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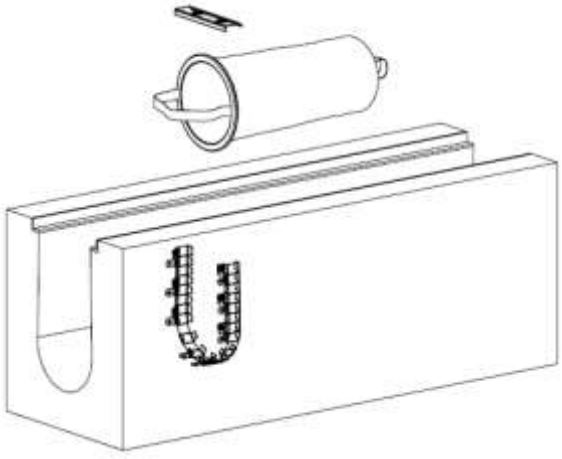
GUTTER BIN®
STORMWATER FILTRATION SYSTEM

CHANNEL FILTER SYSTEM (CFS)

SERVICE & INSTALLATION MANUAL



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INTRODUCTION

Thank you for purchasing the Gutter Bin® stormwater filtration system Channel Filter System (CFS). Congratulations on buying the best channel filter system on the planet. Properly installed, the CFS will provide years of excellent service by effectively and efficiently removing loads of pollution. The CFS is versatile, allowing for installation in series or in parallel configuration, and offers a multitude of different filtration media options.

The goal of this manual is to concisely and comprehensively communicate the installation process for the CFS. By the length of this manual, it may seem that installing a CFS is a complicated process. We can assure you that it is not, and you will find it straightforward. Please read these instructions to the end before you start the installation. You are well on your way to a cleaner world. OK, let's Get Your Mind Into The Gutter™!

CUSTOMER SUPPORT

Need help? Contact us:

Call:	307-797-7720
Email:	support@frogcreek.partners
Website:	https://frogcreek.partners/support
Scan:	QR code (TBD)

You will find instructional videos, technical documentation, specification sheets and product briefs.

We are here to support you 24/7/365.

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PROJECT PREPARATION

1. Obtain approval to perform the work (permits, ROW, management, etc)
2. Communicate with the infrastructure owner and stakeholders about the project
3. Arrange for training the persons who will perform Gutter Bin installs and maintenance.
4. **CLEAN THE TRENCH DRAIN PRIOR TO THE INSTALL**
5. Plan and emphasize a safe work environment.
6. Gather the necessary tools, equipment, and PPE for the job.

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SAFETY NOTICES

Clean out the trench drain prior to installing a Gutter Bin. Gutter trash can contain hazardous materials and dangerous objects.

Failure to properly utilize traffic cones and a high visibility safety vest could cause injury to the installers or pedestrians and may lead to civil penalties. Be sure to adhere to all local, state, and federal regulations when servicing or installing stormwater infrastructure.

Try to avoid installing Gutter Bins in high traffic areas during the busiest time of day. Traffic and pedestrians are one of the main installation hazards. Protect yourself and those around you by using common sense and being safe.

Wear the appropriate personal protective equipment (PPE) for the job and as per your manager's or organization's direction. A list of recommended PPE is included for your reference.

Dispose of all pollution according to your organization's requirements as well as local, state and federal requirements.

SAFETY EQUIPMENT - PPE

1. Gloves
2. Steel toe boots
3. Safety glasses
4. Ear plugs
5. High visibility safety vest
6. Traffic control devices (cones)
7. Dust mask
8. Knee pads
9. Hard hat

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CHANNEL FILTER SYSTEM CLEANING PROCEDURE

Total Cleaning Time: 5 to 10 minutes

Required Tools for Cleaning a CFS

1. Personal Protective Equipment (PPE)
2. Grate Pick
3. Tool to Unlock the Grate (if locked)
4. Receptacle to Hold the Pollution (e.g. trash can or plastic bag)
5. Crane Scale (to weigh the pollutants, if required by your organization)
6. Smartphone with the FCP Field Asset Manager (FAM) mobile app.

Steps:

1. **Secure the Area:**
   - Ensure you have a clean and safe work environment.

