



# Massachusetts Design & Installation Manual

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## TABLE OF CONTENTS

<b>Glossary of Terms .....</b>	<b>2</b>
<b>Description of Technology.....</b>	<b>3</b>
<b>Design &amp; Installation.....</b>	<b>3</b>
<b>Installation Instructions .....</b>	<b>4-5</b>
<b>H-10 Subsurface Prep &amp; Backfill: CTL12 &amp; CTL18 .....</b>	<b>6-7</b>
<b>H-20 Subsurface Prep &amp; Backfill: CTL12 &amp; CTL18 .....</b>	<b>8-9</b>
<b>Design &amp; Sizing: CTL12 &amp; CTL18 .....</b>	<b>10</b>
<b>Trench Sizing Example: CTL12 &amp; CTL18.....</b>	<b>11</b>
<b>Trench Diagrams .....</b>	<b>12</b>
<b>Specs: CTL12 &amp; CTL18.....</b>	<b>13-14</b>
<b>Maintenance Requirtements.....</b>	<b>15</b>
<b>Company Background .....</b>	<b>16</b>

## GLOSSARY OF TERMS

CTL 12	96" x 76" x 14"
CTL 18	96" x 76" x 20"
Filter Fabric	The non-woven synthetic filter fabric shall have adequate tensile strength to prevent ripping during installation and backfilling, adequate air permeability to allow free passage of gases, and adequate particle retention to prevent downward migration of soil particles.
Distribution Box	A plastic or concrete box that receives effluent from the septic tank or pump chamber that distributes the effluent flow to one row or multiple rows of CTL 12's or CTL 18's.
Specified Sand	Titte V Sand
H-20	An American Association of State Highway Transportation Officials (AASHTO) standard. It consists of a truck wheel loading of 16,000 lbs.
H-10	Any installation not H-20

**Please see the following 3.5 minute video with an overview of installation and system operation.**

Link to home page, then click green box 'watch our video';

[www.GoodFlow.com](http://www.GoodFlow.com)

Link direct to video on YouTube;

[https://www.youtube.com/watch?v=KwEP9VPW\\_ZY](https://www.youtube.com/watch?v=KwEP9VPW_ZY)

## DESCRIPTION OF TECHNOLOGY

The GoodFlow Solutions System consists of an H-20 reinforced concrete chamber that is four feet wide by eight feet long. An ABS plastic injection molded fin structure is placed alongside of each chamber. The chambers are open bottomed with rectangular openings on each side to allow effluent to flow to the fins. The fins are open bottomed and the sides are perforated to allow the effluent to flow out to the surrounding soil. The fins are upholstered with non-woven (NW) filter fabric to prevent soil ingress into the system.

## DESIGN & INSTALLATION

1. For ordering contact GoodFlow Solutions at 203-869-2969
2. Surrounding sand of the CTL units shall be Tittle V Sand.
3. The bottom of the CTL unit shall be 4' for new construction and 3' for repairs from the Seasonal High Water Table. The bottom of the CTL unit shall be a minimum of 5' above a restrictive layer or bedrock.
4. Connections of lines to tanks and distribution boxes, must be made using watertight mechanical seals. Use of any grouting is not permitted.
5. Garbage disposals are prohibited with GoodFlow systems.
6. At no time should water softener backwash be disposed of in the septic system. Water softener backwash should be discharged to a separate soil absorption field.
7. Septic Tank filters are required with all GoodFlow systems.
8. System venting is at the discretion of each system designer unless required by OWTS Rules or in DEM permit requirements.
9. **Linear Segements of CTL12 and CTL18 maybe installed side by side.**
10. Tables 1 provides system sizing guidelines which are based on system design flow and leachfield loading rates.

### 1. Preparing Trenches and placing Concrete Chambers

After the work area has been prepared for installation according to approved plans excavate the trench 88" wide. When the trench has been excavated to the plan's specified length and the bottom has been leveled start installing the GoodFlow concrete chambers.

Each chamber has knockouts on the ends and sides. Break out all of the knockouts on the 8' long sides of the chambers. Break out the chamber end knockouts that are to be set against another chamber end. Leave the knockouts intact on the first wall of the first chamber and the end wall of the entire row. This will leave the end walls free from soil migration into the chambers.

### 2. Preparing the CTL Plastic Fins:

After the chambers have been installed level and in proper alignment, make sure that the side bottom areas are level with the bottom of the concrete chambers. Place the 4' long preassembled CTL plastic fin segments on top of the concrete chambers. Connect the two 4' segments together by using the provided back pieces, top straps and base pieces to create an 8' length.

