications.



TOP SLAB OR TOP MODULE (STACKED CONFIGURATION) PLACEMENT

1. **Butyl-Rubber Sealant Application:** Before setting top slab, bridge slab, and or top modules, strips of butyl-rubber sealant must be placed continuously along all joints. The sealant will not only help

provide a water-resistant seal but also provide cushion between pieces when setting.

2. **Top Slab Placement (SingleVault Configuration):** After properly placing the sealant, set the top slab onto each bottom module as specified in the installation sequence document on page 12. Precise, symmetrical alignment of the top slabs is essential for a successful installation. The outer dimensions of the top slabs are identical to those of the bottom modules on all four sides, so ensure that all exterior walls are flush and free of overlaps or surface misalignments. Each StormVault component should be carefully lowered into place and guided by hand using lead lines and appropriate safety equipment.

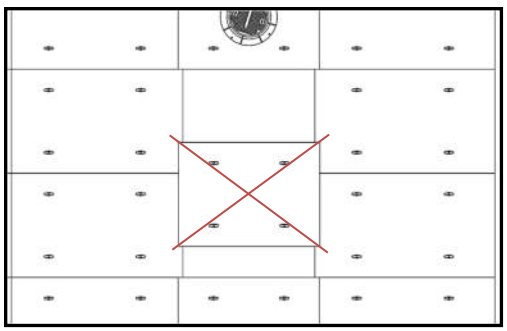
3. **Top Module Placement (DoubleVault Configuration):** After properly applying the sealant, lift and set the top module onto each bottom module as outlined in the installation sequence document. Precise, symmetrical alignment of the top module legs – with even spacing and alignment to the exterior plane – is critical for a successful installation. The top modules share identical outer dimensions with the bottom modules on all four sides, so ensure that all exterior walls are flush and free from overlaps or surface misalignments. Top components should be carefully lowered into place and guided by hand using lead lines and appropriate safety equipment.

BRIDGE SLAB INSTALLATION

1. **Butyl-Rubber Sealant Application:** Before setting bridge slab, strips of butyl-rubber sealant must be placed continuously along all joints. The sealant will not only help provide a water-resistant seal but also provide cushion between pieces when setting.

2. **Bridge Slab Placement:** After properly applying the sealant, lift and set the bridge slab over each span between modules and above the base slabs as outlined in the installation sequence document on page 12. Accurate, symmetrical alignment of the bridge – with even spacing and alignment over the open span – is critical for a successful installation. The amount of overlap should be the same on both the right and left side. Bridge slabs should be carefully lowered into place and guided by hand using lead lines and appropriate safety equipment. The bridge slab must be set on the keyway.

3. **Note:** The bridge slab may not span over to adjacent modules. The bridge slab is the same length as adjacent modules and ends must align with adjacent modules. See the reference below.



Incorrect Alignment



Correct Alignment

ALLIGNMENT ISSUES

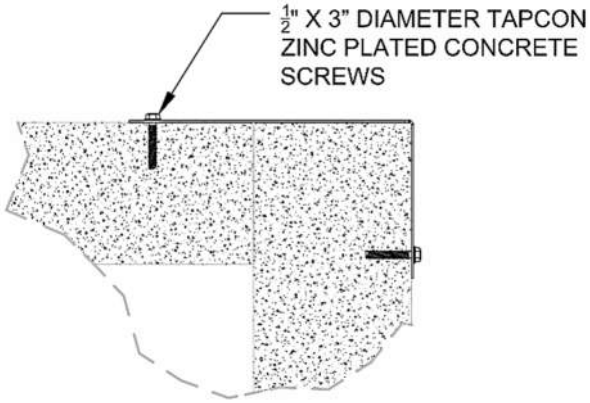
ISSUE 1	SOLUTION 1
StormVault greater ¼" out of level yet sitting firmly on the base.	Re-level base layer to within ¼" of level.
ISSUE 2	**SOLUTION 2**
StormVault level yet not fully supported by aggregate.	Re-level base, removing any high or low spots.
ISSUE 3	**SOLUTION 3**
StormVault greater than ¼" out of level and not supported by base. Solutions 1 and 2 did not fix the issue.	StormVault binding on adjacent modules. Ensure the bottom module and base slab are properly aligned.
ISSUE 4	**SOLUTION 4**
StormVault top module is binding on adjacent module.	Ensure bottom component is properly aligned with adjacent module.

