



GLOBAL INDUSTRIES, INC.

# Clarifier Installation

*6' [1.83 m] - 24' [7.31 m] Diameters*  
CONSTRUCTION AND OWNER'S MANUAL





The Symbol shown below is used to call your attention to instructions concerning your personal safety. Watch this symbol - it points out important safety precautions. It means “ATTENTION” - Become Alert! Your Personal Safety Is Involved! Read the message that follows and be alert to the possibility of personal injury or death.



## **Be Alert! Your Personal Safety Is Involved**

A copy of this manual should be available at all times to the owner/operator. Additional copies may be requested from the company at the address shown on the back cover. Please reference part number #80010036 when requesting additional copies.

Please Contact Global Treatment Systems or Your Dealer if You Have Any Questions Concerning This Manual

**Keep This Manual In A Safe Place Available For Future Reference**



## PREFACE

You have purchased the finest Clarifier manufactured today. This manual includes the following instructions for your Clarifier: pre-construction guidelines, directions for proper construction, and methods for proper use once constructed. Read and understand this manual before building and use of your Clarifier.



### General Safety Statement

Your safety and the safety of others associated with the Clarifier, Clarifier components, all equipment, and construction equipment are of prime concern to us at Global Wastewater Treatment Systems. We wrote this manual to help you to better understand how to safely build and use this Clarifier.

It is your responsibility as the owner, builder, operator, or supervisor, to know what specific requirements, precautions, and hazards exist and to make these known to all personnel working with the equipment or in the area, so that they too may take any necessary safety precautions that may be required!

Failure to read this Manual and all Safety Instructions by all personnel is a misuse of the equipment. We want you as our partner in safety!

All personnel, including construction personnel, must read and understand the manual before starting Clarifier / Global Treatment System construction!





# Global Limited Warranty

## Limited Materials and Workmanship Warranty:

Global Wastewater, a division of Global Industries, Inc., warrants to the initial retail purchaser of the products (the Customer) that the products manufactured by Global contained in its Global Wastewater Treatment System (the System) are free from defects in materials and workmanship in normal use appearing within twenty (20) years from the date of delivery to the Customer. Products that are part of the System that are not manufactured by Global are covered by the specific warranties provided by their manufacturer and are not covered by this limited warranty.

This limited warranty do not apply to: (1) normal wear and tear; (2) damages caused by accidents, abuse, alteration, modification, misuse, neglect or improper care or maintenance (field modifications of products without the express written permission of Global constitute a misuse of the product); (3) damages or failures caused by repair or replacement using products not supplied, rebuilt, repaired or otherwise authorized by Global; (4) damages due to the failure to follow all instructions regarding installation and maintenance specified in the Global Operation and Maintenance manual (proof of proper installation and maintenance are the Customer's responsibility); (5) the cost of normal maintenance or replacement of parts which are not defective (these are the sole responsibility of the Customer); (6) damages caused by the location of the System, improper site preparation or grading or inappropriate soils or terrain; (7) damages suffered as the result of fire, earthquake, flood, lightening, hurricane, or other casualty or act of God; and (8) any System where the hydraulic load and/or organic loading, or other parameters exceeds the design standards and criteria used by Global.

Customer shall have no rights under this warranty (and Company shall have no obligation or liability under this warranty) unless and until the Company has received payment in full from the Customer for the System.

**EXCEPT FOR THE LIMITED WARRANTY SET FORTH HEREIN, THERE ARE NO OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, AND ALL SUCH IMPLIED WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED. IN NO EVENT SHALL ANY WARRANTY EXTEND BEYOND THE DURATION OF THE LIMITED WRITTEN WARRANTY SET FORTH HEREIN.**



### **Customer's Exclusive Remedy:**

Should any warranted product prove defective, Global, at its option, will repair or replace the defective product as follows: (1) for the first five (5) years after the date of delivery at no cost to the Customer; (2) for the next five (5) years, years 6 through 10, the Customer shall pay \_\_\_\_% of the repair or replacement cost; (3) for the next five (5) years, years 11 through 15, the Customer shall pay \_\_\_\_% of the repair or replacement cost; and (4) for the final five (5) years, years 16 through 20, the Customer shall pay \_\_\_\_% of the repair or replacement cost. Any shipping expenses and all labor costs to remove or replace any product warranted are the sole responsibility of the Customer.

A logbook or charts must accompany all claims by the Customer, prepared by a licensed, qualified and approved plant operator. The logbook is to have recorded data pertaining to the hydraulic loading, the organic loading, BOD5 (biological oxygen demand – 5 day average), TSS (total suspended solids) and DO (dissolved oxygen) and any other agreed upon criteria. Preparation and maintaining the logbooks shall be the sole responsibility and expense of the Customer. Failure to provide a logbook as required by this limited warranty shall relieve Global of all its obligations under this limited warranty.

**REPAIR OR REPLACEMENT AS DESCRIBED ABOVE IS THE ONLY RESPONSIBILITY OF GLOBAL, AND THE SOLE, ONLY AND EXCLUSIVE REMEDY OF THE CUSTOMER, FOR ANY BREACH OF EXPRESS OR IMPLIED WARRANTIES. IN NO EVENT SHALL GLOBAL BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES (INCLUDING WITHOUT LIMITATION, LOSS OF USE OR LOST PROFITS) OR ANY PERSONAL INJURY CLAIM OR DAMAGES RELATING TO THIS LIMITED WARRANTY OR THE PRODUCTS MANUFACTURED BY GLOBAL.**

The foregoing limited warranty is the sole and exclusive warranty offered by the Company and none of the Company's dealers, salespersons, franchisees, agents or representatives are authorized to make any other warranty or warranties on behalf of the Company. As the performance of the System is dependent upon many factors beyond the control of the Company, such as proper installation, adequate maintenance and proper operation, the Company makes no performance guarantee or warranty whatsoever and any such performance warranty or guarantee, express or implied, is hereby disclaimed.

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# 1

## Maintenance

An ounce of prevention is worth a pound of cure, an old adage that still rings true. Your GLOBAL Wastewater Treatment System / Global System has been designed for many years of dependable service, but as with any system, proper inspection and maintenance is essential. Corrosion is the primary concern in regard to the long-term structural integrity of the clarifiers. GLOBAL utilizes galvanized sheet good, cathodic protection and an epoxy coating as a standard three-level protection against corrosion. Inspection, detection and repair are the keys to long service life. We suggest implementing the following as part of the a regularly scheduled maintenance program for corrosion and overall clarifier integrity:

1. Keep exterior surfaces free of debris and foreign materials. Maintain a clean plant site.
2. Accumulated organic material, clinging to the interior walls, should be removed by scrubbing or power washing.
3. Inspect the integrity of the basin coating for scratches, abrasion or peeling. Promptly remove loosened paint, clean and re-coat.
4. The anodes should be checked annually to verify proper working condition. Refer to manufactures testing procedures.
5. Inspect for any obvious foundation settlement. Major settlement may cause structural failure of clarifier(s).
6. Inspect for any deterioration or looseness of bolts or fasteners.
7. GLOBAL strongly suggests that any mechanical, electrical or auxiliary equipment installed in or on the clarifier be checked on a yearly basis by a qualified service technician.



# 2 Safety

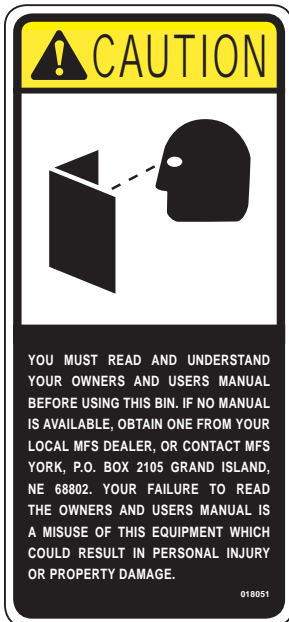
## Sign Identification and Placement



(018035) on sidewall bundles before shipped



Locate on the perimeter fence in the area of an English speaking population.



(018051) Attach this decal in an easily visible location before using bin (basin).



Locate on basin manway door.



1 on the drive side of the head hood, 1 on the drive guard





# General Safety Requirements

This GLOBAL Construction/Safety Manual is written to assist and instruct those who are responsible for the complete clarifier assembly, and for anyone maintaining or using the clarifier once assembled.

GLOBAL assumes no liability with respect to proper constructed and inspection, assembly, or use of its products established under applicable laws, all of which is the sole responsibility of the purchaser and those doing the assembly work.

Appurtenances and the accessories manufactured by us for use with our products conform only to applicable Federal or Safety Standards in effect at such time.

	<p><b>WARNING! Watch For This Symbol:  !</b> It Points Out Important Safety Precautions. It Means <b>“ATTENTION”</b> - Become Alert! Your Safety Is Involved.</p>
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## WORK AREA SAFETY STATEMENT

Under no circumstances should persons not involved in the operation be allowed to trespass into or be present in the work area.

It shall be the duty of all operators to see that children and/or other persons stay out of the work area! Trespass into the work area by anyone not involved in the actual operations, or trespass into a hazard area by anyone, shall result in an immediate shut down by the operator.

It shall be the responsibility of all operators to see that the work area has secure footing and is clean and free of all debris and tools which might cause accidental tripping and/or falling. It shall also be their responsibility to keep the work area clean and orderly during the operation.

## OPERATOR QUALIFICATIONS

Operation of this unit shall be limited to competent and experienced persons. In order to be qualified, he must also know and meet all other requirements, such as, but not limited to, the following:

1. Some laws and regulations specify that no one under the age of 16 years may operate power machinery. It is your responsibility to know what these requirements are in your own area or situation.
2. Current OSHA regulations state in part: “At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved”\*



3. Unqualified persons are to stay out of the work area.
  4. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine.
- \* Federal Occupational Safety & Health Standards for Agriculture  
Subpart D. Section 9128.57 (a) (6).

## **OSHA OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970**

Certain purchasers of our products may be subject to the requirements and standards of the William-Steiger Occupational Safety and Health Act of 1970, which prescribes standards for use of appurtenances of our manufacture, such as handrails, platforms, stairways, fixed ladders, ladder cages, and guard rails. (Occupational Safety and Health Standards Section 1910.21 through 1910.32). Before installing these devices, familiarize yourself with the above Federal Standards.

At the time of manufacture, these optional items conform to applicable standards. GLOBAL assumes no liability with respect to proper constructed, inspection, assembly, or use of its products under applicable laws, all of which is the sole responsibility of the purchaser and those doing the assembly work.

## **PROPER PERSONNEL**

To insure the safe operation of your clarifier be sure that only trained personnel install, maintain, and operate your clarifier!



## ADDITIONAL SAFETY RECOMMENDATIONS

A. You may decide to buy and install “auxiliary equipment” made by other manufacturers. GLOBAL has no control over the design and manufacture of this equipment. If you buy and install auxiliary equipment, then at a minimum **we suggest that you do the following:**

1. Obtain, read, and understand the instructions and cautions of the auxiliary equipment manufacturer. Be sure all equipment is installed according to the manufacturers recommendations.
2. Check with GLOBAL TREATMENT SYSTEMS or your dealer that your clarifier is designed to support any additional loads supplied by the auxiliary equipment.
3. Obtain any applicable safety decals from the manufacturer of the auxiliary equipment and insure they are displayed in a visible location.
4. Make sure all electrical equipment is properly installed and grounded by a qualified electrician.
5. Check availability and operation of electrical lockout and emergency stop systems.
6. Be sure all guards or shields are securely in place.
7. Store all operations/maintenance manuals in a safe place available for future use.

B. In this and other manuals, shields and guards may have been removed for illustrative purposes. Do not operate the equipment without shields and guards in place. Failure to heed this warning may result in serious personal injury or death.

C. The relatively closed environment of a clarifier may promote the presence of toxic molds, hazardous dust, or a lack of oxygen. Never enter such basins without proper respiration equipment and someone else present to watch you.

D. Heed the warning decals shown on pages 9 - 10.

E. When climbing on the clarifier, any of its components, or on ladders / roof ladders, take care not to fall into or from the clarifier. Common sense dictates that such appurtenances should not be used when conditions such as rain or wind preclude their safe use. GLOBAL strongly recommends that optional climbing equipment be purchased to meet the current specifications set forth by OSHA or ANSI whether the individual operator is required by law to do so or not. A properly secured safety belt should be used at all times when performing operations work or maintenance on the clarifier.

F. Care must be taken to avoid entanglement in equipment installed in or on the clarifier. Securely Lock out all power, be it electrical or PTO, prior to working on or near such equipment.

G. Field modification of the clarifier or auxiliary equipment without the authorization of the manufacturer may present unknown dangers to the operator and must be avoided.

# 3

## Specifications

### General Specifications

Clarifier(s) are designed along guidelines which allow years of effective service if it is not used for purposes for which it was not intended. The sidewall gage specifications for your clarifier(s) appear on [clarifier sidewall layout page\(s\)](#) (provided to you by Global Wastewater Treatment Systems with your unit). The general material specifications for your clarifier(s) are as follows:

#### WALLS

All wall sheets are of corrugated, galvanized steel with 2.66" corrugation.

Wall sheets have .90 oz. per square foot zinc coating (G-90 designation).

2.66" corrugation sheets have 32" vertical coverage.

Horizontal coverage of wall sheets is 112 1/2".

All 5/16" bolts are electro-galvanized grade 8.2 with self-sealing injection molded washers.

Anchor Bolts are standard with all clarifiers.



## DESIGN CRITERIA

Clarifiers are designed for contact with water or waste water only.

Have your builder make all non-clarifier equipment in excess of GLOBAL recommendations, like and WALK - WAYS self supporting.

## SAND FILL

GLOBAL recommends that a sand base of 4" be used as fill on the excavated site. Following this and prior to the pouring of the concrete foundation an optional vapor barrier (usually polyethylene) could be laid down upon the sand base. The foundation should be a minimum of six (6") inches and should include wire mesh of 6" X 6", 10/10 or better as required by a Site Engineer.

## STANDARD CLARIFIER CONES

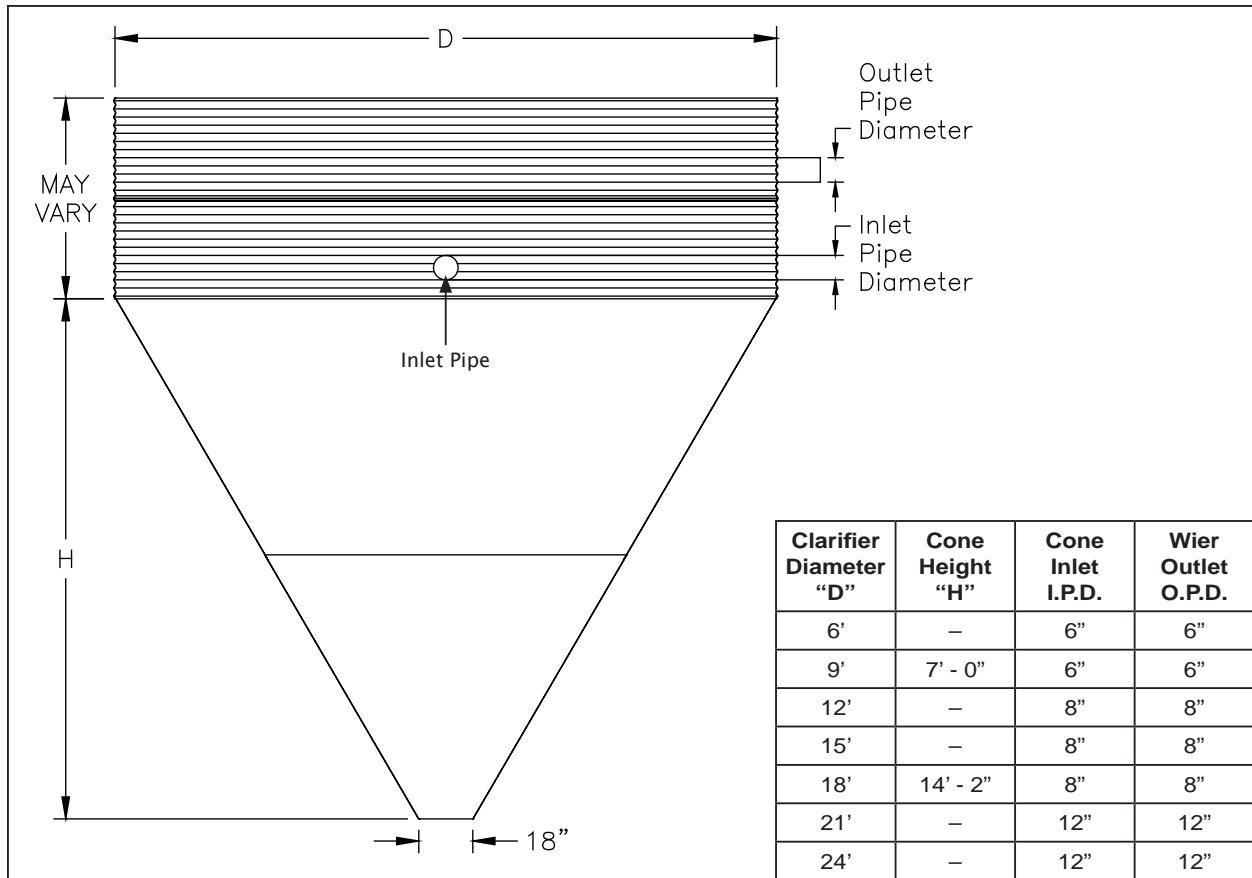
- 6' - 60° cone is 14 gage
- 9' - 60° cone is 14 gage
- 12' - 60° cone is 14 gage
- 15' - 60° cone is 14 gage
- 21' - 60° cone is 14 gage
- 24' - 60° cone is 14 gage



**WARNING!** Clarifier basins are designed to provide a barrier between separate process zones. The clarifiers are designed to have nearly identical pressures on the outside as on the inside of the clarifiers. When filling or draining the clarifiers, the elevation of water on either side of the wall should not vary more than (1) foot. Unequal pressure may cause structural failure of the clarifier basin.



**WARNING!** Installation of accessories or equipment in or on the clarifier, and/or other clarifier accessories that would over stress the structure in any manner will void the Warranty. If you do not have specific recommendations from Global Wastewater Treatment Systems, where additional loading is involved, please contact Global Treatment Systems before installing any such appurtenances or equipment.