2. **Remove the Storm Drain Cover:**
   - Remove the storm drain cover above the CFS frame and bag. The cover may be bolted or locked down. Unlock and remove grate(s).
   - Use a grate pick or your hands to remove the cover.
   - Remove as many storm drain covers above the CFS as needed.

3. **Sweep or Spray Pollution:**
   - Sweep or spray the pollution into the CFS and the Mundus Bag.

4. **Remove the Bag Lock:**
   - If present, remove the bag lock on the top of the CFS by sliding it out of the frame.

5. **Remove the Mundus Bag:**
   - Grab the top front part of the bag where the hoop engages with the frame and gently pull straight up to remove the bag from the CFS frame.
   - To avoid ripping the bag or bending the frame components, ensure that the handles or other fabric do not get hung up on any part of the CFS frame.

6. **Weigh the Bag:**
   - Using a crane scale, weigh the bag and record the necessary data in the FCP Gutter Bin Field Asset Manager (FAM).

7. **Remove and Replace Internal Media:**
   - Inside the Mundus Bag, you may find specialized media components.

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- Mycelx Snippets: These are doughnut-shaped hydrocarbon, oil, and grease capture media. They originally start out as bright yellow. Replace the Snippets if they are black or dark brown. Dispose of them properly.
- Performer Media: This media is in a blue, porous fabric that looks like mosquito netting. It should be replaced at least once per year. Dispose of it properly as well.
- For accurate weighing of the captured pollution, weigh the contents of the bag without the Performer Media, as it adds significant mass.

8. **Dispose of the Contents Properly:**
   - Dispose of the contents of the Mundus Bag properly.
   - If reusing the bag, wash it from the outside inward to backflush the pollution and clear out the filter holes.
   - Avoid washing the pollution back into the storm drain. Drain into a sanitary sewer or other approved discharge point.

9. **Replace or Reinstall the Bag:**
   - If the bag is soiled or blinded off, replace it by removing the Mundus Bag from the adjustable hoop and installing a new filter bag.
   - Reinsert the hoop and Mundus Bag back into the CFS frame, guiding it gently into place to avoid bending the flexible hoop.
   - If you face resistance, push on the sides of the hoop closest to the frame rather than in the middle to avoid bending or collapsing the hoop.
   - Ensure proper fit where the bag and hoop are snug and fit well into the frame with no gaps.
   - Tug on the tail of the Mundus Bag to make sure it's snug and properly extended to maximize its pollution capture ability.

10. **Record Data**
    - Take a picture and record the final data in the FCP Gutter Bin Field Asset Manager (FAM) - or other data recording device.

11. **Replace the Grate:**
    - Replace the grate as you found it and re-secure any locking bolts.

12. **Clear the Area:**
    - Clear the area of any equipment.

13. **Contact Frog Creek Partners:** if you need replacement media or Mundus Bags.

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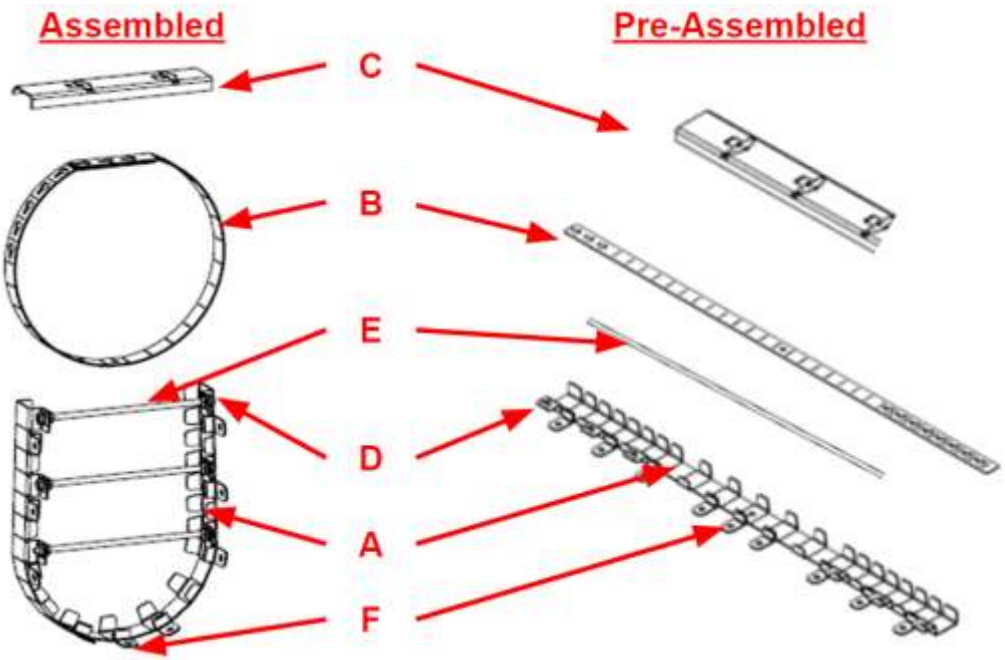
CHANNEL FILTER SYSTEM (CFS) INSTALLATION INSTRUCTIONS

