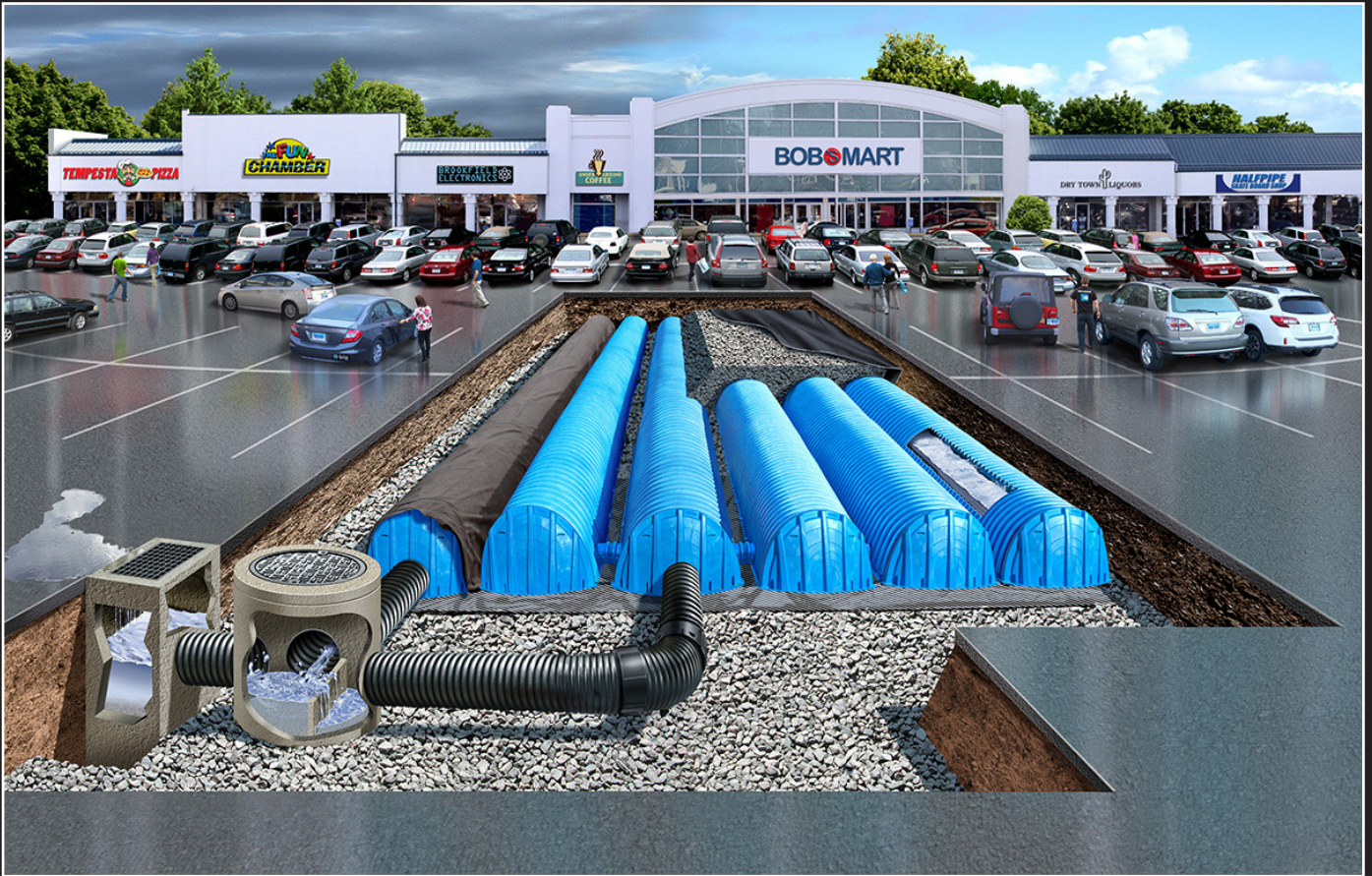
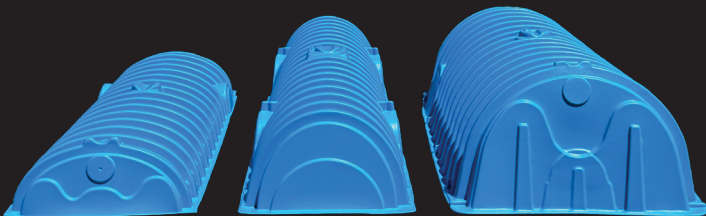


CONTACTOR® 100HD RECHARGER® 150XLHD & 280HD STORMWATER MANAGEMENT SOLUTIONS



INSTALLATION INSTRUCTIONS



RETENTION • DETENTION • INFILTRATION • WATER QUALITY





Published by

CULTEC

878 Federal Road
Brookfield, Connecticut 06804 USA
www.cultec.com

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Visit www.cultec.com/downloads.html for Product Downloads and CAD details.

Doc ID: CLT058 12-24

December 2024

You are using version CLT058 12-24 of our CULTEC Stormwater Installation Instructions for Contactor® Model 100HD, Recharger® Models 150XLHD & 280HD Stormwater Systems.

*These instructions are for single-layer traffic applications only. For multi-layer applications, contact CULTEC.
All illustrations and photos shown herein are examples of typical situations. Be sure to follow the engineer's drawings.
Actual designs may vary.*

Required Materials and Equipment

- Proper geotechnical soil evaluation by a qualified engineer or soil scientist to determine suitability of structural installation
- OSHA compliance
- CULTEC warning tape, or equivalent
- Assurances from local utilities that no underground gas, electrical or other potentially dangerous pipelines or conduits are already buried at the site
- Acceptable 3/4 – 2 inch washed, crushed stone as shown in Table 5, page 22. Cleanliness of stone to be verified by engineer.
- Acceptable fill material
- CULTEC No. 410™ non-woven geotextile or equivalent
- CULTEC AFAB-HPF woven geotextile or equivalent, as required
- All CULTEC chambers and accessories as specified in the engineer's plans including CULTEC No. 410™ non-woven geotextile, CULTEC StormFilter® and CULTEC AFAB-HPF woven geotextile, where applicable. Check CULTEC chambers for damage prior to installation. Do not use damaged CULTEC chambers. Contact your supplier immediately to report damage or packing list discrepancies.
- Reciprocating saw or router
- Stone bucket
- Stone conveyor and/or tracked excavator
- Transit or laser level measuring device
- Compaction equipment

Requirements for CULTEC Chamber System Installations

- **CULTEC systems must be designed and installed in accordance with CULTEC's minimum requirements. Failure to do so will void the limited warranty. To request a copy and submit the CULTEC limited warranty, call CULTEC at 203-775-4416 or visit www.cultec.com.**
- Installing contractors are expected to comprehend and use the most current installation instructions prior to beginning a system installation. If there is any question as to whether these are the most current instructions, contact CULTEC at (203)775-4416 or visit www.cultec.com.
- Contact CULTEC at least thirty days prior to system installation to arrange a pre-construction meeting.
- All CULTEC system designs must be certified by a registered professional engineer.
- Use these installation instructions as a guideline only. Actual design may vary. Refer to approved construction drawings for job-specific details. Be sure to follow the engineer's drawings as your primary guide.
- System cover/backfill requirements will vary based on installation type.
- Any discrepancies with the system sub-grade soil's bearing capacity must be reported to the design engineer.
- Non-woven geotextile must be used as specified in the engineer's drawings.
- Erosion and sediment-control measures must meet local codes and the design engineer's specifications throughout the entire site construction process.
- **Responsibility for preventing vehicles that exceed CULTEC's requirements from traveling across or parking over the chamber system lies solely with the contractor throughout the entire site construction process. The placement of warning tape, temporary fencing, and/or appropriately located signs is highly recommended. Imprinted warning tape is available from CULTEC. For Acceptable Vehicle Load information, refer to Table 1 on page 17.**