**CLARIFIER BASIN VOLUMES**

Tank Diameter	Number of Sidewall Rings	Tank Gallons (U.S. gallons)	Tank Height (ft)	Liquid Height (ft)	Surface Area (ft <sup>2</sup> )
6'	3	1,733	11.40	9.90	28
6'	4	2,297	14.07	12.57	28
9'	2	3,036	11.28	9.78	64
9'	3	4,304	13.95	12.45	64
12'	2	6,116	13.83	12.33	113
15'	1	7,156	13.72	12.22	177
15'	2	10,679	16.38	14.88	177
18'	1	11,922	16.27	14.77	254
18'	2	16,995	18.93	17.43	254
21'	1	18,428	18.82	17.43	346
21'	2	25,334	21.48	19.98	346
24'	1	26,945	21.37	19.87	452
24'	2	35,964	24.03	22.53	452

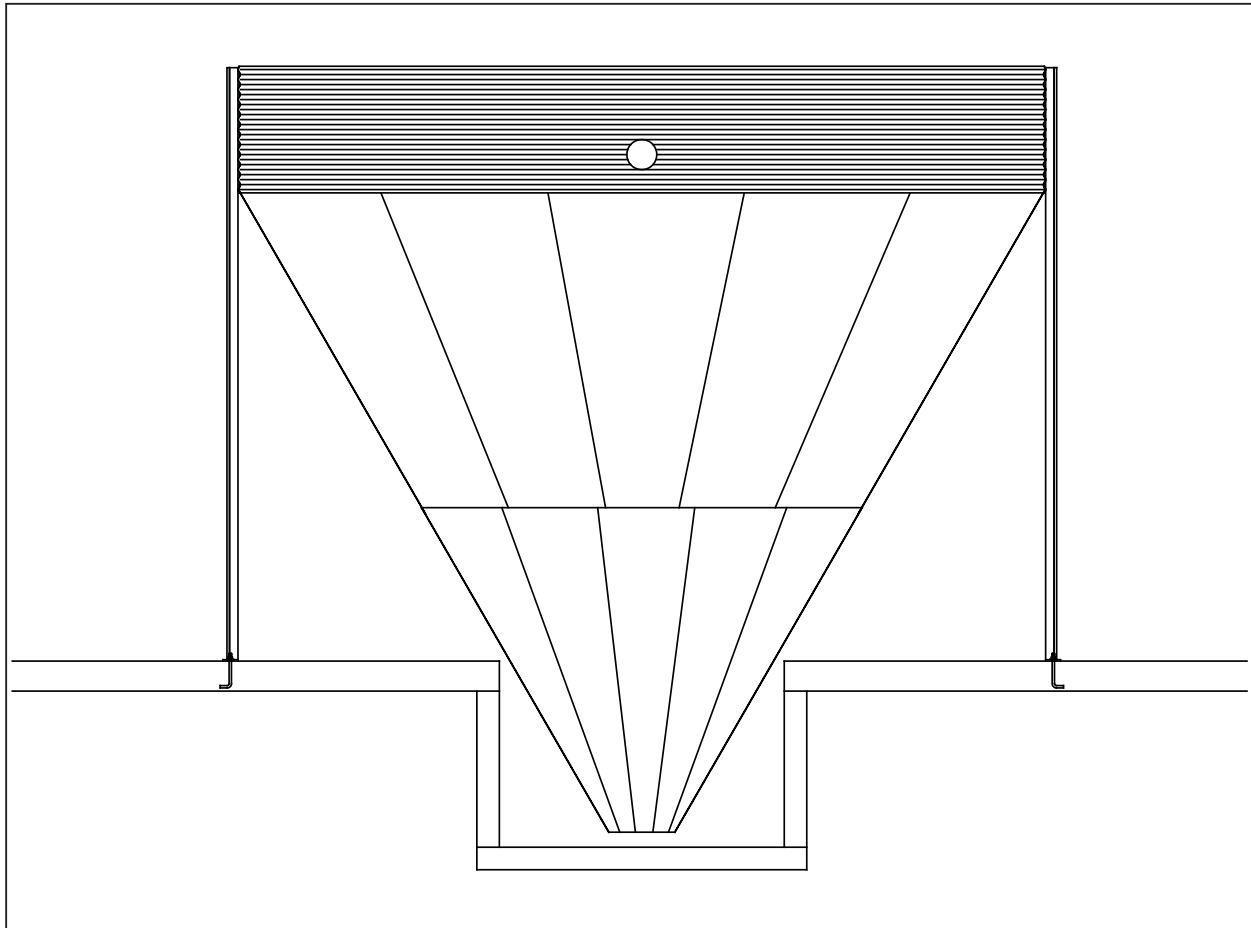
NOTE: All volumes are calculated on 32" per sidewall ring and 18" down from the top of the tank.





Clarifier basins have been designed to be located on the interior of aeration basins in certain installations. Depending on the size of clarifier and aeration tank, many of the clarifier cone bottoms will be placed below the aeration tank floor elevations. Plans will specify construction details for tank installation. The table on [the previous page](#) illustrates the volume of the clarifiers and related cone bottom elevation location in regard to the aeration tank floor elevation.

### CLARIFIER BASIN EXAMPLE ELEVATION





## Other Specifications

### CHECK DELIVERY

Your clarifier has been carefully checked before shipment. However, you should check your shipment upon arrival using the Packing List provided to insure it is complete.




Should you discover that a shortage exists or find that some material is damaged you should note on the freight bill that a shortage or damage exists. This should be done before you sign the freight bill since your signature indicates an acceptance of the shipment as it is received. Claims of any shortages must be made within ten (10) days from receipt of the shipment. Parts that are short or damaged are the responsibility of the delivering carrier. If there is damaged or missing equipment it must be reordered immediately so the installation of the equipment is not delayed.

### CAUTION

All galvanized steel is subject to oxidation, sometimes called "white rust" when exposed to moisture from any source. Care should be taken to protect sidewall sheets and roof sheets as much as possible. **INSIDE STORAGE IS ADVISABLE.** When on the job site, sheets should be placed on edge far enough apart to allow air to circulate freely.



## BOLT IDENTIFICATION AND TORQUE VALUES

Bolt Size	Bolt Head	Torque
1/4" grade 2		6 ft-lbs, 8.1 Nm, 0.83 kgf-m
5/16" grade 8.2		27 ft-lbs, 37 Nm, 3.7 kgf-m
1/2" grade 5		83 ft-lbs, 110 Nm, 11 kgf-m

**Have your contractor demonstrate that he/she is giving you the correct torque.**

Approximate torque levels for the fasteners that bolt your bin together are listed here. For all these “bearing type” sidewall sheet connections, a “snug tight” condition is sufficient to ensure structural soundness, where “snug-tight” is defined as the tightness attained by several impacts on an impact wrench, or the full effort of a worker with an ordinary spud wrench that brings the connected sheets into firm contact. A properly tightened bolt must have its seal washer fully seated in the hole and the sheets fully drawn together to produce a water-tight seal.

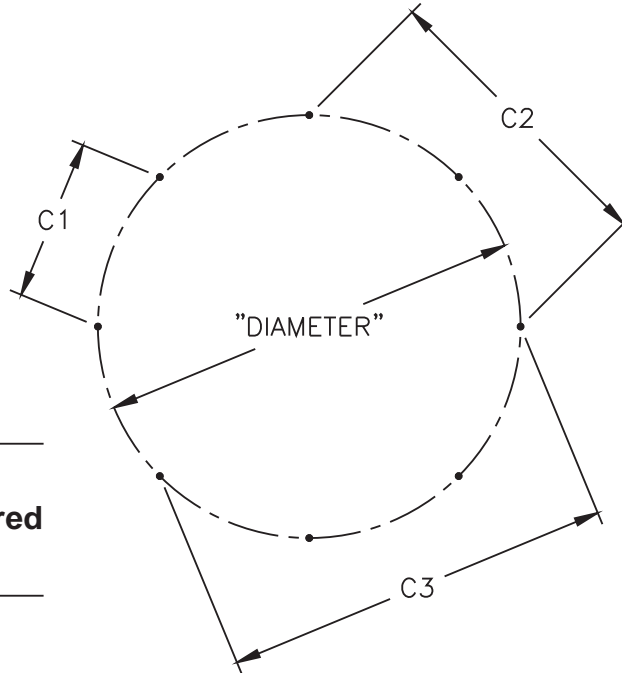


**WARNING! CRITICAL:** The correct bolts as specified and provided by Brownie Systems must be used throughout the entire assembly of this Global Treatment System / Basin! And, the correct bolt torques as indicated in the table above must be achieved throughout the entire assembly! Using the wrong bolts or not achieving the correct torque values could result in the structural damage or failure!

# 4

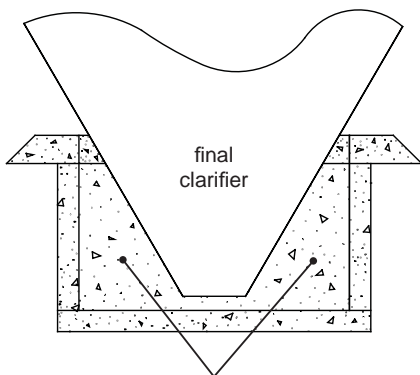
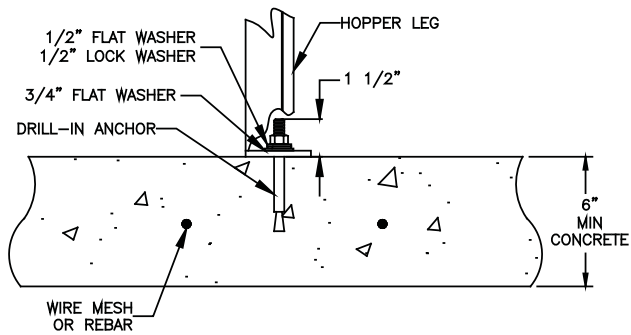
# Concrete / Site Location

## ANCHOR BOLT PLAN VIEW



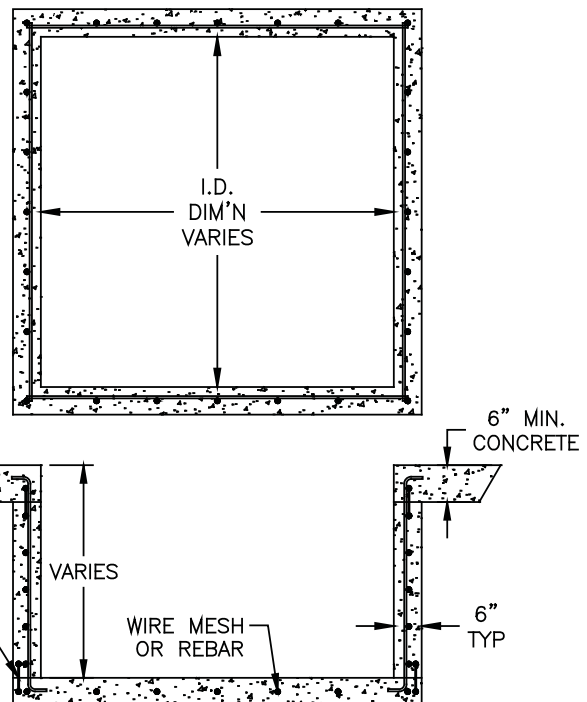
**\* NOTE:**  
Cone Box not required  
on all models.

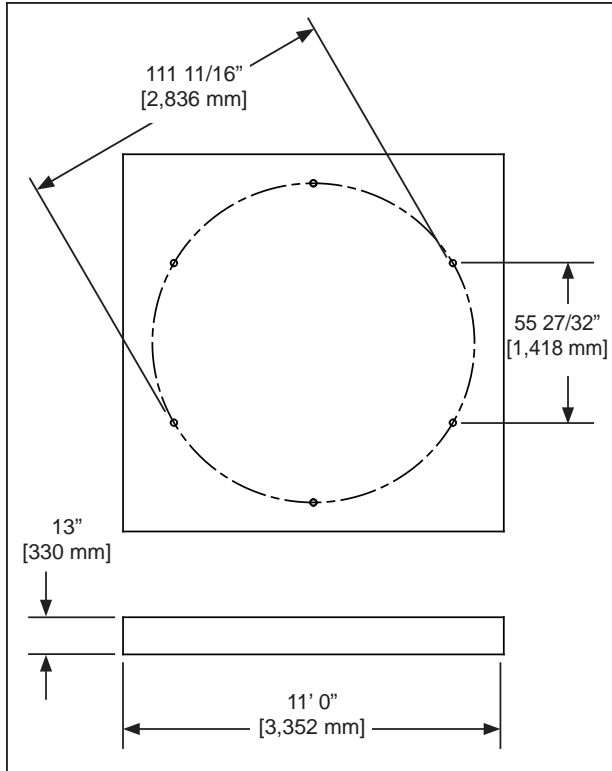
## CLARIFIER COLUMN CONNECTION



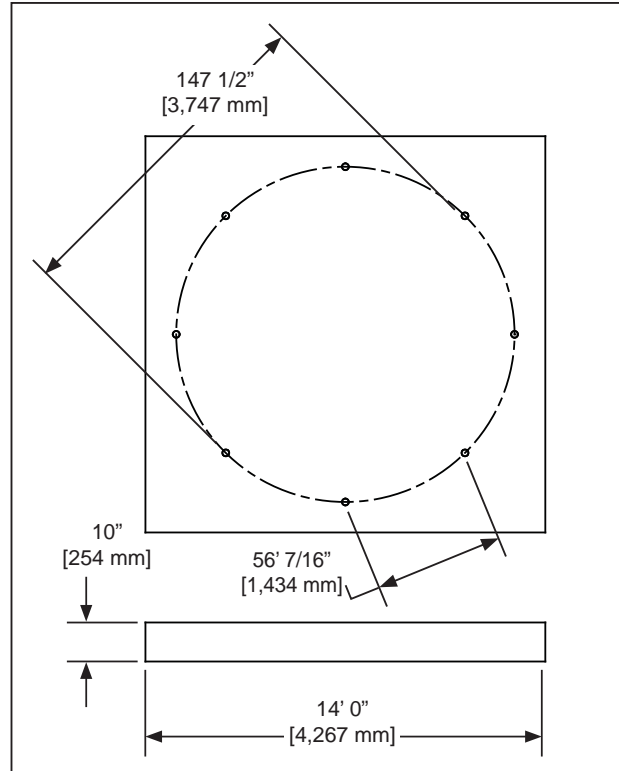
fill void with concrete after clarifier is installed

## \* CONE BOX DETAILS





**c** 9' [2.74 m] DIAMETER CLARIFIER FOUNDATION



**d** 12' [3.66 m] DIAMETER CLARIFIER FOUNDATION

### FOUNDATION NOTES:

1. The foundation site should be well drained and free of vegetation and/or debris.
2. Foundation(s) should be on undisturbed soil or engineered compacted backfill.
3. Foundation Design is based on an allowable soil bearing capacity of 3500 psf.
4. The concrete shall have a minimum compressive strength of 3000 psi. at 28 days.
5. Concrete should be allowed to cure 7 days before beginning the clarifier assembly and 28 days before filling the clarifier.
6. Welded Wire Fabric (WWF) shall conform to "specifications for welded steel wire fabric for concrete reinforcement" (ASTM A 185)
7. Concrete should be kept level to 1/8" between two adjacent columns, and 1/4" between any two other columns. High spots or debris should be removed prior to setting the bin.
8. **Foundation details in this manual are to be considered general in nature and are intended only as a guide. It is the owner's responsibility to provide an appropriate site and foundation design for the adequate support of clarifier(s) / basin(s).** GLOBAL assumes no responsibility for results arising from these suggestions.

# 5

## Pre-Assembly

### SIDEWALL SHEET IDENTIFICATION

The clarifier wall sheets are color coded on the end of the sheets for easy reference as follows:

Yellow - 14 Gage

To determine the number of sheets per ring, divide the bin diameter by three:  
(IE: 12' diameter clarifier divided by 3 = 4 sheets per ring.)

### CLARIFIER HARDWARE AND WHERE IT IS USED

5/16" x 1" bolts with seal washer and nuts -  
Used on clarifier sidewall sheets and roof sheets  
Used to bolt the columns to the sidewall

5/16" x 1-1/4" bolts with seal washers and nuts -  
Used to bolt the columns to the sidewall

5/16" x 3/4" truss bolts -  
Used to bolt cone sheets together

5/16" flange nuts -  
Used to bolt together the column bracing

1/2" x 1" bolts, washers, and nuts -  
Used to secure the columns to the concrete

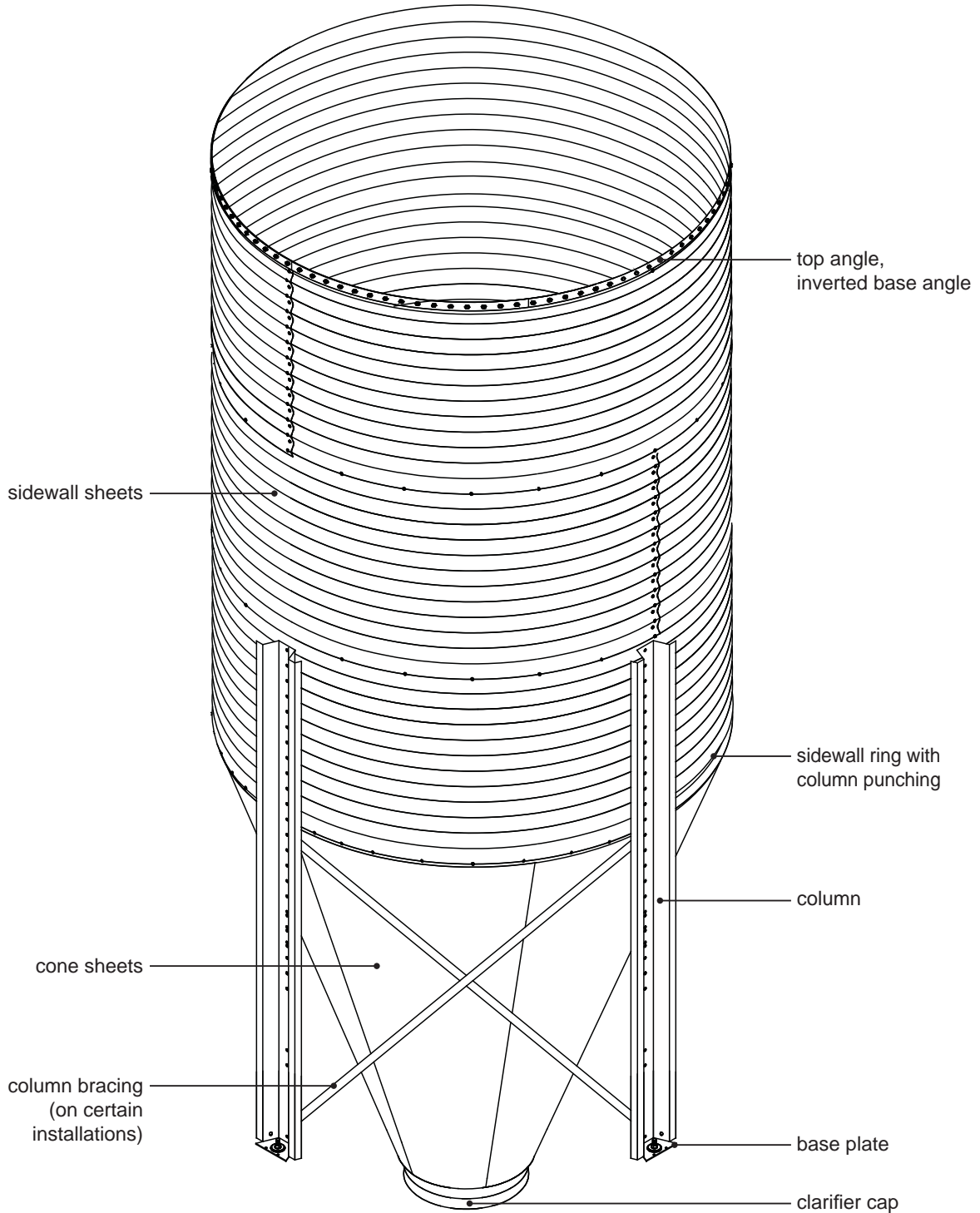
Sealer tape -  
Used on VERTICAL clarifier wall seams (2 strips)  
Used on the cone seams (2 strips)