Pick up each 8' segment and place it alongside the concrete chamber with the fabric covered side facing away from the chamber. Align the plastic with the concrete chamber side so that the ends line up and all the side openings are covered. If any gaps are present between the plastic and concrete part, carefully tap the back piece, tops, and base pieces to close any gaps that may occur.

Repeat these procedures until both sides of the concrete chambers are tightly fitted with the plastic structures to the designated lengths.

### 3. Backfilling

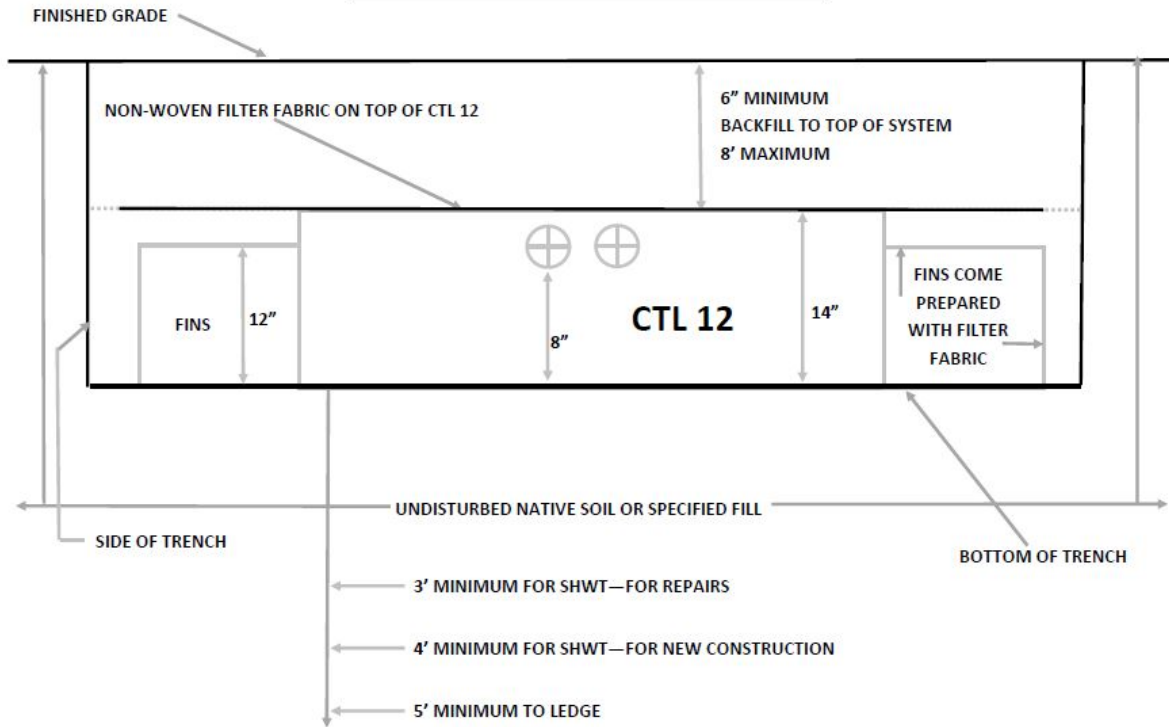
See pages 6 & 7 for details. Once the concrete and plastic parts have been installed properly backfill the system with Tittle V Sand. Place backfill material between the fins along the filter fabric wrap and in front of the fins. Backfill in 12" lifts using a modified hand tamper (available from GoodFlow) or equal form of compaction. Compact the material as tight as possible. Be careful not to tear or pull away the filter fabric. Repeat the process until the Tittle V Sand is on top of the plastic fins and filled level with the top of the concrete chambers. Cover the entire GoodFlow system with filter fabric including the 2" of Sand on the fins. Then, backfill at a minimum of 6" of cover from the top of the system (see diagrams). The distribution line to feed effluent to the CTL system is a 4" P.V.C. pipe.