END WALL INSTALLATION

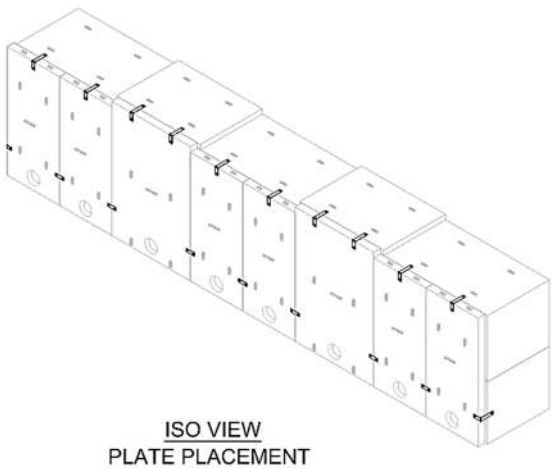
1. **Wall Placement:** After all modules, top slabs, and bridge slabs have been properly set into place and verified to be completed it is time to place the end walls. The end walls come in different widths. It's important to start placement of end walls at one corner and work toward the other corner to ensure proper alignment. Each StormVault end wall should be carefully lowered into place and guided by hand using lead lines and appropriate safety equipment.

2. **Connection Hardware – L brackets:** Secure the slabs using the provided connection hardware. Jensen supplies L-brackets designed to lock each end wall in place by mechanically connecting it to the adjacent top module, top slab, or bridge slab. Once the wall is positioned, place the L-bracket so that the short leg extends downward from the top to hold the wall in place, while the long leg rests along the top surface of the module. Hold the bracket firmly in position.

   Using a rotary hammer with a 9/16-inch diameter concrete bit, drill a hole through the bracket into the top of the module. After drilling, insert a ½-inch x 3-inch zinc-plated Tapcon concrete screw into the hole. Use an impact driver or ratchet to tighten the screw until the head is flush with the surface of the L-bracket. Repeat this process for all wall sections to ensure secure installation.



END WALL ANGLE PLATE CONNECTION



ISO VIEW PLATE PLACEMENT

JOINT SEALING

StormVault systems are designed to be soil-tight using a polymer wrap. All exterior joints between adjacent modules, slabs, and end walls are sealed using a preformed, cold applied, self-adhering, polymer joint wrap conforming to ASTM E-1745, C-877, C-990, and AASHTO M198 Type B specifications.

1. **Preparation:** Ensure the area along all vertical and horizontal seams between modules are free of debris and other materials that could interfere with the adhesion of the polymer wrap/ joint tape.
2. **Application:** Seal all joints between modules, slabs, and wall panels on the exterior top and side surfaces. The joint wrap should span the joint evenly on both sides. In cases where modules are misaligned such that the space between modules exceeds 3/4” but is less than 2” use a double layer of polymer joint wrap.
3. **Note:** Contact Jensen Infrastructure if the space between modules exceeds 2”.

SOIL-TIGHT

By following the above installation process including the proper application of butyl-rubber and polymer joint sealing wrap the StormVault system will be soil-tight. Additional measures can be taken to minimize the migration of fine particulates into the system by wrapping the entire assembly in a non-woven geofabric. Contact Jensen Infrastructure for more information.

WATER-TIGHT

There are various methods to make a system water-tight and vary per project details. Generally, an impervious liner can be wrapped below and up the sides of the system to make it watertight. For details on this application please refer to the project specific submittal package and contact a Jensen Infrastructure representative for more information.

PIPE CONNECTIONS

Pipe connections to the StormVault system will vary depending on the specific system type being installed. Connections may be either silt-tight or water-tight, based on the project’s requirements. Concrete components requiring pipe connections will be clearly identified in the Shop Drawings and Project Plans. The contractor is responsible for verifying that the pipe connection locations and elevations align with the specifications shown on the plans. In most cases, StormVault components are pre-formed with pipe openings sized to accommodate the specified pipe type and diameter. However, in some instances, pipe openings may need to be field-cored to meet project-specific conditions.

1. **Soil-Tight Connections:** Silt-tight pipe connections are suitable for infiltration systems and certain detention systems. These connections involve sealing the pipe to the concrete module or wall panel using grout. The grouted connection should be installed in accordance with the Project Plans, with the pipe set flush or slightly protruding from the concrete surface. Only non-shrink grout conforming to project specifications should be used to ensure a durable and effective seal.
2. **Watertight Connections:** Watertight pipe connections are appropriate for both infiltration and detention systems. These connections utilize a rubber boot that seals tightly around the pipe and to the interior surface of the concrete opening in the module or wall panel. The installation of the

rubber boot should follow the detailed instructions provided below. Pipe openings must be properly sized to accommodate the specified pipe sizes and materials. The seal should be achieved using a resilient connector that conforms to ASTM C923, C1478, or F251 standards.