CULTEC Chamber Specification Information

	Contactor 100HD Chamber	Recharger 150XLHD Chamber	Recharger 280HD Chamber
Size (L x W x H)	8' x 36" x 12.5"	11' x 33" x 18.5"	8' x 47" x 26.5"
Installed Length	7.5'	10.25'	7'
Length Adjustment per Row	0.5'	0.75'	1'
Chamber Storage	1.87 ft ³ /ft 14.00 ft ³ /unit	2.65 ft ³ /ft 27.16 ft ³ /unit	6.079 ft ³ /ft 42.55 ft ³ /unit
Minimum Installed Storage	3.842 ft ³ /ft 28.81 ft ³ /unit	4.89 ft ³ /ft 50.17 ft ³ /unit	9.21 ft ³ /ft 64.46 ft ³ /unit
Minimum Area Required	25 ft ²	33.31 ft ²	30.33 ft ²
Minimum Center-to-Center Spacing	3.33'	3.25'	4.33'
Minimum Spacing Between Chambers	4"	6"	5"
Minimum Cover Requirements	12" (Paved) 16" (Unpaved)	14" (Paved) 16" (Unpaved)	14" (Paved) 16" (Unpaved)
Maximum Allowable Cover	10'	12'	12'
Maximum Allowable O.D. in End Wall	10" HDPE, 10" PVC	12" HDPE, 15" PVC	18" HDPE, 18" PVC
Maximum Allowable O.D. in Side Portal	6" HDPE, 6" PVC	10" HDPE, 10" PVC	10" HDPE, 12" PVC
Compatible Feed Connector	HVLV SFCx2 Feed Connector	HVLV FC-24 Feed Connector	HVLV FC-24 Feed Connector

CULTEC HVLV Feed Connector Specification Information

	HVLV SFCx2 Feed Connector	HVLV FC-24 Feed Connector
Length	24.2"	24.2"
Installed Length (exposed)	4"	For Recharger 150XLHD: 6" typ. For Recharger 280HD: 5" typ.
Width	12"	16"
Height	7.6"	12"
Chamber Storage Capacity	0.29 ft ³ /ft	0.91 ft ³ /ft
Pipe Comparison	Greater flow capacity than 6" pipe	Greater flow capacity than 12" pipe
Compatible Models	Contactor 100HD	Recharger 150XLHD, Recharger 280HD

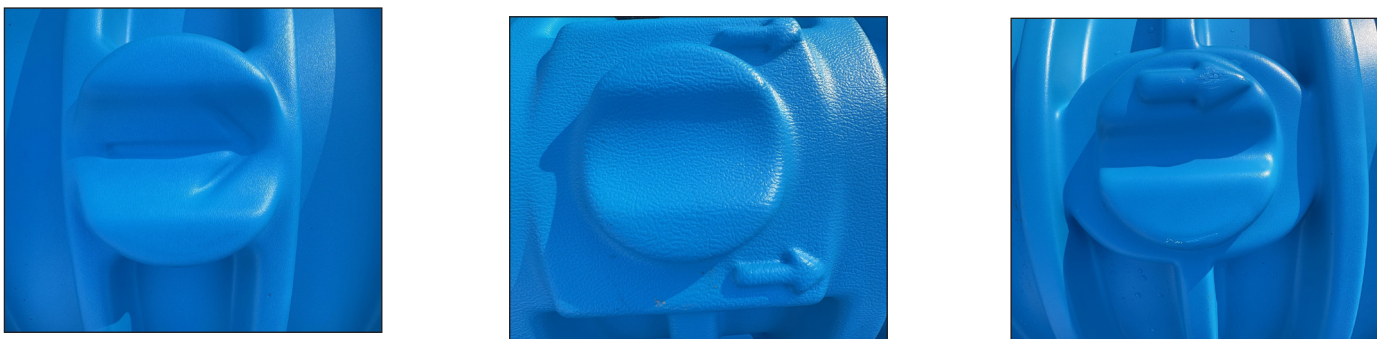
Site Preparation and Excavation

- Excavate and level the area per engineer's drawings. Refer to plan view and cross-section details and excavate bed to accommodate chambers and manifold system. Be sure to allow for a minimum 12 inch (305 mm) stone border around the perimeter of the system and unforeseen overages in your excavation calculations.
- Remove any standing water and maintain positive drainage of the site throughout the installation. Dewatering procedures must be used if necessary.
- Prepare the sub-grade soil for the chamber bed as specified by the engineer's drawings.
- Place CULTEC No. 410™ non-woven geotextile (or equivalent — see Table 4, page 22) on the excavated bed bottom and perimeter sidewalls as specified by the engineer's drawings. CULTEC No. 410 non-woven geotextile is required on the sides and over the top of the system. It is also recommended on the system bottom. Overlap the geotextile by at least 24 inches (610 mm) where the fabric edges meet.
- Disperse a level base of 3/4 to 2 inch (19 - 51 mm) diameter washed, crushed stone over the entire area of the bed bottom (see Table 6, page 22 for stone requirements). Refer to the engineer's drawings for sub-grade soil preparation and required stone foundation thickness.
- Compact the stone base to achieve a flat, level surface. **Vibratory rollers may only be used on the stone base prior to the installation of chambers. Use of vibratory rollers is strictly prohibited on all other backfill layers.**



Chamber Information for Contactor 100HD, Recharger® 150XLHD, & 280HD

Directional arrows located on the top of the chamber point towards the Small Rib End.



Shown: Examples of directional arrows.

CULTEC Contactor® 100HD, Recharger 150XLHD & 280HD Chambers

The Contactor 100HD and Recharger models 150XLHD & 280HD chambers come in four model types: Stand Alone, Starter, Intermediate, and End. One rib is dimensionally smaller to be able to interlock with additional units. A directional arrow points towards the small rib end. Typically, the build of the row begins with the large rib end facing you.



Shown: Contactor 100HD, Recharger 150XLHD, & Recharger 280HD Chambers.

Typical Interlock Method



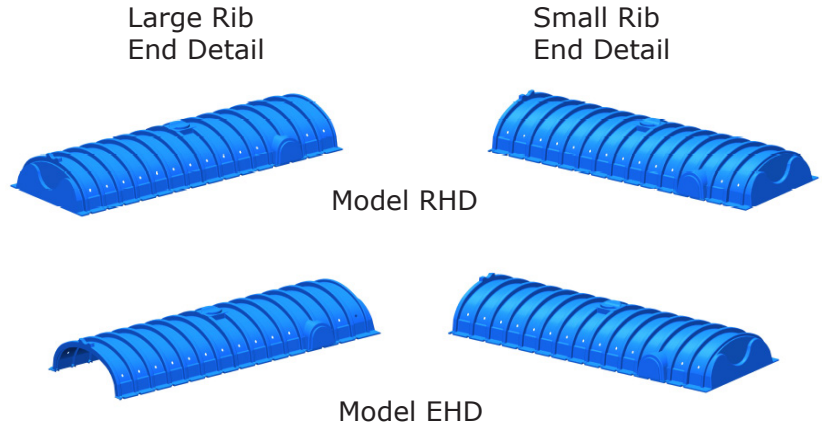
Directional arrows located on the top of the chamber point towards the Small Rib End. The open end of the next chamber overlaps the small rib end of the preceding chamber.

End Detail Information for CULTEC Contactor® Model 100HD

Directional arrows located on the top of the chamber point towards the Small Rib End.

Model RHD is a **starter / stand alone** unit with two full end walls. They are used to start lines or can be used singularly. They may also be trimmed into model type EHD.

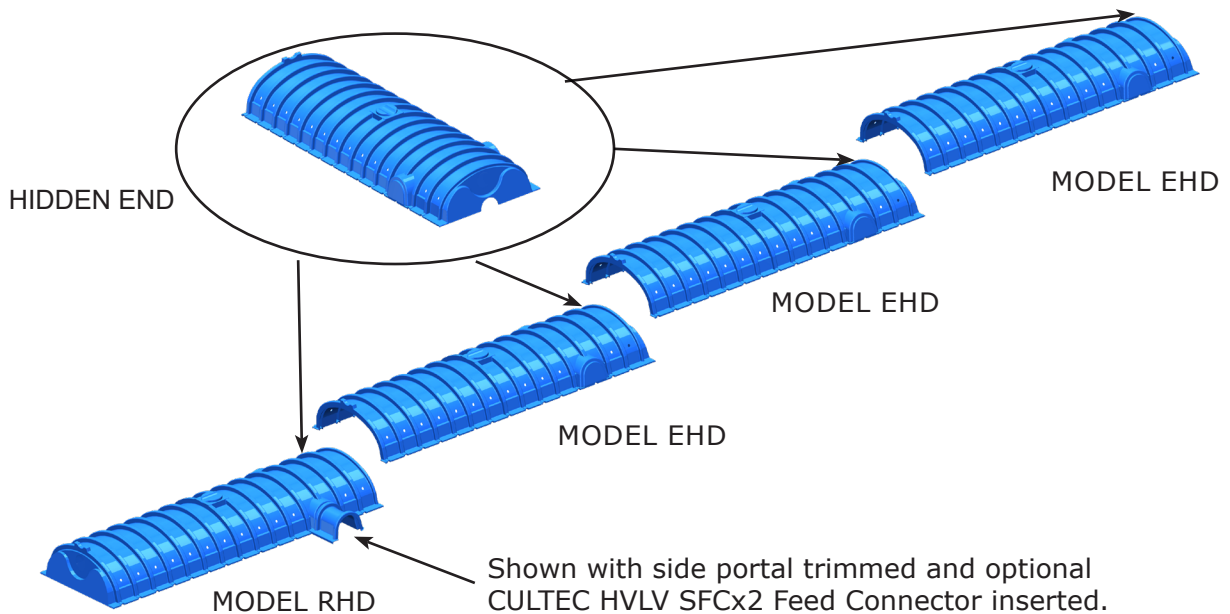
Model EHD is a **middle / end unit** with one closed end wall and one open end. They are used to continue lines and also used to end a line.



