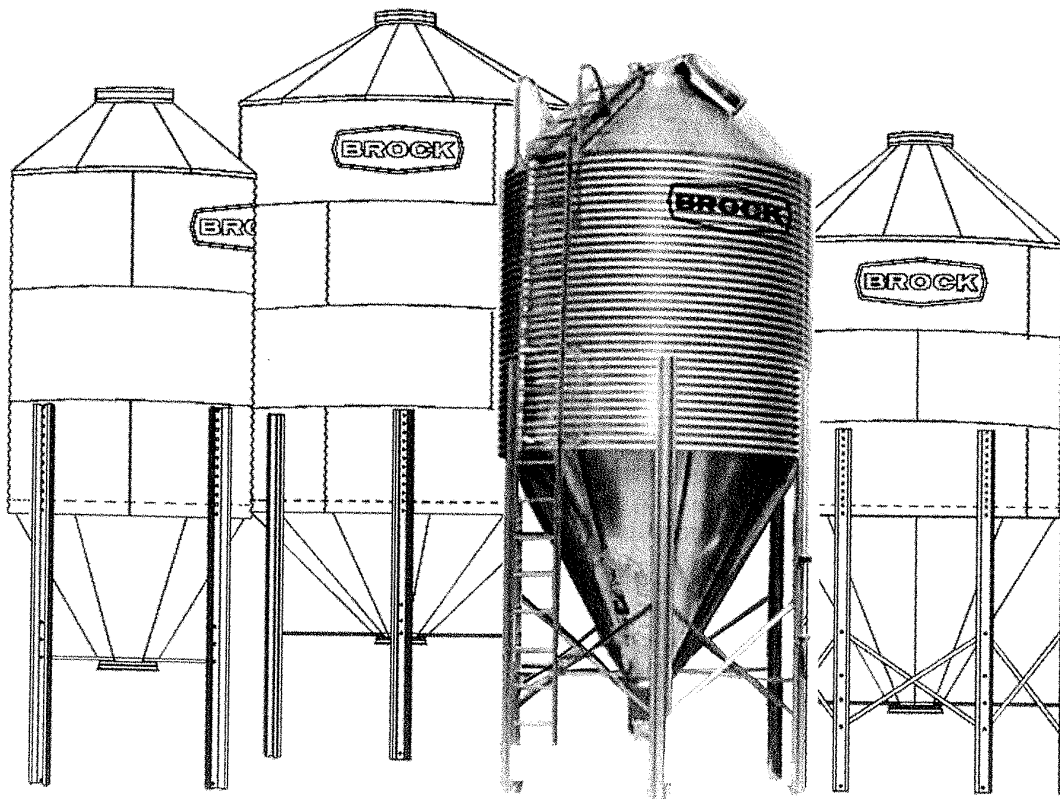


# CONSTRUCTION MANUAL



6', 7', and 9'  
[1 829, 2 134, and 2 743 mm] Dia.  
**HOPPER BINS**



# Foundations



The Foundation shall be placed on undisturbed soil of bearing capacity of at least 3000 psf [14 647 kg/m<sup>2</sup>] or special modification of foundation must be considered. If questions arise, contact a qualified soil engineer.

The Foundation shall be appropriately designed for local soil and frost depth conditions. Sizes given are adequate for resisting 1.5 times the overturning due to a 90 mph [145 km/h] wind acting on 0.6 times the area of bin and seismic zone 1.

The Foundation should be smooth and level to within 1/4" [6.4].

**Concrete in footings** shall have a minimum compressive strength,  $f_c' = 3000$  psi (pounds per square inch) [20 684 kPa] at 28 days.

**Concrete reinforcing steel** shall have a minimum yield strength of 33,000 psi [227 527 kPa].

Concrete should be cured seven days before building bin and 28 days before filling the bin.

## Standard Anchoring

A 5/8" x 8" x 2" Bolt (Part No. 39-20075)\* is available from Brock Grain Systems. Bolts must be embedded 6 1/2" [165].

\* The following bins use 5/8 x 13" Gr. 5 Heavy Hex Head Bolt, embedded 11" [279], with Heavy Nut and Heavy Washer. These are included in the parts kit.

