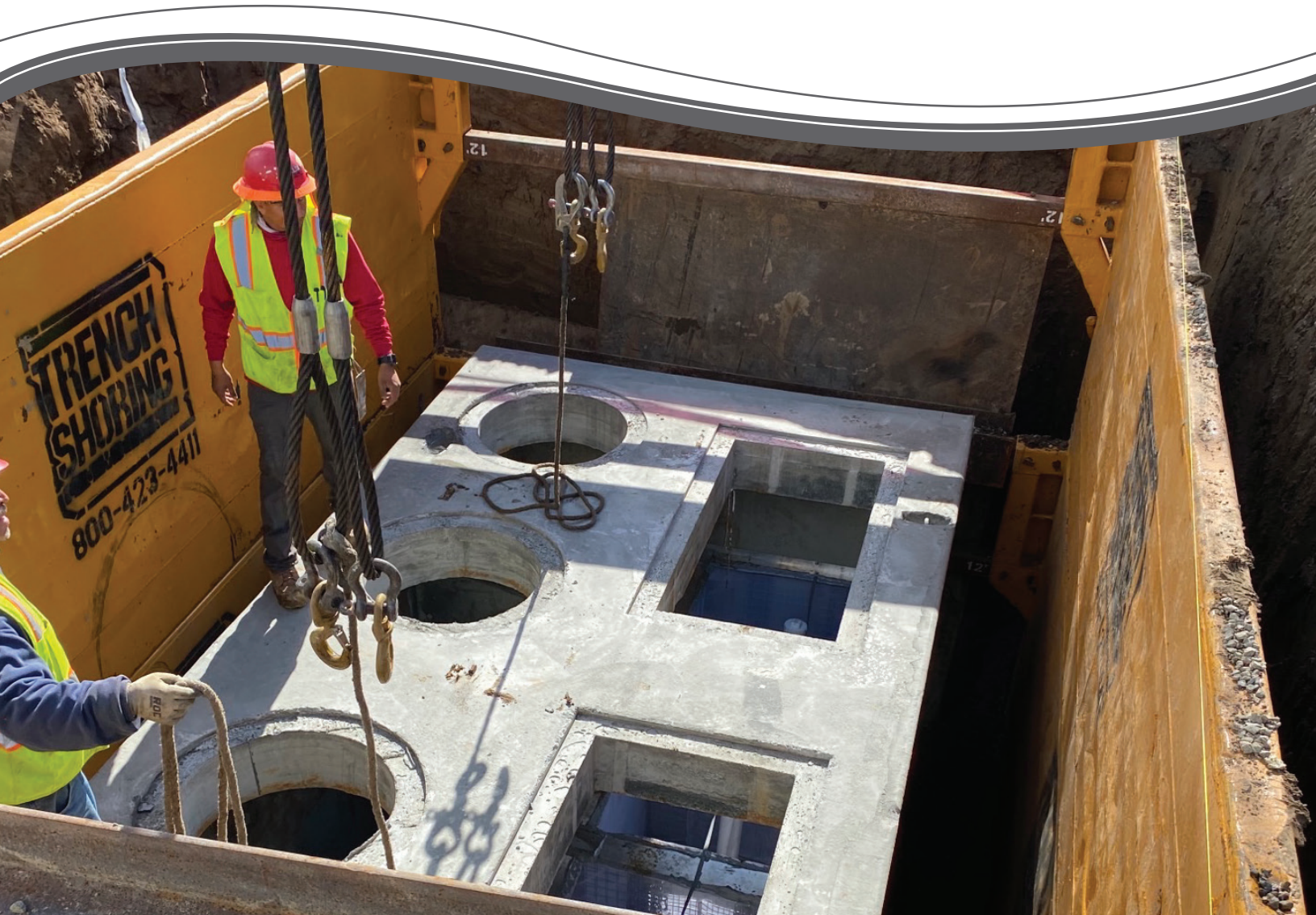


Modular Wetlands[®] Linear Vault Installation Manual for Underground Units



OVERVIEW

This installation guide is for the vaults containing the Underground variation of the Modular Wetlands Linear (MWL). Please refer to the separate installation guide for the Open Planter variations of the Modular Wetlands Linear. Read all warning and safety instructions prior to rigging and installing the vault. The Contractor is responsible for supplying all cranes and rigging equipment required for installation. The Contractor is also responsible for all pipe grouting and system pre-activation requirements.