### **H2O Requirements:**

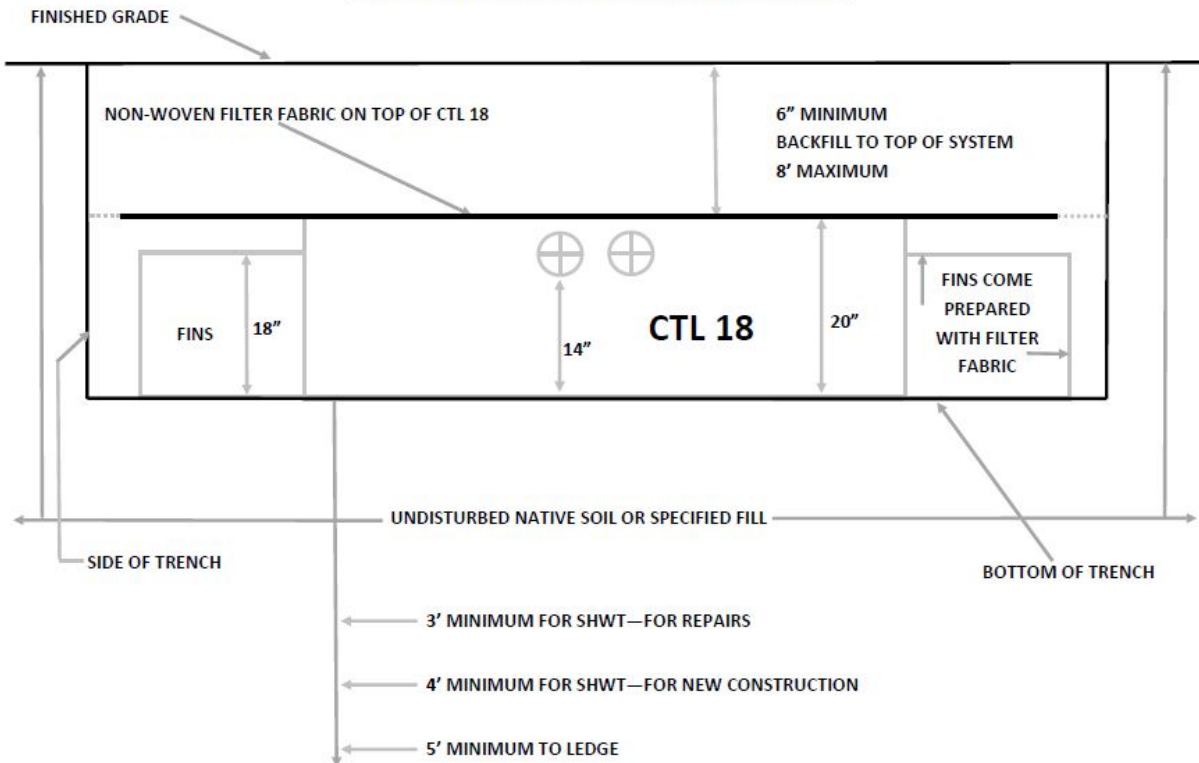
See pages 8 & 9 for details on subsurface prep and backfilling. GoodFlow requires in the H-20 application 2" of Tittle V Sand on top of the fins so the area on top of the plastic fins will be filled level with the concrete chambers. Cover the entire GoodFlow system with filter fabric including the 2" of Sand on the fins. For H-20 applications, backfill the area on top of the entire structure with a minimum of 10" of compacted gravel or  $\frac{3}{4}$ " process material with 2" of finish surface.