3. **Note:** An expanding water stop on the concrete surface of the module or wall opening may also be used prior to grouting for a more water resistant grouted connection.
4. **Note**: Pipe connections at the top of the system may be postponed until the backfill reaches the level of the pipes to simplify the backfilling process.



Grouted Pipe Connection



Rubber Boot Connection

GROUTING DETAILS

Only non-shrink grout that conforms with ASTM C107 should be used. A fortifying bonding adhesive can be used to improve set up time, workability, and adhesion.

1. **Pipe Connections:** Only non-shrink grout that conforms with ASTM C107 should be used. A fortifying bonding adhesive can be used to improve set up time, workability, and adhesion. The pipe must be grouted from both the inner and outer sides of the concrete wall in which the pipe is placed into.
2. **Large Floor Gaps:** Any gaps greater than 1-inch inch can also be filled with non-shrink grout.
3. **Lifting Pockets:** All lifting pockets on the floor section should be filled and leveled with non-shrink grout. The metal bar in the lifting pockets is connected to the internal rebar of the precast rebar reinforced concrete component. To prevent long-term corrosion, the pockets shall be filled and sealed with grout.



BACKFILL

Once all modules and wall panels have been installed and sealed, and all pipe connections have been completed, the system is ready for backfilling. Note: Pipe connections at the top of the system may be postponed until the backfill reaches the level of the pipes to simplify the backfilling process.

The backfill material for a StormVault infiltration system should consist of borrow material that meets ASTM D2487 group GP or SP standards. These materials are typically washed granular aggregates, such as ¾-inch crushed rock or washed sand.

Excavated or borrowed material with appropriate moisture content should be placed around the system in controlled layers to ensure uniform compaction density throughout the backfill. The backfill should be applied evenly on all sides of the system, with each layer compacted thoroughly using mechanical tampers or rammers. Density tests should be conducted as needed to verify compliance with the compaction requirements outlined in the Geotechnical Report.

Once backfilling reaches the top of the StormVault system and access structures have been installed, the final fill material should be placed and compacted. The selection of final fill material should align with the Project Plans and Specifications, as well as the recommendations of the Geotechnical Engineer.

For a StormVault detention system, the backfill material should be composed of native material or borrow that complies with ASTM D2487 standards, excluding groups OL, CH, MH, OH, and PT. Excavated material that meets these requirements may be used for detention system bedding.

FINAL FILL

Once backfilling has been completed up to the top of the StormVault system and access structures have been installed, the final fill material should be placed and compacted. The selection of final fill material should align with the Project Plans and Specifications, as well as the recommendations of the Geotechnical Engineer.

For a StormVault detention system, the backfill material should consist of native material or borrow that meets ASTM D2487 standards, excluding groups OL, CH, MH, OH, and PT. Excavated material that complies with these requirements may be used for detention system bedding.

Special care should be taken when compacting near the polymer sealing tape seal in order to prevent disruption of the seal.

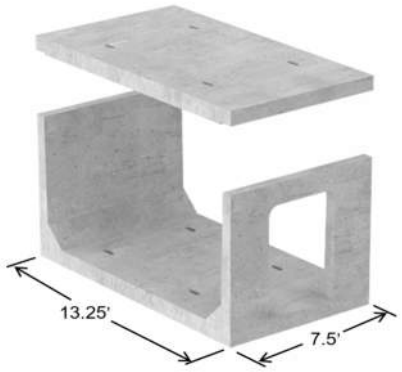
The movement of construction machinery over the stormwater storage system at any phase of construction is at the Contractor's risk. Any damaged components must be removed and replaced. All equipment utilized during construction should adhere to a maximum load of HL93 Truck plus HS20 per AASHTO - Standard Specifications for Highway Bridges, 17th Edition - 2002. No permissible equipment should operate over the system without a minimum of 12 inches of structural cover:

1. **Load Considerations**: The unit is designed to withstand HL93 truck loading (including HS20 standards). Some equipment with tandem wheels may pass under HL93 loading. Verify equipment compatibility before operation.

2. **Minimum Cover Depth**: Maintain a minimum of 2 feet of cover over the unit during top fill and post-

installation to ensure safe passage of heavy equipment, unless the system is specifically designed for shallow bury.