- 6' [1 829] 7 and 8 ring
- 7' [2 134] 6, 7 and 8 ring
- 9' [2 743] 45° 11 ring

**CAUTION!**



**Measure between opposite and adjacent Anchors to be sure they are an equal distance apart before securing. Failure to do so may cause damage to the Bin.**

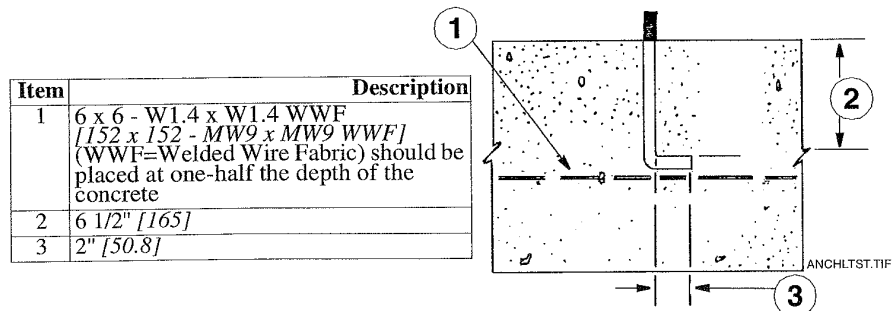


Figure 10. Anchor Bolt Detail

## Alternate Anchoring

**IMPORTANT:** *The alternate anchoring presented on this page is not for 7' [2 134] 67° 6-ring bins, nor for the 9' [2 743] 60° 7-ring bins.*

Install Anchor Bolts before setting bin to insure proper location.

1)A 5/8 x 9" Heavy Hex Gr. 2 Bolt embedded to a depth of 7 1/2" [191].

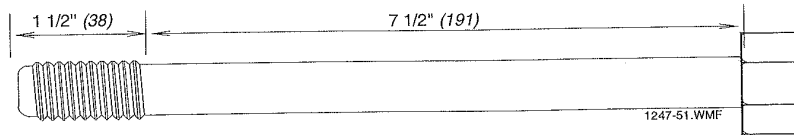


Figure 11. 5/8 x 9" Heavy Hex Gr. 2 Bolt

2)HILTI® Kwik-Bolt II 3/4 x 6 1/2" or equivalent. Each Bolt must have a minimum embedment of 4 3/4" [121].

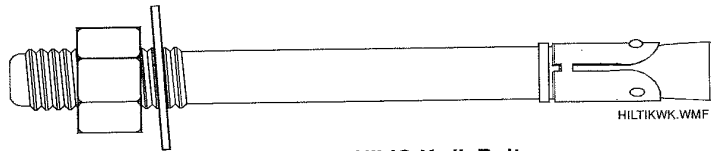


Figure 12. Hilti® Kwik Bolt

3)HILTI® HVA Adhesive anchor 5/8" x 6 1/2" Gr. 2 or equivalent. Each Bolt must have a minimum embedment of 5" [127].

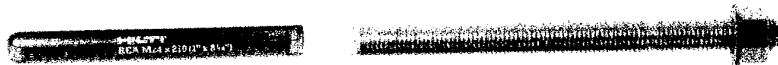


Figure 13. Hilti® HVA Adhesive Anchor and Capsule

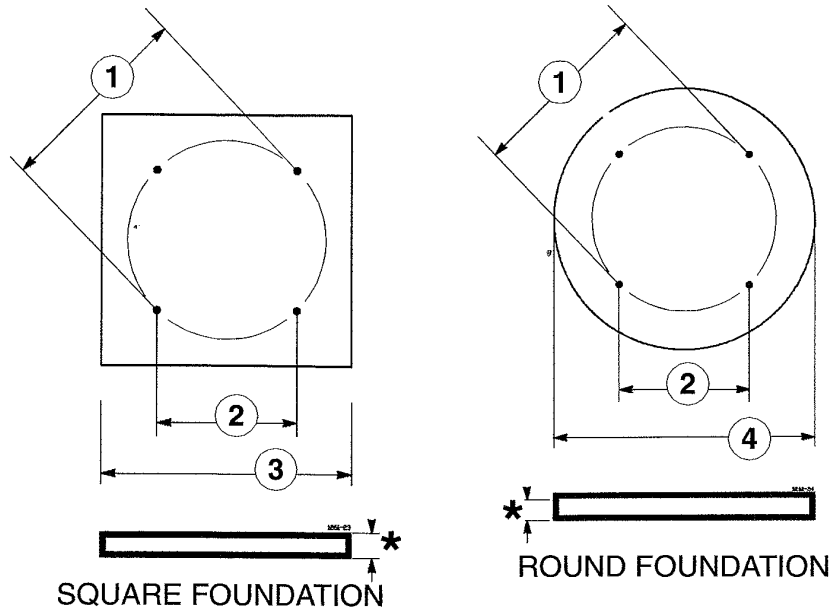
### CAUTION!