REQUIRED INSTALLATION TOOLS

1. Hammer drill (corded or cordless)
2. Masonry drill bit, ¼ inch (at least 2” long)
3. Hammer
4. 7/16” open end wrench (spanner)
5. Linesman pliers
6. Vice grips
7. Grate puller
8. Tape measure
9. Scraper
10. Broom
11. Marker (Sharpie)
12. Handheld angle grinder with grinder cutoff wheel
    a. or a shop cutoff saw & grinder
13. Metal punch with 1/8” tip picture
14. Silicon sealant & application gun (if gaps between frame and trench wall are present)

CFS COMPONENT LEGEND



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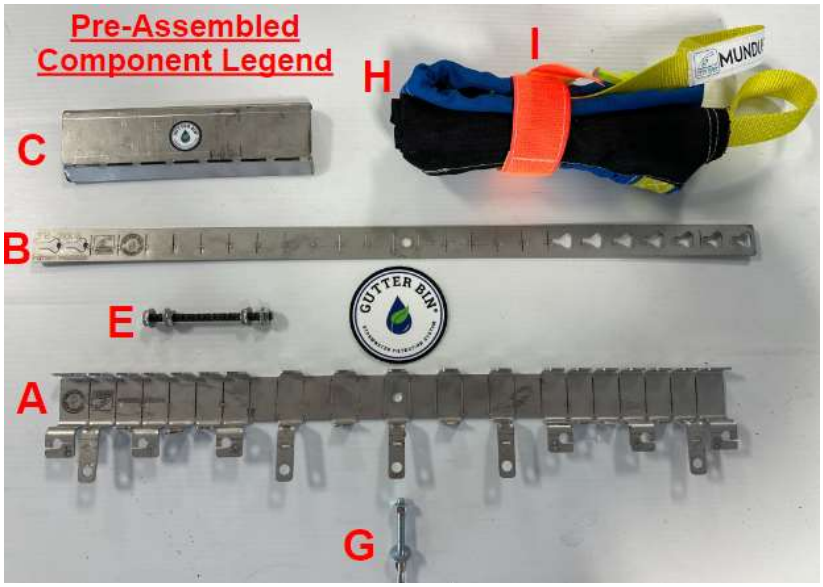

COMPONENT LIST

PART	PART NAME	LOCATION AND PURPOSE	QTY
A	**CFS Frame**	Bendable channel filter frame that all parts attach to	**1**
B	**Adjustable Hoop**	Bendable adjustable hoop that fits within the CFS frame and attaches to the Mundus Bag	**1**
C	**Bag Lock**	Cut to length bended metal part that prevents the bag from dislodging from the CFS Frame (optional on small CFS units)	**1**
D	**Extender Tab**	A tab on the upstream side of the CFS Frame that the Extender Device attaches to causing the CFS Frame to compress against the wall of the trench. ~ 3 on each side	**6**
E	**Extender Device**	Cut to length ¼" stainless steel all-thread with at least 2 nuts.	**1**
F	**Anchor Tab**	A tab situated on the upstream side and bottom of the CFS frame that attaches to an anchor bolt	**3**
G	**Concrete Anchor Bolt**	Secures the CFS frame to the bottom centerline of the trench	**6**
H	**Mundus Bag**	A versatile water filter bag that removes pollution from stormwater	**1**
I	**Mundus Strap**	Used to choke up the bag length or as an attachment device	**1**