3. **Compaction Guidelines**: Compaction is permitted with 2 feet of cover. If asphalt paving is planned, the cover may be reduced to 18 inches. For compaction with 12 inches of cover, use only approved equipment, such as a sheepsfoot compactor, to avoid overloading the unit.



Ensure all equipment and compaction methods comply with these specifications to prevent damage and ensure system integrity.

WEIGHTS & DIMENSIONS

Table 1 below displays the weight and dimensions of standard StormVault modules and component units, excluding openings or custom modifications. Each module has uniform measurements of 13.25 feet in width and 7.5 feet in length.

Single Vault

Total Inside Height (ft)	Total Outside Height (ft)[1]	Top Module Height (ft)	Bottom Module Height (ft)	Bottom Exterior Module Weight (lbs)	Bottom Interior Module Weight (lbs)	Top Slab Weight (lbs)	Base Slab Weight (lbs)	Bridge Slab Weight (lbs)	Module End Wall Weight (lbs)	Bridge Slab End Wall Weight (lbs)
3	4.5	-	3	14,994	13,829	11,064	7,526	7,502	7,022	5,929
4	5.5	-	4	15,955	14,498	11,064	7,526	7,502	8,602	7,115
5	6.5	-	5	16,881	15,142	11,064	7,526	7,502	10,188	8,305
6	7.5	-	6	17,771	15,761	11,064	7,526	7,502	11,792	9,494
7	8.5	-	7	18,624	16,335	11,064	7,526	7,502	13,361	10,684

1. Add 0.75 ft to total outside height to the bridge slab sections profile as the bridge slabs sit above the module top.

Double Vault

Total Inside Height (ft)	Total Outside Height (ft)[1]	Top Module Height (ft)	Bottom Module Height (ft)	Bottom Exterior Module Weight (lbs)	Bottom Interior Module Weight (lbs)	Top Exterior Module Weight (lbs)	Top Interior Module Weight (lbs)	Base Slab Weight (lbs)	Bridge Slab Weight (lbs)	Module End Wall Weight (lbs)	Bridge Slab End Wall Weight (lbs)
8	9.5	2	6	17,780	15,770	13,874	13,874	7,526	7,502	7,412	11,874
9	10.5	3	6	17,780	15,770	14,857	14,857	7,526	7,502	8,206	13,064
10	11.5	4	6	17,780	15,770	15,804	15,804	7,526	7,502	8,999	14,253
11	12.5	5	6	17,780	15,770	16,714	16,714	7,526	7,502	9,792	15,443
12	13.5	6	6	17,780	15,770	17,588	17,588	7,526	7,502	10,602	16,633

1. Add 0.75 ft to total outside height to the bridge slab sections profile as the bridge slabs sit above the module top.
2. End walls come in various heights, lengths, and thicknesses. For specific weight details, please reach out to your Jensen Infrastructure representative.

VISUAL DETAILED INSTALLATION INSTRUCTIONS



1. Excavation

Perform appropriate excavation based on project specific plans and elevations. Plan for sufficient over-excavation or shoring along with access for heavy equipment if applicable. Use a laser level for proper grading (level or up to 1% slope).

Subgrade, subbase, and base preparation will be in accordance with project specifications and any available geotechnical report.



2. Bedding

Use appropriate equipment such as a laser level to ensure the following. Compaction and grading to 1/4 inch of the plan elevation. Infiltration systems require washed granular materials like 3/4-inch rock or sand, while detention systems allow a broader range of materials. Bedding must be at least 6 inches thick, extend 12 inches beyond the system, and be compacted to at least 90% of maximum dry density. When open-graded materials are used, they must be separated with non-woven geotextile fabric.



3. Alignment & Setting Prep

It is recommended that guidelines should be drawn on the bedding material with a laser level in combination with a chalk line and/or spray paint. Specifically, guidelines should be drawn for the first row of base slabs set, to ensure proper installation specifications.



4. Rigging and Offloading

Select and use properly sized rigging and lifting equipment to hoist and position StormVault components. Rigging design must be handled by a qualified professional. Contact Jensen Precast for details on lifting weights and project-specific lifting connection equipment. Moving, dragging, or sliding sections with excavation equipment is not allowed.



5. Placement of First Component

Place the base slab on the prepared bedding, ensuring it is level and aligned. **This is the most important part of the installation process**. Exact and precise position and alignment of this module will predicate the position of all other modules and final position of the assembly. Again, the see sequence plan should be properly executed.