*Layout locations and install anchors before setting the bin to insure proper location. Failure to do so may cause damage to the bin.*

*Do NOT use Legs as a template to drill, because the bin may not be round.*

**6' [1 829] Foundations: Anchor Bolt and Concrete Specifications**

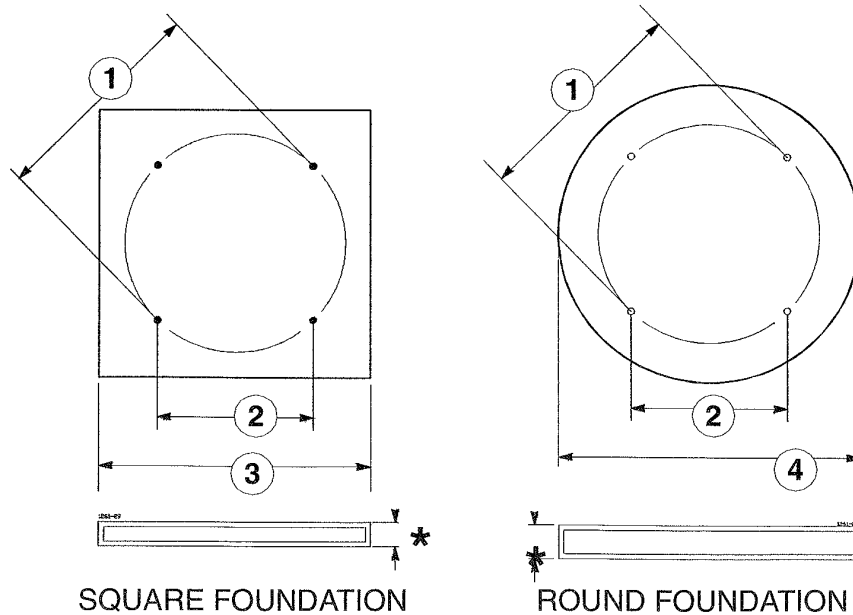


| Item | Description       |
|------|-------------------|
| 1    | 76 1/16" [1 932]  |
| 2    | 53 25/32" [1 366] |
| 3    | 8' [2 438]        |
| 4    | 9' [2 743]        |

Anchor Bolt dimensions are the same for each diameter foundation, round or square.  
 \*See Thickness Charts on Pages 20 and 21.

Figure 14. 6' [1 829] Diameter Bins

**7' [2 134] Foundations: Anchor Bolt and Concrete Specifications**

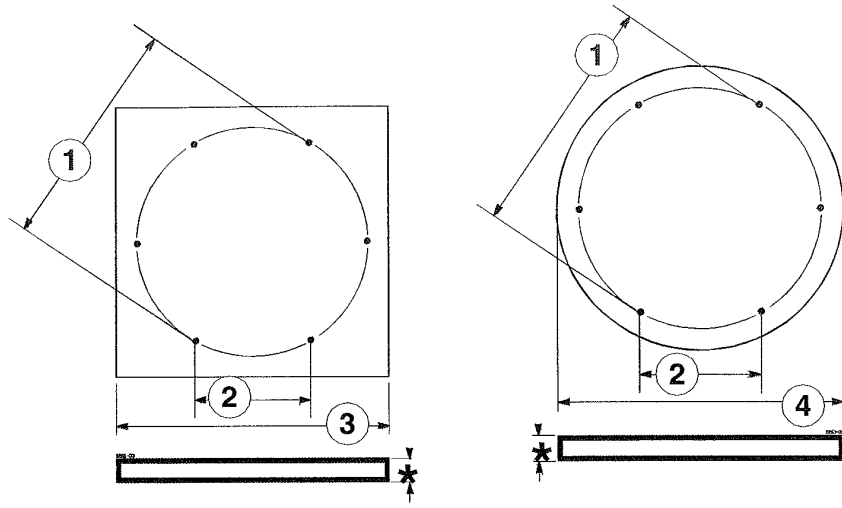


| Item | Description     |
|------|-----------------|
| 1    | 88" [2 235]     |
| 2    | 62 1/4" [1 581] |
| 3    | 9' [2 743]      |
| 4    | 10' [3 048]     |

Anchor Bolt dimensions are the same for each diameter foundation, round or square.  
 \*See Thickness Charts on Pages 20 and 21.