# H-10 SUBSURFACE PREPARATION & BACKFILL CTL12 & CTL18

## CTL 12 H-10 Subsurface Preparation & Backfill



## CTL 18 H-10 Subsurface Preparation & Backfill



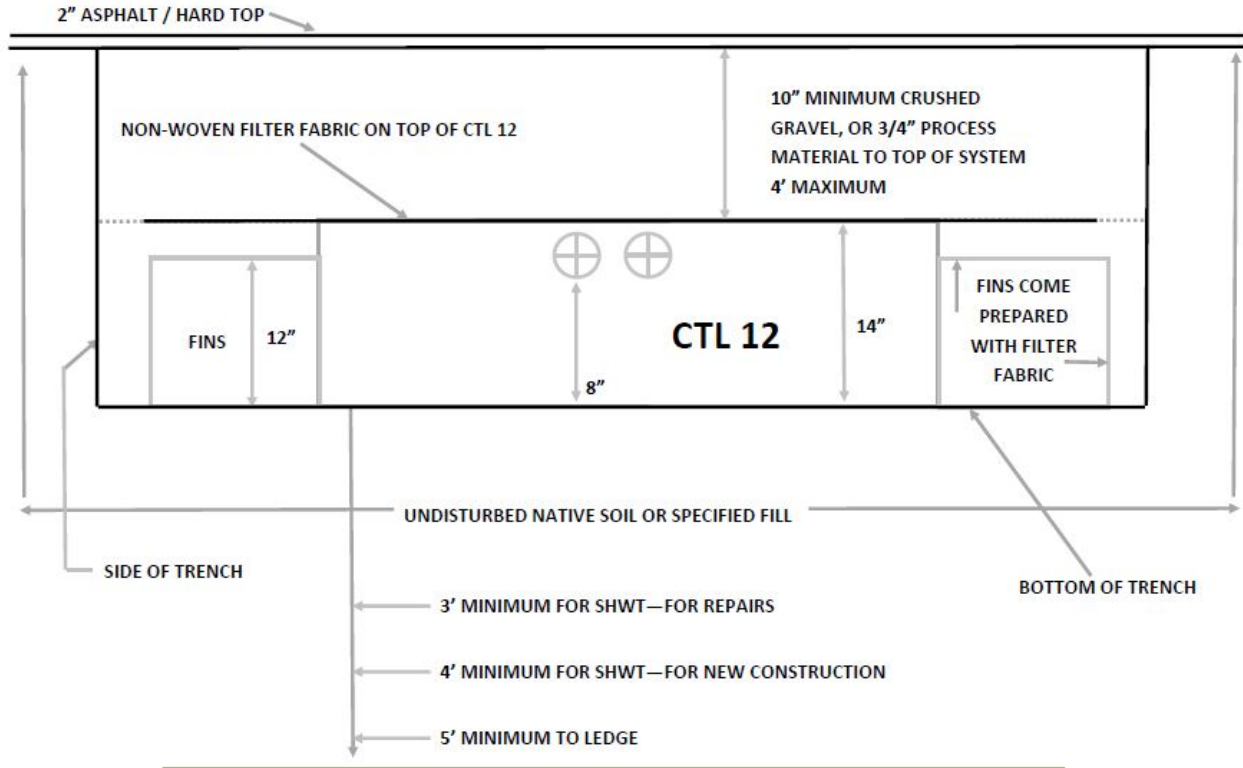
## H-10 SUBSURFACE PREPARATION AND BACKFILL CTL12 & CTL18

- Fins come prepared with Filter Fabric on all sides except the bottom – this is separate from the filter fabric on top of the system provided by installer.
- Minimum 2” of Tittle V Sand from the top of the fins to the top of the chamber
- Filter fabric is placed across the concrete chamber and on top of the 2” of Sand on top of the fins. The non-woven synthetic filter fabric shall have adequate tensile strength to prevent ripping during installation and backfilling, adequate air permeability to allow free passage of gases, and adequate particle retention to prevent downward migration of soil particles.
- Minimum 6”/Maximum 8’ (2” Tittle V Sand above Fins) Clean Backfill
- Minimum 3’ to SHWT for Repairs
- Minimum 4’ to SHWT For New Construction
- Minimum 5’ to Ledge

