Contactor® & Recharger®
Stormwater Chambers The Chamber With The Stripe®

Installation Instructions
for CULTEC Stormwater Management Systems

Contactor® Models Field Drain™ C-4HD™, 100HD™
Recharger® Models 150XLHD™, 280HD™, 330XLHD™, & V8HD™

CULTEC®

Stormwater Installation Instructions

Published by
CULTEC, Inc.
P.O. Box 280
878 Federal Road
Brookfield, Connecticut 06804 USA
www.cultec.com

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U.S. Patents 6,129,482; 6,322,288; 6,854,925; 7,226,241; 7,806,627; 8,366,346; 8,425,148; and others; U.S. Designs D613819; D638,095; D668,318 and others; Canadian Patent 2,591,255 and others; Community Designs 1092191; 1745209; and others.

Contact Information:
For general information on our other products and services, please contact our offices within the United States at (800)428-5832, (203)775-4416 ext. 2002, or e-mail us at custservice@cultec.com.

For technical support, please call (203)775-4416 ext. 2003 or e-mail tech@cultec.com.

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You are using version CULG012 05-14 of our CULTEC Stormwater Installation Instructions

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.

BEFORE YOU BEGIN

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 1– 2 inch (25 - 51 mm) washed, crushed stone as shown in Table 4, page 19. Cleanliness of stone to be verified by engineer.
- Acceptable fill material as shown in Table 5, page 20
- CULTEC No. 410™ filter fabric or equivalent non-woven filter fabric (See Table 3, page 19 for detailed specifications)
- All CULTEC chambers and accessories as specified in the engineer's plans including CULTEC No. 410™ Filter Fabric, CULTEC StormFilter® and CULTEC No. 20L™ Polyethylene Liner, 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 with maximum gross vehicle weight of 12,000 lbs (5,440 kgs). Vibratory rollers may only be used on the stone base prior to the installation of chambers.

Requirements for CULTEC Chamber System Installations

- 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 for 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 CULTEC chamber model. Please refer to Table 6 on page 20 and engineer's drawings.
- Any discrepancies with the system sub-grade soil's bearing capacity must be reported to the design engineer.
- Filter fabric must be used as specified in the engineer's drawings.
- CULTEC requires the contractor to refer to CULTEC's Installation Instructions Tables 1 - 6 shown on pages 18 - 20, concerning vehicular traffic. 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 Tables 1 and 2 on page 18.
- Erosion and sediment-control measures must meet local codes and the design engineer's specifications throughout the entire site construction process.
- CULTEC systems must be designed and installed in accordance with CULTEC's minimum requirements. Failure to do so will void the limited warranty (See page 22-23).

CHAMBER TYPES

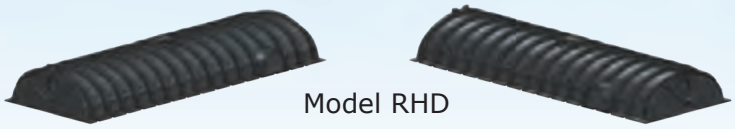
CULTEC Contactor® Series End Detail Information

for Contactor Model 100HD

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

Large Rib End Detail | Small Rib End Detail

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



Model RHD

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

Model EHD

CULTEC Recharger® Series End Detail Information

for Recharger Models 150XLHD, 280HD, and 330XLHD

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

Large Rib End Detail | Small Rib End Detail

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

Model RHD

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

Model SHD

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

Model IHD

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

Model EHD

CHAMBER TYPES

CULTEC End Detail Information for Recharger® V8HD

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

Large Rib End Detail | Small Rib End Detail

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

Model RHD

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

Model SHD

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

Model IHD

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

Model EHD

Shown L->R: Contactor 100HD, Recharger 150XLHD, Recharger 280HD, Recharger 330XLHD and Recharger V8HD.

REQUIREMENTS

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 filter fabric (or equivalent — see Table 3, page 19) on the excavated bed bottom and perimeter sidewalls as specified by the engineer's drawings. Filter fabric is required on the sides and over the top of the system. It is also recommended on the system bottom. Overlap the filter fabric by at least 24 inches (610 mm) where the fabric edges meet.
- Disperse a level base of 1 to 2 inch (25 - 51 mm) diameter washed, crushed stone over the entire area of the bed bottom (see Table 4, page 19 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 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 4 - 5.
- 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 14. Insert one end of the HVLV Feed Connector into the trimmed portal to create the internal manifold. Refer to Manifold Installation section on 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.

INTERLOCK PROCEDURE

- 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 16 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.