Figure 15. 7' [2 134] Diameter Bins

**9' [2 743] Foundations: Anchor Bolt and Concrete Specifications**  
 Anchor Bolt dimensions are the same for each diameter foundation, round or square.



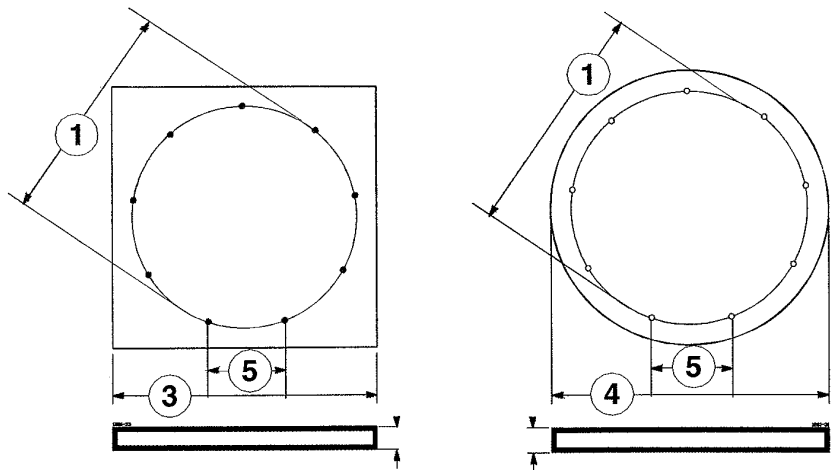
SQUARE FOUNDATION

ROUND FOUNDATION

Figure 16A. 9' [2 743] Diameter Bins (6 Legs)

| Item | Description   |
|------|---|
| 1    | 111 7/8" [2 842] diameter                                     |
| 2    | 55 15/16" [1 421] 6-Leg Chord (45° 1-7 Rings; 60° 1-10 Rings) |
| 3    | 11' [3 353]   |
| 4    | 12' [3 658]   |
| 5    | 38 1/4" [972] 9-Leg Chord (45° 8-11 Rings)                    |

\*See Thickness Charts on Pages 20 and 21.



SQUARE FOUNDATION

ROUND FOUNDATION

Figure 16B. 9' [2 743] Diameter Bins (9 Legs)

### Square Foundations

| Footer Concrete Specs (ENGLISH) |                    |                   |                    |                   |                      |                   |
|---------------------------------|--------------------|-------------------|--------------------|-------------------|----------------------|-------------------|
| Model Foundation Size           | 6' dia.<br>8' x 8' |                   | 7' dia.<br>9' x 9' |                   | 9' dia.<br>11' x 11' |                   |
| Rings                           | Thickness (inches) | Volume (cu. yds.) | Thickness (inches) | Volume (cu. yds.) | Thickness (inches)   | Volume (cu. yds.) |
| 1                               | 8"                 | 1.6               | 8"                 | 2.0               | 8"                   | 3.0               |
| 2                               | 8"                 | 1.6               | 9"                 | 2.3               | 9"                   | 3.4               |
| 3                               | 8"                 | 1.6               | 10"                | 2.5               | 9"                   | 3.4               |
| 4                               | 9"                 | 1.8               | 11"                | 2.8               | 10"                  | 3.7               |
| 5                               | 10"                | 2.0               | 11"                | 2.8               | 10"                  | 3.7               |
| 6                               | 13"                | 2.6               | 13"                | 3.3               | 11"                  | 4.1               |
| 7                               | 15"                | 3.0               | 16"                | 4.0               | 12"                  | 4.5               |
| 8                               | 18"                | 3.6               | 18"                | 4.5               | 14"                  | 5.2               |
| 9                               |                    |                   |                    |                   | 16"                  | 6.0               |
| 10                              |                    |                   |                    |                   | 18"                  | 6.7               |
| 11                              |                    |                   |                    |                   | 17"                  | 6.3               |