**WARNING! UNDER NO CIRCUMSTANCES SHALL ANY OTHER BOLT BE SUBSTITUTED FOR THOSE SUPPLIED BY MFS/YORK/STORMOR!**

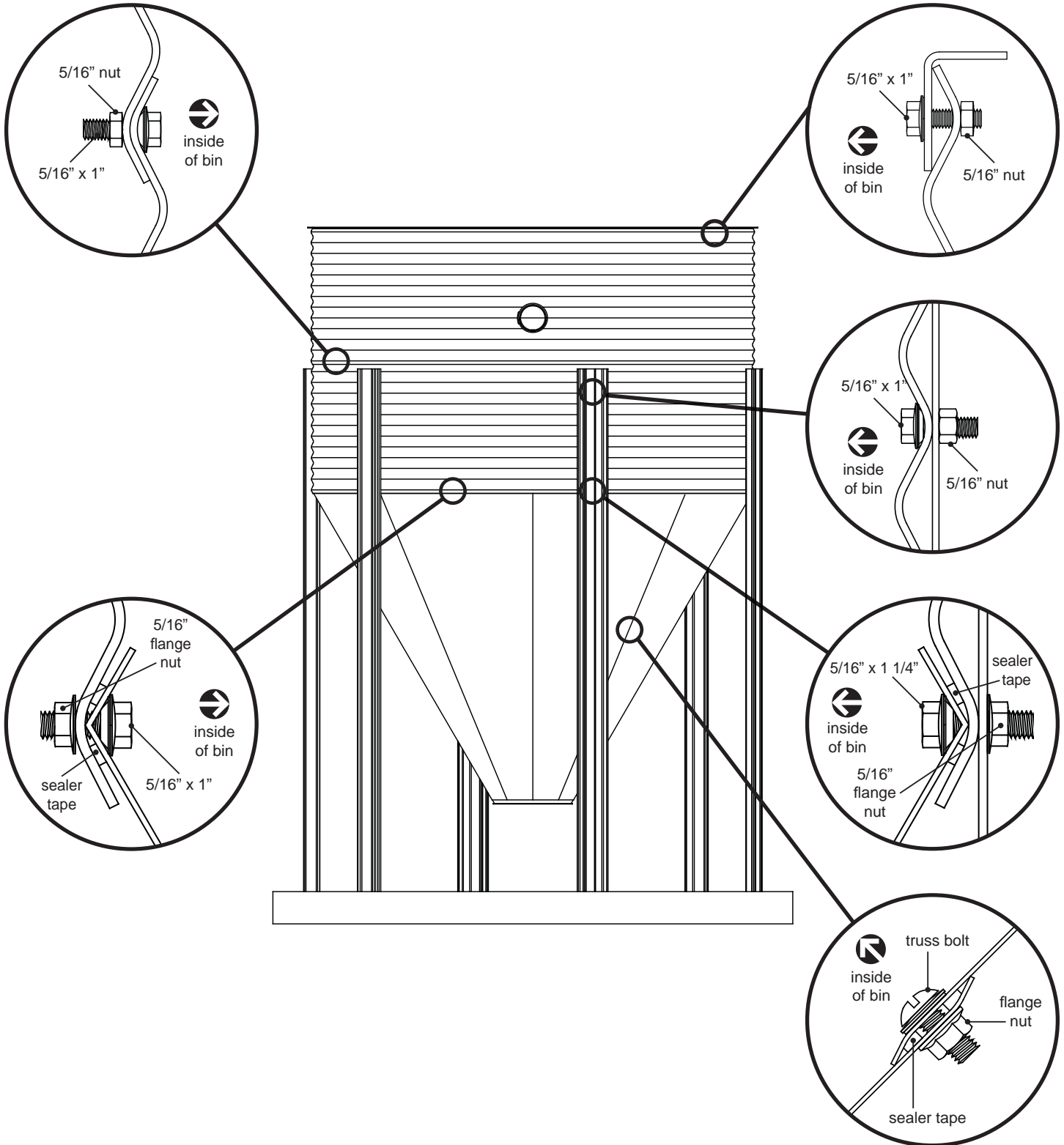


# Parts Identification





# Connection Details





# 6

## Assembly

### GENERAL ASSEMBLY INSTRUCTIONS

1. Complete the foundation. See the foundation section of this manual.
2. Set the sidewall sheets out near the pad in preparation for assembly.
3. Assemble the sidewall making sure that all the sidewall sheets overlap in the same direction.
4. Connect half of the cone sheets to the sidewall.
5. Install the bottom collar to the first half of the cone sheets that were just installed.
6. Finish the cone assembly.
7. Install the bottom cap.
8. Bolt the columns to the clarifier sidewall.
9. Install the cross braces to the brace brackets on the columns.
10. Install cone braces between the columns and the cone.
11. Install the base plates to the column bottoms.
12. Install inlet and outlet flanges.
13. Install the wier.
14. Raise the completed unit into position and secure with drill-in anchors.
15. Install any optional equipment.
16. Make certain all connections are tight.

**The rest of this manual provides necessary details and drawings for completing construction of a clarifier. Familiarize yourself with this manual before construction.**



# Clarifier Sidewall Construction

## 1

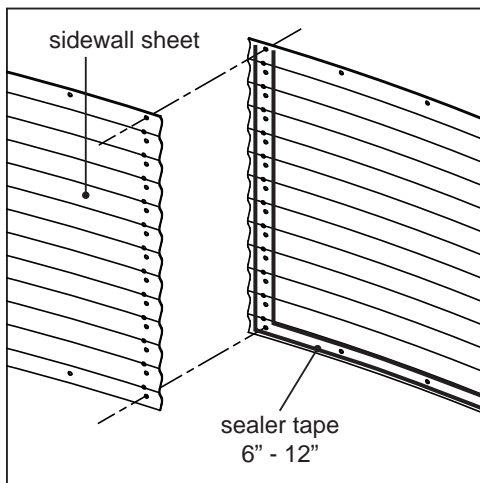
### mark clarifier location

Clarifier center location should be marked after pouring the foundation as shown on the drawings that come with your unit. It is recommended that the scribing that is needed should be finished before the concrete is fully set. Leave only a lightly etched mark.

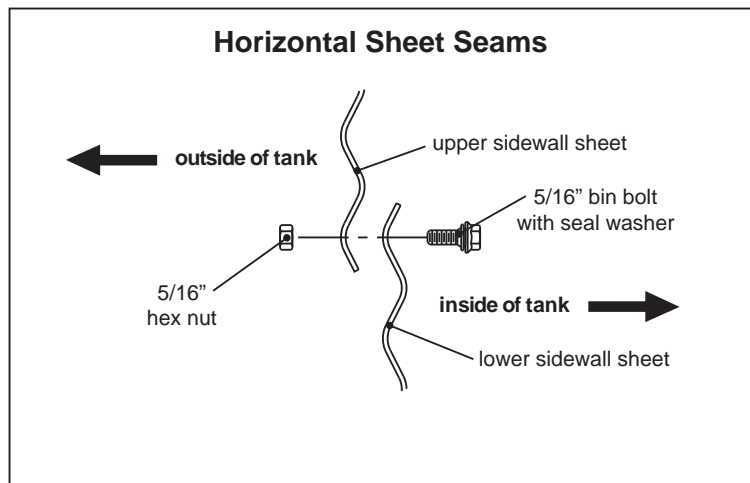


### IMPORTANT! Instructions to follow throughout sidewall construction

1. Always overlap the sidewall sheets in the same direction (example c, [the next page](#)).
2. Use 2 rows of sealer tape at all vertical sidewall seams and horizontally from sidewall seams 6" - 12" (example a).
3. Wipe sidewall sheets clean before sidewall sheet installation.
4. Bolt vertical sidewall sheets together with the bolt head and seal washer to the inside of the tank and the nut to the outside. Even at column locations, install bolt heads to the inside of the tank.
5. The sheets should be staggered in halves, or 56 1/4".
6. The top sidewall ring has a different hole punch pattern for the top angle and the bottom sidewall ring is punched for the columns and cone.
7. At horizontal seams, bolt lower sheets to the inside of upper sheets (example b).



a EXAMPLE



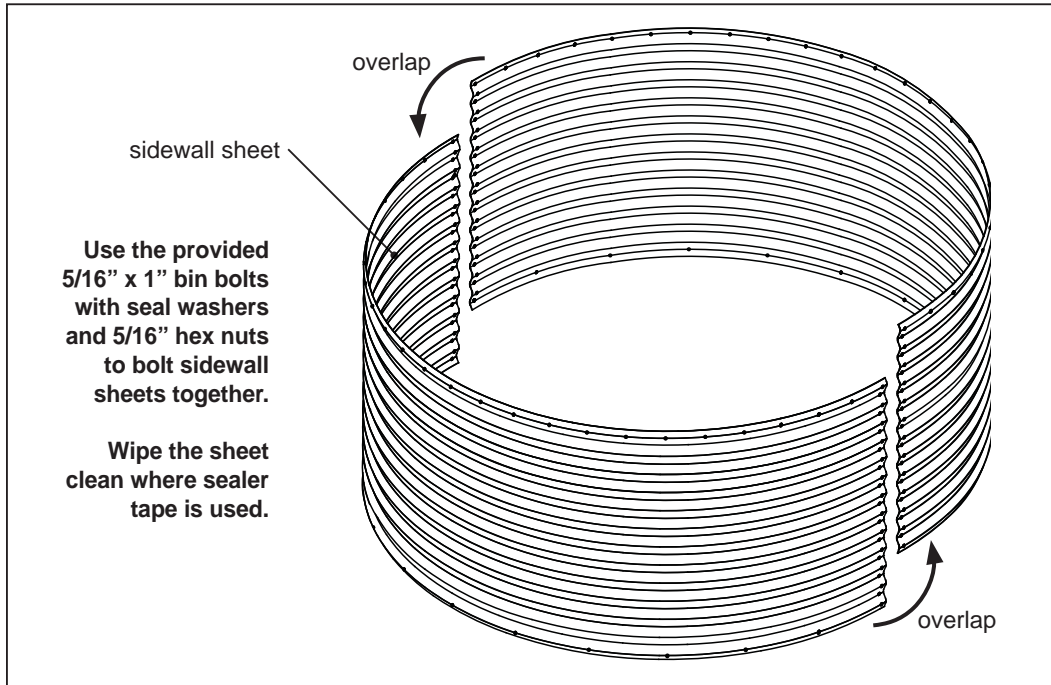
b SEALER TAPE ILLUSTRATION AND HORIZONTAL SHEET SEAMS



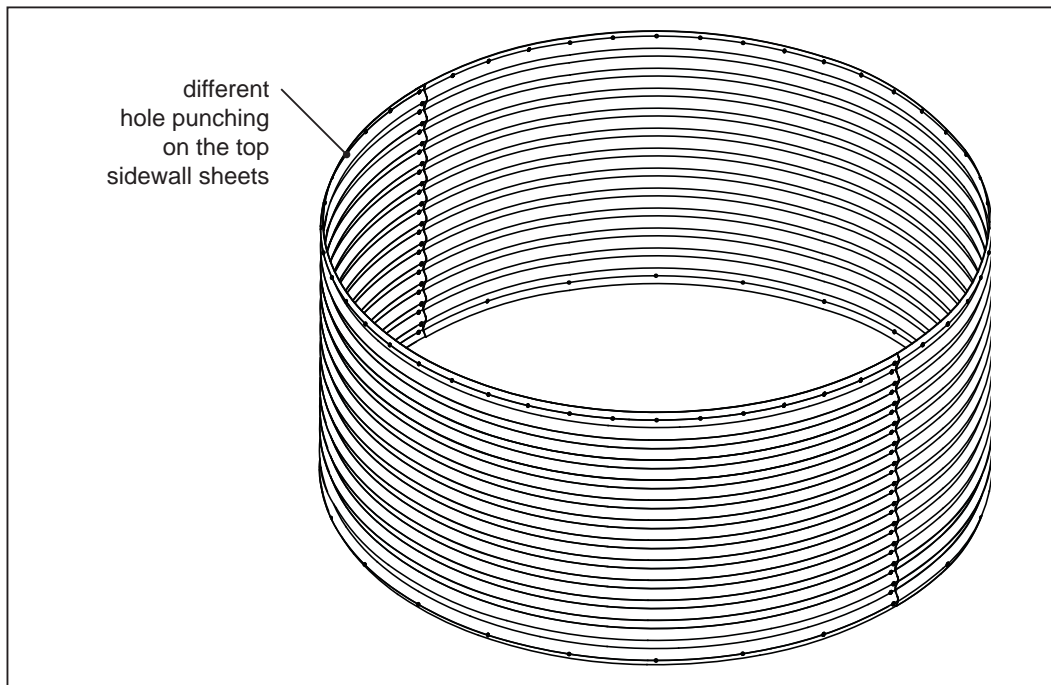
# 2

## assemble the top sidewall ring

Assemble the topmost sidewall ring on the upper part of the sidewall sheet (example d). Note the sheets on the topmost ring have special hole punching for installing the top angle.



**c** OVERLAP SHEETS IN (1) DIRECTION ONLY



**d** DIFFERENT HOLE PUNCHING ON THE TOP SIDEWALL SHEETS



**Note:** Make certain that the sidewall sheets are correctly positioned so that the I.D. COLOR CODES are at the BOTTOM CORNERS of the sidewall sheets!

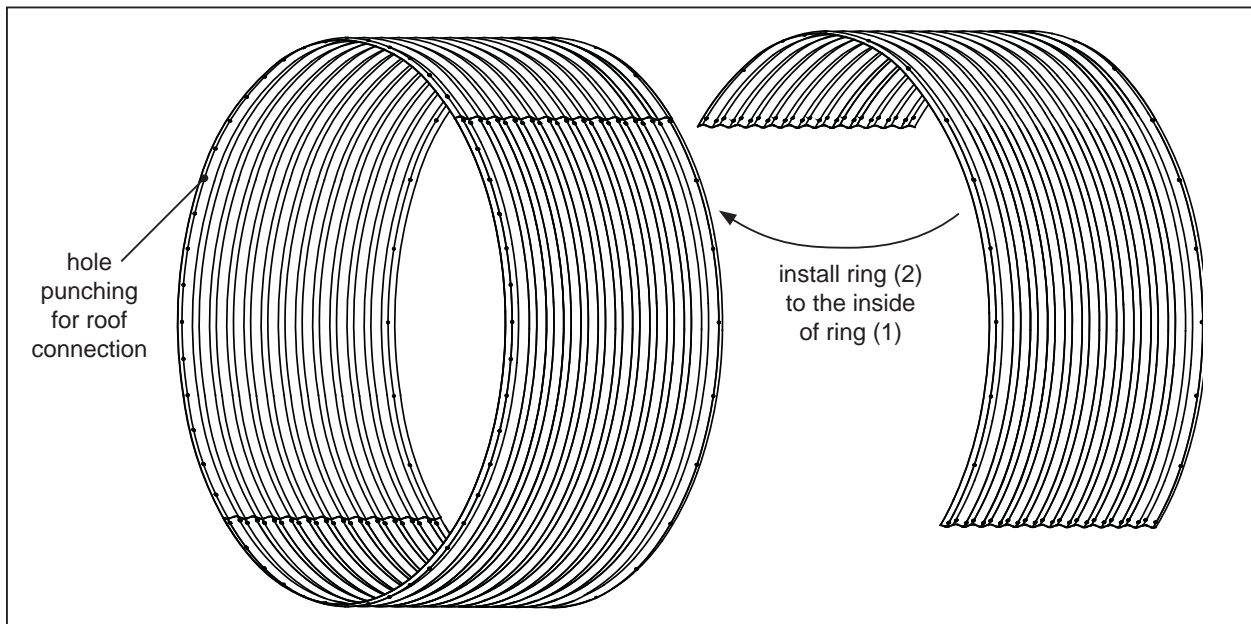


**Note:** In many cases it may be preferable to initially rest the tank on its side for assembly. Determine if this will work best for your situation. We suggest using 4" x 4" [100 mm x 100 mm] pieces of wood to keep it from rolling.

### 3

*install the next sidewall ring*

Install the next sidewall ring staggering the sheets (example a).



**a** INSTALL THE SECOND SIDEWALL RING



# 4

## complete the sidewall assembly

Install the rest of the sidewall rings to the tank in the same way. Note the hole punching for the columns and cone on the bottom sidewall ring (example a).

# 5

## tip the bin into the upright position

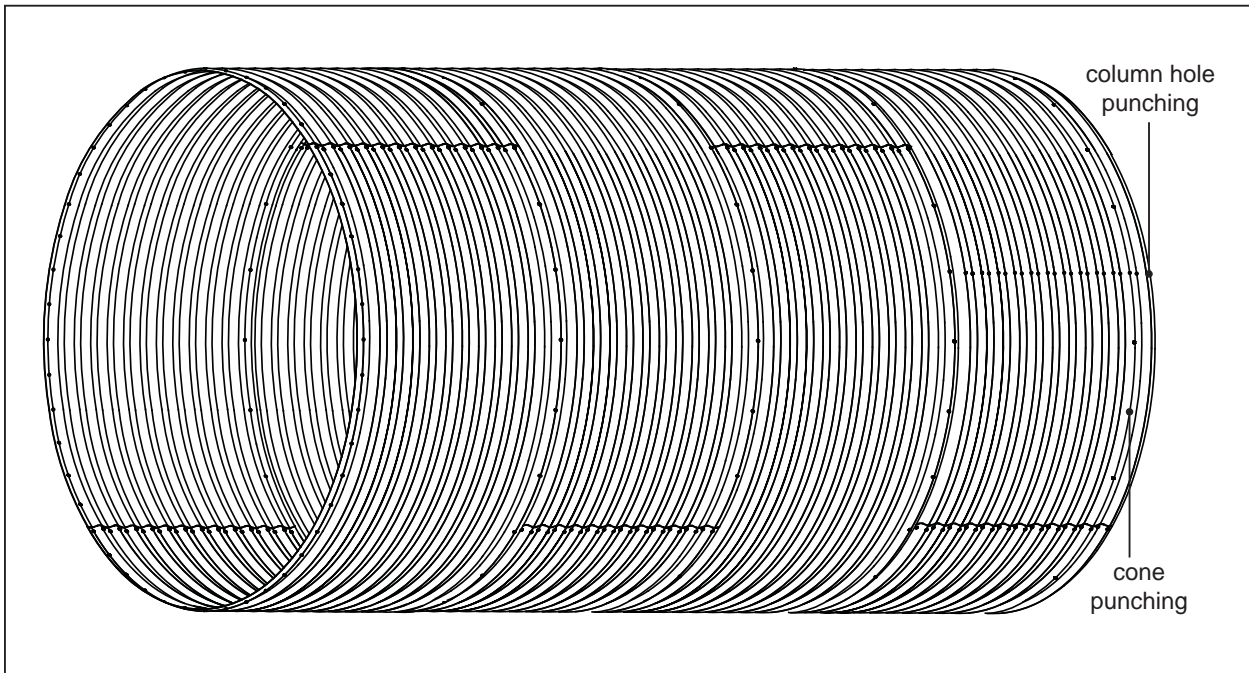
Construction methods and equipment vary. If you are assembling your tank on its side, tip it into the upright position without damaging your clarifier at a point during the construction which makes the most sense for your situation.