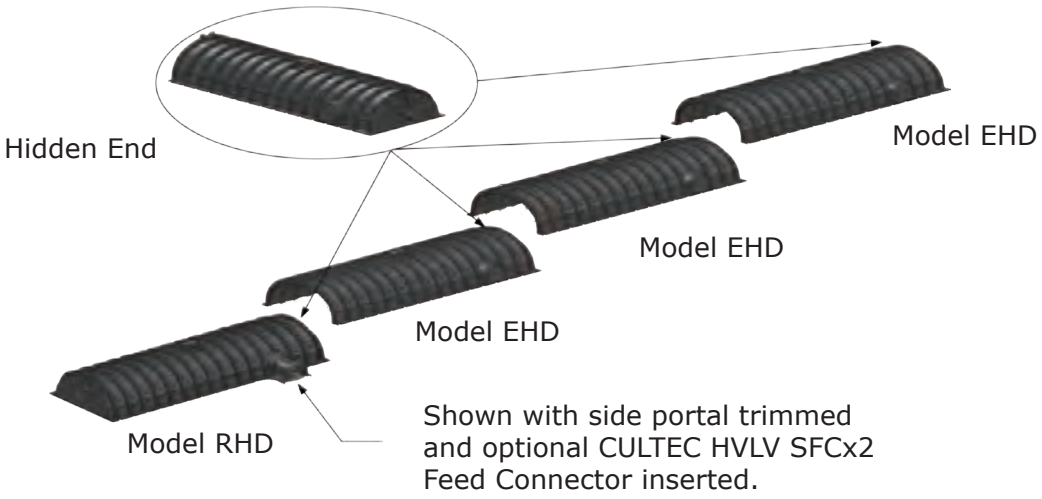
Directional arrows located on the top of the chamber point towards the Small Rib End. The open end of the next chamber overlaps the small rib end of the preceding chamber.

CULTEC Contactor® Series Typical Installation Method

for 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.



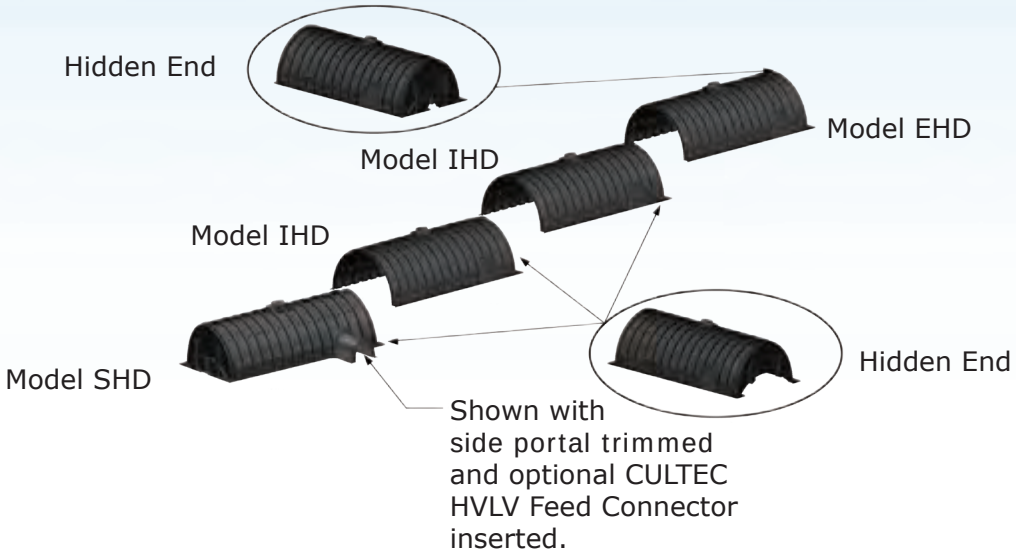
INTERLOCK PROCEDURE

CULTEC Recharger® Series Typical Installation Method

for Recharger Models 150XLHD, 280HD, and 330XLHD

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

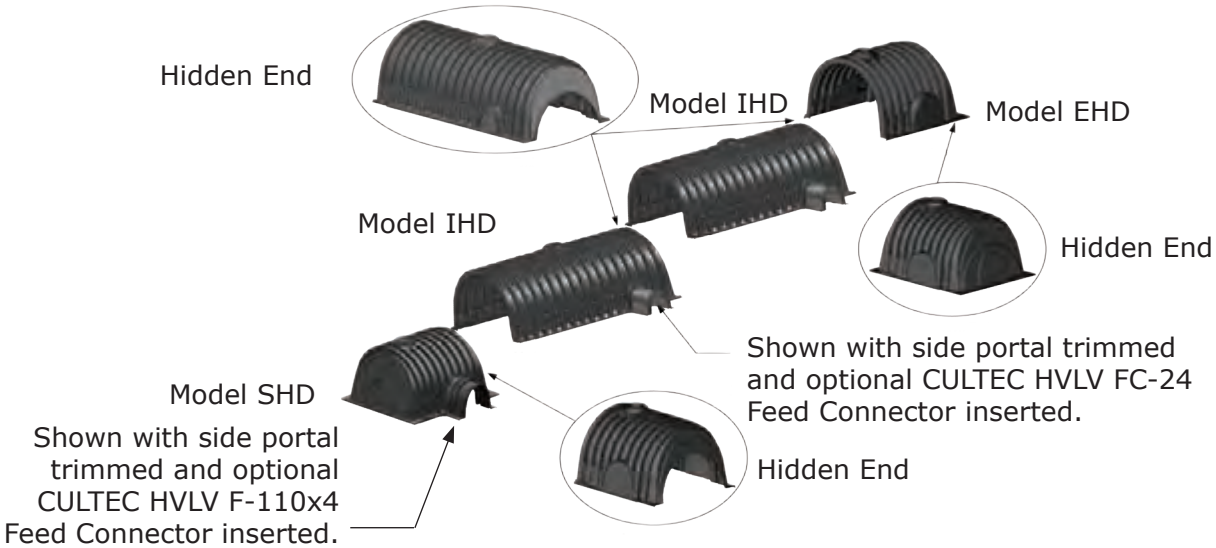
- Start each row with a Model SHD.
- Use Model IHD to continue the length of your row.
- End your row by using a Model EHD.



