1.0 Introduction

TerraBrute® CR is an integral-bell restrained-joint PVC pipe that meets the performance requirements of AWWA C900\(^{(1)}\). It has a slight modification that allows the joints to be locked for use in trenchless installations as well as restrained joint applications.

This installation guide covers the basic handling and installation information required to assemble and install the product. Figure 1.1 below shows the required parts for TerraBrute® CR pipe installation.

![Figure 1.1 Typical TerraBrute® CR Parts](image)

2.0 Pipe Technical Data

TerraBrute® CR is a gasketed cast iron outside diameter (CIOD) pipe. Pipe properties can be found below in Tables 1.1-1.5.

<table>
<thead>
<tr>
<th>Size, in</th>
<th>Dimension Ratio</th>
<th>Bell OD, in</th>
<th>Pipe OD, in</th>
<th>Avg. ID, in</th>
<th>Weight, lb/ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>14</td>
<td>6.49</td>
<td>4.80</td>
<td>4.09</td>
<td>3.3</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>9.06</td>
<td>6.90</td>
<td>5.87</td>
<td>6.8</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
<td>11.33</td>
<td>9.05</td>
<td>8.03</td>
<td>9.3</td>
</tr>
<tr>
<td>10</td>
<td>18</td>
<td>14.00</td>
<td>11.10</td>
<td>9.84</td>
<td>13.8</td>
</tr>
<tr>
<td>12</td>
<td>18</td>
<td>16.36</td>
<td>13.20</td>
<td>11.69</td>
<td>20.2</td>
</tr>
</tbody>
</table>

*Table 1.1 Pipe Dimensions and Weights*
3.0 Joint Assembly Instructions

The TerraBrute® CR locking mechanism requires assembly in the field. The pipe joint itself is assembled in a similar manner as bell and spigot PVC pipe. A spigot end is inserted into the bell end of a commensurately sized and standardized pipe length. A gasket between the two pipe ends effects the seal to provide a watertight joint that can carry internal pressure.
3.1 General Recommendations

Pipe joints should be assembled using manual effort wherever possible. However, if mechanical assistance is required, it is recommended that a Pipe Stop be used to aid in lining up the restraint groove with the restraint pins. This can be easily accomplished by installing a TerraBrute® CR Pipe Stop or a standard restrainer grip ring along the insertion line on the spigot. Please contact your Underground Solutions, Inc. representative for more information on procuring pipe stops for your TerraBrute® CR pipe project.

Figure 1.3 Pipe Stops for 8-inch through 10-inch pipe

3.1.1 Lay out the two pipe sections to be assembled. If the pipe is being installed via a trenchless method, the pipe should be inserted spigot end first. Regardless of installation method, allow at least 12-inches of clearance under the bottom of the bell to facilitate the pin installations. All pins must be fully installed for the joint to function as indicated for pull force and bending.

3.1.2 Locate the insertion line on the spigot end of the pipe to be inserted. If the line is missing, it can be marked as shown in Figure 1.4 and Table 1.6.

Figure 1.4 Illustration of insertion line in spigot pipe end
### Table 1.6 Insertion line depths by pipe size

<table>
<thead>
<tr>
<th>Size, in</th>
<th>Insertion Line Depth L, in</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>7-3/4</td>
</tr>
<tr>
<td>6</td>
<td>8-5/8</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>10-5/8</td>
</tr>
<tr>
<td>12</td>
<td>11-1/2</td>
</tr>
</tbody>
</table>

3.1.3 Installation forces can easily be controlled when using manual effort, but can be more difficult when using mechanical means such as a backhoe. In these cases, it is recommended that a Pipe Stop be installed on the insertion line prior to pipe assembly to prevent over insertion. A standard split-ring restrainer gland that can be removed after assembly may also work as a substitute. Follow the installation procedures below if a TerraBrute® CR Pipe Stop is being used.

3.1.3.1 Open the Pipe Stop and place it around the pipe at the insertion line as shown below in Figure 1.5.

![Figure 1.5 Placing Pipe Stop around the pipe](image)

3.1.3.2 Position the Pipe Stop so that it just covers the insertion line. See Figure 1.6 below for positioning.
3.1.3.3 Secure the Pipe Stop using a pair of vice grips as shown below in Figure 1.7.

3.1.4 Prior to joint assembly, lubricate the spigot end and gasket with an NSF 61 certified lubricant made for the assembly of PVC potable water pipe.

3.1.5 Using a bar and block for smaller sizes (4-inch through 8-inch) or mechanical means for larger sizes, line up the two pipes in a straight line and push the spigot into the bell as shown in Figures 1.8 and 1.9. The pipe should be pushed until the line marked on the spigot is aligned with the end of the bell, or until the end of the bell butts up against the Pipe Stop as shown in Figure 1.10. Do not insert spigot past the insertion mark, as the locking pins may not line up with the inner groove. As shown in Figure 1.8, the groove area is white in color. When looking through the holes in the bell, the entire hole should be white, without any blue showing.
TerraBrute® CR (4”-12”)
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Figure 1.8 Aligning bell and spigot ends of pipe

Figure 1.9 Pushing the spigot into the bell

Figure 1.10 Inserting spigot to the insertion line or Pipe Stop
3.1.6 Once the holes on the bell are aligned with the inner groove, line up the pins on the external half ring with the holes in the bell so that the entire circumference and all holes are covered. See Figure 1.11 below.

Working with a hammer and pins represents a personal injury hazard due to flying debris. **ALWAYS WEAR SAFETY GLASSES DURING PIN INSTALLATION.**

![Figure 1.11 Checking bell and spigot alignment and placing the ring on the pipe](image)

3.1.7 Using a plastic impact hammer, tap in the pins starting at the top of the pipe working your way down. The pins should be tapped until they bottom out on the inner groove or are flush with the ring. A good technique to ensure proper alignment is to tap each pin on the ring 1/4 to 1/2 of the way in before hammering in fully. **If the pins will not go all the way in, check to see if the rings, holes, and inner groove are properly aligned on all sides.**

![Figure 1.12 Installing the pins with a plastic impact hammer](image)
3.1.8 When the pin is fully inserted, continue hammering in the remaining pins. Check to make sure all pins are fully inserted before starting the next joint or continuing with the installation.

3.1.9 Once initial sections are assembled, a pull-head can be attached as required. The standard Fusible PVC® pipe pull-head can be used. If high installation forces are expected, the grooved portion of the spigot should be removed before pull-head installation.

3.2 Important Notes

3.2.1 Ensure the inner groove is completely aligned with holes before inserting pins. All pins must be bottomed out on the inner groove after insertion.

3.2.2 When connecting to standard C900 pipe or fittings, cut off grooved portion and chamfer pipe edges as shown in the Installation Manual. DO NOT use the TerraBrute® CR insertion mark as a guide for insertion into standard pipe or fittings – it is designed for the extended bell of TerraBrute® CR.
References


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This document does not purport to address all of the safety concerns, if any, associated with the handling, installation or use of TerraBrute® CR pipe or with the various application techniques described herein. It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

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