**Note:** Position the roof cap and peak ring so that the roof cap will open away from the roof ladder.



**Note:** The way sidewall sheets are punched varies according to the clarifier model.



**a** COMPLETE THE SIDEWALL



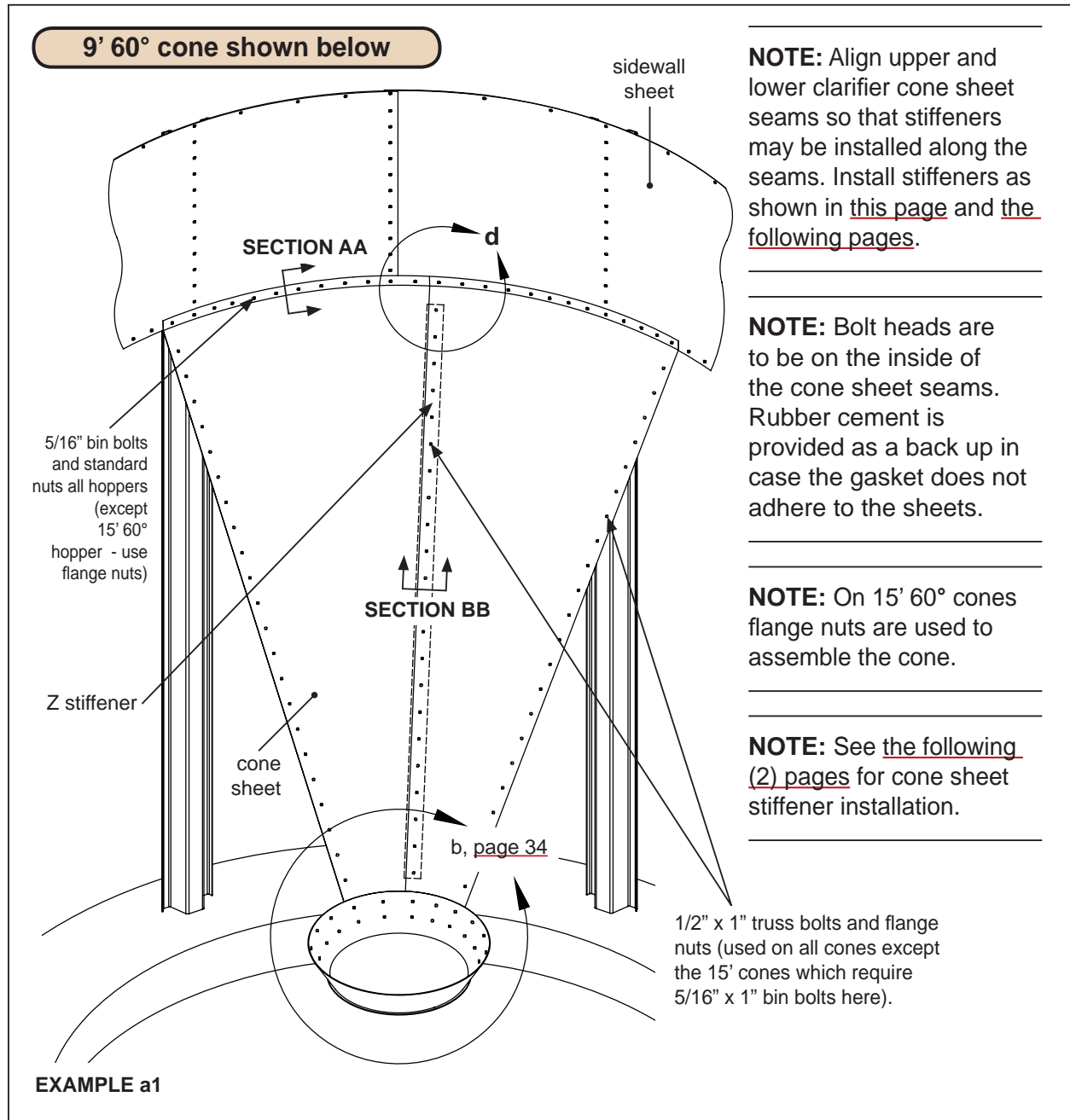
# Cone Construction

1

install the cone sheets

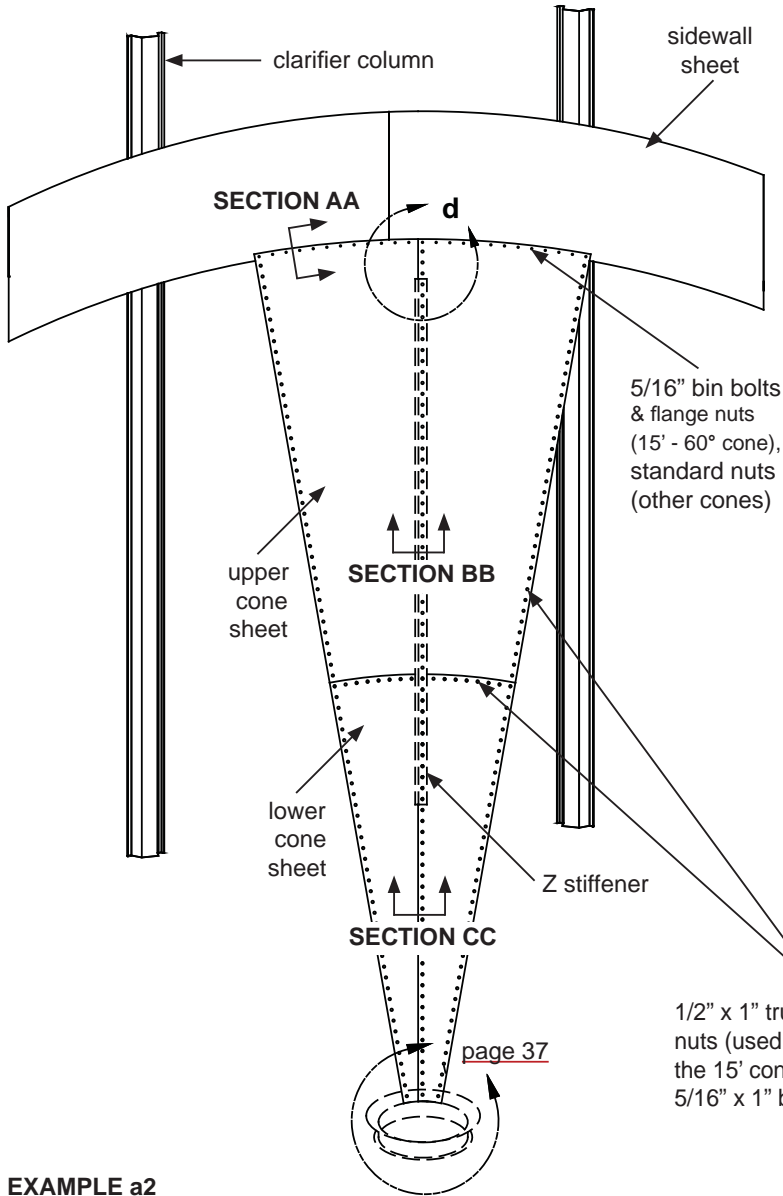
Before assembly **preread the next (4) pages**. Install cone sheets as shown (examples a - f). Place the first cone seam on a column hole. As

with sidewall sheets, **overlap each cone sheet in the same direction**. Use sealer tape on both sides of cone seams. Cones may have upper and lower sections as shown below, models vary.





18' 60° cone shown below



EXAMPLE a2

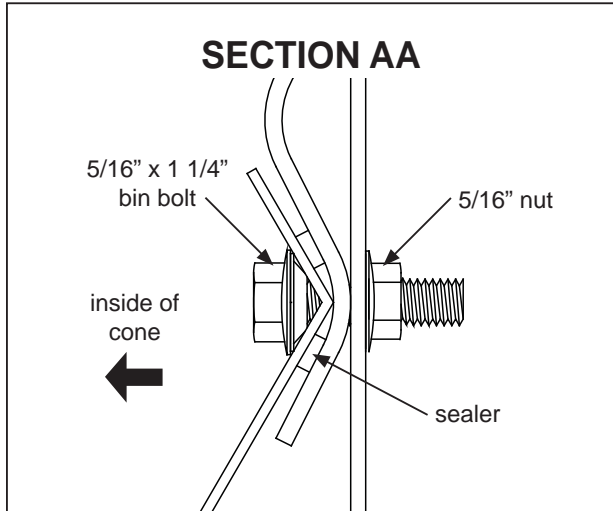
**NOTE:** Align upper and lower clarifier cone sheet seams so that stiffeners may be installed along the seams. Install stiffeners as shown in [this page](#) and the [following pages](#).

**NOTE:** Bolt heads are to be on the inside of the cone sheet seams. Rubber cement is provided as a back up in case the gasket does not adhere to the sheets.

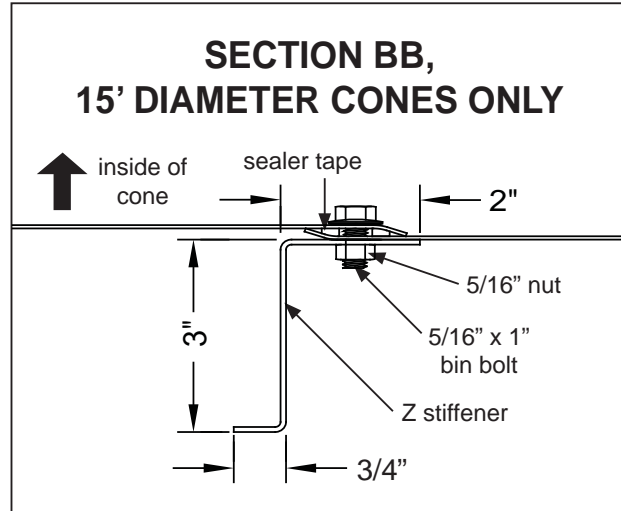
**NOTE:** On 15' 60° cones flange nuts are used to assemble the cone.

**NOTE:** See [the following \(2\) pages](#) for cone sheet stiffener installation.

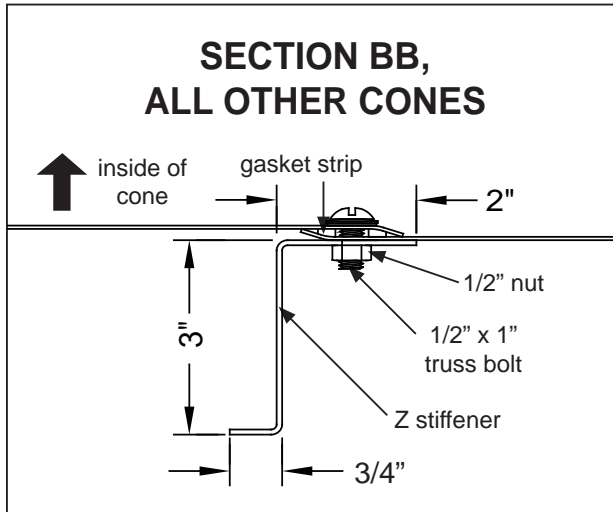
1/2" x 1" truss bolts and flange nuts (used on all cones except the 15' cones which require 5/16" x 1" bin bolts here).



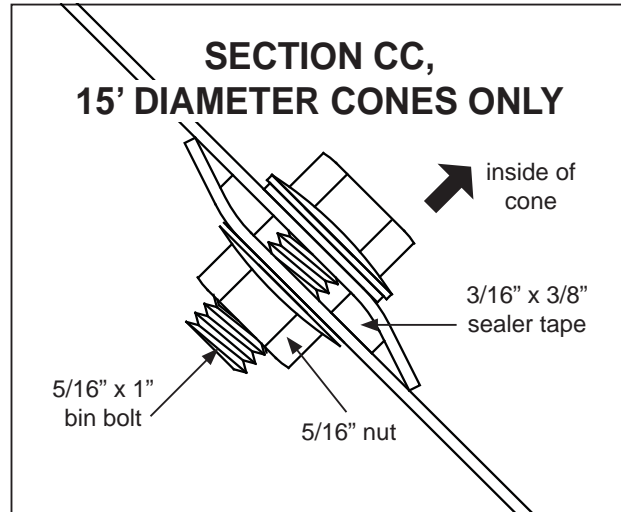
AA



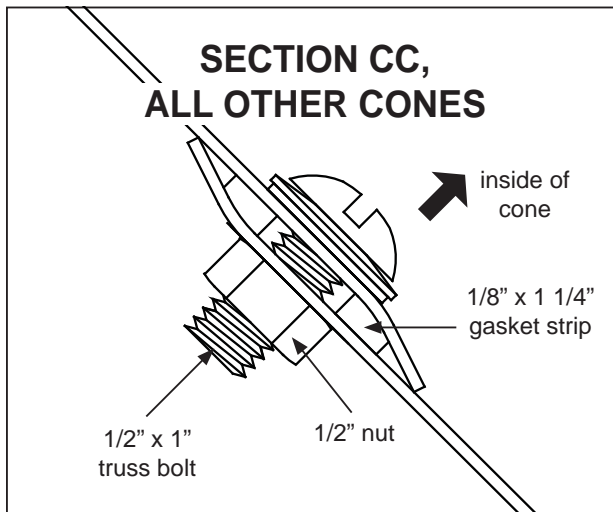
BB



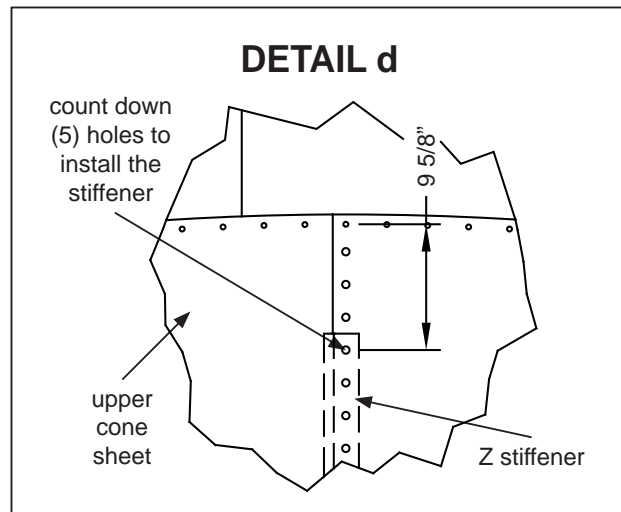
BB



CC



CC



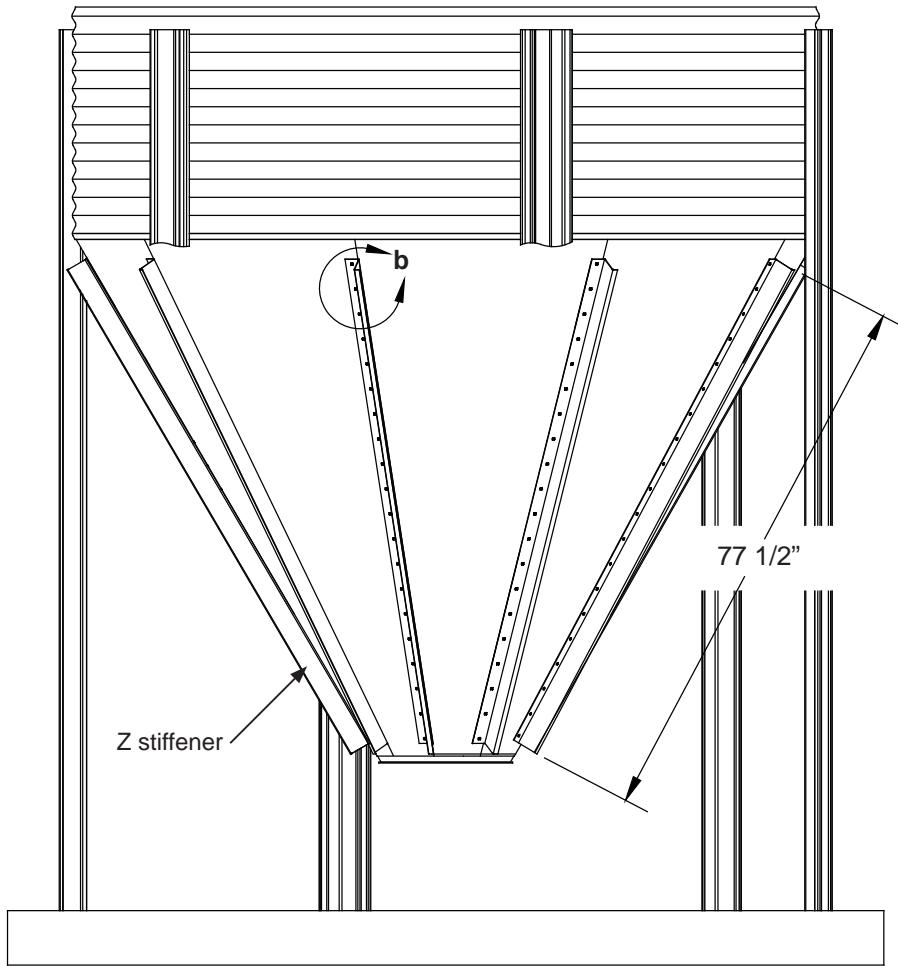
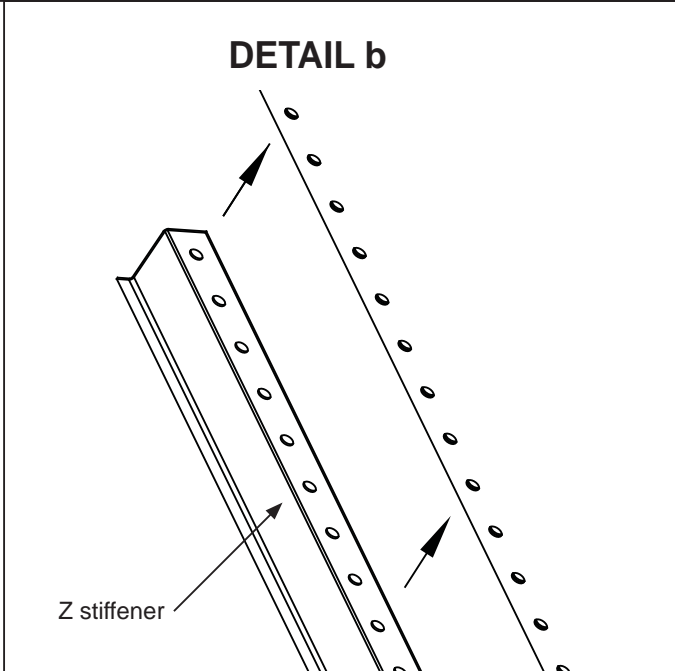
d