CULTEC Typical Installation Method for Recharger® V8HD

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

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



SPECIFICATIONS

CULTEC HVLV Feed Connector Specification Information

Model	Size (LxWxH)	Compatible Models	Installed Length (exposed)
HVLV® SFCx2 Feed Connector	19.7" x 12" x 7.6" 500 mm x 305 mm x 194 mm	Contactor® 100HD	For Contactor 100HD: 4" (102 mm) typ.
HVLV® FC-24 Feed Connector	12" x 16" x 24.2" 305 mm x 406 mm x 614 mm	Recharger® 150XLHD Recharger® 280HD, Recharger® 330XLHD, Recharger® V8IHD Intermediate,	For Recharger 150XLHD: 6" (152 mm) typ. For Recharger 280HD: 5" (127 mm) typ. For Recharger 330XLHD: 6" (152 mm) typ. For Recharger V8IHD: 6" (152 mm) typ.
HVLV® F-110x4 Feed Connector	39" x 27.5" x 18" 991 mm x 699 mm x 457 mm	Recharger® V8RHD Stand Alone, Recharger® V8SHD Starter, Recharger® V8EHD End *Not for Recharger® V8IHD Intermediate.*	For Recharger V8HD: 6" (152 mm) typ.

Shown L-->R: HVLV SFCx2 Feed Connector, HVLV FC-24 Feed Connector, HVLV F-110x4 Feed Connector

CULTEC Chamber Specification Information

	Size (LxWxH)	Installed Length	Length Adjust-ment	Max. Inlet in Endwall	Max. O.D. in Side Portal	Compatible Feed Connector
Contactor® Field Drain C-4HD	8.5' x 48" x 8.5" 2.59 m x 1219 mm x 216 mm	8' 2.44 m	0.5' 0.15 m	4.5" 114 mm	n/a	n/a
Contactor® 100HD	8' x 36" x 12.5" 2.44 m x 914 mm x 318 mm	7.5' 2.29 m	0.5' 0.15 m	10" 250 mm	6.9" 175 mm	HVLV® SFCx2 Feed Connector
Recharger® 150XLHD	11' x 33" x 18.5" 3.13 m x 838 mm x 470 mm	10.25' 2.87 m	0.75' 0.28 m	12" 300 mm	10.25" 260 mm	HVLV® FC-24 Feed Connector
Recharger® 280HD	8' x 47" x 26.5" 2.44 m x 1194 mm x 673 mm	7' 2.13 m	1' 0.30 m	18" 450 mm	12.25" 311 mm	HVLV® FC-24 Feed Connector
Recharger® 330XLHD	8.5' x 52" x 30.5" 2.59 m x 1321 mm x 775 mm	7' 2.13 m	1.50' 0.46 m	24" 600 mm	11.75" 298 mm	HVLV® FC-24 Feed Connector
Recharger® V8HD	8' x 60" x 32" 2.44 m x 1524 mm x 813 mm	7.5' 2.29 m	-5.83' -1.78 m	24" 600 mm	V8SHD or V8EHD 15.3" V8IHD 12.25" V8SHD or V8EHD 387 mm V8IHD 311 mm	HVLV® F-110x4 Feed Connector

Recharger V8HD information is based on V8IHD Intermediate section.
CULTEC Heavy Duty (HD) chambers must be used for any traffic applications. CULTEC Heavy Duty chambers have a colored stripe permanently affixed along the full length of the chamber. Chambers that do not have this stripe must not be used for traffic applications.
All dimensions are nominal. Actual dimensions may vary on-site due to shipping and temperature.

MANIFOLD INSTALLATION

Manifold Installation

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

- CULTEC No. 20L™ Polyethylene Liner is to be placed under all chambers utilizing the internal manifold feature, beneath Separator Row chambers 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 4 oz. filter fabric and polyethylene liner is recommended to prevent washout. See detail on page 12.

- 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 14.

- 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 endwall or side portal as detailed on engineer's drawings. See page 9 for maximum inlet sizes for endwall and side portals. There is no need to feed every row if utilizing the internal manifold feature.

The side portal feature is not available on the Contactor Field Drain C-4HD. If manifold installation does not include CULTEC's side portal internal manifold, proceed according to the engineer's drawings for manifold pipe installation.