WARNING

Fall protection may be required. Great care must be taken while transporting and installing the vault to ensure the vertical underdrains of the system remain perfectly centered and level. 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 MWL internals. The MWL internals may be damaged under high impact loads. This type of activity voids all warranties.

SAFETY NOTICE AND PERSONAL SAFETY EQUIPMENT

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, 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 Contech Engineered Solutions.



Fall Protection Equipment



Safety Boots



Gloves



Hard Hat



Eye Protection



Ear Protection



Ventilation and Respiratory Protection

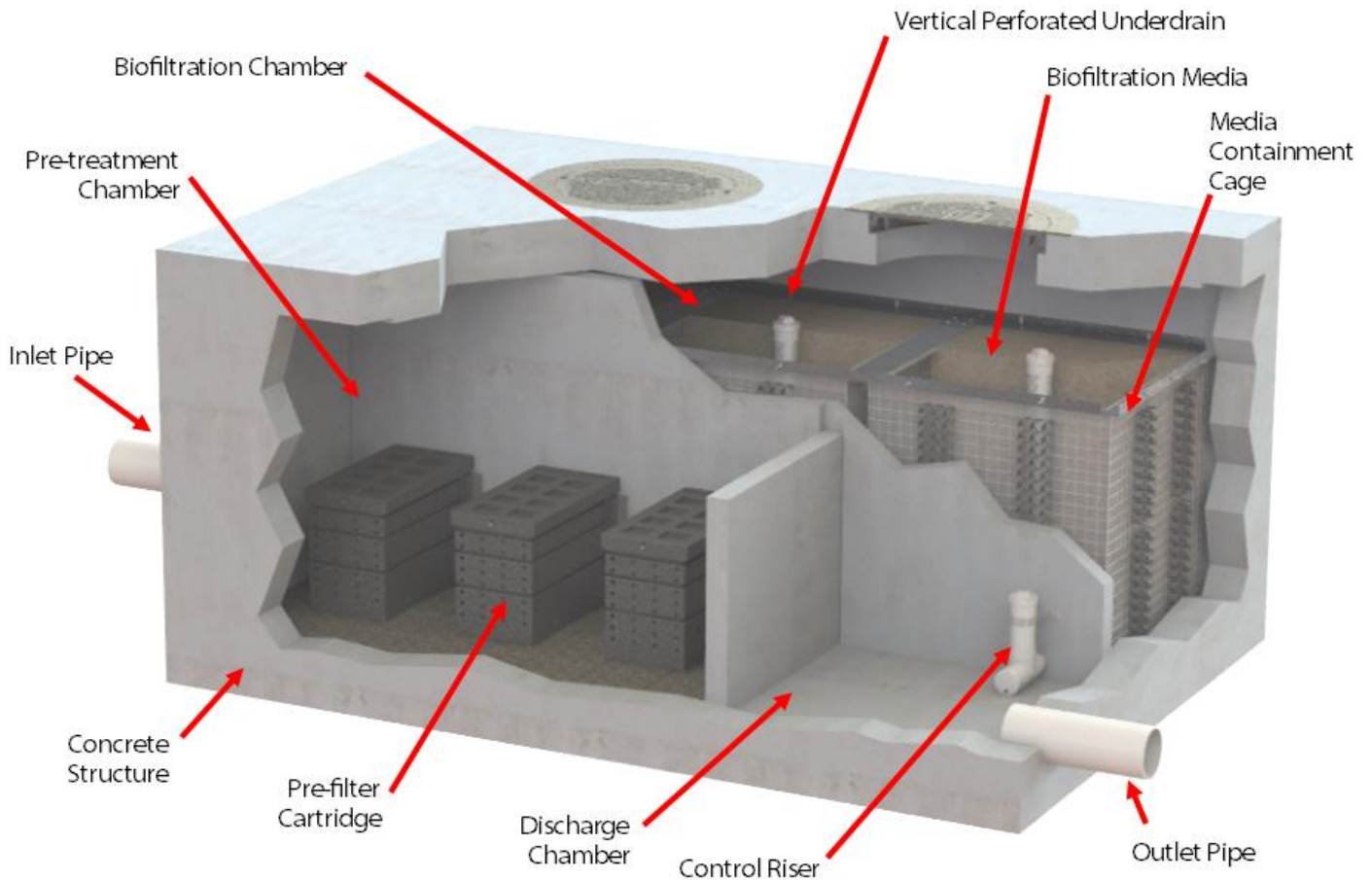


Maintenance and Protection of Traffic Plan

MODULAR WETLANDS LINEAR COMPONENTS LIST

The MWL will typically arrive on-site with the internals pre-installed, secured, and sealed to a precast structure. Some taller MWL vaults may require onsite assembly of internals. Due to weight restrictions, biofiltration media for MWL ships separate and needs to be installed on site after the system has been installed in the ground. The MWL comes in multiple sizes and configurations, including side-by-side or end-to-end layouts. See shop drawings (plans) for project specific details.