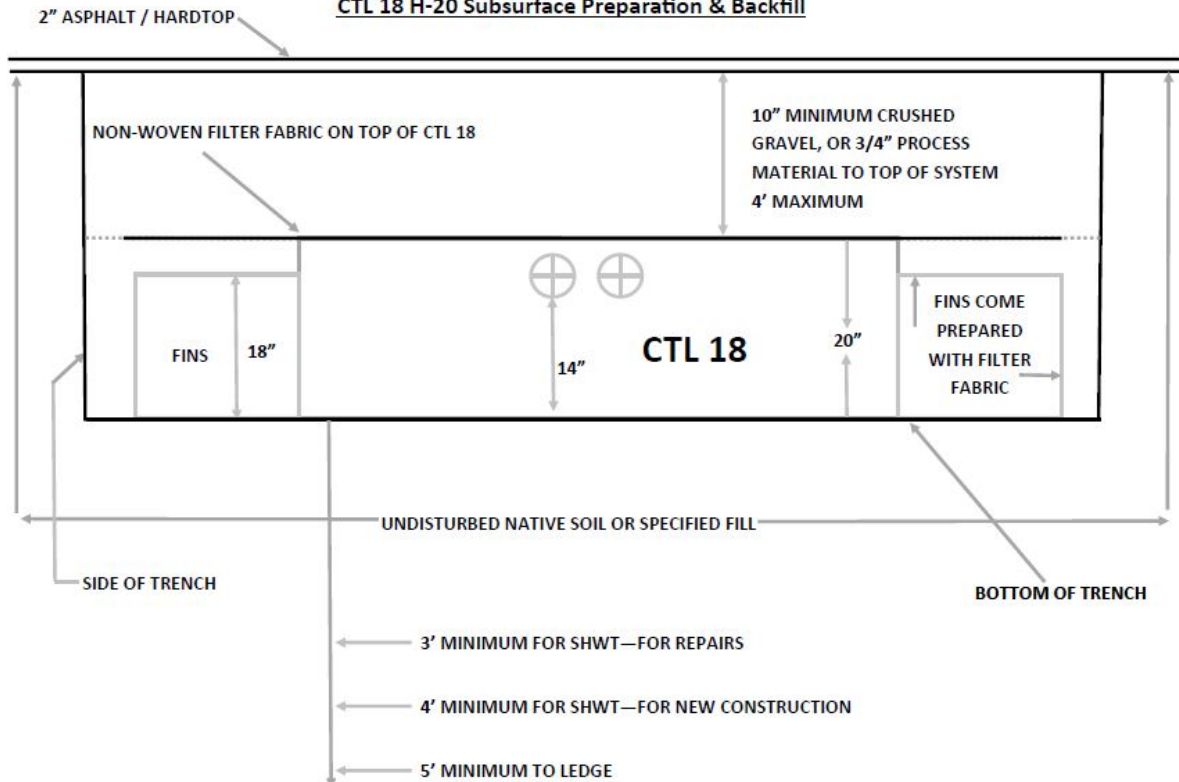


# H-20 SUBSURFACE PREPARATION AND BACKFILL CTL12 & CTL18

## CTL 12 H-20 Subsurface Preparation & Backfill



## CTL 18 H-20 Subsurface Preparation & Backfill



## H-20 SUBSURFACE PREPARATION AND BACKFILL CTL12 & CTL18

- Fins come prepared with Filter Fabric on all sides except the bottom – this is separate from the filter fabric on top of the system provided by installer.
- Minimum 2" of Tittle V Sand from the top of the fins to the top of the chamber
- Filter fabric is placed across the concrete chamber and on top of the 2" of Sand on top of the fins. The non-woven synthetic filter fabric shall have adequate tensile strength to prevent ripping during installation and backfilling, adequate air permeability to allow free passage of gases, and adequate particle retention to prevent downward migration of soil particles.
- Minimum 10"/Maximum 4' (2" Tittle V Sand above Fins and 2" hard top), Backfill with compacted gravel or  $\frac{3}{4}$ " process material with 2" of finish surface
- Minimum 3' to SHWT for Repairs
- Minimum 4' to SHWT For New Construction
- Minimum 5' to Ledge

**TABLE 1 - MASSACHUSETTS SYSTEM SIZING CTL12 & CTL18**

			MINIMUM AREA OF TRENCH REQUIRED (SF)			LINEAR FOOTAGE OF CUR-TECH CTL-12 OR CTL-18 REQUIRED (FT)		
			Bedrooms per House			Bedrooms per House		
Soil Type	Percolation Rate (MPI)	Application Rate (GPD/SF)	3	4	5	3	4	5
Class I	1-5	0.74	446	596	743	42	56	70
Class II	1-5	0.60	550	733	916	52	70	86
Class I	6	0.70	471	629	786	44	60	74
Class II	6	0.60	550	733	916	52	70	86
Class I	7	0.68	485	647	809	46	62	78
Class II	7	0.60	550	733	916	52	70	86
Class I	8	0.66	500	667	833	48	64	80
Class II	8	0.60	550	733	916	52	70	86
Class II	10	0.60	550	733	916	52	70	86
Class II	15	0.56	590	786	982	56	74	94
Class III	15	0.37	892	1189	1486	84	112	142
Class II	20	0.53	623	830	1038	60	80	98
Class III	20	0.34	971	1294	1618	92	122	154
Class II	25	0.40	825	1100	1375	78	104	130
Class III	25	0.33	1000	1333	1666	96	126	158
Class II	30	0.33	1000	1333	1666	96	126	158
Class III	30	0.29	1138	1517	1897	108	144	180
Class III	40	0.25	1320	1760	2200	126	168	208
Class III + IV	50	0.20	1650	2200	2750	156	208	260
Class III + IV	60	0.15	2200	2933	3666	208	278	348

1. The calculation of trench area is based on a 40% reduction from the Title 5 requirements in 310 CMR 15.242.
2. Wastewater flow based on 110 gallons per bedroom in accordance with 310 CMR 15.203.
3. Minimum square feet required for new construction is 400 sf.