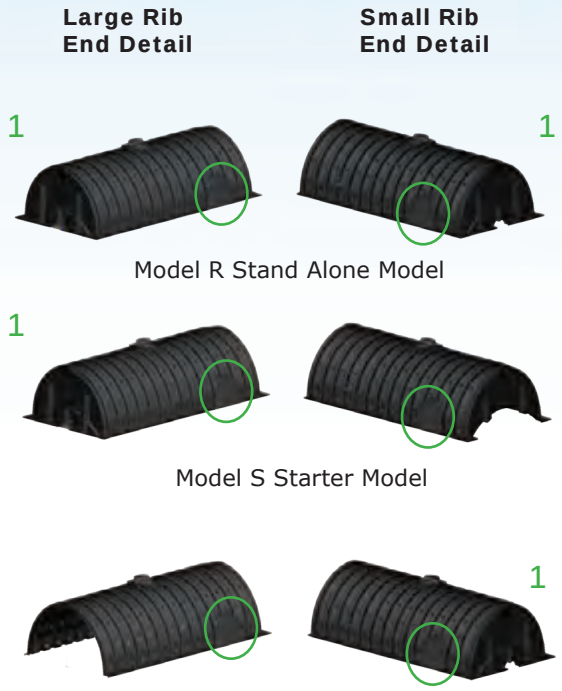
How to Trim CULTEC Chamber to Accommodate Pipe on Endwall

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 endwall 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 endwall large enough to accommodate a saw bit.
- Following the grease pen outline, use a recipro-cating saw to trim out the opening to accommo-date 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.
- Backfill as noted in the installation instructions and engineering details.

Fig. 1



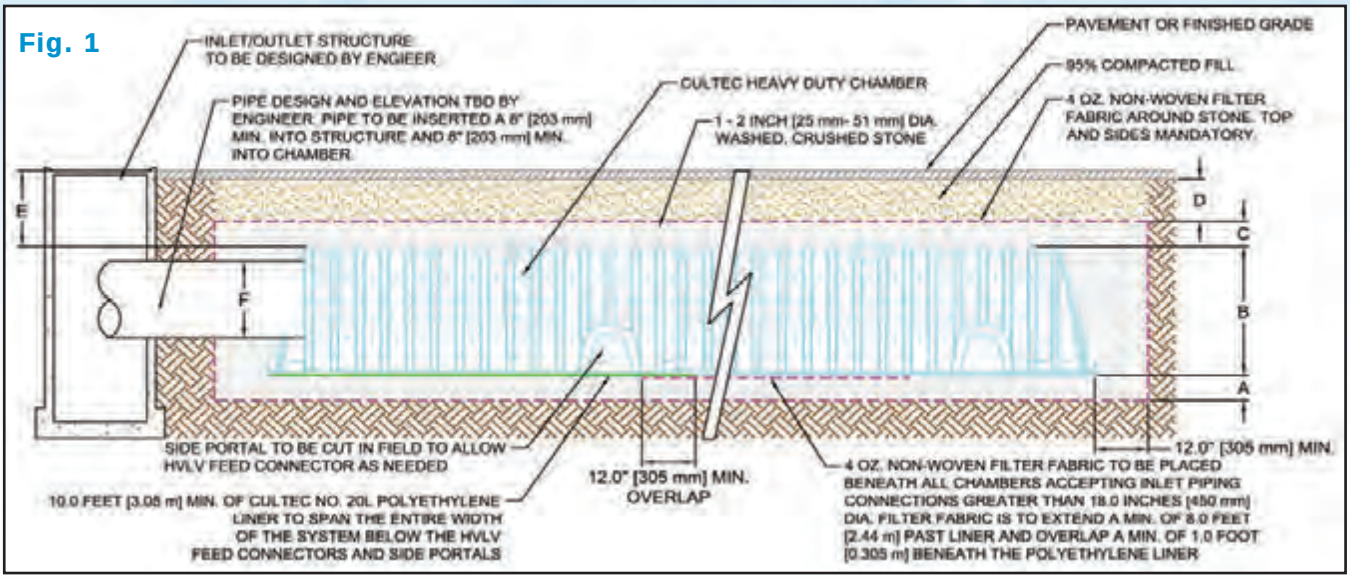
Trimming may only be performed on fully closed endwalls (indicated by Number 1 in Fig. 1) or side portal areas (See green circles in Fig. 1 for side portal locations). Pipe may not be inserted into the sidewall of the chamber unless it is within the side portal trim lines See page 14 for more information on trimming side portals.