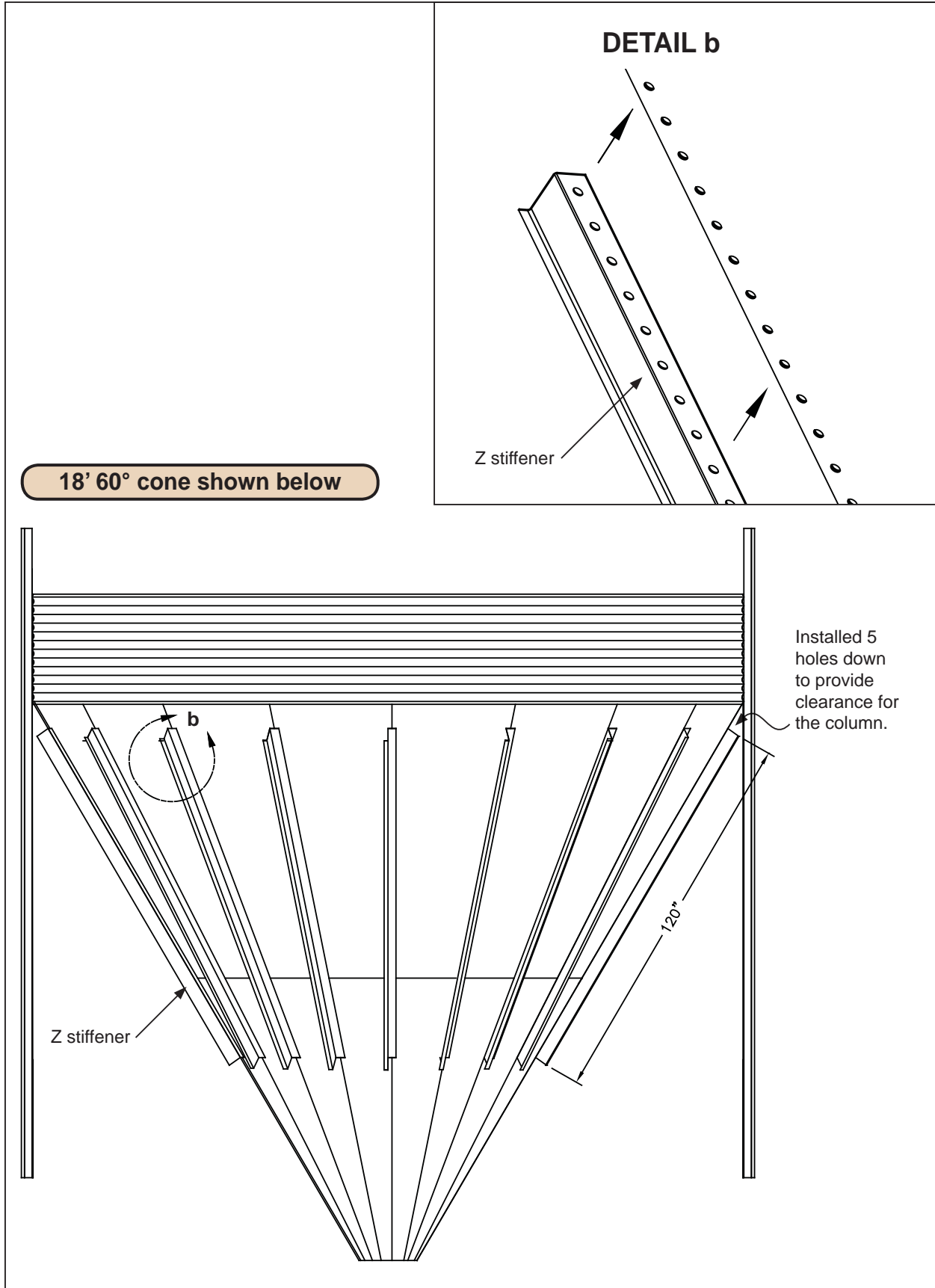


The views on this page are from the outside of the clarifier.

9' 60° cone shown below



**a1** INSTALL THE Z STIFFENER



**a2** INSTALL THE Z STIFFENER

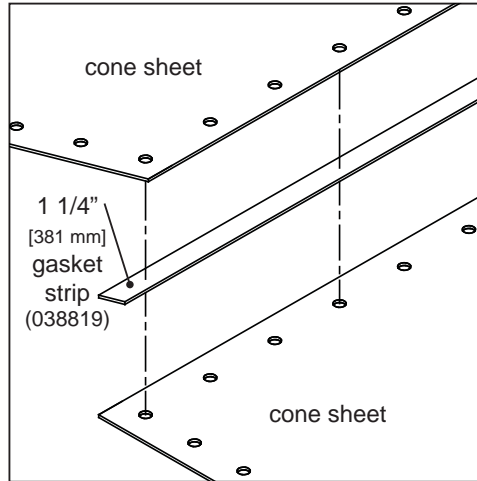


## 6 Assembly

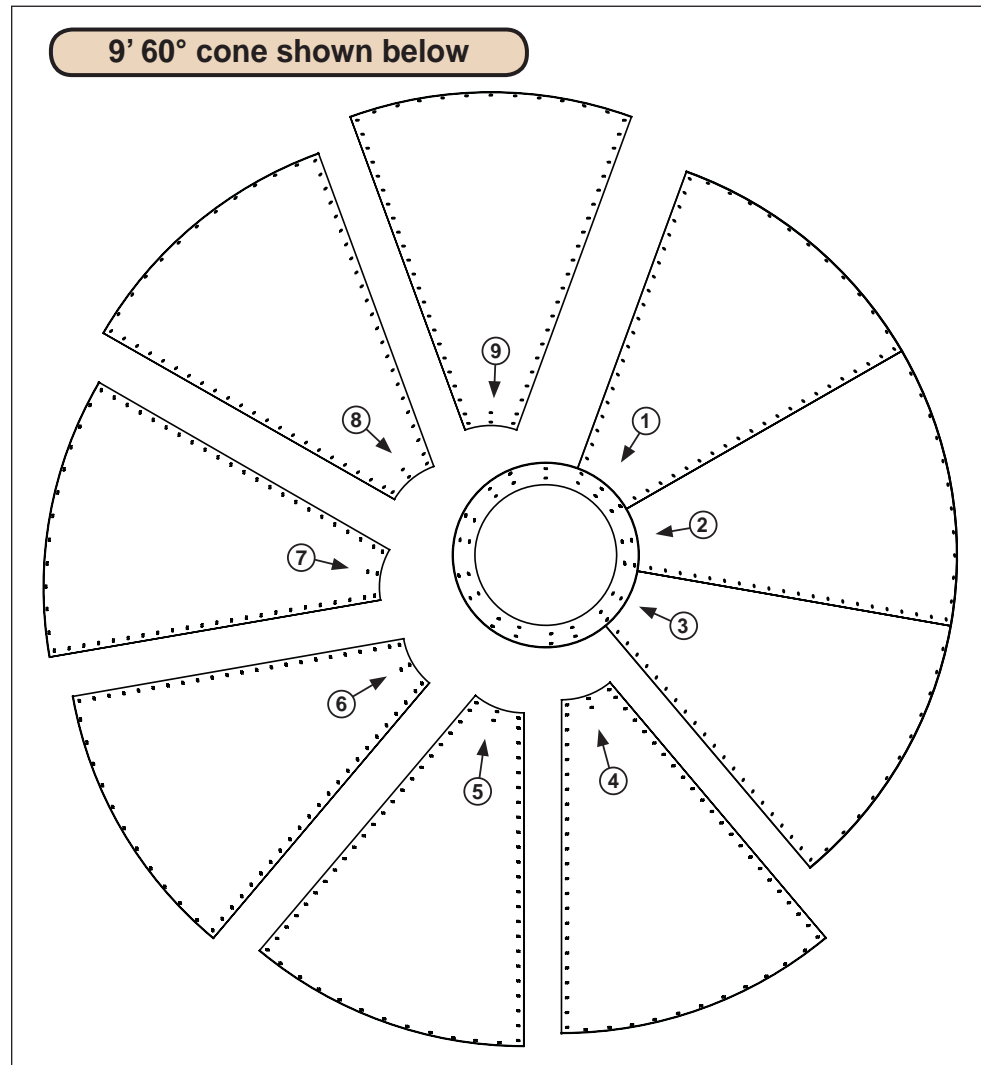
# 2

*install the rest of the cone sheets*

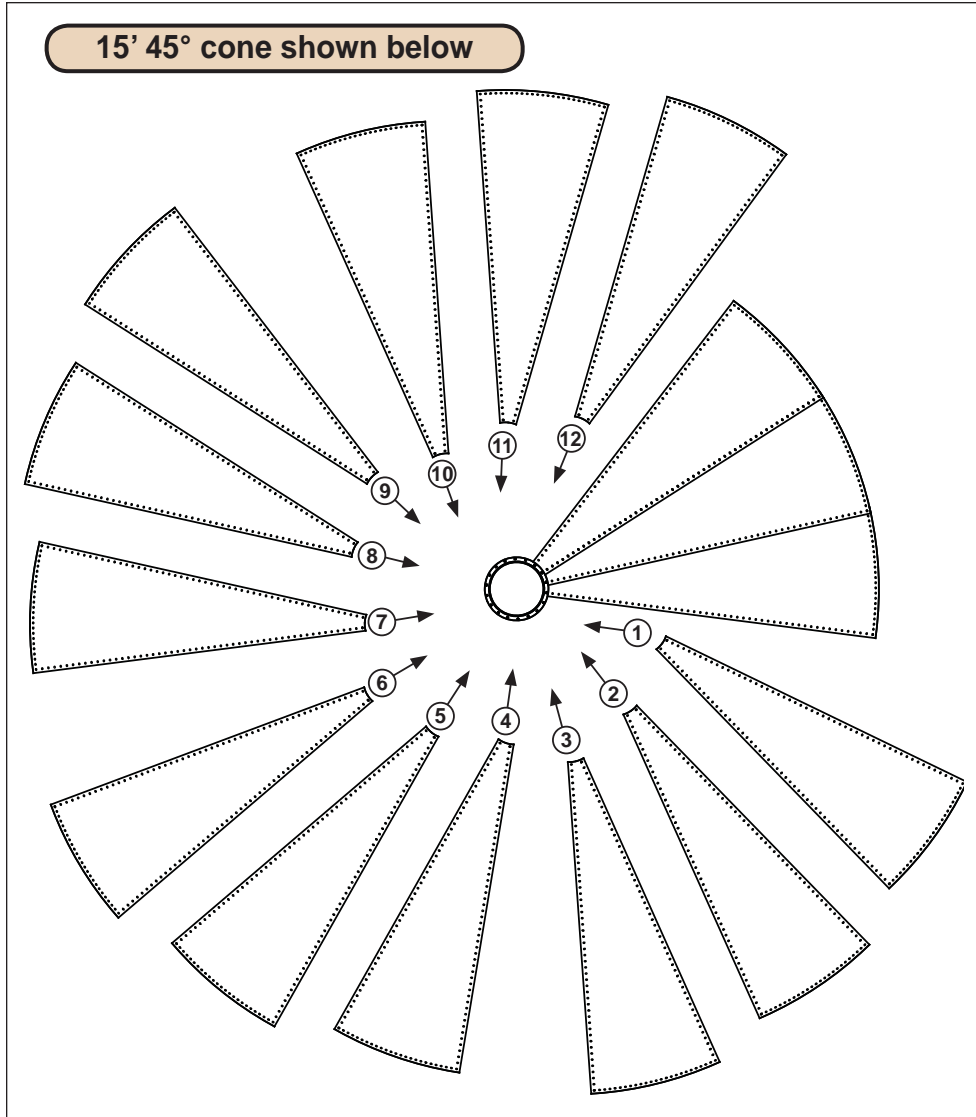
See also the next page now. Install the rest of the cone sheets around the bin as shown below (example b). Use the same method as given in the (2) previous steps. Continue to overlap each cone sheet in the same direction. Securely tighten all cone bolts.



**a** 18' - 21' USE GASKET STRIP AT SEAMS

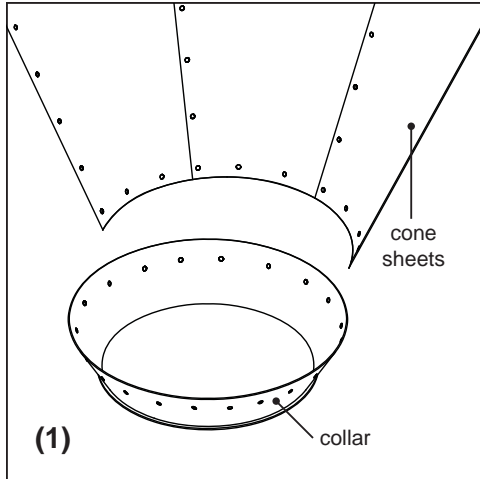


**b1** INSTALL THE REST OF THE CONE SHEETS

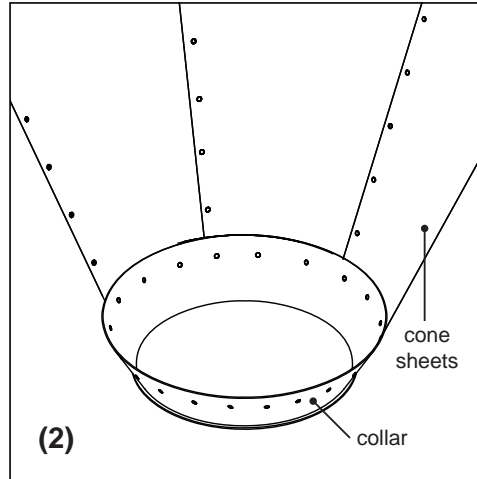


**b2** INSTALL THE REST OF THE CONE SHEETS

## 6 Assembly



**a** INSTALL THE COLLAR (1)



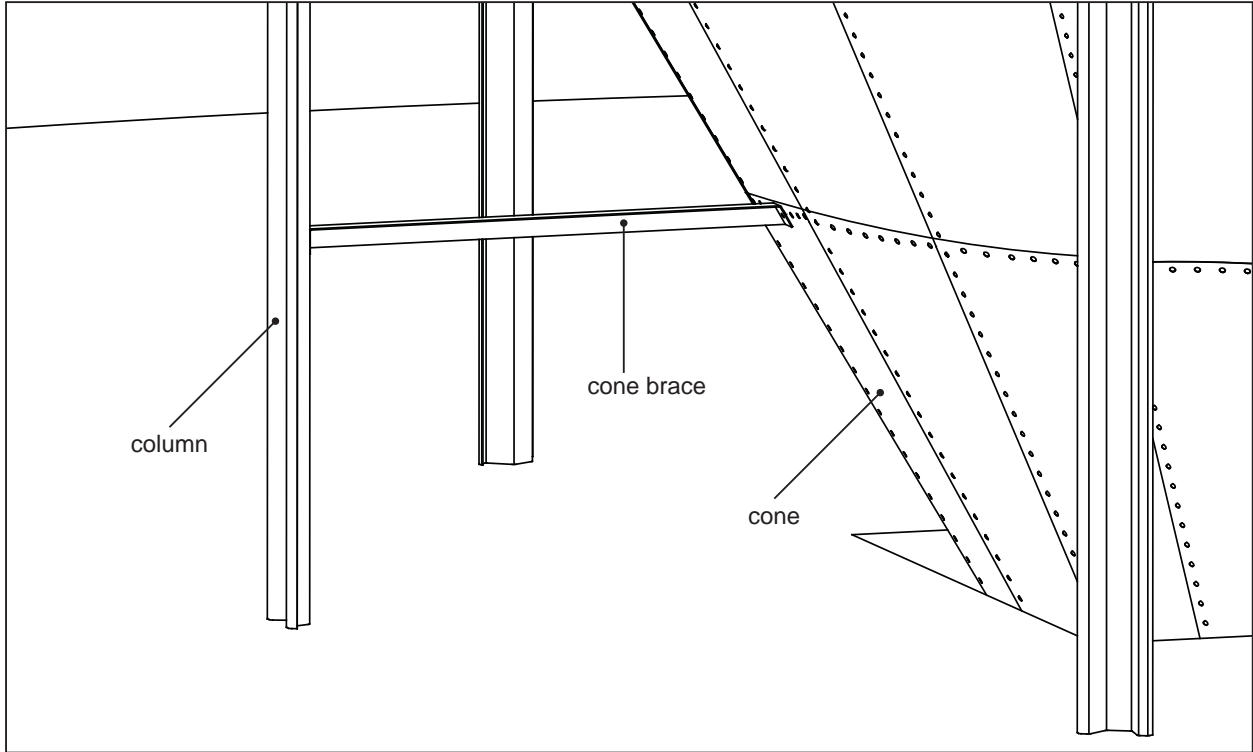
**b** INSTALL THE COLLAR (2)

**NOTE:** Continue installing bolts so bolt heads are on the inside of the clarifier.

### 3

*install cone braces if required*

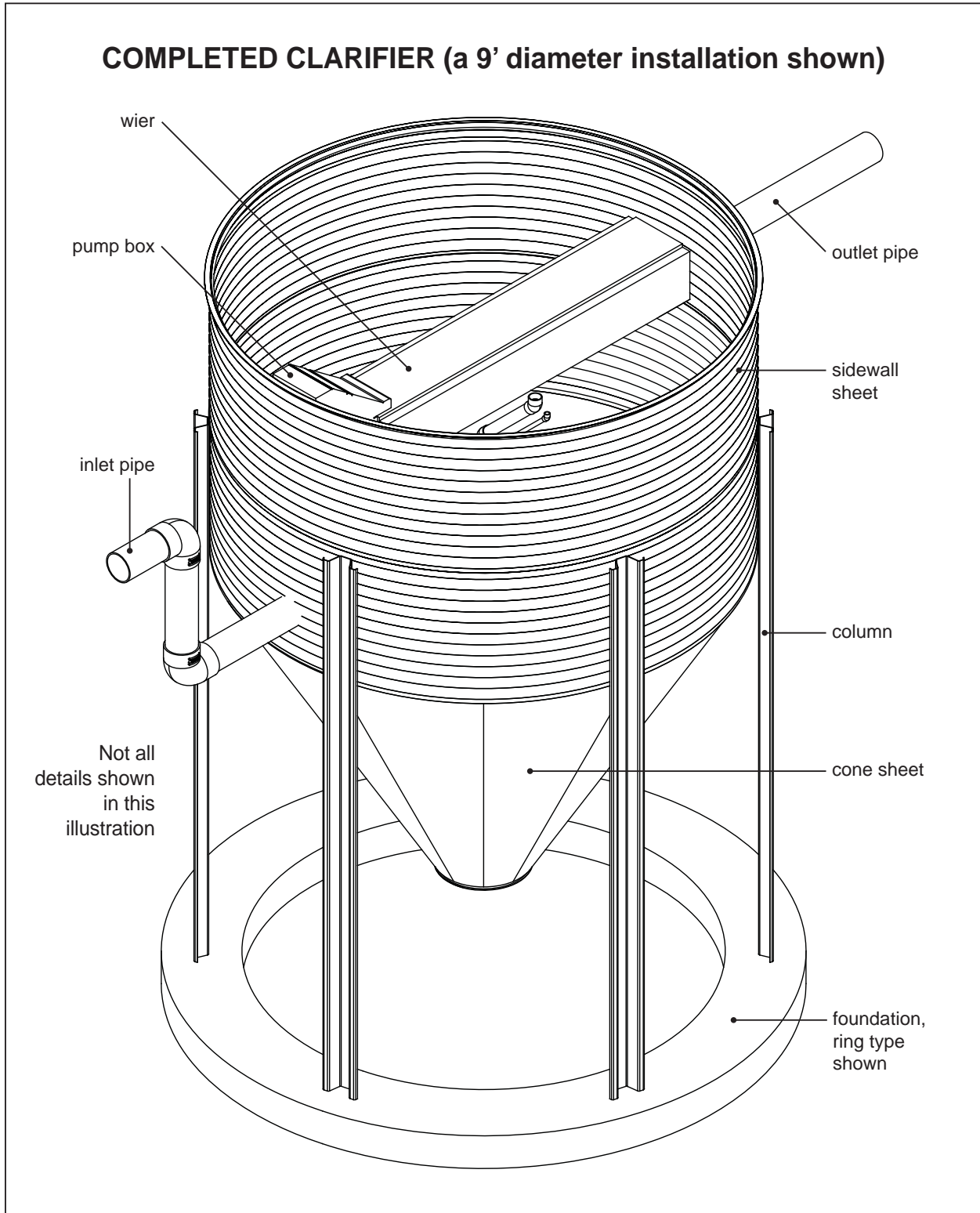
Bolt the cone braces into place between the columns and the cone if required on your installation (example c, on [the next page](#)). See [the following pages](#) to find the appropriate brace layout for your clarifier.