The standard MWL is comprised of the following components:



CONFINED SPACE ENTRY

Confined space entry may be required. Contractor to obtain 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 always proceed safely.

UNLOADING AND HANDLING

Any unloading/handling guidance of the MWL precast structure is beyond the scope of work of Contech but can be obtained from the precaster. Contact Contech to obtain precaster contact information. Handle MWL 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, immediately call Contech.

The Contractor is responsible for the inspection of all MWL 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 Contech 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 at 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 MWL, as well as provide a safe environment at the jobsite for the offloading and installation/assembly of the structure. Contech or the precast producer will provide the Contractor with the maximum pick 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 Contech.

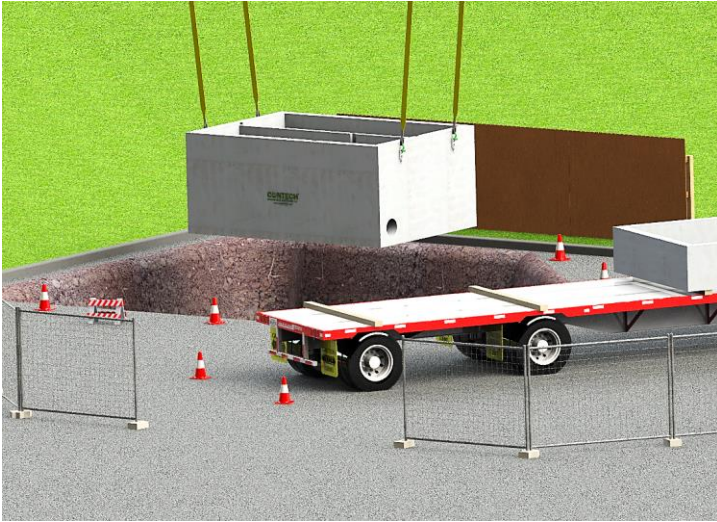
EXCAVATION SAFETY

Any site excavation and shoring are beyond the scope of work of Contech. **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.**

BASE PREPARATION

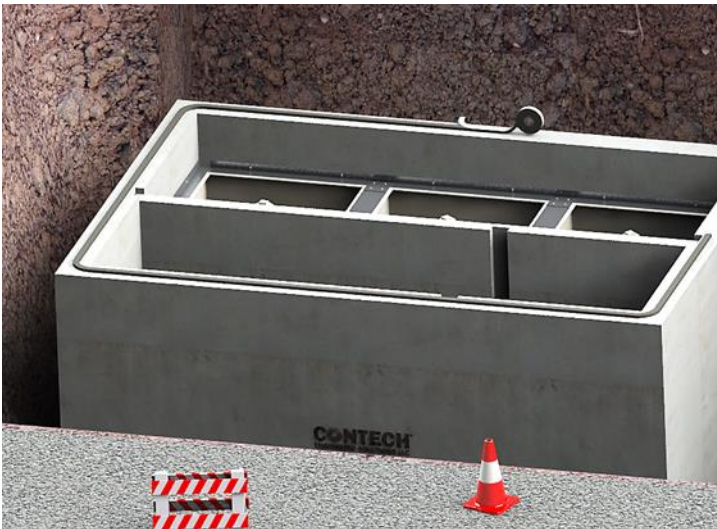
The MWL shall be placed on a compacted surface to ensure matching the final grade listed on the drawings. Compact undisturbed sub-grade materials to 95% of maximum density at +/- 2% of optimum moisture content prior to placement of crushed rock. Crushed rock base material shall be six-inch minimum layer of ¾-inch minus rock. Unsuitable material below sub-grade shall be replaced per site engineer's approval. The allowable amount of variation from corner to corner is 0.5%.