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

CROSS SECTION DETAILS

Typical Cross Section for Hi-Flow Pipes

Fig. 1



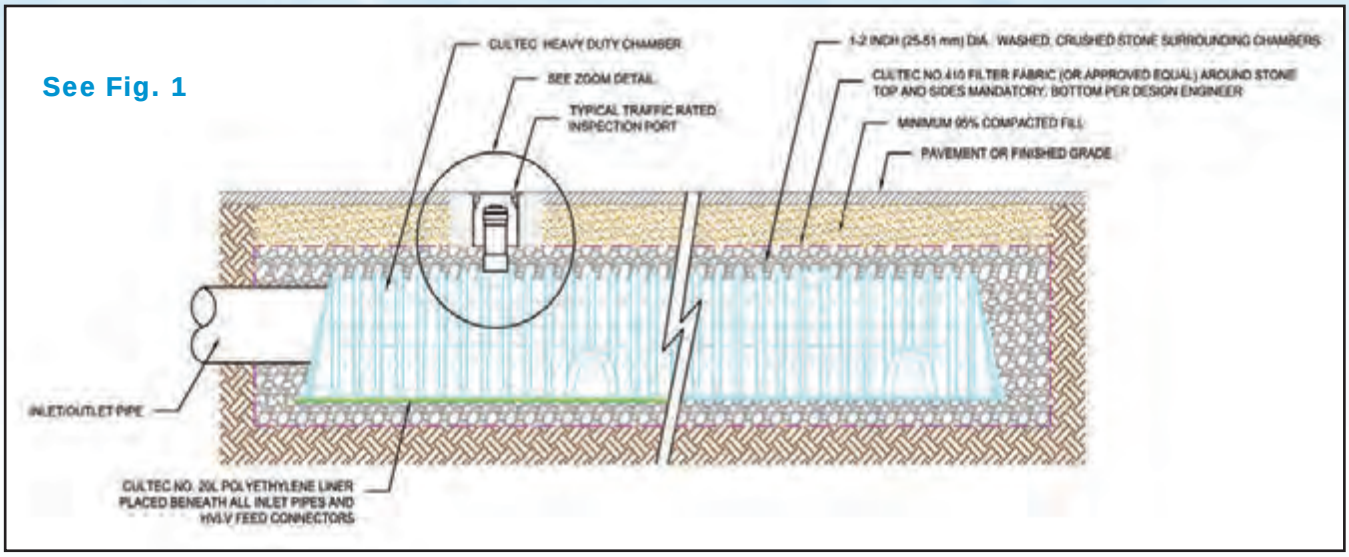
See Fig. 1	Description	Contactor 100HD	Recharger 150XLHD	Recharger 280HD	Recharger 330XLHD	Recharger V8HD
A	Min. depth of stone base	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm
B	Chamber Height	12.5″ 318 mm	18.5″ 470 mm	26.5″ 673 mm	30.5″ 775 mm	32″ 813 mm
C	Min. depth of stone required above units for traffic applications	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm
D	Min. depth of required 95% compacted fill for paved applications	8″ 203 mm	8″ 203 mm	8″ 203 mm	10″ 254 mm	12″ 305 mm
	Min. depth required of 95% compacted fill for unpaved applications	10″ 254 mm	10″ 254 mm	10″ 254 mm	12″ 305 mm	14″ 356 mm
E	Max. depth of cover allowed above crown of chamber	12′ 3.66 m	12′ 3.66 m	12′ 3.66 m	12′ 3.66 m	8′ 2.44 m
F	Max. inlet/outlet pipe size into the end wall of the chamber	10″ 250 mm	12″ 300 mm	18″[1] 450 mm[1]	24″[1] 600 mm[1]	24″[1] 600 mm[1]

[1] For Recharger Models 280HD, 330XLHD and V8HD, 4 oz. non-woven filter fabric to be placed beneath all chambers accepting inlet piping connections greater than 18″ (450 mm) diameter. Filter fabric to extend a minimum of 10′ (3.04 m) past liner and overlap a minimum of 1′ (0.305 m) beneath the polyethylene liner. (See Fig. 1).

INSPECTION PORT DETAILS

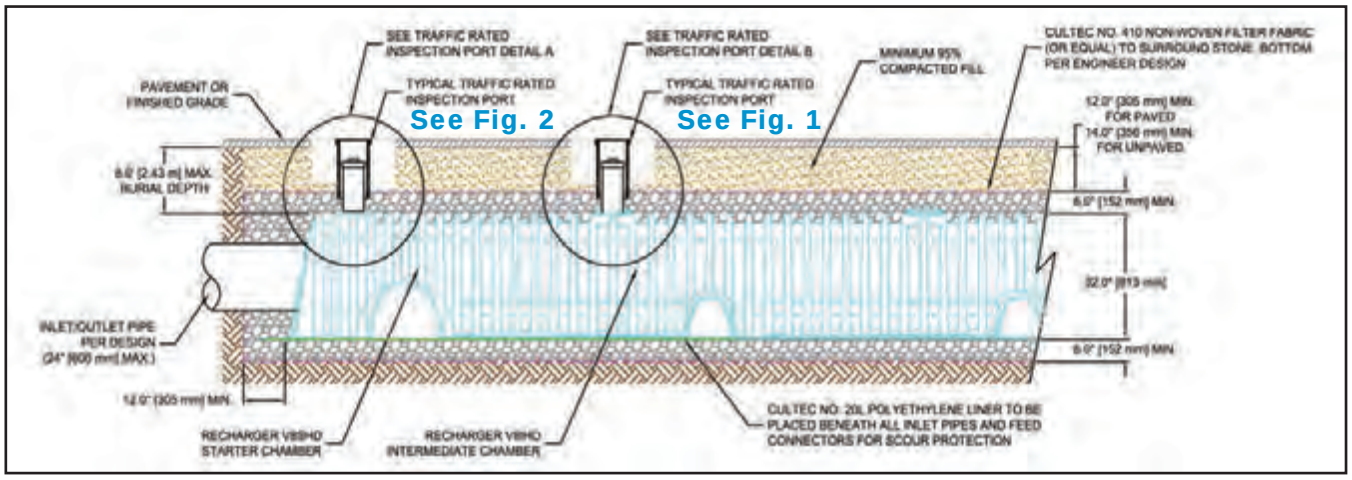
Inspection Port Detail for Paved Traffic Applications

not for Contactor C-4HD or Recharger V8HD



Inspection Port Detail for Paved Traffic Applications

for Recharger V8HD



The Recharger V8HD has an 8" (200 mm) diameter inspection port on Model V8SHD Starters, V8RHD Stand Alone and V8EHD End units. The Recharger V8IHD Intermediate unit has a 6" (150 mm) diameter inspection port opening.