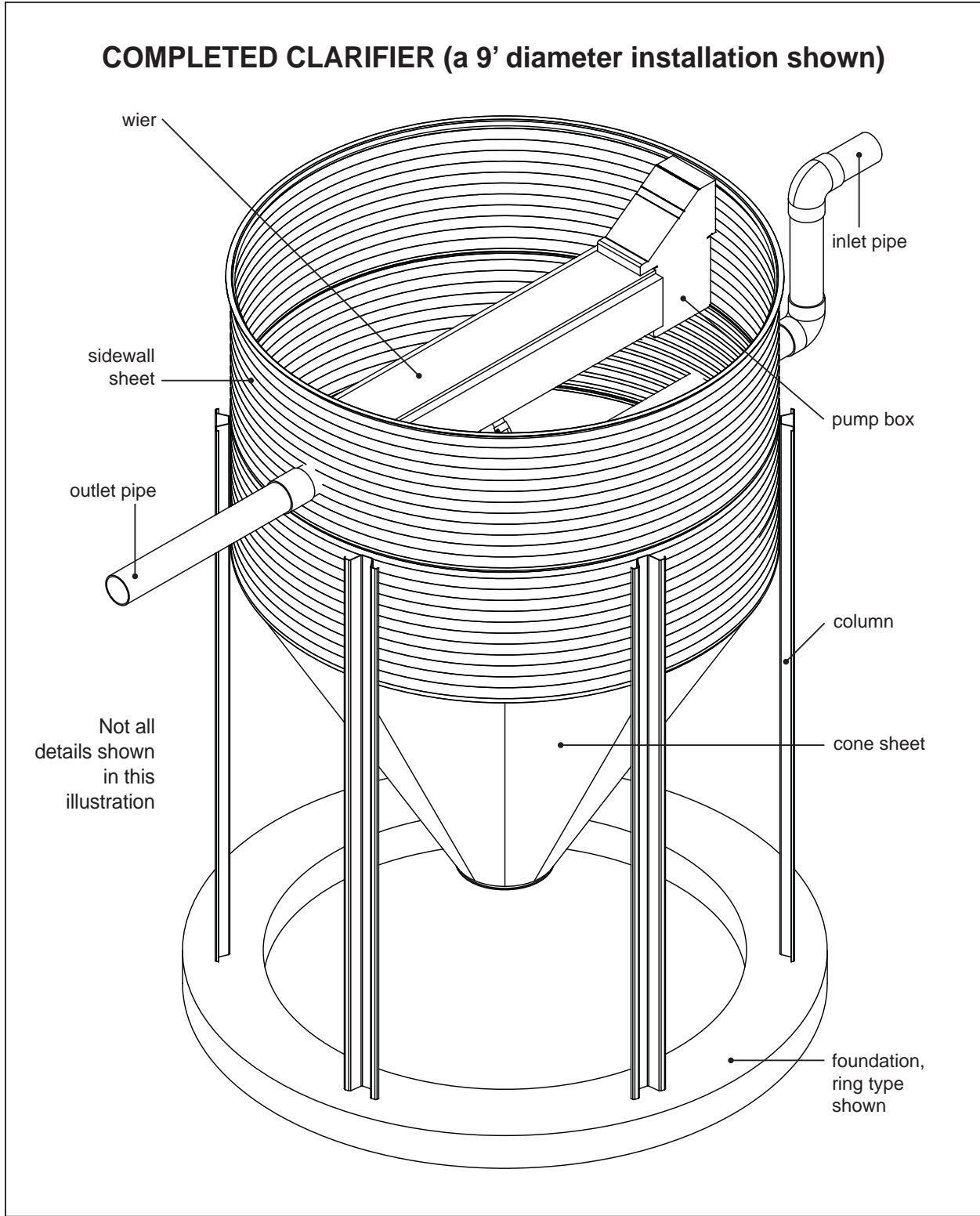


C CONE BRACE CONNECTIONS TO COLUMN AND CONE

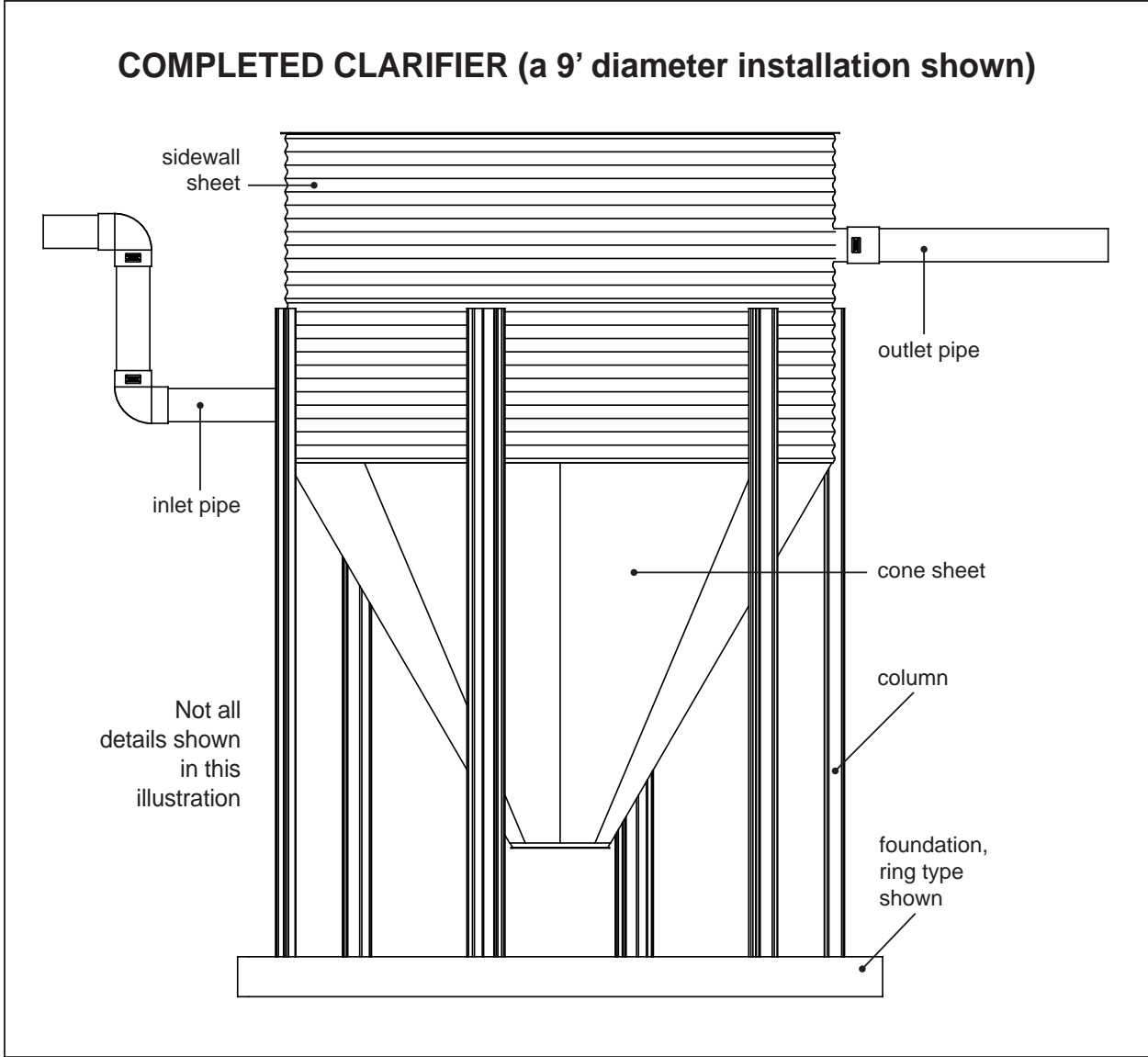


# Completed Clarifier, Example Drawings











# Backfilling



**Note:** Before backfilling, you must apply exterior coating to the outside of the Clarifier. Refer now to the instructions for applying Clarifier exterior coating on [pages 44 - 48](#).



**Note:** Backfill with free-draining, non-cohesive, granular materials.



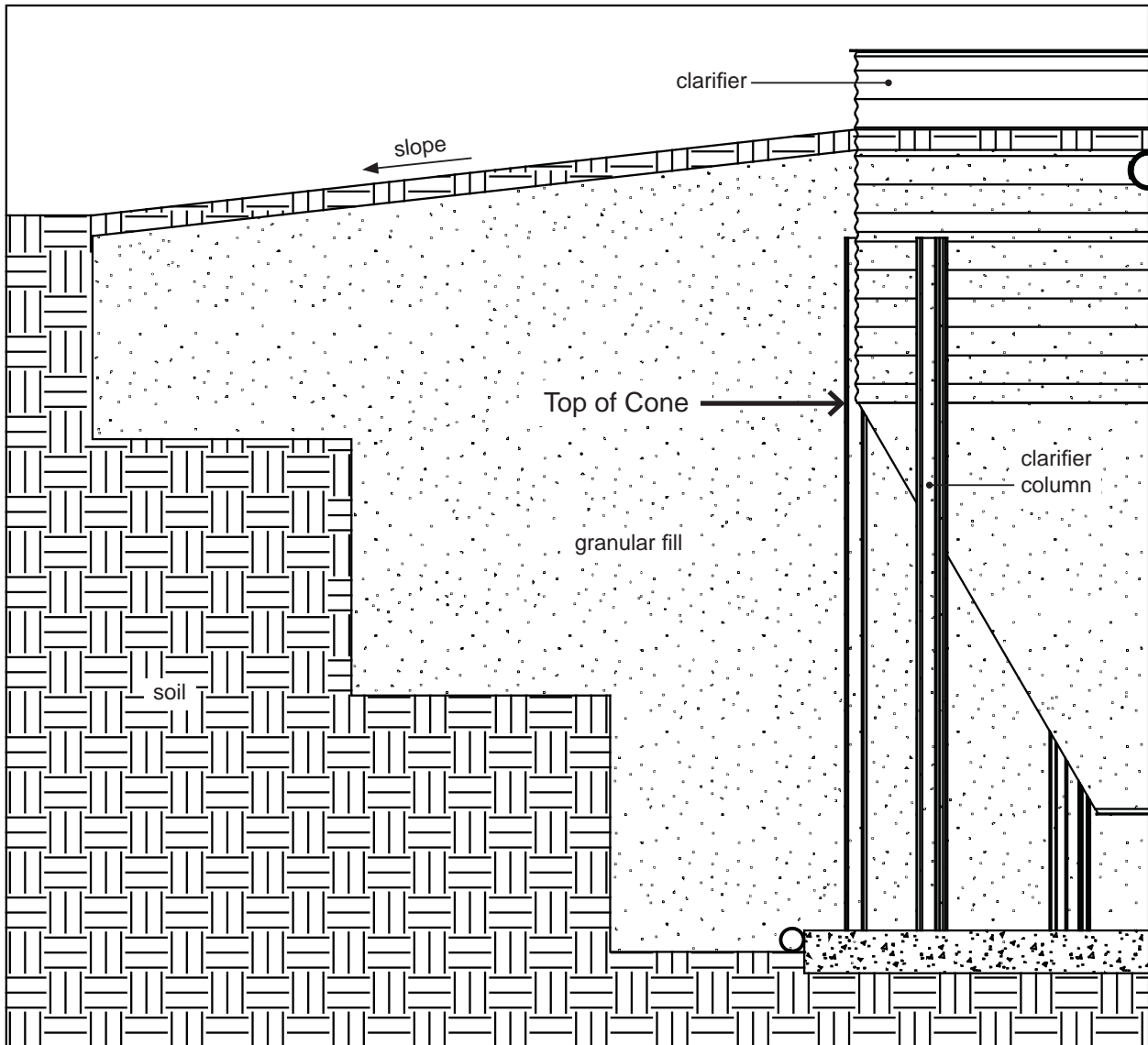
**WARNING!** Its important to stabilize the clarifier with backfill material before filling the clarifier with water. This must be done in order to prevent clarifier (support) column failure.

## Backfilling Procedure

1. **Install the Drain Tile.**
2. Backfill in uniform lifts of approximately 1' (using granular fill 3-10 mm) completely around the tank. However, you must backfill at least up to the level of the Top of Cone before starting to fill the clarifier with water. After backfill is level to the top of the cone, backfilling must occur as the tank fills.
3. **Start Filling the Tank** - Check for leaks and make repairs as needed.
4. Grade backfill to provide slope away from the tank. The top 6 to 12 inches of the fill may be non-granular soil to support vegetation (if desired).



**Note:** By starting construction of the project immediately after placing the order for the GLOBAL Clarifier the excavation can be completed in advance so that the concrete work can be completed and ready for the clarifier(s) / basin(s) construction as soon as the plant arrives.



a TYPICAL IN-GROUND TANK, FOUNDATION RING, SOIL, AND BACKFILL ILLUSTRATION

# 7

## PermaDri™ Exterior Coating (Exterior Basin Application)

### Exterior Coating Products:

1. Mine Spray
2. Mine Coat, which is brushed on

**NOTE:** Read the sprayer manual before operating the sprayer!



**Note:** The coating applied to the Exterior Clarifier is for corrosion protection only. **The Exterior Clarifier coating is applied differently from the Interior Clarifier Liner!!!** For Interior Clarifier Liner application, you must follow the instructions on pages 45 - 52!



**Note:** If rain is expected within 2 - 4 hours, delay installation of exterior coating until conditions and surfaces are dry!



**Note:** Read and understand the instructions that came with your PermaDri™ products and equipment before applying any PermaDri™ products! Read and understand all PermaDri™ instructions pertaining to safety, operation, equipment, product familiarization, rubber spray, mixing, identifying product contamination, product maintenance, part “B” accelerator, pump, cleaning, and all other instructions pertaining to your installation.



**Note:** REQUIRED BEFORE EXTERIOR COATING APPLICATION. Etch exterior (including cone sheets) with vinegar. Apply vinegar with a sprayer or with a cloth rag. Put vinegar covering on exterior for 15 minutes minimum, then rinse / pressure wash with water and allow to fully dry.



**Note:** When applying Mine Spray or when in the work area while Mine Spray is applied, you must wear a NIOSH N95 dust respirator mask. For proper use, see the instructions that come with your NIOSH N95 mask!



**Note:** Mine Spray and Mine Coat application differs from painting. If your Exterior Coating is not applied properly, **THIS WILL VOID YOUR WARRANTY!** If your Exterior Coating is not applied correctly, as indicated in these instructions, **THIS WILL VOID YOUR WARRANTY!** See [pages 44 - 47](#) before applying.

## Apply Exterior Coating to Entire Clarifier Exterior

### 1

*start applying coating at clarifier base*

Follow the Spray Technique instructions. Spray exterior starting from bottom (with 4015 TIP "A" Nozzle). Cover the exterior of the clarifier with Exterior Coating to protect against corrosion.

A. Use Mine Spray Part "A" and Accelerator Part "B". Always lead with Part "A" product.

B. ALWAYS KEEP NOZZLE PERPENDICULAR to work surface.

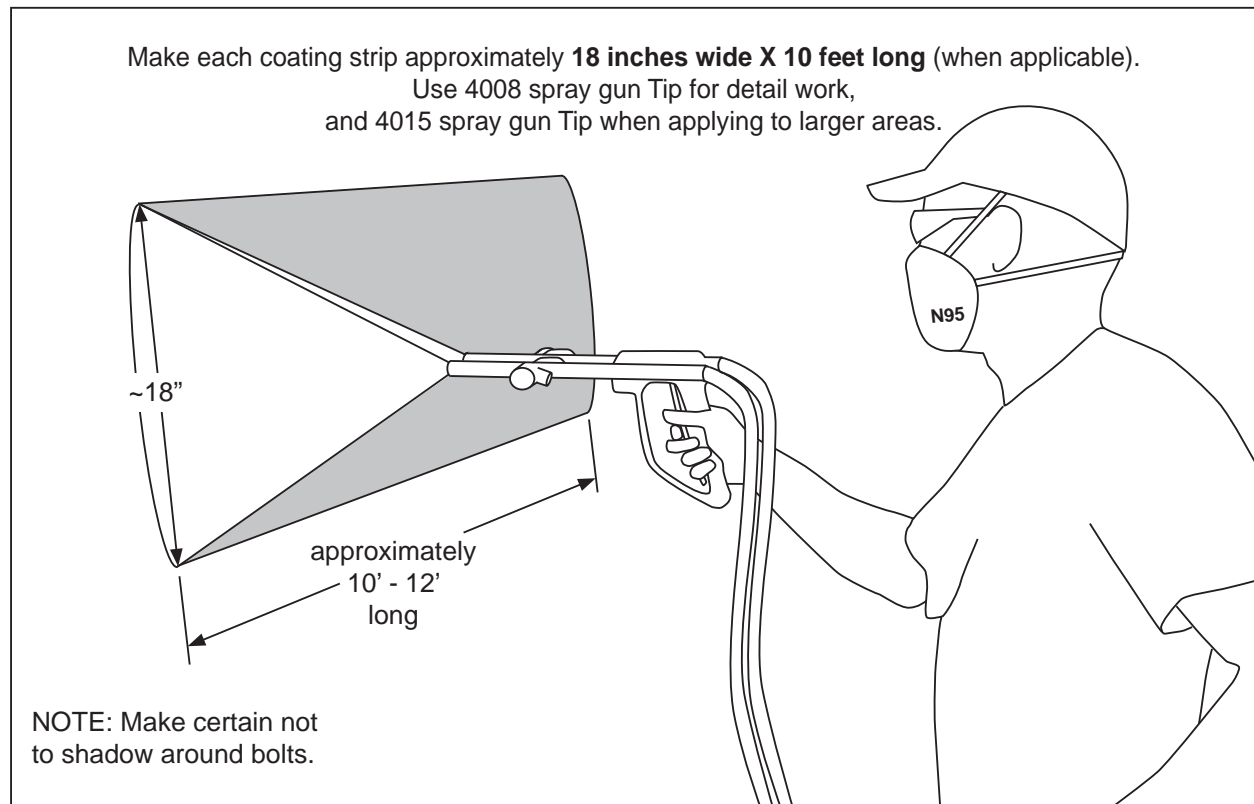
C. See the application instructions on [the next \(2\) pages](#) now. Follow these application instructions throughout

exterior coating application. Start at the base (bottom) of the clarifier. **It is important to work from the bottom of the clarifier to the top of the clarifier** (because of moisture weeping)!