Typical Installation Method for CULTEC Contactor® Model 100HD

Interlock Model RHD to EHD using the patented overlapping rib connection.

- Start each row with a Model RHD.
- Use Model EHD to continue the length of your row.
- End your row by using a Model EHD.



End Detail Information for CULTEC Recharger® Models 150XLHD and 280HD

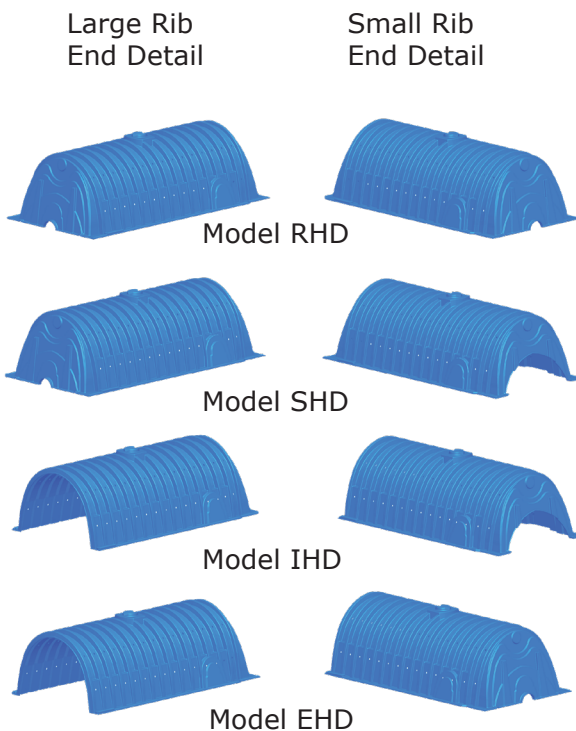
Directional arrows located on the top of the chamber point towards the Small Rib End.

Model RHD is a **stand alone** unit with two fully closed end walls. They are used when a single unit is required. They may also be trimmed into model types SHD, IHD, or EHD.

Model SHD is a **starter** unit with one closed end wall and one partially open end wall. They are used to start a chamber row.

Model IHD is an **intermediate** unit with one fully open end and one partially open end wall. They are used to continue the length of a line of chambers.

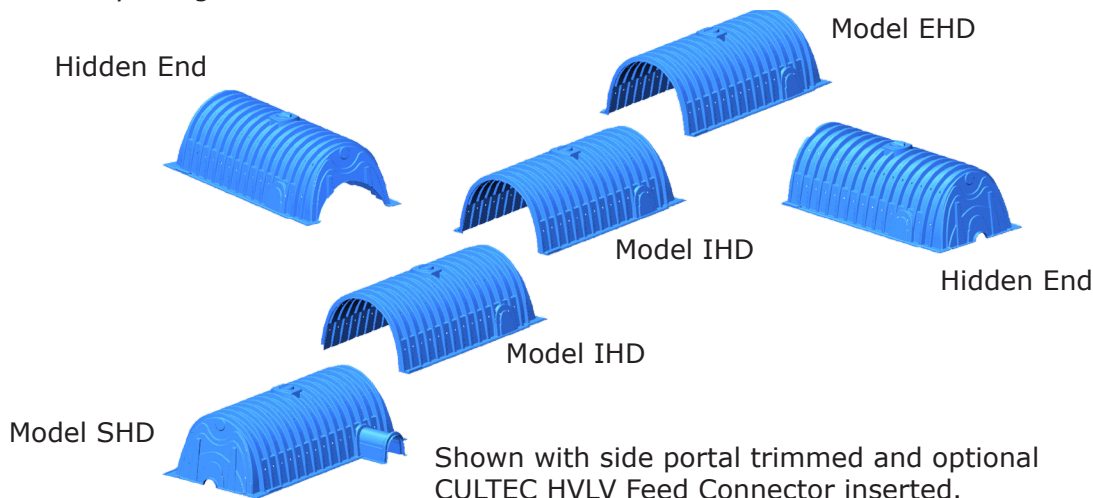
Model EHD is an **end unit** with one fully open end and one fully closed end wall. They are used to end a chamber run.



Typical Installation Method for CULTEC Recharger® Models 150XLHD and 280HD

Interlock Model SHD to IHD using the patented overlapping rib connection. Finish the row with Model EHD.

- Start each row with a Model SHD.
- Use Model IHD to continue the length of your row.
- End your row by using a Model EHD.



Chamber Preparation and Installation

CULTEC Contactor® and Recharger® chambers have the distinctive features of a fully formed end wall and over-lapping rib connection. CULTEC chamber ribs are dimensionally sized with an open large rib and a closed smaller rib to allow for an easy interlocking rib connection.

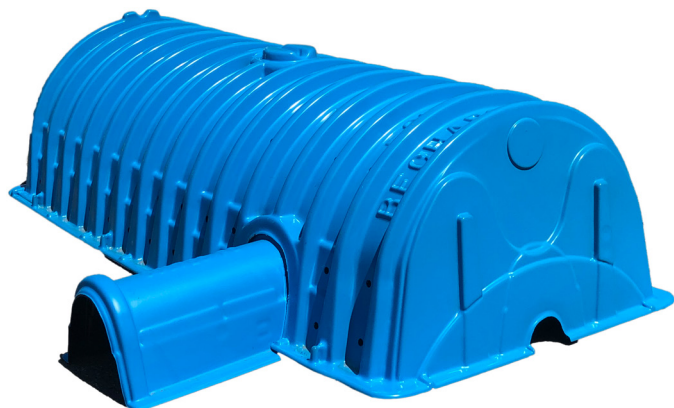
- Identify and group the different chamber types to ensure proper placement and usage as outlined on pages 7-8.
- Place one Starter Unit (Model S for Recharger® series, Model R for Contactor® series) as designed for each row of units to be installed. Directional arrows point towards the small rib end of the chamber.
- If using the side portal internal manifold feature, trim the side portal(s) according to guidelines located on the sidewall of the chamber, as required - see page 12. Insert one end of the HVLV Feed Connector into the trimmed portal to create the internal manifold. Refer to Installation of Manifold, page 10.
- Place middle chamber (Model I for Recharger® series, Model E for Contactor® series) so the directional arrow located in the center of the unit points downstream towards the end of the line. Overlap the large open end rib over the small rib of the preceding chamber's end wall, interlocking the chambers together - see page 7-8. When placing chambers, take care to maintain center-to-center separation requirements, measuring from the base of the chamber.
- To ease backfilling requirements, only install as many middle chambers as the stone-laying bucket or conveyor can reach.
- Place stone as outlined on page 14 taking care not to drop stone over the last rib to be overlapped.
- Continue chamber and stone placement using middle chambers (Model I for Recharger® series, Model E for Contactor® series) to extend the length of the row.
- Model E chamber is used to end the line.
- Prior to the placement of the next line of chambers, the level and alignment of the chamber units shall be checked and corrected, where needed.



Installation of Manifold

Utilize the side portals located on the chamber as an internal manifold in locations where indicated on the engineer's drawings. HVLV® Feed Connectors are inserted into the portals to promote flow. An additional external manifold is not required unless specified by the engineer's design.