Fig. 1

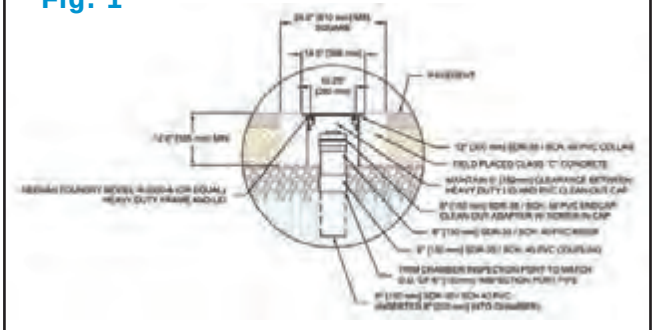
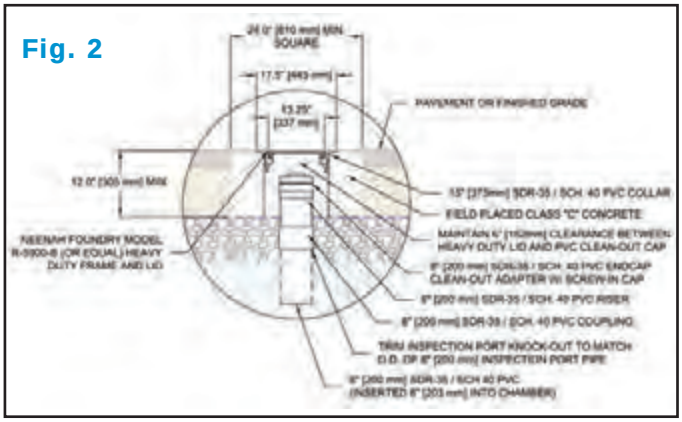


Fig. 2

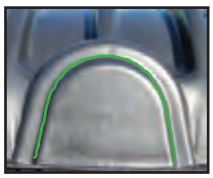


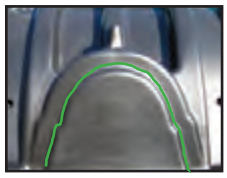
INTERNAL MANIFOLD

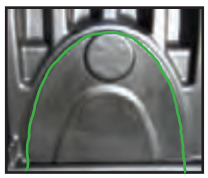
How to Trim Side Portal to Accommodate HVLV Feed Connector for Internal Manifold

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.







Shown L-->R: Guidelines to follow for correct trimming for SFCx2, FC-24 and F-110x4 portals.
Do not cut outside of the side portal area guides.

Trimming may only be performed on the side portal area. Side entry in any other location is unacceptable.

Model	Compatible Feed Connector
Contactor 100HD	HVLV SFCx2 Feed Connector
Recharger 150XLHD	HVLV FC-24 Feed Connector
Recharger 280HD	HVLV FC-24 Feed Connector
Recharger 330XLHD	HVLV FC-24 Feed Connector
Recharger V8RHD, V8SHD, V8EHD	HVLV F-110x4 Feed Connector
Recharger V8IHD	HVLV FC-24 Feed Connector

Insert the HVLV Feed Connector into the chamber.
This is not required to be a watertight connection.

How to Trim 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 in Table 1.
- 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.

Fig. 1

Shown L-->R: Max. allowable trim area for SFCx2, FC-24 and F-110x4 portals when using pipe. .
Do not cut outside of the side portal area guides.

Trimming may only be performed on the side portal area. Side entry in any other location is unacceptable.

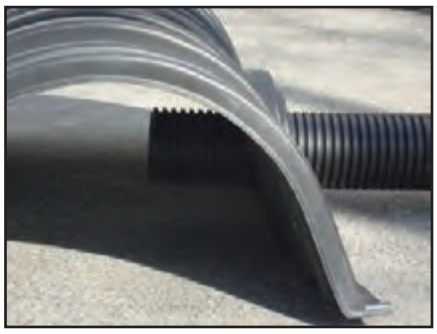


Table 1

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
Recharger 330XLHD	11.75"	298 mm
Recharger V8RHD, V8SHD, V8EHD	15.3"	387 mm
Recharger V8IHD	12.25"	311 mm

Insert the pipe or fitting a minimum of 8" (203 mm) into the chamber.
This is not required to be a watertight connection.

BACKFILL PROCEDURE

Embedment Stone Backfill

Backfill using washed, crushed stone as specified in Table 4, page 19 and Table 5, page 20. To maintain row separation distance and prevent chamber displacement, slowly distribute stone on top of chamber crown so that stone 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.

CULTEC recommends two methods of stone placement: excavator or stone conveyor boom.

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 2, page 18 and Table 6, page 20.

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.

With both stone-placement methods, ladling the stone carefully over the chambers’ centers will secure them in place. Evenly distributing the stones will help prevent chamber movement and maintain row separation.

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. Refer to Table 6 on page 20 and engineer’s drawings.