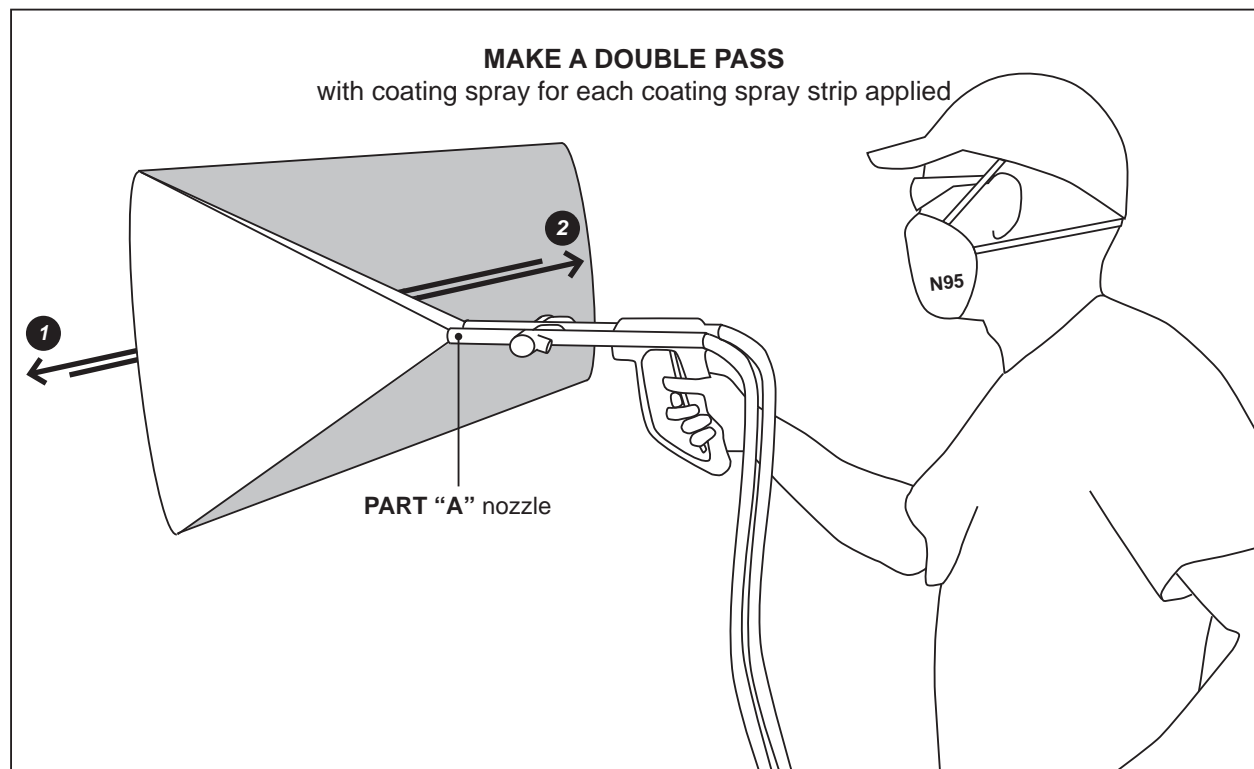
D. When applicable, work in lengths of 10' - 12'.

E. Now, apply exterior coating and uniformly apply 64 Wet Mils of Spray Liner parts A and B to the first full sidewall ring up to the level of the first sidewall seam.

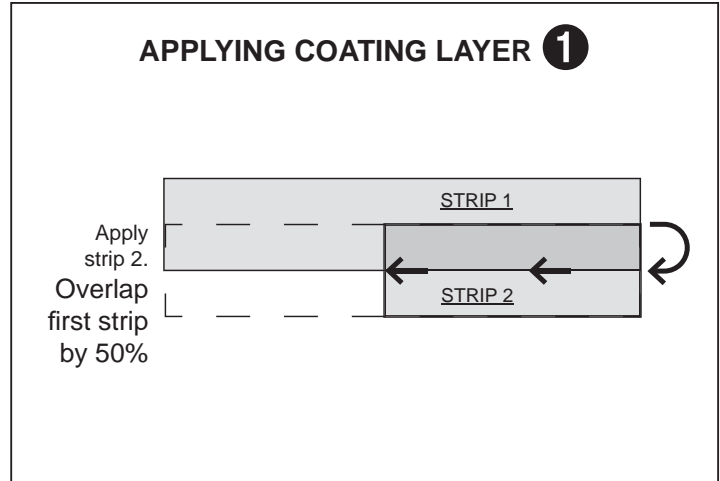
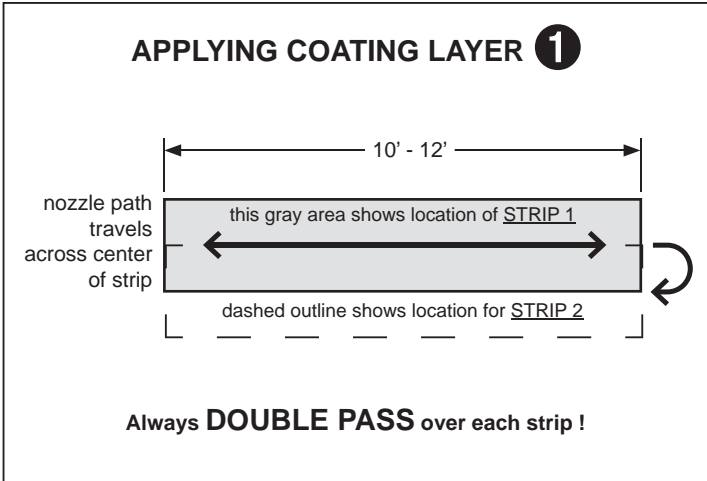
# Exterior Coating Application



**<A>** When applying a coating strip, make each strip approximately 18" wide and 10' - 12' long.

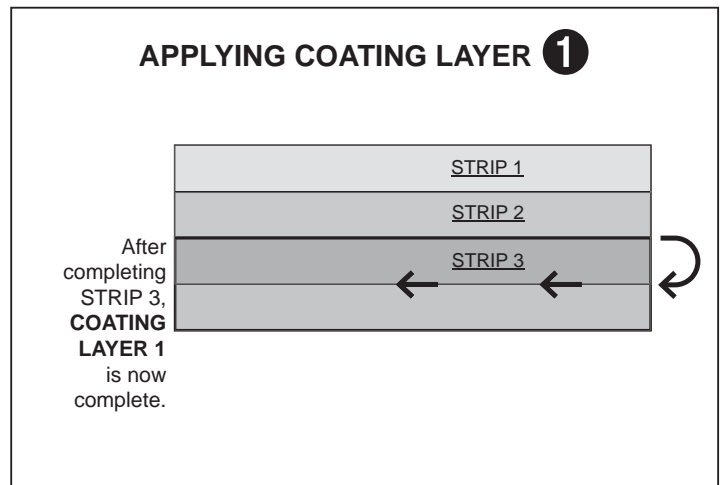
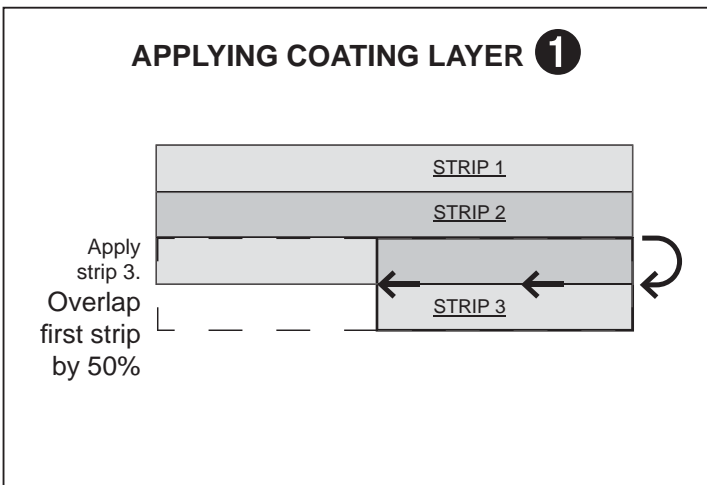


**<B>** When applying a liner strip, make a double pass (2 passes) with coating spray for each strip of coating applied, left and then right. **ON THE FIRST PASS OF EACH STRIP, ALWAYS LEAD WITH PART "A" MINE SPRAY PRODUCT.**



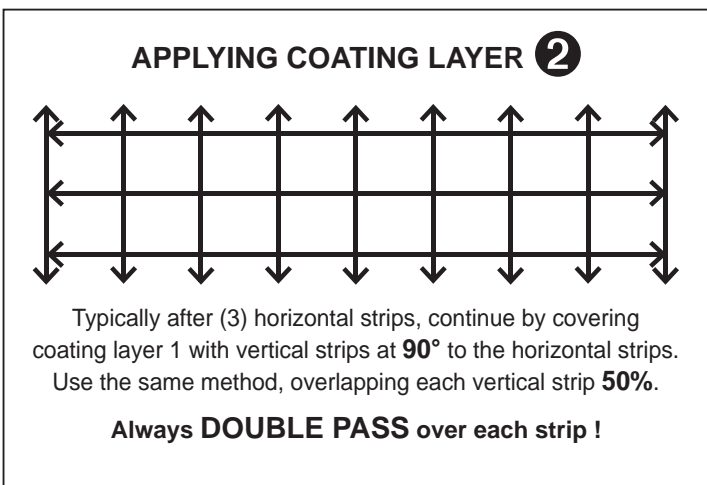
<C> Start spray coating layer 1. Apply spray liner strip 1.

<D> Apply spray coating strip 2.



<E> Apply spray coating strip 3.

<F> Complete coating layer 1 by completing strip 3.



<G> Apply coating layer 2.



## Continue Exterior Coating Application Until Complete

### 2

*continue applying liner up exterior*

Following the same method, continue up the exterior. Apply liner in sections and (1) sidewall ring at a time, from the bottom of the clarifier to the top sidewall ring. Apply liner until a 64 Wet Mils / 40 Dry Mils liner thickness is achieved over the entire clarifier exterior.

### 3

*allow coating to cure, rinse with water*

Allow the entire exterior coating to cure and dry to the touch. Rinse or use a wet rag and remove all salt from the entire coating. Allow all rinsed or wiped surfaces to dry to the touch. After the coating is complete and dry, you are ready to apply the PermaDri™ rubber liner to the inside of the clarifier(s).



# 8

## PermaDri™ Rubber Liner (Interior Basin Application)

### Rubber Liner Products:

1. Mine Spray, or Spray Liner
2. Mine Coat, which is brushed on

---

**NOTE:** Read the sprayer manual before operating the sprayer!

---



**Note:** If rain is expected within 2 - 4 hours, delay installation of rubber liner until conditions and surfaces are dry!



**Note:** If rubber liner membrane is punctured, repair with a layer of Mine Coat, embed with geotextile fabric and cover with an additional layer of Mine Coat. \*Geotextile Fabric recommendation: Tietex T272 Polyester.



**Note:** Read and understand the instructions that came with your PermaDri™ products and equipment before applying any PermaDri™ products! Read and understand all PermaDri™ instructions pertaining to safety, operation, equipment, product familiarization, rubber spray, mixing, identifying product contamination, product maintenance, part “B” accelerator, pump, cleaning, and all other instructions pertaining to your installation.



## Apply Liner to Clarifier Interior



**Note:** The third liner layer (LINER LAYER 3) of Spray Liner should yield **96 Wet Mils or 60 Dry Mils**. If the liner is applied too thick, it will take too long to cure. If the liner is applied too thin, you will not have an adequate liner! **If you do not achieve the correct consistent Liner thickness or Mine Coat thickness everywhere the liner is applied, THIS WILL VOID YOUR WARRANTY!**



**Note:** Spray Liner and Mine Coat application differs from painting. If your Rubber Liner is not applied properly, **THIS WILL VOID YOUR WARRANTY!** If your Rubber Liner is not applied correctly, as indicated in these instructions, **THIS WILL VOID YOUR WARRANTY!** Read [pages 49 - 57](#) before applying.



**Note:** When applying Spray Liner or when in the work area while Spray Liner is applied, you must wear a NIOSH N95 dust respirator mask. For proper use, see the instructions that come with your NIOSH N95 mask!



**Note:** **REQUIRED BEFORE LINER APPLICATION.** Etch clarifier interior with vinegar. Apply vinegar with a sprayer or with a cloth rag. Put vinegar covering on walls for 15 minutes minimum, then rinse / pressure wash with water and allow to fully dry.



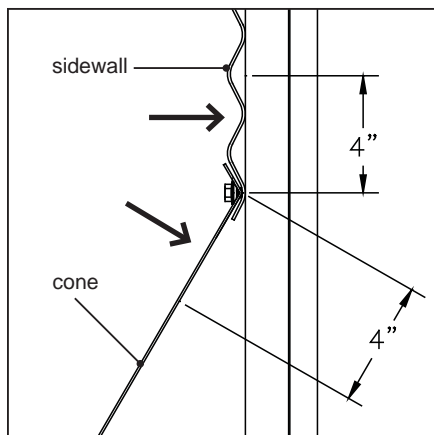
# Prep-work: APPLY MINE COAT AND FABRIC AT THE SIDEWALL TO FLOOR TRANSITION

## 1

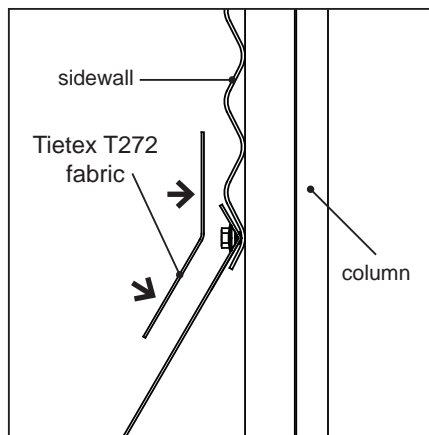
*brush on Mine Coat, work-in fabric*

<A> Start the Prep-work. Brush on Mine Coat around the clarifier with gloves until saturated with coating. (Cut and apply fabric in manageable lengths (5' - 10'.) Coat approximately 4" up the sidewall and 4" down the cone.

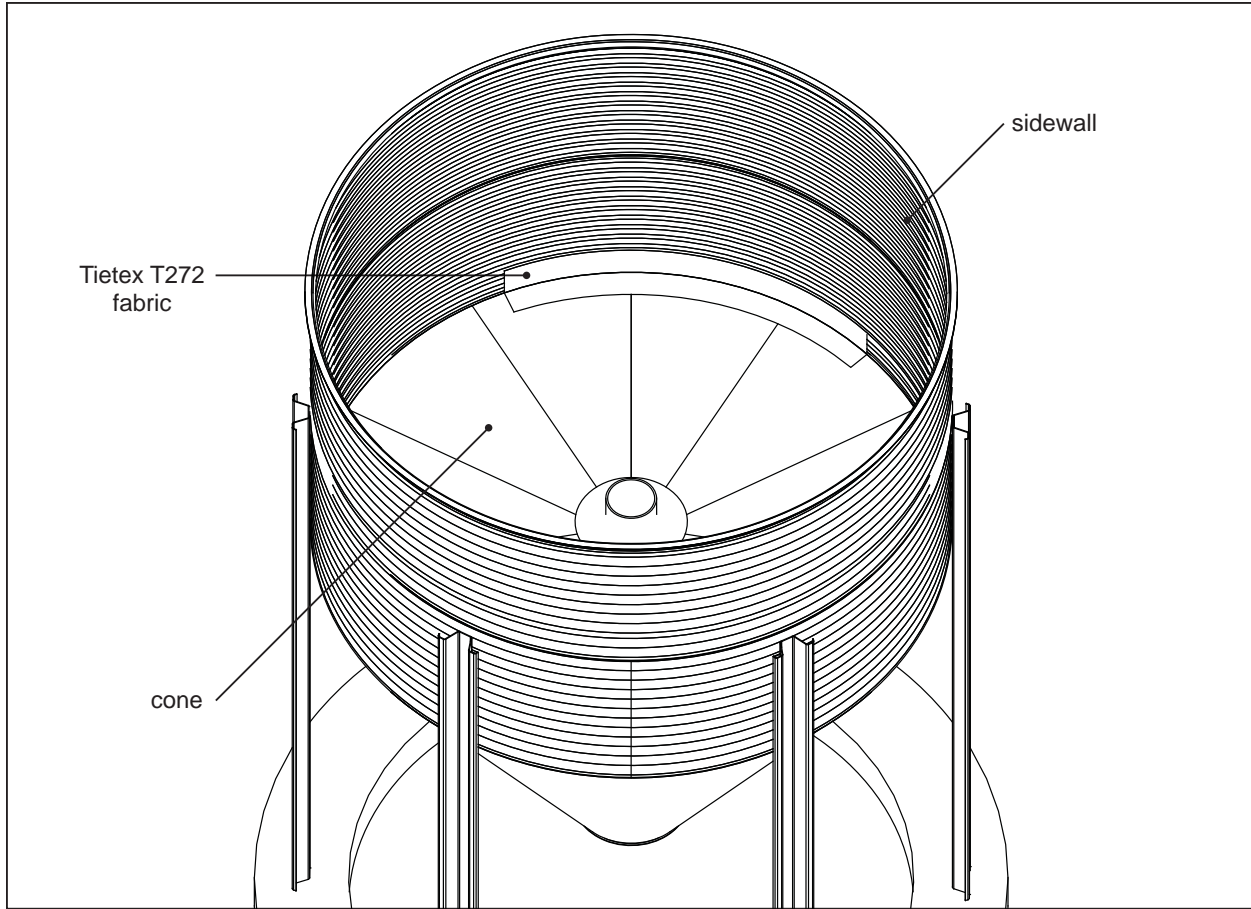
<B> Work-In Fabric (6"-wide Tietex T272) in sections all the way over fabric. <C> Brush on thin layer of Mine Coat over fabric.



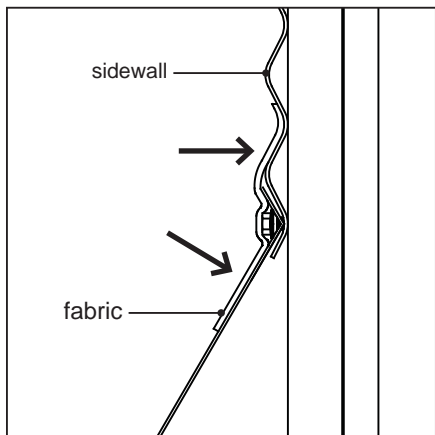
<A> Brush on Mine Coat



<B> Work-in Fabric



<B> Work-in Fabric



<C> Brush on Mine Coat over fabric



## Prep-work: COAT ALL SEAMS AND BOLTS WITH MINE COAT AND SPRAY ALL PREP-WORK WITH 1 PASS OF LINER

### 2

*coat / dab Mine Coat on seams/bolts*

A. Continue Prep-work. Coat / dab Mine Coat over all bolt heads and coat all sheet seams. Make certain bolts are completely coated. Use a stiff brush.