- CULTEC AFAB-HPF woven geotextile is to be placed under all chambers utilizing the internal manifold feature and under all chambers accepting inlet/outlet pipe connections per engineer's drawings. If inserting a pipe 18" (450 mm)* diameter or larger into the CULTEC chamber, the use of CULTEC AFAB-HPF woven geotextile is recommended to prevent washout. See page 4 for Maximum Allowable O.D. in End Wall.
- Most installations are designed with the internal manifold located at the ends of the chamber bed. However, the side portal internal manifold feature allows for the manifold to be located at any point within the chamber run. Refer to system design for manifold location(s). Install chambers according to directional arrows located in the top center of the unit.
- Using a reciprocating saw or router, trim the sidewall portals of the units that are to receive the HVLV Feed Connectors. Feed connectors may be placed on any chamber requiring a manifold, as indicated by the engineer's drawings. See page 12.
- Place the HVLV Feed Connectors into the side portal of the chambers per engineer's drawings.
- Check for correct center-to-center spacing of chamber runs according to engineer's drawings before proceeding to next row.
- Insert inflow/outflow pipe(s) into end wall or side portal as detailed on engineer's drawings. See page 4 for maximum inlet sizes for end wall and side portals. There is no need to feed every row if utilizing the internal manifold feature.
- Maximum acceptable pipe sizes vary by chamber size.

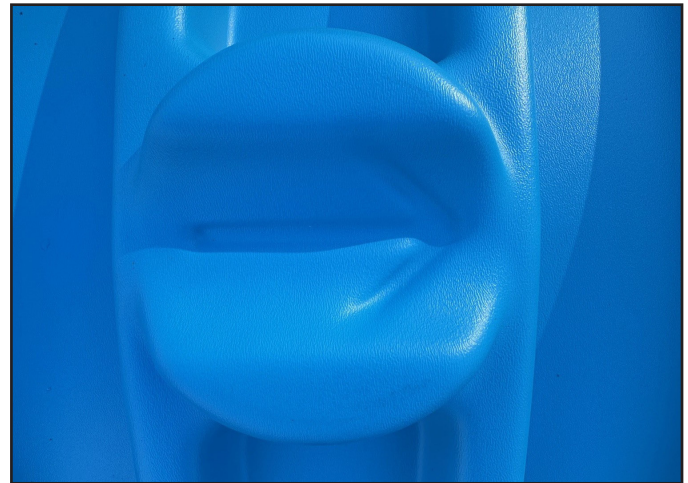


If manifold installation does not include CULTEC's side portal internal manifold, proceed according to the engineer's drawings for pipe manifold installation.

How to Trim the CULTEC Chamber to Accommodate Pipe on End Wall

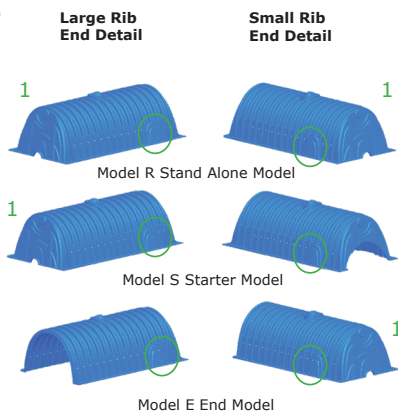
When using a conventional pipe manifold or inlet / outlet pipes, the contractor is required to trim the CULTEC Chamber on site. Here are some quick steps to ensure a successful outcome:

- Lay out chambers according to engineered plans.
- Directional arrows located at the top of the chamber point towards the small rib end.
- Line up the pipe on the chamber end wall to the designated pipe elevation as detailed on the engineer's drawing.
- Using a grease pen, outline the pipe on the end wall of the CULTEC chamber.
- Drill a hole on the chamber end wall large enough to accommodate a saw bit.
- Following the grease pen outline, use a reciprocating saw to trim out the opening to accommodate the pipe. Trimming should be within 1/4" (6 mm) tolerance of pipe O.D.
- Insert the pipe or fitting a minimum of 8" into the chamber. This is not required to be a watertight connection. Maximum inlet pipe sizes:
 - Contactor 100HD: 10" HDPE, 10" PVC
 - Recharger 150XLHD: 12" HDPE, 15" PVC
 - Recharger 280HD: 18" HDPE, 18" PVC
- Backfill as noted in the installation instructions and engineering details.



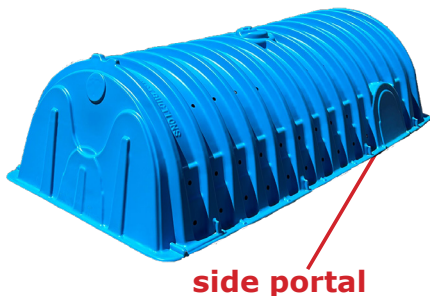
Trimming may only be performed on fully closed end walls (indicated by Number 1 in Fig. 1) or side portal areas (See green circles in Fig. 1 for side portal locations). Pipe may not be inserted into the sidewall of the chamber unless it is within the side portal trim lines. See page 11-12 for more information on trimming side portals.

Fig. 1

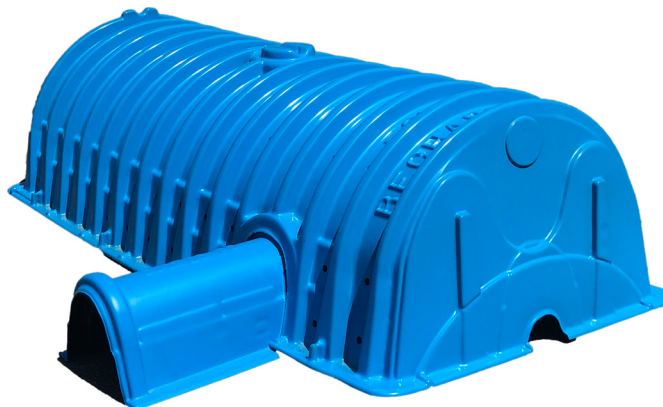
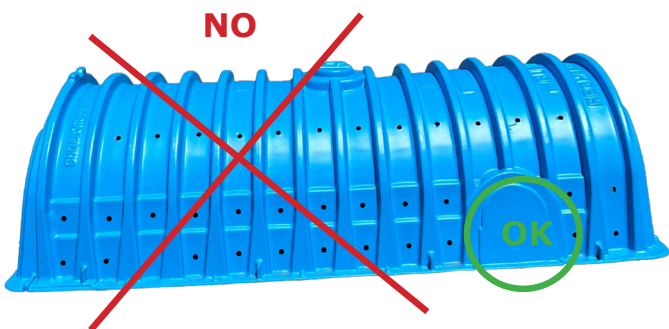


How to Trim the Side Portal to Accommodate HVLV Feed Connector for Internal Manifold

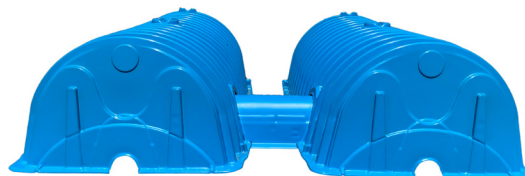
When using the side portal internal manifold feature, the contractor is required to trim the side portal of the CULTEC Chamber on site.



- Following the guides on the side portal, use a reciprocating saw to trim out the opening to accommodate the HVLV Feed Connector. Trimming should be within 1/4" (6 mm) tolerance of the HVLV Feed Connector to prevent soil intrusion.



- Trimming may only be performed on the side portal area. Side entry in any other location is unacceptable.
- Insert the HVLV Feed Connector a minimum of 8" (203 mm) into the chamber. This is not required to be a watertight connection.
- Maintain proper minimum separation between chamber rows.



Model	Compatible Feed Connector
Contactor 100HD	HVLV SFCx2 Feed Connector
Recharger 150XLHD	HVLV FC-24 Feed Connector
Recharger 280HD	HVLV FC-24 Feed Connector

How to Trim the Side Portal to Accommodate Pipe for Side Entry

When using the side portal feature as an inlet /outlet location, the contractor is required to trim the side portal of the CULTEC Chamber on site.



Line up the pipe on the chamber side portal to the designated pipe elevation as detailed on the engineer's drawing. Pipe outside diameter (O.D.) may not exceed those listed

- Using a grease pen, outline the pipe on the side portal of the CULTEC chamber. See Fig. 1 for acceptable trim area.
- Drill a hole on the chamber side portal large enough to accommodate a saw bit.
- Following the grease pen outline, use a reciprocating saw to trim out the opening to accommodate the pipe. Trimming should be within 1/4" (6 mm) tolerance of pipe O.D.
- Insert the pipe or fitting a minimum of 8" (203 mm) into the chamber. This is not required to be a watertight connection.
-

Fig. 1



- **Trimming may only be performed on the side portal area. Side entry in any other location is unacceptable.** **Shown left-to-right:** Guidelines to follow for correct trimming for SFCx2 and FC-24 portals when using pipe. Do not cut outside of the side portal area guides.