Do not allow equipment to drive over the chambers unless the minimum cover as shown in Table 6, page 20 is in place. Use a warning tape (available from CULTEC) to restrict access.

Repeat steps until all of the last chamber units are in place. Be certain to use the Model E to end the line of chambers in place 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.

BACKFILL PROCEDURE

Top Fabric Layer Placement & System Backfill Process

- Place the stone over the entire bed area as described in previous section (See 2 in Fig. 1 on page 21).

- Cover the entire installation area with CULTEC No. 410 non-woven filter fabric, starting from the perimeter and laying it atop the stone. The filter fabric must overlap at least 24 inches (610 mm) at the edges.

- Fill the first 12 inches (305 mm) with enough material (See 3 in Figure 1 on page 21) to meet the requirements as shown in Table 5, page 20. Backfill over the top of the filter fabric (See 3 in Fig. 1 on page 21) 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 on specified in Tables 1 & 2 on page 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 on page 21) in 6-inch (152 mm) maximum lifts until the specified grade is achieved. CULTEC's cover requirements vary by model. See Table 3, page 19 for minimum and maximum coverage. For pavement sub-base or special fill requirements, see engineer's drawings.

- Backfill height differential should never exceed 24 inches (610 mm) with adjacent chambers. 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 5, page 20 for acceptable cover materials, or contact the design engineer for approved fill types.

ACCEPTABLE VEHICLE LOADS

Table 1: Maximum allowable axle loads for wheeled vehicles at various cover depths

	Fill Depth Over Chamber		Max. Axle Load	
	inches	mm	lbs	kN
All Models	6	152	8,000	35.6
All Models	9	305	16,000	71.2
Contactor® Field Drain C-4HD	14" with pavement 18" without pavement	356 mm with pavement 457 mm without pavement	40,000	177.9
Contactor® 100HD Recharger® 150XLHD Recharger® 280HD	14" with pavement 16" without pavement	356 mm with pavement 406 mm without pavement	40,000	177.9
Recharger® 330XLHD	16" with pavement 18" without pavement	406 mm with pavement 457 mm without pavement	40,000	177.9
Recharger® V8HD	18" with pavement 20" without pavement	457 mm with pavement 508 mm without pavement	40,000	177.9

Any load which travels over the system that exceeds the maximum load allowed is strictly prohibited and will void the warranty.
All depths listed above are based on compacted fill and include min. 6" (152 mm) of stone above the crown of the unit as listed as 3 of Fig. 1, page 21.

Table 2: Maximum allowable ground pressures for various vehicle track widths and fill depths

Fill Depth Over Chamber		Track Width		Max. Ground Pressure[2]	
inches	mm	inches	mm	PSF	kPa
6	152	12	305	1070	51
		18	457	900	43
		24	610	800	38
		30	762	760	36
		36	914	720	34
12	305	12	305	1540	74
		18	457	1190	57
		24	610	1010	48
		30	762	910	43
		36	914	840	40
18	457	12	305	2010	96
		18	457	1480	71
		24	610	1220	58
		30	762	1060	51
		36	914	950	45

[2] *Ground pressure is vehicle operating weight divided by total truck contact area for both tracks. Turning should be kept to a minimum.*

The use of wheeled equipment is strictly prohibited.

ACCEPTABLE MATERIALS

Table 3: CULTEC No. 410™ Non-Woven Filter Fabric Specification Information

Properties	Test Method	Test Results
Appearance		Black
Grab Tensile	D 4632	90 lbs 400 N
Elongation	D 4632	50%
Trapezoid Tear	D 4533	35 lbs 155 N
Puncture	D 4833	55 lbs 245 N
Mullen Burst	D 3786	175 psi 1205 kPa
AOS	D 4751	70 U.S. sieve .21 mm
Permittivity	D 4491	2.0 sec^{-1}
Permeability	D 4491	.2 cm/sec
Water Flow	D 4491	145 gal/min/sf 5908 l/min/sq.mt
UV Stability	D 4355	70%

Substitutions must meet or exceed these minimums.
Filter fabric placement is mandatory over top and sides of system. Coverage of system bottom is recommended, however, follow engineer's design preference.

Table 4: Criteria for acceptable 1 - 2 inch (25 - 51 mm) 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 1 and 2 of Table 5 for additional stone requirements.

ACCEPTABLE FILL MATERIALS

Table 5: Acceptable Fill Materials

	Material Location	Description	AASHTO M43 Classification	AASHTO M145 Classification	Compaction / Density Requirement
1	Foundation Stone below chambers per engineer's drawing 6" (152 mm) min. required for most models.	Washed, crushed stone with the majority of particles between 1" - 2" (25 - 51 mm)	4, 5, 56, 57, 467	Per engineer's drawings	Plate compact or roll to achieve a 95% Standard Proctor density
2	Embedment Stone surrounding chambers and to a min. 6" (152 mm) elevation above chamber crown for most models.	Washed, crushed stone with the majority of particles between 1" - 2" (25 - 51 mm)	4, 5, 56, 57, 467	Per engineer's drawings	No compaction required
3	Fill Material for Layer 3 starts from top of embedment stone (Layer 2) to minimum required depth above top of chamber. Refer to Table 6 page 20 for proper minimum fill requirements.	Granular well-graded soil/aggregate mixtures, <35% fines	4, 5, 6, 7, 8, 9, 10, 56, 57, 67, 68, 78, 89, 467	Group A-1 Group A-2 Group A-3	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)
4	Fill Material for Layer 4 starts from the top of Layer 3 to the bottom of pavement or unpaved finished grade above. Refer to Table 6 page 20 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	Per engineer's drawings	Prepare per engineer's drawing. Paved installations may have strict material and preparation requirements

The listed AASHTO classifications are for gradations. The stone must be washed, crushed and angular. See Table 6, page 20.
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.