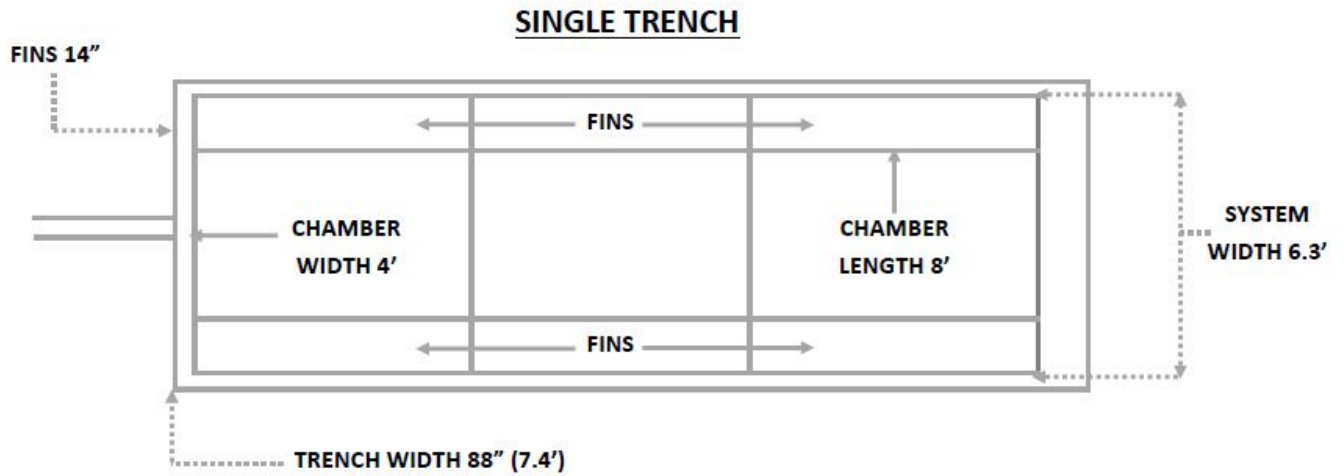
**Example:** Cur-Tech design calculation for one row of CTL-12 and CTL-18 in bed configuration

- House Size – 3 Bedrooms
  - Percolation Rate + 1 inch in 10 minutes
  - Design Flow – 110GPD x 3 bedrooms = 330GPD
    - $330\text{GPD} / .60 = 550 \text{ sq ft required}$
  - $550 \text{ sq ft} / 10.57 \text{ sq ft} = 52 \text{ linear ft of Cur-Tech CTL-12 or CTL-18 system}$

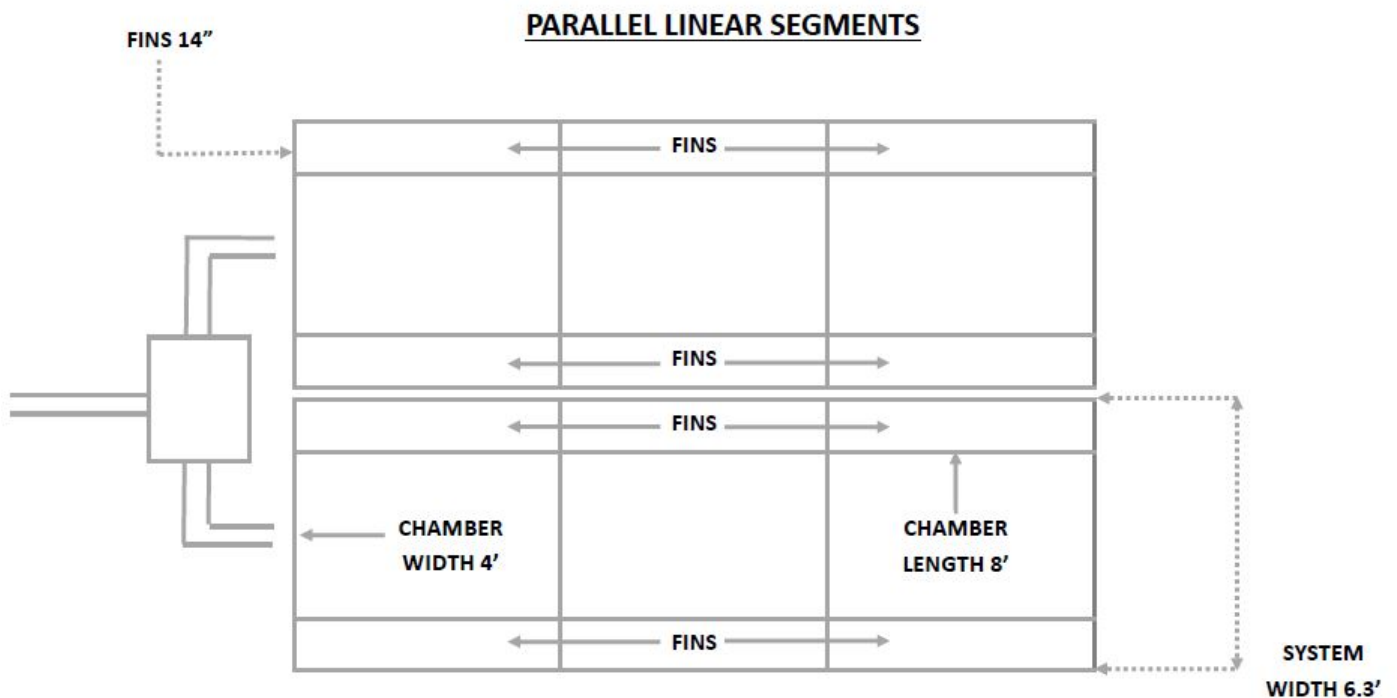
**\*Due to the large displacement of sand because of the volume of the Cur-Tech structures a large savings in sand is gained.**