SETTING THE MODULAR WETLANDS LINEAR VAULT



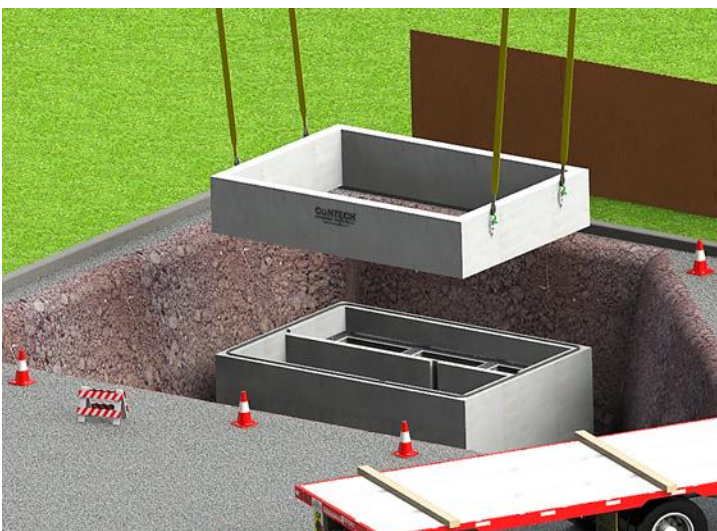
1. SETTING BASE SECTION

Before offloading, obtain a copy of the final approved shop drawings and site plan to verify all components are correctly placed and at the proper elevation. The Contractor is responsible for safely rigging and offloading the structure and associated components. Set the base section of the MWL vault on solid, level sub-grade. Ensure the inlet(s) and outlet are properly oriented. The system floor shall slope $\frac{1}{4}$ " maximum across the width and slope downstream 1 inch per 12 foot of length.



2. SEAL PRECAST SECTIONS

Place butyl mastic tape between each precast vault section to seal. Verify level and elevation of the base section before adding any additional precast riser sections.



3. RISER SECTIONS (IF APPLICABLE)

Set riser section(s), if needed, on the base section per approved shop drawings. If riser sections are not required, proceed to Step 4.



4. BIOFILTRATION MEDIA INSTALLATION

Biofiltration media will be provided in super sacks for easy installation. Each sack will weigh between 1,000 and 2,000 lbs. Media sacks must be stored in a dry, temperate environment prior to installation. To install media, first ensure that the chamber is fully clear of debris and the vertical riser pipes are centered and straight. A lifting apparatus (forklift, backhoe, boom truck, or other) is recommended to position the super sack over the biofiltration chamber. Add media in lifts to ensure that the riser pipes remain vertical. Do not let media free fall at a height greater than 3ft to prevent damage to pipes. Fill the media cage(s) up to the cleanout in the vertical standpipe.