Table 6: Minimum and Maximum Fill and Separation Requirements for Traffic Installations

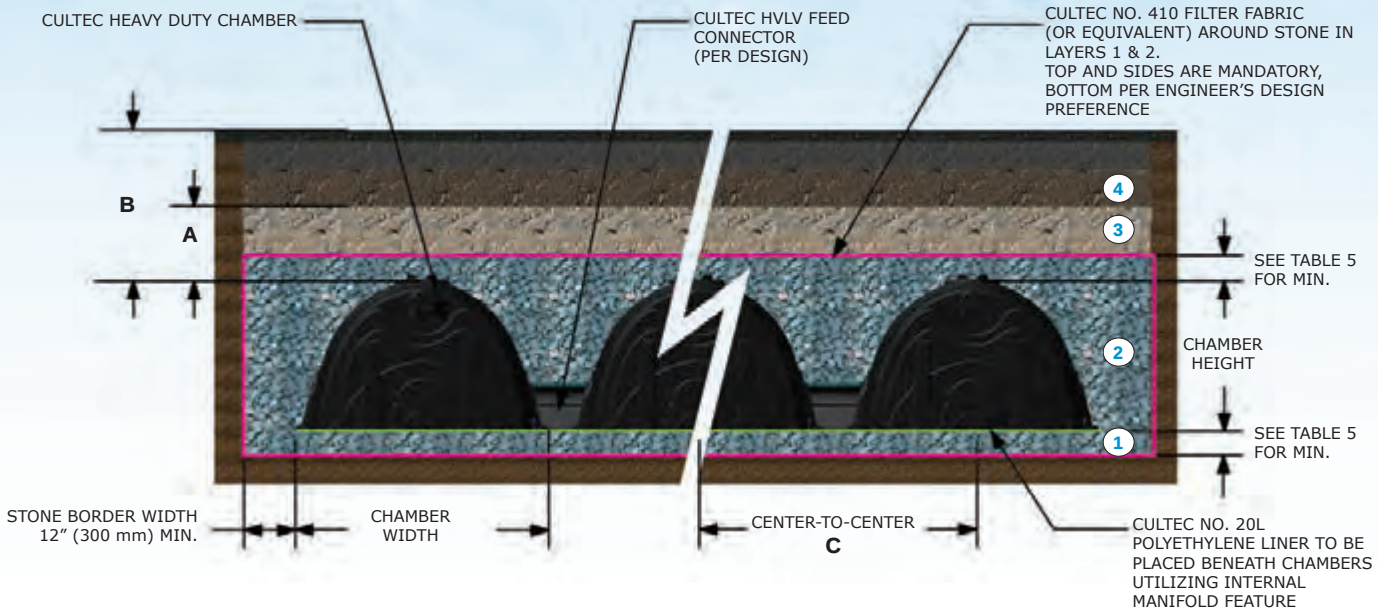
(See Fig. 1 on page 21)

Model	A Minimum Fill Requirements				B Maximum Fill Requirements		C Center-to-Center Separation Requirement	
	For Paved inches	For Paved mm	For Unpaved inches	For Unpaved mm	feet	m	inches	mm
Contactor® Field Drain C-4HD	14	356	16	406	12	3.66	48	1219
Contactor® 100HD	14	356	16	406	12	3.66	40	1016
Recharger® 150XLHD	14	356	16	406	12	3.66	39	991
Recharger® 280HD	14	356	16	406	12	3.66	52	1321
Recharger® 330XLHD	16	406	18	457	12	3.66	58	1473
Recharger® V8HD	18	457	20	508	8	2.44	66	1676

Refer to Table 5 and Fig. 1 on page 21 and Table 4 on page 19 for acceptable fill requirements.
Table refers to Heavy Duty version only, requirements differ for Standard Duty version.
When fill requirements will exceed Maximum Fill Requirements listed above, contact CULTEC at 203-775-4416.
All depths listed above are based on compacted fill and include the required stone above the crown of the unit.

ACCEPTABLE FILL MATERIALS

Fig. 1. Fill Material Locations – *refer to Tables 4, 5, and 6.*



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Contact information for warranty assistance:
Mail: CULTEC, Inc. • P.O. Box 280 • Brookfield, CT 06804-0280 USA
Fax: 203-775-5887 • **E-mail:** warranty@cultec.com

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CULTEC, Inc.
878 Federal Road • P.O. Box 280 • Brookfield, CT 06804 USA
Phone: 203-775-4416 • Toll Free: 1-800-4-CULTEC • Fax: 203-775-1462
Web: www.cultec.com • E-mail: custservice@cultec.com