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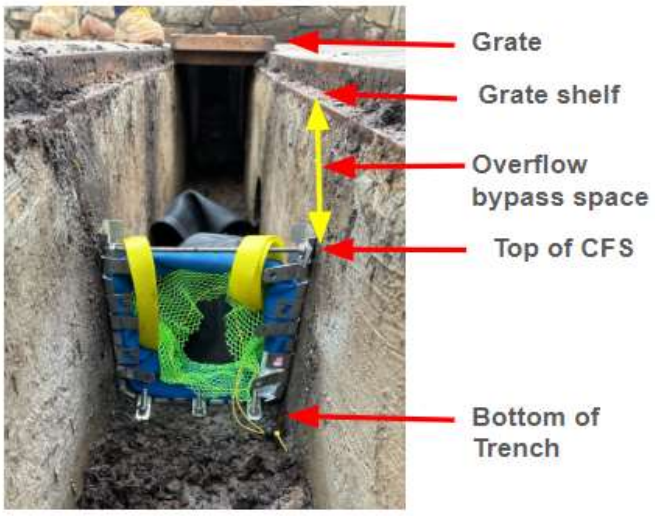
OBJECTIVES FOR INSTALL:

1. Proper Installation: Ensure all CFS components are correctly installed into the trench or channel for years of service.
2. Optimize Position: Position the frame and filter bag to maximize pollution capture while allowing overflow during high storm events.
3. Safe Installation: The installer safely completes a high-quality Gutter Bin Channel Filter System installation.

CFS INSTALLATION PROCEDURE:

1. Identify Placement:

- Identify where you are going to place the Channel Filter System (CFS) . It should be placed near the lowest downstream end of your trench drain to filter the most water. Ensure you have enough room downstream of the CFS so that the Mundus Bag has sufficient space to rest without dropping into a hole. The Mundus Bag will lay out approximately 3-4" below the CFS frame.



- Confirm that you will have enough overflow bypass space between the top of the CFS frame and the bottom of the storm grate. This will allow water to continue flowing even if/when the filter bag becomes full.

2. Clean the Site:

- Properly clean the site with a broom or hose. The site should be clean and dry before working to ensure a better and safer work environment. This will also improve the visibility of marks and adhesion of sealant.

3. Prepare Performer™ filter media

- If you intend to install MYCELX Performer™ filter media to remove heavy metals from your stormwater, then you must soak it in a bucket of clean water for at least 20 minutes. This will activate the media. Frog Creek likely shipped it to you dry.

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4. Mark the Center Line and Confirm Dimensions:

- Use a measuring tape to determine the centerline of the trench a few inches upstream of where you intend to place the Gutter Bin Channel Filter System. Mark the center line, within plus or minus 1/4 inch.

- Confirm & note the width of the trench drain. This measurement is crucial for cutting the length of the expansion device and the bag lock in future steps.

Note: a blue trench drain cross section model is used for demonstration purposes

4. Bend the CFS Frame:

- Bend the flat CFS frame to match the profile of your channel or trench drain. Be deliberate and intentional, as excessive bending or hard hits can fatigue or break the metal. Bend it so the flat edge is facing outward toward the trench drain wall.

5. Test Fit the CFS Frame:

- Place the bent CFS frame into the trench. Align the center anchor tab facing upstream with the dot or line you marked earlier.

- If the frame is too long, then you may need to cut it down to size. If this is the case, you always want the center hole of the frame to align with the center of the trench. Therefore, you will cut equal lengths from each end of the CFS frame so that the Expansion Tabs will line up at install. You may also need to cut down the adjustable hoop to length too. Make sure that you cut the end of the adjustable hoop off that does not have the Frog Creek logo or Gutter Bin logo on it.

6. Drill the Anchor Hole:

- Drill a 1/4-inch hole at the designated point to a depth that accommodates your concrete anchor bolt. Ensure at least 1/2 inch of the bolt head is showing.

- For plastic or fiberglass trench drains, it is recommended that you don't drill into the structure. Use an environmentally safe adhesive like silicone. Place it around the outside wall of the CFS Frame so that it adheres to the trench drain wall. The expansion device will provide a lot of hold power.