Model	Max. Allowable O.D. in Side Portal	
Contactor 100HD	6.9"	175 mm
Recharger 150XLHD	10.25"	260 mm
Recharger 280HD	12.25"	311 mm

Embedment Stone Backfill

Backfill using washed, crushed stone as specified in Table 3, page 19 and Table 6, page 22. To maintain row separation distance and prevent chamber displacement, slowly distribute stone on top of the center of the chamber crown so that stone trickles down and builds between chamber rows as required. Stone column differential should not exceed 12" (300 mm) between adjacent chamber rows or between chamber rows and perimeter.

Place the stone carefully over the centerline of the chamber crown. Embedment stone must only be placed by an excavator or telescoping conveyor boom. Placement of embedment stone with a bulldozer is not an acceptable method of installation and may cause damage to the chambers. Any chambers damaged using an unacceptable method of backfill are not covered under the CULTEC limited warranty.

Excavator-Placed Stone

Typically the most common method, excavator-placed stone is limited by the reach of the arm. To accommodate this issue with larger beds, it is common to prepare a bed by joining just a few chamber units at a time, then placing the stone and fabric before installing the next few units.

The excavator is usually operated within the excavation area. The excavator may work at grade level over recently placed chambers, provided coverage between the chambers and the excavator tracks meets the minimum requirements as shown in Table 1, page 17 and Table 2, page 18.

Telescoping Conveyor Boom Placement

With booms as much as 120-140 feet (36.6 - 42.7 meters) long, telescoping aggregate conveyors can greatly aid the process of stone placement.

Once secured, stone may be placed to surround the chambers and fill the perimeter areas. System cover/backfill requirements will vary based on CULTEC chamber model and engineer's design.

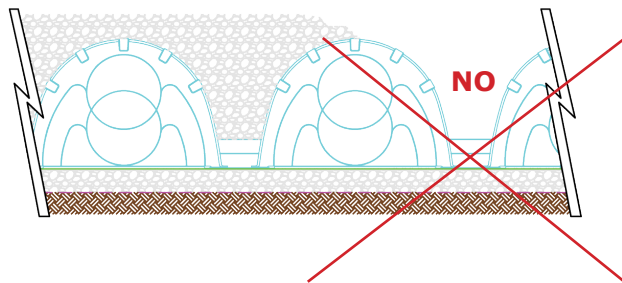


Do not allow equipment to drive over the chambers unless the minimum cover is in place. Use a warning tape (available from CULTEC) to restrict access.

Repeat steps until the last chamber is in place. Be certain to use the Model E to end the line of chambers as specified by the drawings.

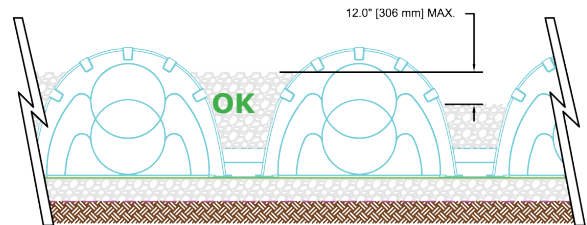
If a manifold system is designed on the back end of the chamber bed, follow manifold installation instructions as described previously.

Stone column height differential should never exceed 12 inches (306 mm) with adjacent chambers or between chamber rows and perimeter. Minimum depth of cover of properly compacted material must be met before allowing vehicles to drive over the bed. Avoid using large rocks and/or organic matter as backfill material. See Table 3, page 19 for acceptable cover materials, or contact the design engineer for approved fill types.



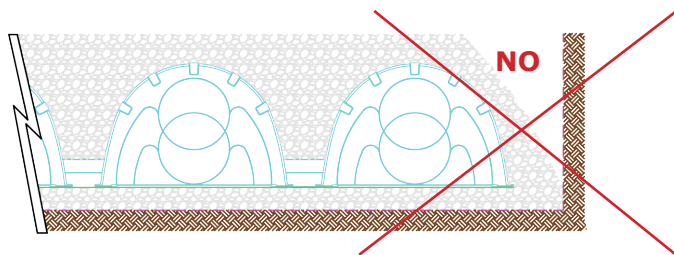
NOTE: CHAMBERS MUST BE BACKFILLED EVENLY.

UNEVEN BACKFILL - **INCORRECT INSTALLATION**



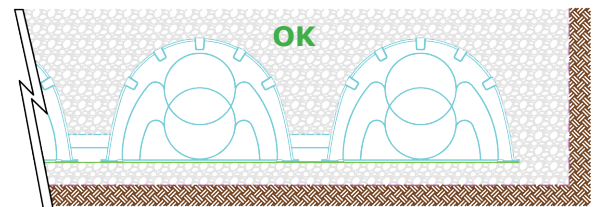
NOTE: STONE HEIGHT IN BETWEEN ROWS AND PERIMETER SHOULD NOT DIFFER BY MORE THAN 12" (306 MM)

EVEN BACKFILL - **CORRECT INSTALLATION**



NOTE: WHEN FILLING IN PERIMETER, STONE MUST BE FILLED IN EVENLY WITH CHAMBER ROWS.

PERIMETER NOT FULLY BACKFILLED
INCORRECT INSTALLATION

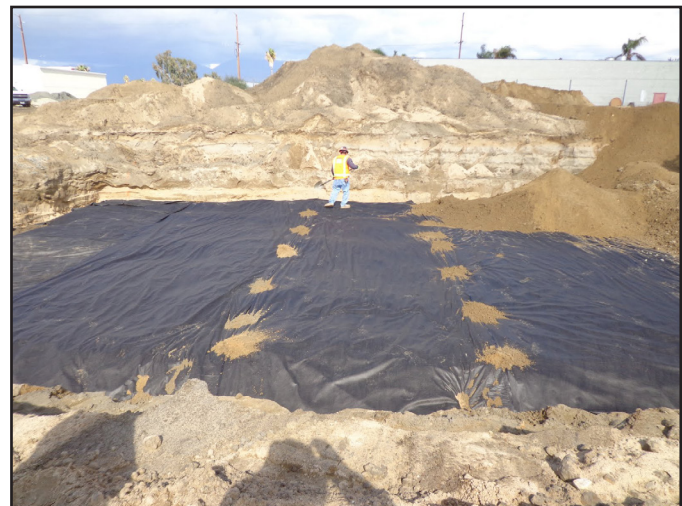


NOTE: PERIMETER STONE MUST BE FULLY BACKFILLED WITH STONE AND EXTEND TO THE EXCAVATION WALL.

PERIMETER FULLY BACKFILLED
CORRECT INSTALLATION

Placement of Top Fabric Layer & System Backfill Process

- Place the stone over the entire bed area as described in previous section (See Item 2 in Fig. 1, page 19) per engineer's depth specifications.
- Cover the entire installation area with CULTEC No. 410 non-woven geotextile, starting from the perimeter and laying it atop the stone. The geotextile must overlap at least 24 inches (610 mm) at the edges.
- Fill the first 12 inches (305 mm) with enough material (See 3 in Fig. 1, page 19) to meet the requirements as shown in Table 3, page 19.
- Backfill over the top of the geotextile (See 3 in Fig. 1, page 19) in lifts that do not exceed 6 inches (152 mm), and disperse the fill with a vehicle that meets the maximum wheel loads or ground pressure limits as specified in Tables 1 & 2 on page 17-18.
- Compact each lift of backfill as specified in the engineer's drawings. CULTEC specifies compacting to a minimum of 95% of the standard proctor density using compaction equipment with a gross vehicle weight of less than of 12,000 lbs (5,400 kg). **The use of vibratory equipment is strictly prohibited and will void any warranties.**
- Backfill over the chamber bed (See 4 in Fig. 1, page 19) in 6-inch (152 mm) maximum lifts until the specified grade is achieved. CULTEC's cover requirements vary by model. For pavement sub-base or special fill requirements, see engineer's drawings.



NOTE:

Excavation alongside already installed chamber rows backfilled with stone is not acceptable. No chambers may be added or subtracted from previously installed systems.