**\* Please see trench diagrams on page 12**

## TRENCH DIAGRAMS

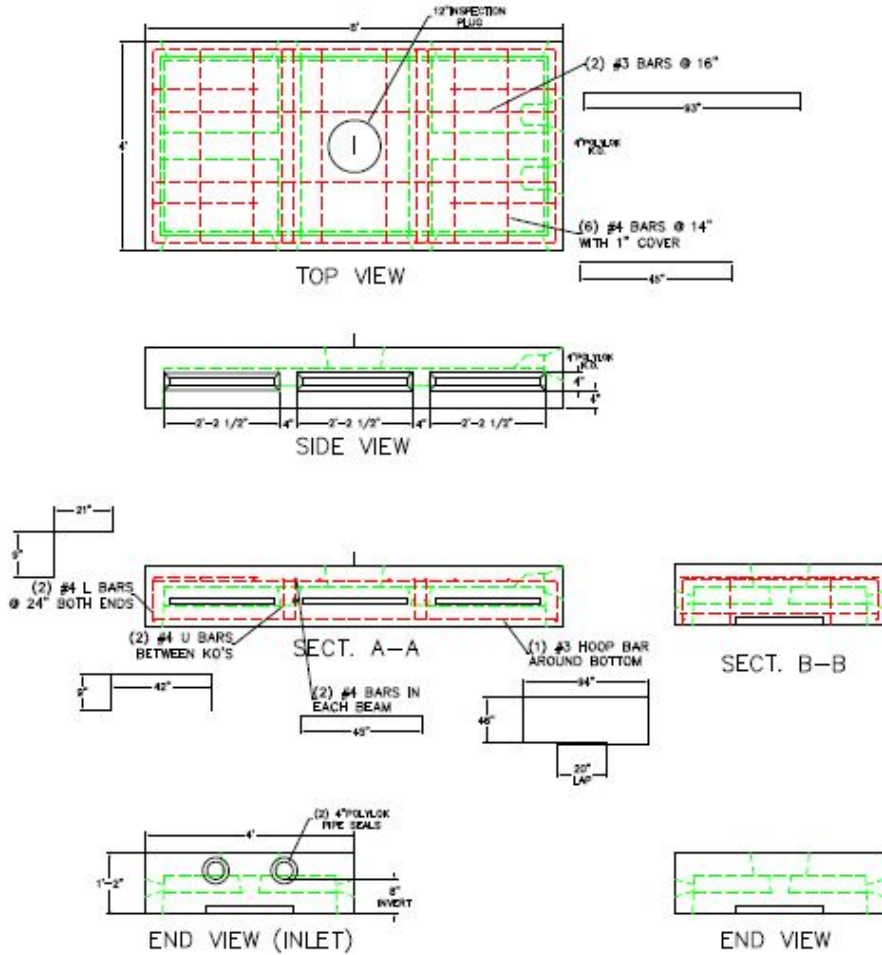


- Width of CTL 12/18 Systems 6.3'
- Width of Trench CTL 12/18 Systems 88" (7.4')
- Length of Trench: (# of chambers x 8') + 6" Front + 6" Back = Trench Length
- The system only needs 6 inches in the front and back to install chambers and fins
- Length of this Example: (3x8') + 6" + 6" = 25'



- Parallel linear segments of CTL 12 and CTL 18 units can be placed **side by side with no spacing**
- Length calculation same as single trench

# 4'x8'x14" HS-20 CUR-TECH



**DESIGN NOTES:**

1. PIPE INLET FOR 4" DIAMETER POLYLOK PIPE SEALS
2. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM A615 GRADE 60
3. CONCRETE COMPRESSIVE STRENGTH 5,000 PSI AT 28 DAYS
4. SECTION IS CAST MONOLITHICALLY
5. DESIGNED FOR HS-20 LOADING WITH 12" TO 48" OF EARTH COVER.