6. Subsequent Base Component Placement

After it is verified that the first piece is set properly (level & aligned) set each adjacent piece following the same procedure. If issues are encountered reference the “Issues” table on page 11 of this document for additional guidance. Ensure all components are properly aligned with all adjacent pieces.



7. Top Slabs or Top Modules Placement

After properly placing the sealant, set the top slab or top module onto each bottom module as specified in the installation sequence document. Precise, symmetrical alignment of the top slab, bridge, or module is essential for a successful installation. The outer dimensions of the top slabs are identical to those of the bottom modules on all four sides, so ensure that all exterior walls are flush and free of overlaps or surface misalignments. Each StormVault component should be carefully lowered into place and guided by hand using lead lines and appropriate safety equipment.



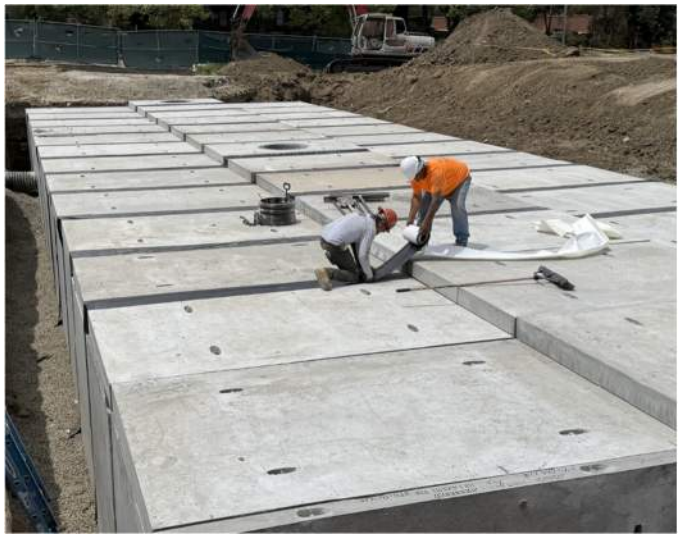
8. Bridge Slab Placement

After properly applying the sealant, lift and set the bridge over each span between modules and above the base slabs as outlined in the installation sequence document on page 12. Precise, symmetrical alignment of the bridge—with even spacing and alignment over the open span—is critical for a successful installation. The amount of overlap should be the same on both the right and left side. Bridge slabs should be carefully lowered into place and guided by hand using lead lines and appropriate safety equipment.



9. End Wall Placement

After verifying all modules and slabs are in place, begin installing end walls from one corner to the other for proper alignment. Carefully lower each StormVault end wall using lead lines and safety gear. Secure each end wall with supplied L-brackets, attaching them to adjacent modules. Drill through the bracket into the module using a 9/16" bit, then insert and tighten a ½" x 3" Tapcon screw until flush. Repeat for all sections to ensure stability.



10. Joint Sealing

StormVault systems use a self-adhering polymer wrap to create soil-tight seals at all exterior joints, meeting ASTM and AASHTO standards. Clean all vertical and horizontal seams to ensure proper adhesion. Apply wrap evenly across joints on top and side surfaces. For gaps over 1" but under 2", use a double layer of wrap. If space between modules exceeds 2”, contact your Jensen Infrastructure representative.



11. Pipe Connections & Grouting

StormVault pipe connections vary by system type and may be silt-tight or water-tight, depending on project needs. Connection points are shown in the Shop Drawings and must be verified by the Contractor for correct location and elevation. Most components come with pre-formed pipe openings, but some may require field coring to meet specific site conditions.

Please remember to grout all lifting pockets in the floor of the StormVault to prevent corrosion.



12. Backfill and Final Fill

Begin backfilling after installation is complete. Place material in even, compacted layers using mechanical tampers or rammers. Verify compaction with density tests as needed. After reaching the top of the system and installing access structures, place and compact final fill per Project Plans and Geotechnical Engineer recommendations. Avoid disturbing polymer seals during compaction. Do not operate equipment over the system without 12" of structural cover; equipment must meet HS20 load limits. Remove L-brackets before placing final fill.

Take the next step.

Talk to a Jensen stormwater expert to find the best solution for your project.

Contact Us

Connect with our team to discuss your project needs and get expert guidance.

Request a Lunch & Learn

Schedule an educational session for your team on detention, treatment, and biofiltration solutions.

Contact Information

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About Jensen Infrastructure

Jensen Infrastructure is a second-generation, family-run business that's been helping build America's infrastructure since 1968. We bring deep engineering expertise, multi-material capabilities, and personal support to every project – so you get the right solution delivered by a team that stands behind it.

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