Table 1: Maximum Allowable Construction Loads

Material Location See Fig. 1, p. 19		Maximum Allowable Wheel Loads		Maximum Allowable Track Loads		Maximum Allowable Compaction Loads		
		Cumulative Depth (in)	Max. Axle Truck (lbs)	Max. Axle Loaders (lbs)	Track Shoe Width (in)	Max Ground Pressure (psi)	Max. Centrifugal Force (lbs)	Max. Gross Vehicle Weight (lbs)
4	Final Fill Material	36 Compacted	32,000	16,000	12	17.85	38,000	16,000
					18	12.23		
					24	9.60		
					20	7.95		
					36	6.83		
		30 Compacted	32,000	16,000	12	15.38	38,000	16,000
					18	10.73		
					24	8.55		
					20	7.13		
					36	6.23		
3	Initial Fill Material	24 Compacted	32,000	16,000	12	12.90	20,000	12,000
					18	9.23		
					24	7.43		
					20	6.30		
					36	5.55		
		24 Loose/Dumped	32,000	16,000	12	11.70	20,000	12,000
					18	8.48		
					24	6.90		
					20	5.93		
					36	5.25		
		16 Compacted	32,000	16,000	12	10.50	20,000	12,000
					18	7.73		
					24	6.38		
					20	5.55		
36	4.95							
16 Loose/Dumped	16,000	NOT ALLOWED	12	9.45	NOT ALLOWED	12,000		
			18	6.98				
			24	5.78				
			20	5.03				
2	Embedment Stone	12	8,000	NOT ALLOWED	12	8.03	NOT ALLOWED	NOT ALLOWED
					18	6.23		
					24	5.25		
					20	4.73		
					36	4.35		
		6	NOT ALLOWED	NOT ALLOWED	12	5.55	NOT ALLOWED	NOT ALLOWED
					18	4.73		
					24	4.20		
					20	3.98		
					36	3.75		

The use of wheeled equipment without proper cover is strictly prohibited.
 For Tracked Vehicles: Ground pressure is vehicle operating weight divided by total truck contact area for both tracks. Turning should be kept to a minimum. No wheeled vehicles are allowed prior to compacted fill placement.

Table 2: Placement Methods and Descriptions

Material Location See Fig. 1, p.19	Placement Method/ Restrictions	Wheel Load Restrictions	Track Load Restrictions	Compaction Restrictions
<p>4 Final Fill Material</p>	See Table 1, p. 17 for Maximum Allowable Construction Loads			
<p>3 Initial Fill Material</p>	<p>A variety of placement methods may be used.</p> <p>All construction loads shall not exceed the maximum values listed in Table 1.</p>	<p>24" minimum of stabilized cover recommended for dump truck and wheel loader travel during the construction phase.</p>	<p>Dozers shall push parallel to rows until 24" of stabilized cover is reached.</p>	<p>Roller travel shall be parallel to rows only until 24" of stabilized cover is reached.</p>
<p>2 Embedment Stone</p>	<p>No equipment shall be permitted to contact the chambers.</p> <p>Stone conveyor positioned off of bed or on foundation stone.</p> <p>Excavator positioned off of bed or on foundation stone.</p> <p>Stone column height differential between chamber rows shall never exceed 12".</p> <p>Stone to be placed at the crown of the chamber.</p> <p>No stone shall be pushed over chambers.</p>	<p>No front end wheel loaders allowed over chambers.</p> <p>No wheel loaders permitted to dump stone directly onto chambers.</p>	<p>No tracked equipment is allowed on chambers until 6" of embedment stone is in place.</p> <p>Allowable track loads based on vehicle travel only.</p>	<p>No rollers allowed.</p>
<p>1 Foundation</p>	<p>A variety of placement methods may be used including but not limited to excavator placement, stone conveyor placement or dozer placement.</p> <p>Plate compact or roll to achieve a flat, unyielding surface.</p> <p>Contractor is responsible for any conditions or requirements relating to subgrade bearing capacity, dewatering or protection of subgrade infiltrative capacity.</p>			

Storage of materials such as construction materials, construction equipment, and soil stockpiles should not be located over the Cultec system. The use of construction equipment (ex. cranes, etc.) not covered in Table 1 is prohibited. Please contact Cultec Technical Services for additional information.

Allowable track loads based on vehicle travel only.

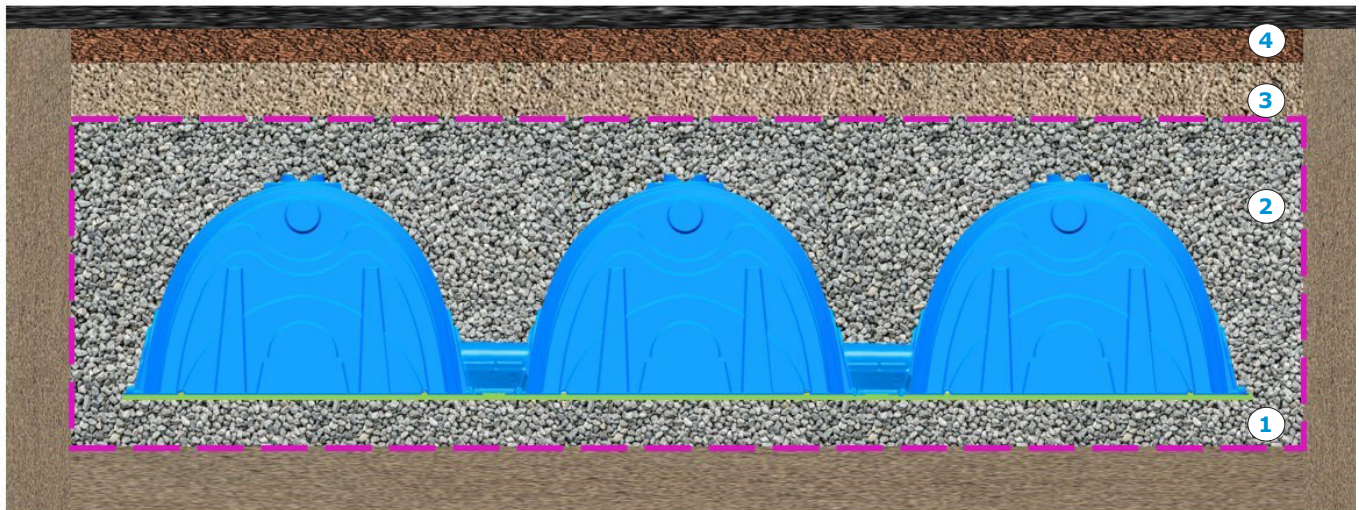
24" minimum of stabilized cover recommended for dump truck and wheel loader travel during the construction phase.

Table 3: Acceptable Fill Materials

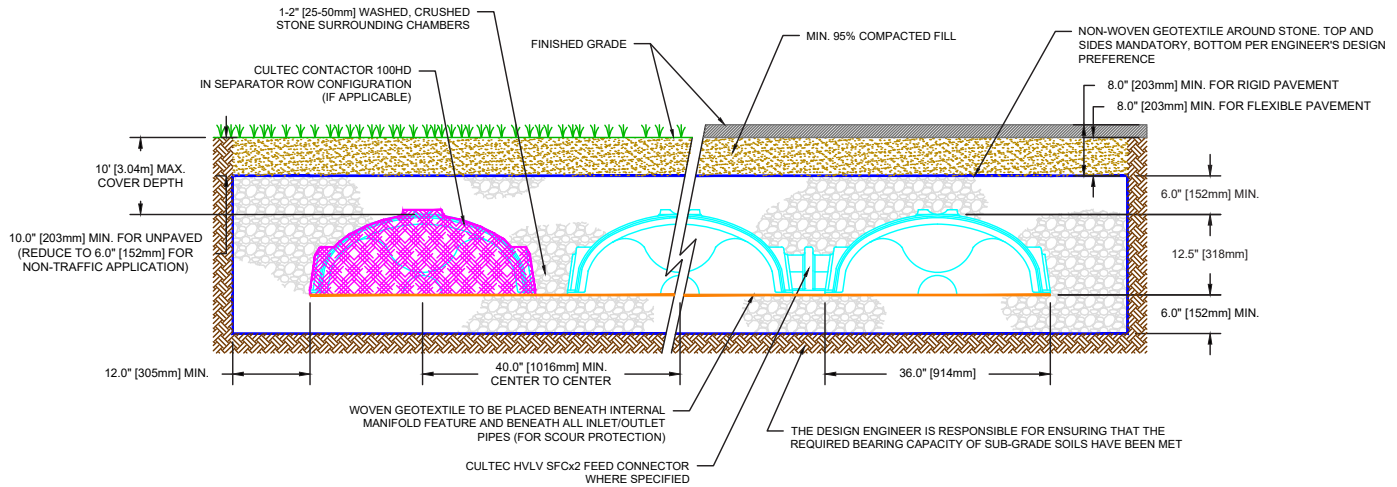
	Material Location	Description	AASHTO M43 Classification	Compaction/ Density Requirement
4	Final Fill Material Fill Material for Layer 4 starts from the top of Layer 3 to the bottom of pavement or unpaved finished grade above. Refer to cross section, pages 20-21, for proper chamber model minimum fill requirements.	Any soil/rock materials, native soils or per engineer's plans. Check plans for pavement subgrade requirements.	Per engineer's drawings	Prepare per engineer's drawing. Paved installations may have strict material and preparation requirements
3	Initial Fill Material Fill Material for Layer 3 starts from top of embedment stone (Layer 2) to minimum required depth above top of chamber. Refer to cross section, pages 20-21, for proper minimum fill requirements.	Granular well-graded soil/aggregate mixtures, <35% fines	3, 4, 5, 6, 7, 8, 9, 10, 56, 57, 67, 68, 78, 89, 467	Compact in 6" (152 mm) lifts to a minimum 95% Standard Proctor density. Roller gross vehicle weight not to exceed 12,000 lbs. (53 kN) Dynamic force not to exceed 20,000 lbs. (89 kN)
2	Embedment Stone surrounding chambers and to a min. 6" (152 mm) elevation above chamber crown.	Washed, crushed stone with the majority of particles between 3/4" - 2" (19 - 51 mm)	3, 4, 57, 467	No compaction required
1	Foundation Stone below chambers per engineer's drawing 6" (152 mm) min. required.	Washed, crushed stone with the majority of particles between 3/4" - 2" (19 - 51 mm)	3, 4, 57, 467	Plate compact or roll to achieve a 95% Standard Proctor density