SCITUATE RAY PRECAST  
 120 CLAY PIT ROAD  
 MARSHFIELD, MA 02050  
 PHONE # 1-800-440-0009  
 FAX # 781-837-4320

CONTRACTOR:

JOB NAME:

DATE:

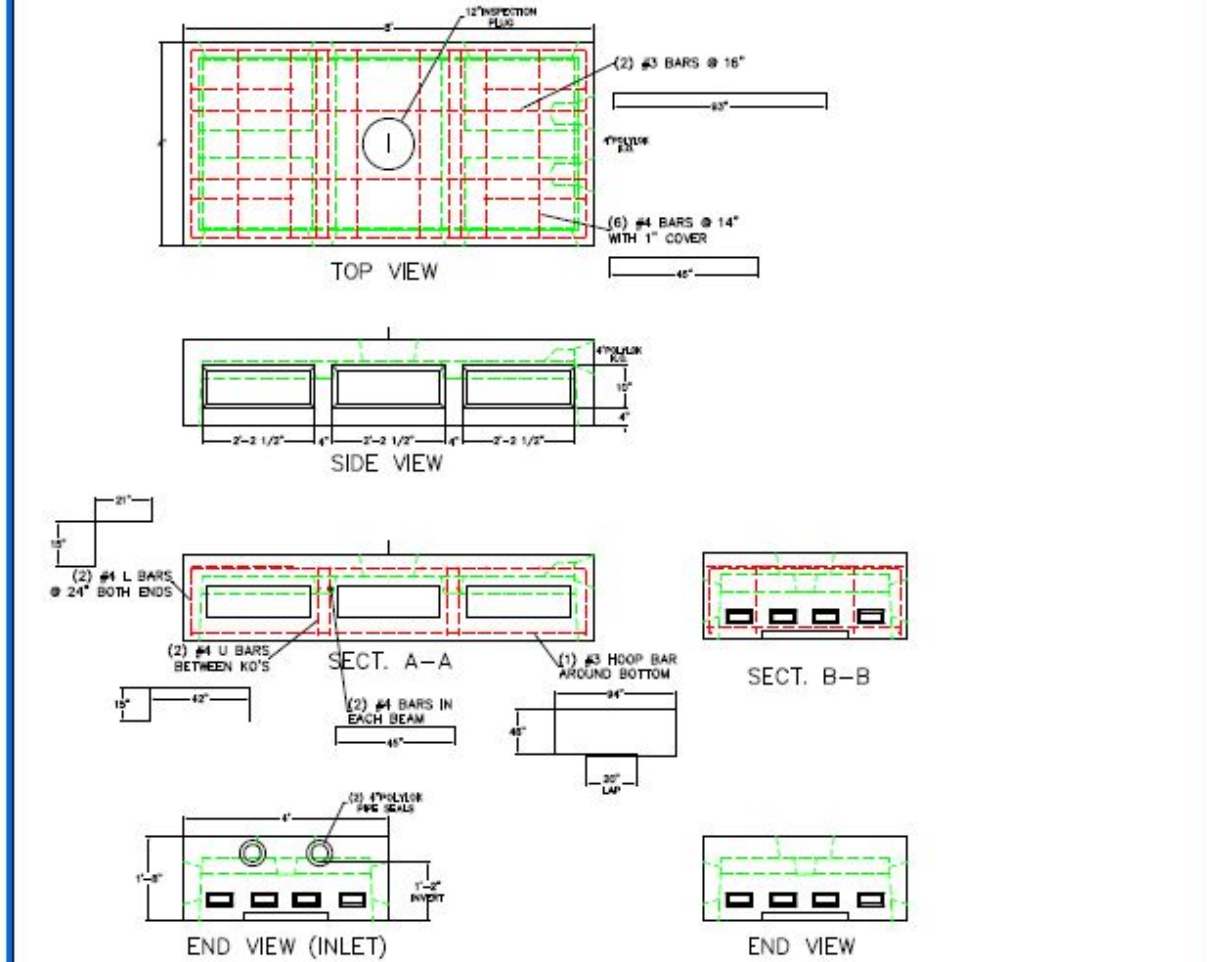
DRAWING: CURTECH4820

DRAWING BY: C.J. SCOTT



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# 4'x8'x20" HS-20 CUR-TECH



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## MAINTENANCE REQUIRTEMENTS

The only maintenance required for the CTL System is to have the septic tank pumped on an annual or biannual basis.



## COMPANY BACKGROUND

GoodFlow, a Connecticut-based company, designed a new system called the CTL series that allows contractors, builders, and engineers to design larger square foot septic systems in a smaller footprint area.



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