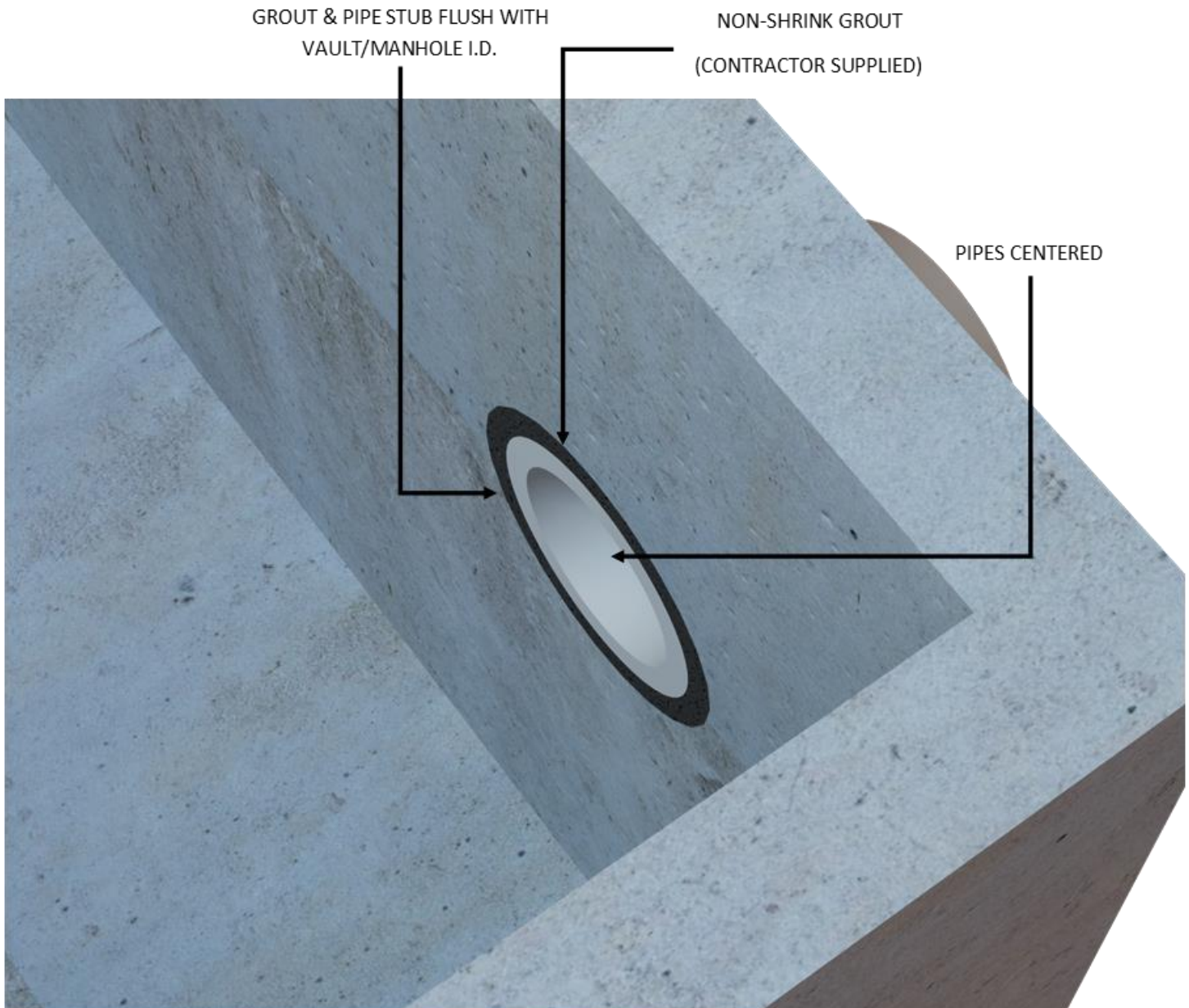


5. TOP SLAB

Set the Top Slab according to the approved shop drawings. Prior to setting the top slab, ensure butyl mastic tape has been applied to all joints. Proceed with closing and backfilling the system.

PIPE CONNECTIONS

Inlet pipe(s) and outlet pipe shall be stubbed in and connected to the system according to Engineer's requirements and specifications. The pipe material should be indicated on the site plan. Connect pipes in accordance with approved watertight boot connection, if applicable. Contractor to grout all inlet and outlet pipes flush with interior of vault per plan and specifications. Contractor to supply non-shrink grout. Inlet pipe(s) should be centered in the hole and the outlet pipe should be flush with the chamber floor.



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 of clearance should be provided between the ballast and the inlet/outlet pipes.

RISERS, COVERS, AND CLOSING THE SYSTEM

The MWL is delivered with the necessary risers and covers (if necessary) to bring the unit to grade. It is the contractor's responsibility to assemble the MWL per the plans and as directed by the Engineer.

- Place a layer of butyl mastic sealant between the top slab, riser sections, and riser rings
- The top slab should be oriented per the drawing with access openings positioned over steps (if provided)
- Place riser sections and riser rings with steps oriented as shown on plans
- Install frames and covers per plans

The contractor is responsible for sealing and making all joints, line entry, and exit points watertight.



BACKFILL

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

SYSTEM ACTIVATION

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

The contractor is responsible for keeping the MWL clean and free of construction debris and sediment prior to activation. This reduces the potential of a large rainfall/runoff event entering the pretreatment chamber and/or biofiltration chamber and prematurely contaminating the prefilter cartridges or wetland media during the project construction phase. Practices to protect the media include, but are not limited to, plugging the inlet pipe and diverting construction run off around the unit. Prior to requesting final activation, the contractor is responsible for completing the pre-activation items attached in the appendix. Final activation is performed ONLY by Contech authorized personnel. Please call 513-645-7770 to schedule your activation.



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DRAWINGS AND SPECIFICATIONS ARE AVAILABLE AT WWW.CONTECHES.COM

Modular Wetlands Linear Vault Install for Planters 2/26