The listed AASHTO classifications are for gradations. The stone must be washed, crushed and angular. See Table 6, page 22. For example, the stone must be specified as washed, crushed No. 4 stone. Fill materials shall be free of debris, trash, frozen lumps and other deleterious matter. Contact CULTEC for gradation requirements for specific projects that do not fall within the above specifications.

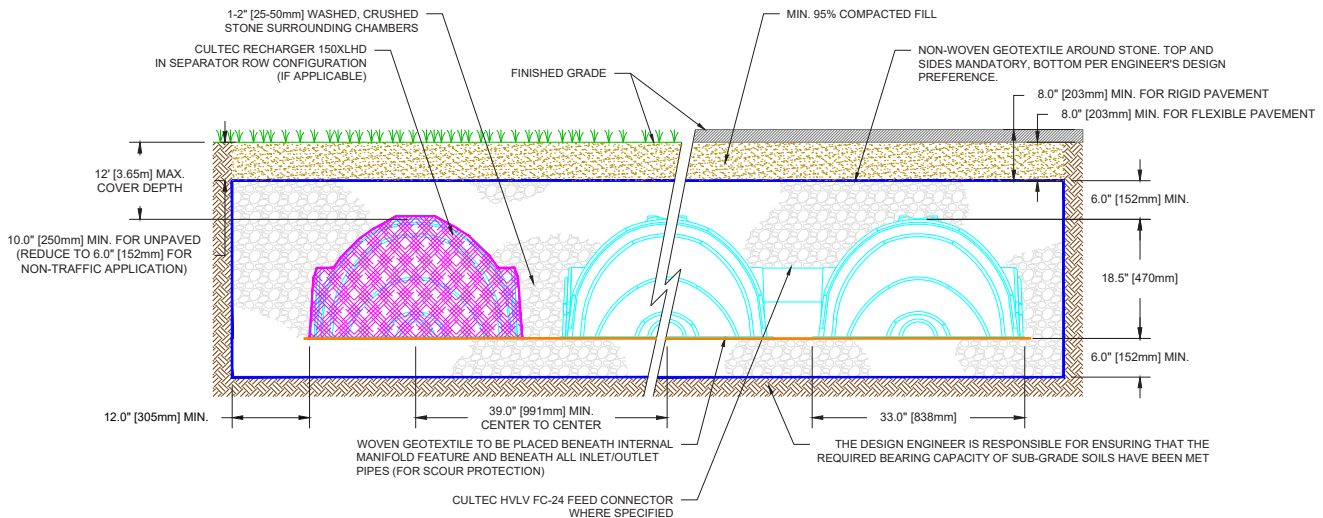
Fig. 1. Fill Material Locations - refer to Tables 1-3



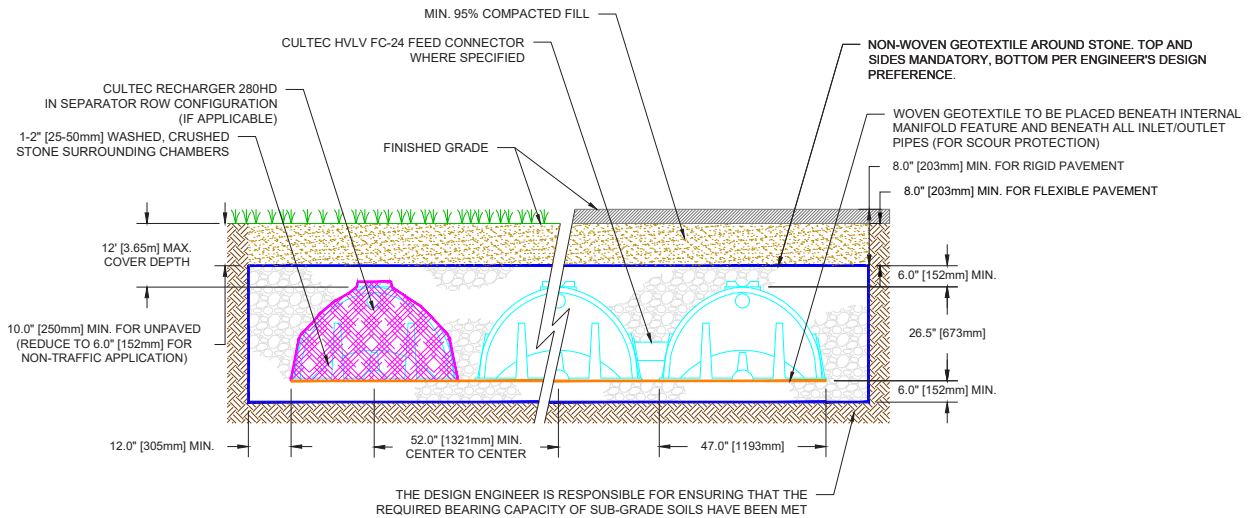
Contactor 100HD Typical Cross Section for Traffic Applications



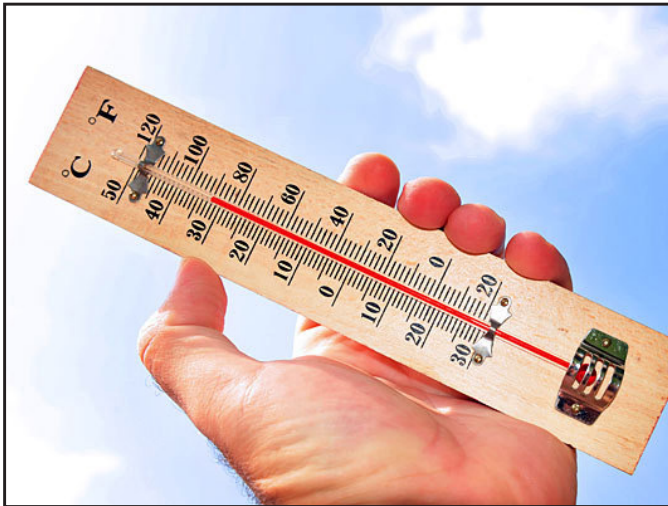
Recharger 150XLHD Typical Cross Section for Traffic Applications



Recharger 280HD Typical Cross Section for Traffic Applications



Special Handling Instructions for Polyethylene Chambers in Warmer Temperatures



CULTEC chambers are manufactured of high molecular weight polyethylene, which is inherently resistant to cold temperatures, corrosion and chemical breakdown. Additional UV inhibitors increase the chambers' resistance to sunlight and warm temperature degradation. However, CULTEC recommends that, when installed in warm temperatures above 85°F (29°C), the installer separate the units the day before installation and lay them on a flat surface (preferably not asphalt). This allows the chambers to cool and maintain their original shape as when formed. It is best practice to separate starters, intermediates and ends and lay them out individually and use those separated units rather than removing each off the stack individually. When possible, CULTEC recommends that the stone backfill be placed in temperatures less than 85°F (29°C) to minimize depressions or deflections. Also note that in sunny, warm temperatures, the chambers may be hot to the touch.