B. Let all Prep-work Mine Coat cure/blacken and dry to the touch. (This may take up to 12 hours depending on weather conditions.)

### 3

*apply 1 pass of part A and B liner*

Spray all Prep-work with a 1-direction pass of Spray Liner, spraying both parts A and B. Use 4008 TIP "A" Nozzle. Allow all Prep-work to dry to cure and dry to the touch. Always lead with part A liner product.

## Apply Spray Liner to the Entire Clarifier Interior



**Note:** Read and understand the **Liner Spraying Technique** instructions on **pages 49 - 57** before starting spray liner application!

### 4

*start applying liner at clarifier base*

Follow the Spray Technique instructions. Spray walls starting from bottom (with 4015 TIP "A" Nozzle).

A. ALWAYS KEEP NOZZLE PERPENDICULAR to work surface.

B. Start at the base of the clarifier. First, spray the bottom of the clarifier and then work up.

C. Work in lengths of 10' - 12'.

D. Now, apply Liner following the Spraying Technique instructions. Uniformly apply 96 Wet Mills of Spray Liner parts A and B to the first full sidewall ring up to the level of the first sidewall seam. (Make certain all 4-sides of bolts are covered to avoid bolt shadowing.)

### 5

*continue applying liner up interior*

Following the same method, continue up the interior. Apply liner, (1) sidewall ring at a time, from the bottom sidewall ring to the top sidewall ring. Apply liner until a 96 Wet Mills / 60 Dry Mills liner thickness is achieved over the entire clarifier interior.

### 6

*allow liner to cure, rinse with water*

Allow the entire clarifier interior liner to cure and dry to the touch. Rinse or use a wet rag and remove all salt from the entire liner. Allow all rinsed or wiped surfaces to dry to the touch.



# Liner Spraying Technique

**FOLLOW THE INSTRUCTIONS IN THIS MANUAL SECTION TO CORRECTLY APPLY 96 WET MILS OF SPRAY LINER**



**Note:** The third liner layer of overlapping double passes (**LINER LAYER 3**) of Spray Liner should yield **96 Wet Mils or 60 Dry Mils**. If the liner is applied too thick, it will take too long to cure. If the liner is applied too thin, you will not have an adequate liner! **If you do not achieve the correct consistent Liner thickness or Mine Coat thickness everywhere the liner is applied, THIS WILL VOID YOUR WARRANTY!**



**Note:** Spray Liner and Mine Coat application differs from painting. If your Rubber Liner is not applied properly, **THIS WILL VOID YOUR WARRANTY!** If your Rubber Liner is not applied correctly, as indicated in these instructions, **THIS WILL VOID YOUR WARRANTY!** Read [pages 49 - 57](#) before applying.



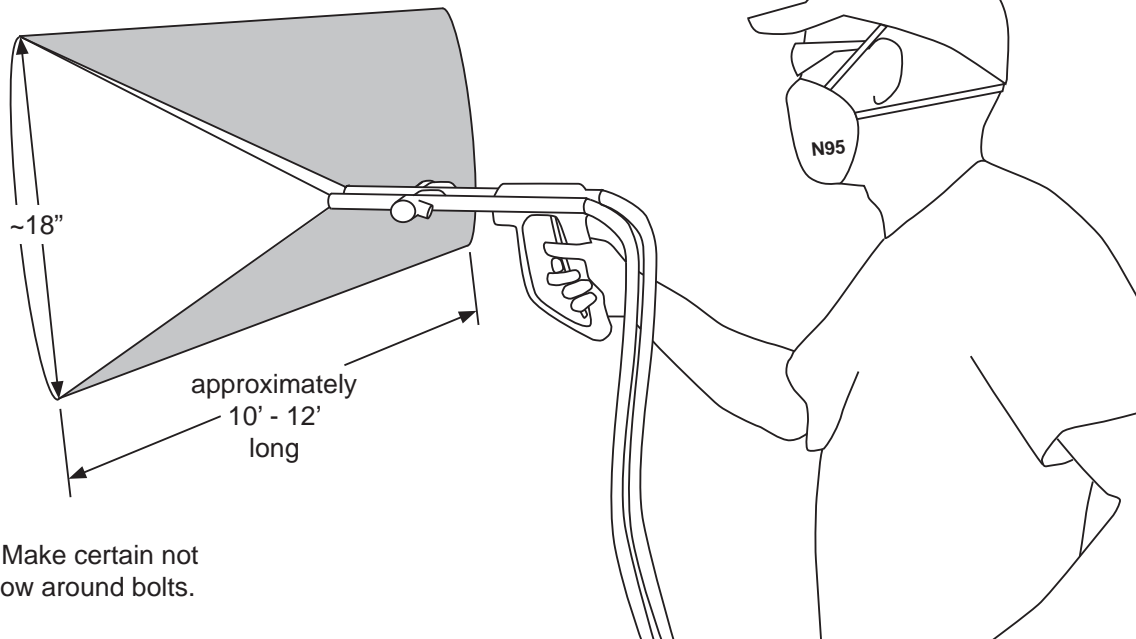
**Note:** When applying Spray Liner or when in the work area while Spray Liner is applied, you must wear a NIOSH N95 dust respirator mask. For proper use, see the instructions that come with your NIOSH N95 mask!



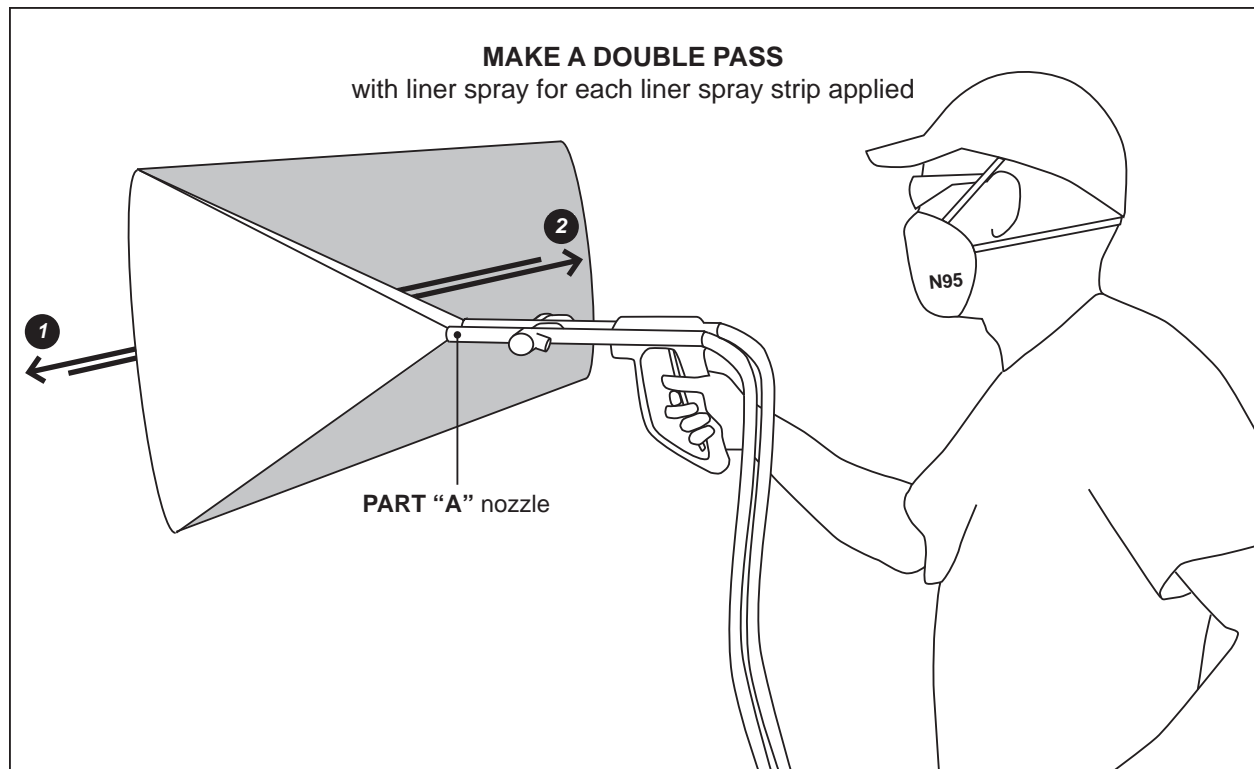
**Note:** REQUIRED BEFORE LINER APPLICATION. Etch clarifier interior with vinegar. Apply vinegar with a sprayer or with a cloth rag. Put vinegar covering on clarifier interior for 15 minutes minimum, then rinse / pressure wash with water and allow to fully dry.



Make each coating strip approximately **18 inches wide X 10 feet long** (when applicable).  
Use 4008 spray gun Tip for detail work,  
and 4015 spray gun Tip when applying to larger areas.

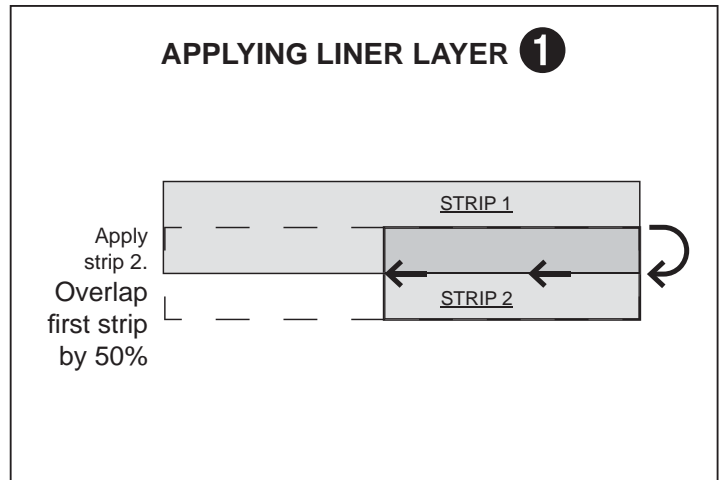
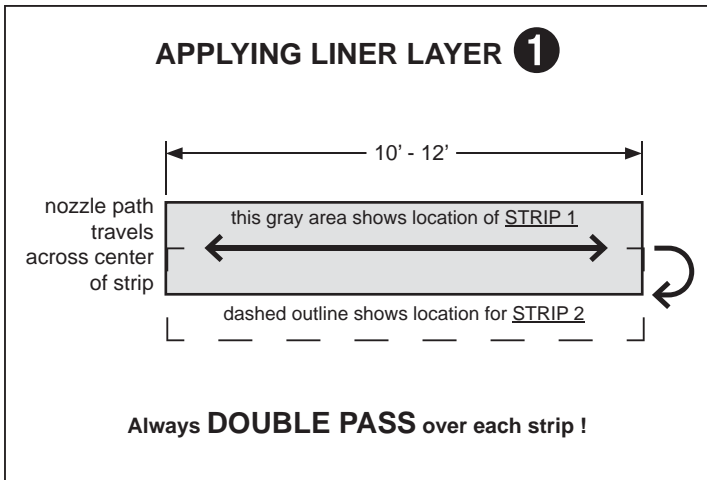


<A> When applying a liner strip, make each strip approximately 18” wide and 10’ - 12’ long.



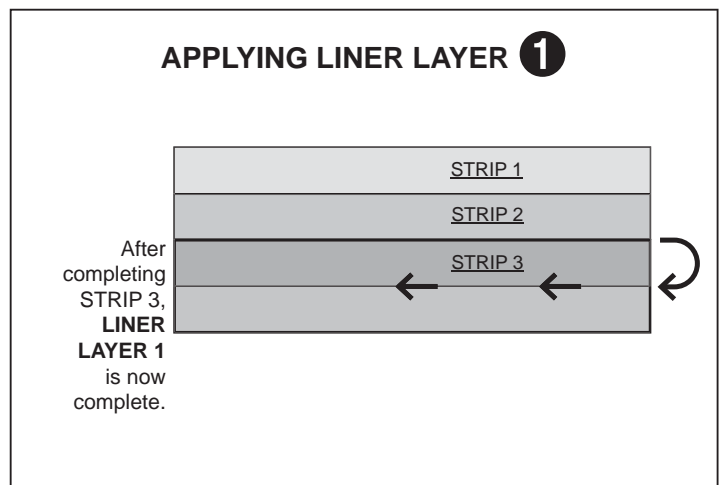
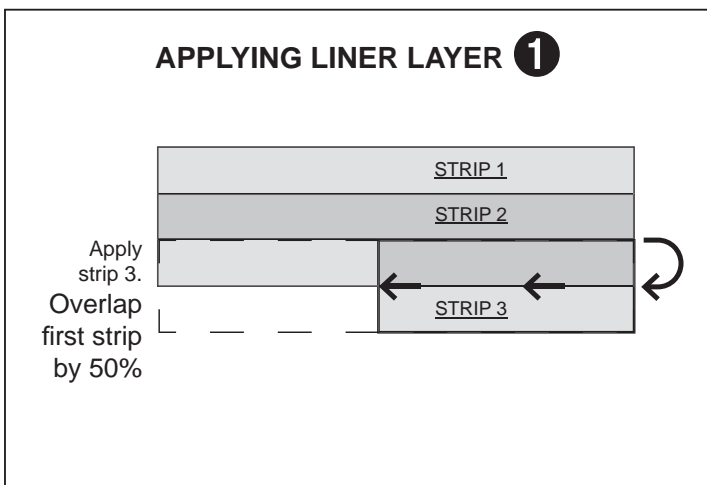
<B> When applying a liner strip, make a double pass (2 passes) with liner spray for each strip of liner applied, left and then right. **ON THE FIRST PASS OF EACH STRIP, ALWAYS LEAD WITH PART “A” LINER PRODUCT.**





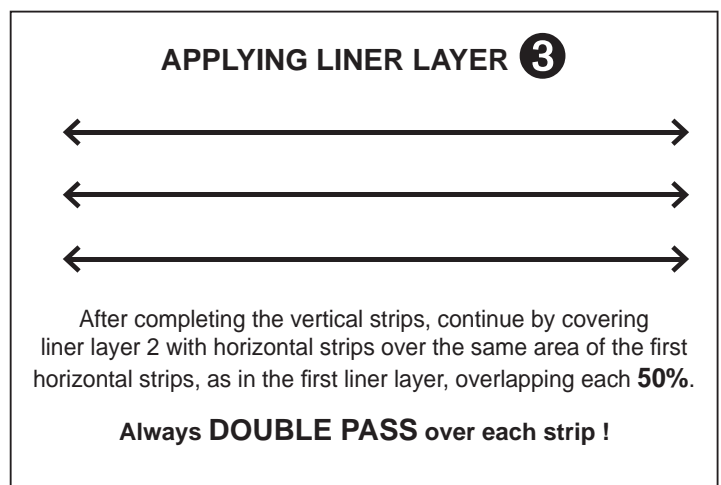
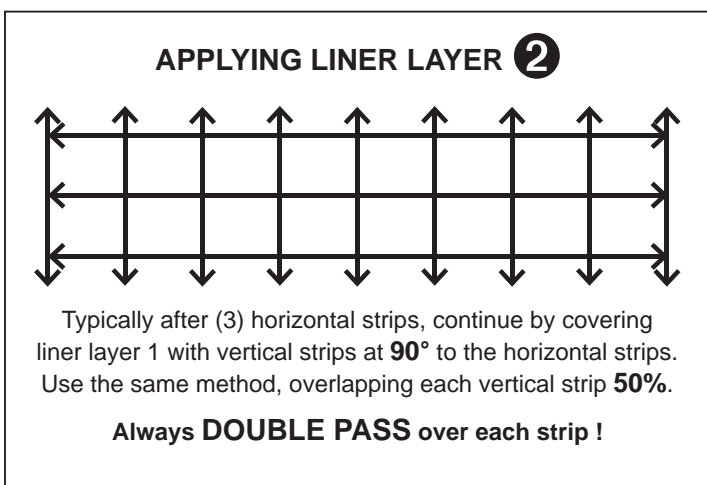
<C> Start spray liner layer 1. Apply spray liner strip 1.

<D> Apply spray liner strip 2.



<E> Apply spray liner strip 3.

<F> Complete liner layer 1 by completing strip 3.



<G> Apply liner layer 2.

<H> Apply liner layer 3.

# 9

## PermaDri™ Site Checklists

### PermaDri™, Items Needed Checklist

#### TYPICAL ITEMS NEEDED ON JOBSITE:

1. SHEARS FOR FABRIC (GOOD RAZOR KNIVES)
2. DUST MASKS
3. 1 BOTTLE OF GOO-GONE
4. 5 GALLONS OF MINERAL SPIRITS
5. EMPTY 5 GALLON BUCKETS
6. TYVEK SUITS
7. DRILL WITH LONG MIXER BLADE (MIX SALT WATER & EMULSION)
8. UNLEADED GAS
9. NON-DETERGENT 10/30WT OIL
10. DISPOSABLE GLOVES
11. 9" SHORT NAP PAINT ROLLERS
12. HANDLES FOR THE PAINT ROLLERS
13. 3" or 4" CHIP BRUSHES
14. ELECTRICAL EXTENTION CORD
15. SHOP TOWELS
16. DRINKING WATER
17. SUN SCREEN
18. SHADE COVERING
19. PLASTIC OR TARP FOR UNDER MACHINE (SPILLS)
20. SMOOTH SOLE SHOES (STEEL TOE)



# PermaDri™, Quality Checklist

- Motor Oil
- Gear Oil
- Belts Tightened
- Controller Clips
- Check Hoses
- Compensator Pressure MP30
- Compensator Pressure MP20
- Suction Hose
- Dual Gun Check
- Check Port Caps

## PUMP:

- A) ---- Check Oil
- B) ---- Check Oil
- Fluid Flow
- Fluid Flow
- Pressure
- Pressure

## PACKING LIST:

- Pump Package
- 200' Pressure Hose w/ Caps
- A Side Suction Tube & Hose
- B Side Suction Tube & Hose
- Return Hoses (2)
- Dual Gun W/Wands 8"
- Spray Tips (2 @ 4001, 2 @ 4008, 2 @ 4015)
- Spare Parts Kit 5026-080
- Magic Tape
- Manuals (Honda & comet)
- Air Pressure/ Inflator Tool
- Gun Repair Kit Plus additional Brass Seat
- 1 ea. Metric Allen Wrench set
- 1 ea. Dentist Tool to remove Check Valves
- 1 ea. Crescent Wrench 8" & 10"
- Small wire Brush
- Small Bottle Cleaning Brush
- Hose Clamps (4)
- Tie-Wraps
- 13/16" Spark Plug Wrench w/ a 4" Extension
- 1 Quart of SAE 30 Non-Detergent Oil
- 1 Roll of Aluminum Window Screen
- Duct Tape



## Notes:



## Recent Significant Manual Changes:

### 11-09 [1] Revision Changes

- 1** Changes were made throughout the entire manual.
- 2** PermaDri™ instructions were added to this manual.



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