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7. Prepare the Expansion Device (ED):

- Cut the expansion device (1/4-inch stainless steel all-thread) to a length 1/4 inch less than the width of the channel at the height where the expansion device is positioned. Use an angle grinder or chop saw to cut the all-thread. Use a grinder to remove burrs and bevel each end of the all thread so that a nut can spin on/off.

- We recommend that you spin at least one nut on the all-thread before you cut it. This makes it easier to reform threads after cutting it because a nut is a lot easier to spin a cut thread than it is to spin ON a cut thread.

the OFF

8. Install Anchor Bolts:

- Align the anchor bolt with the anchor tab on the upstream center of the frame. If more than one anchor bolt is required, drill additional holes. Typically, one properly anchored bolt is sufficient.

9. Affix the Expansion Device (ED):

- Attach the expansion device to the CFS. Typically, at least two EDs are used per CFS, but only one may be required for smaller CFS frames.

10. Bend the Top Segments:

- Before inserting the CFS frame into the trench, slightly bend the very top segments of the frame outward (toward the trench wall) so that it flares out a few degrees. This will allow the filter bag and hoop to be more easily inserted.

11. Adjust Unused Tabs (optional):

- Bend any unused tabs outward towards the trench walls to allow water and pollution to flow more easily into the CFS.

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12. Insert the CFS Frame:

- Insert the CFS frame into the trench, ensuring the anchor bolt is facing upstream. Place the anchor tab hole over the anchor bolt and tighten the bolt until snug.

- If using adhesive, do not apply it until you have contoured the CFS frame.

13. Contour the Frame:

- Push the CFS frame against the trench walls, using a hammer, 2x4 wood block, or metal hand steel to gently pound it into place. Avoid excessive force to prevent breaking the frame.

- Apply adhesive to the outside of the frame at this step if it is a plastic or fiberglass trench drain structure. You may find that you don't even need adhesive because the expansion device(s) provide a firm hold. We will leave that for you to decide.

14. Expand and Secure the Expansion Device (ED):

- Ensure the CFS frame is vertical and square to the trench drain before final fit up and ED expansion.

- Use a 7/16-inch open-end wrench to move the outside nuts to the end of the all thread on either side of the ED. The flanged portion of the nuts should face each other and squeeze the ED tab between the nuts. Use vice grips to prevent the all thread from spinning.

- Expand both inner bolts on each ED all thread outward towards the trench walls to cause the CFS frame to press against the trench walls until snug.

15. Ensure Adequate Overflow Gap:

- See earlier step, "Identify Placement" for overflow/bypass instructions

- Ensure there is an adequate distance between the top of the filter bag and the top of the trench drain (overflow gap). This overflow gap

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is where water will flow if/when the bag is full. If needed, minimize or decrease the size of the hoop to allow for proper overflow.

16. Bend the Adjustable Hoop to Match the Frame Contour:

- Bend the adjustable hoop to match the contour of the CFS frame. Ensure the rigid handle end is centered at the top of the open end of the frame.

17. Attach the Adjustable Hoop:

- Attach the ends of the adjustable hoop together using a metal punch, hammer, and/or pliers. Bend at least two tabs opposing each other to secure the hoop.

18. Install Filter Media:

- Performer Media: Hold the Mundus Bag™ water filter upright with the handle in the air. Drop the performer media and bag into the Mundus Bag.

- Mycelx Snippets: Drop the Snippet™ bag on top of the Performer™ media in the Mundus Bag. This ensures hydrocarbons are removed first before the water interacts with the performer media and bag walls.

19. Attach the Mundus Bag:

- Pull the open top end of the Mundus Bag through the center of the adjustable hoop a couple of inches. Ensure the shock cord knot faces upward and overlaps the handle of the hoop. Roll the anchor fabric over the hoop to fasten the bag.

- Step on the tail of the Mundus Bag and pull with your fingers to snug the bag onto the hoop.

20. Test Fit the Bag:

- Test fit the bag and adjustable hoop into the CFS frame. Ensure there are minimal to no gaps between the bag and the frame. Push near the edges of the adjustable hoop when inserting to prevent hoop collapse.

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- Tug on the tail to ensure it is secure within the frame.