Table 4: CULTEC No. 410™ Non-Woven Geotextile Specification Information

Properties	ASTM Test Method	Test Results
Appearance		Black
Weight - Typical	D 5261	4.5 oz/sy
Tensile Strength	D 4632	120 lbs
Elongation @ Break	D 4632	50%
Mullen Burst*	D 3786*	225 psi
Puncture Strength*	D 4833*	65 lbs
CBR Puncture	D 6241	340 lbs
Trapezoid Tear	D 4533	50 lbs
AOS	D 4751	70 US Sieve
Permittivity	D 4491	1.70 Sec ⁻¹
Water Flow Rate	D 4491	135 gal/min/sf
UV Resistance @ 500 Hours	D 4355	70%

* Historical averages (current values not available): Mullen Burst Strength ASTM D3786 is no longer recognized by ASTM D-35 on Geosynthetics as an acceptable test method. Puncture Strength ASTM D4833 is not recognized by AASHTO M288 and has been replaced with CBR Puncture ASTM D6241. Substitutions must meet or exceed these minimums. Non-woven geotextile placement is mandatory over top and sides of system. Coverage of system bottom is recommended. However, follow engineer's design preference.

Table 5: CULTEC AFAB-HPF Woven Geotextile Specification Information

Properties	ASTM Test Method	Test Results
Appearance		Black
Tensile Strength	D 4632	320 lbs
Elongation @ Break	D 4632	15%
Wide Width Tensile	D 4595	52 kN/m
Wide Width Elongation	D 4595	15%
CBR Puncture	D 6241	1,500 lbs
Trapezoidal Tear	D 4533	120 lbs
Apparent Opening Size	D 4751	30 US Sieve
Permittivity	D 4491	0.2 Sec ⁻¹
Water Flow Rate	D 4491	22 g/min/sf
UV Resistance @ 500 Hours	D 4355	70%

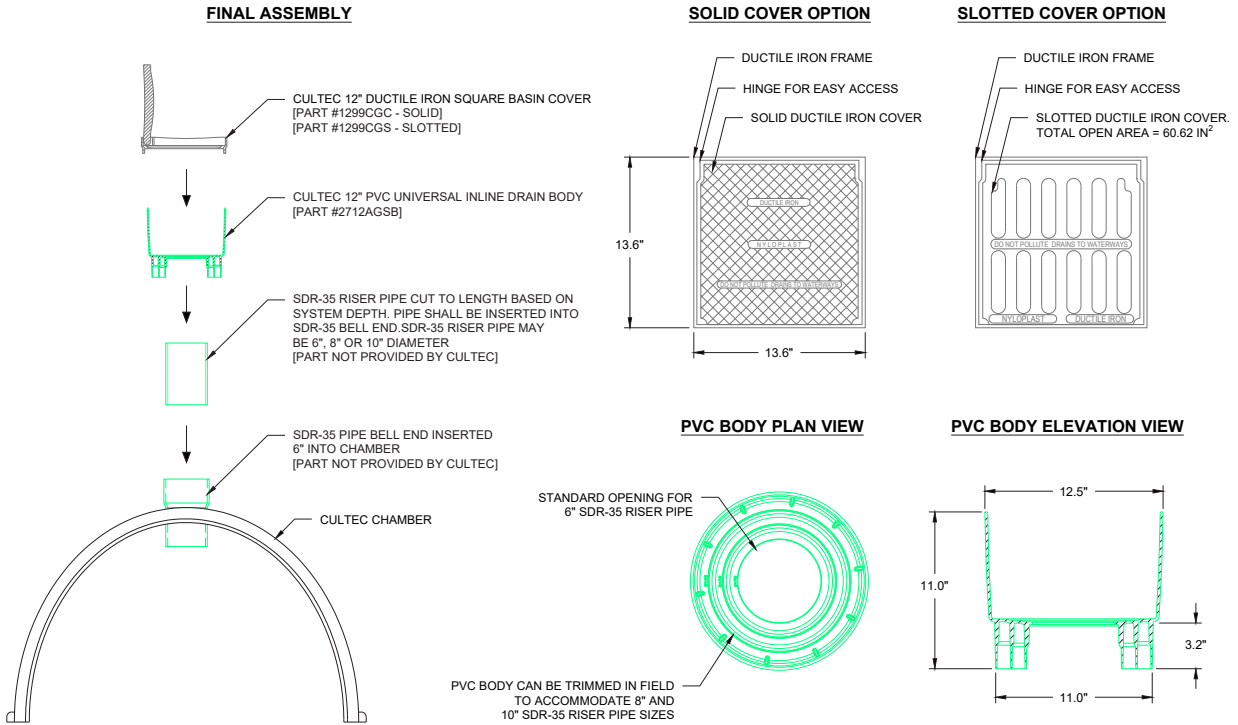
Substitutions must meet or exceed these minimums. To be used as scour protection and in conjunction with CULTEC Separator Row (if specified).

Table 6: Criteria for acceptable 3/4 - 2 inch washed, crushed, angular stone

Washed Crushed Stone	Description	Criteria
Acceptable	Angular	Stones have sharp edges and relatively plane sides with unpolished surfaces
	Subangular	Stones are similar to angular description but may have slightly rounded edges
Unacceptable	Subrounded	Stones have nearly plane sides but have well-rounded corners and edges
	Rounded	Stones have smoothly curved sides and no edges

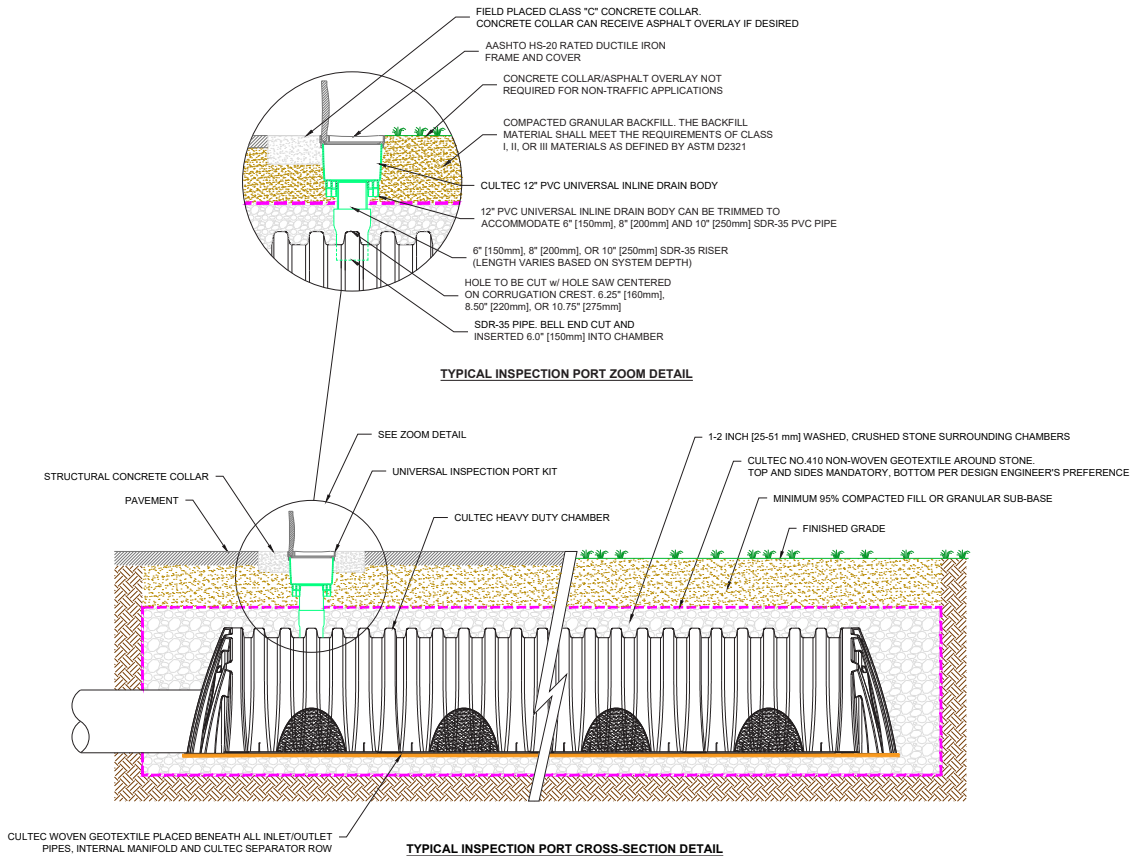
See Table 3 on page 19 for additional stone requirements.

Inspection Port Detail for Paved Traffic Applications



Trim inspection port knock-out with reciprocating saw or hole-saw.
Corrugated pipe is not suitable for inspection port.

Typical Cross Section Detail





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