21. Cut the Bag Lock:

- Cut the bag lock to a length 1/4 inch less than the width of the trench drain width immediately above the top of the bag. Grind down any burrs to prevent snags and cuts. Insert the bag lock from the upstream side into the segment gap above the top of the adjustable hoop.
- On top of the bag lock is a cleat to hold the handle loops. Bend the cleat up to 90 degrees so that you can attach a handle to it.

22. Seal Gaps:

- Fill any gaps with sealant or silicone from the upstream side to prevent pollution loss. For larger gaps, use rags, rubber, wood, or metal to create a small dam, then apply sealant.

23. Make any final note in FAM:

- Take three pictures of your final product.
  1. From upstream looking downstream into the filter.
  2. Top view looking down on the filter.
  3. Location view with the filter in the foreground and a recognizable feature in the background.
- Complete and log data within the FCP Field Asset Manager (FAM) App.

24. Replace grate, Clean up site, Ensure save for public use again.

25. Series Configuration for Highly Polluted Water:

- For extremely polluted water, use a pre-filter and post-filter setup with two or more CFS units in series. Place the first CFS with a TDS bag and Mycelx snippets 5-10 feet upstream of the secondary CFS with a TDS bag, Performer™ media, and Mycelx snippets.

CONGRATULATIONS, YOU DID IT. PLEASE EMAIL US A PICTURE OF YOUR INSTALLATION(S) AT:

SALES@FROGCREEK.PARTNERS

THANK YOU!

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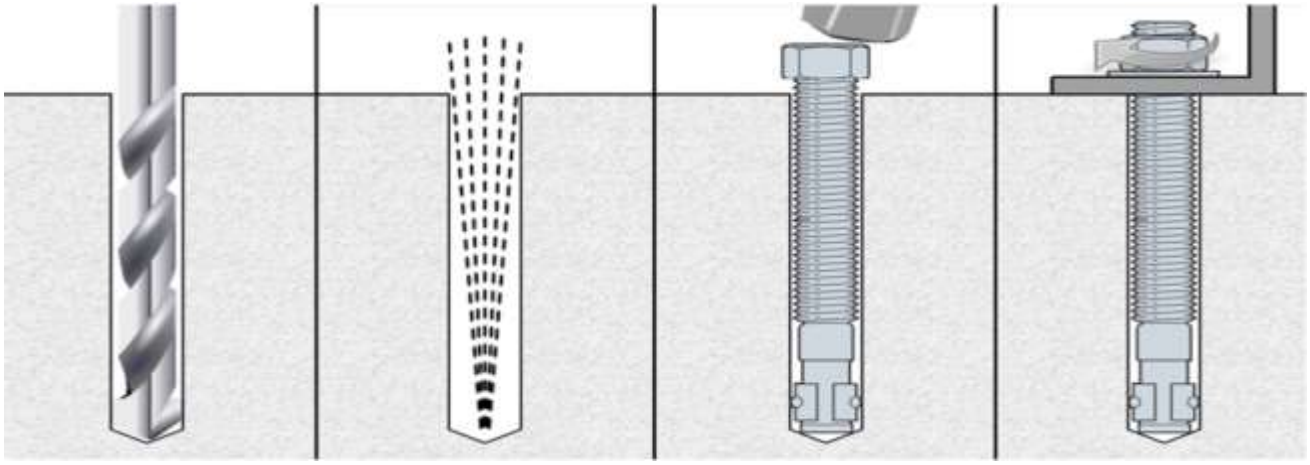
APPENDIX

How to drill & set a concrete anchor bolt:

1. Wear PPE
2. Use a hammer drill with ¼" masonry drill bit to drill the hole
3. Drill perpendicular to anchor's surface to a depth about one-half to one inch less than the total length of the anchor bolt
4. Cycle the drill bit into and out of the hole repeatedly to remove excess dust.
5. With the nut spun on the pounding end of the bolt to protect the threads, tap the bolt into the hole without bending the bolt
6. Remove the nut and then place the component over the anchor bolt with a washer and nut
7. Tighten the nuts only when all of the components are properly positioned. Recommended tightening torque is 8 ft-lbs. Do not overtighten or the anchor may disengage. It just needs to be firmly snug



Good Job! Please email us some pictures of your install and project location. Thank you again for installing Gutter Bins to help protect and restore the waters of this world!

REVISION NOTES:

(FCP note) add material info here, MSDS