| Footer Concrete Specs (METRIC) |                             |                 |                             |                 |                             |                 |
|--------------------------------|-----------------------------|-----------------|-----------------------------|-----------------|-----------------------------|-----------------|
| Model Foundation Size          | 1 829 dia.<br>2 438 x 2 438 |                 | 2 134 dia.<br>2 743 x 2 743 |                 | 2 743 dia.<br>3 353 x 3 353 |                 |
| Rings                          | Thickness [mm]              | Volume [cu. m.] | Thickness [mm]              | Volume [cu. m.] | Thickness [mm]              | Volume [cu. m.] |
| 1                              | 203                         | 1.2             | 203                         | 1.5             | 203                         | 2.3             |
| 2                              | 203                         | 1.2             | 229                         | 1.8             | 229                         | 2.6             |
| 3                              | 203                         | 1.2             | 254                         | 1.9             | 229                         | 2.6             |
| 4                              | 229                         | 1.4             | 279                         | 2.1             | 254                         | 2.8             |
| 5                              | 254                         | 1.5             | 279                         | 2.1             | 254                         | 2.8             |
| 6                              | 330                         | 2.0             | 330                         | 2.5             | 279                         | 3.1             |
| 7                              | 381                         | 2.3             | 406                         | 3.1             | 305                         | 3.4             |
| 8                              | 457                         | 2.8             | 457                         | 3.4             | 356                         | 4.0             |
| 9                              |                             |                 |                             |                 | 406                         | 4.6             |
| 10                             |                             |                 |                             |                 | 457                         | 5.1             |
| 11                             |                             |                 |                             |                 | 432                         | 4.8             |

### Round Foundations

| Footer Concrete Specs (ENGLISH) |                    |                       |                      |                       |                      |                       |
|---------------------------------|--------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|
| Model<br>Foundation<br>Size     | 6' Dia.<br>9' Dia. |                       | 7' Dia.<br>10' Dia.  |                       | 9' Dia.<br>12' Dia.  |                       |
|                                 | Rings              | Thickness<br>(inches) | Volume<br>(cu. yds.) | Thickness<br>(inches) | Volume<br>(cu. yds.) | Thickness<br>(inches) |
| 1                               | 8"                 | 1.6                   | 8"                   | 1.9                   | 8"                   | 2.8                   |
|                                 | 8"                 | 1.6                   | 9"                   | 2.2                   | 9"                   | 3.1                   |
|                                 | 8"                 | 1.6                   | 10"                  | 2.4                   | 10"                  | 3.5                   |
| 4                               | 9"                 | 1.8                   | 11"                  | 2.7                   | 10"                  | 3.5                   |
|                                 | 10"                | 2.0                   | 12"                  | 2.9                   | 11"                  | 3.8                   |
|                                 | 12"                | 2.4                   | 13"                  | 3.2                   | 12"                  | 4.2                   |
| 7                               | 14"                | 2.7                   | 15"                  | 3.6                   | 12"                  | 4.2                   |
|                                 | 16"                | 3.1                   | 17"                  | 4.1                   | 13"                  | 4.5                   |
|                                 |                    |                       |                      |                       | 15"                  | 5.2                   |
| 10                              |                    |                       |                      |                       | 17"                  | 5.9                   |
|                                 |                    |                       |                      |                       | 17"                  | 5.9                   |

| Footer Concrete Specs (METRIC) |                             |                   |                             |                   |                             |                   |
|--------------------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|
| Model<br>Foundation<br>Size    | 1 829 dia.<br>2 438 x 2 438 |                   | 2 134 dia.<br>2 743 x 2 743 |                   | 2 743 dia.<br>3 353 x 3 353 |                   |
|                                | Rings                       | Thickness<br>[mm] | Volume<br>[cu. m.]          | Thickness<br>[mm] | Volume<br>[cu. m.]          | Thickness<br>[mm] |
| 1                              | 203                         | 1.2               | 203                         | 1.5               | 203                         | 2.1               |
|                                | 203                         | 1.2               | 229                         | 1.7               | 229                         | 2.4               |
|                                | 203                         | 1.2               | 254                         | 1.8               | 254                         | 2.7               |
| 4                              | 229                         | 1.4               | 279                         | 2.1               | 254                         | 2.7               |
|                                | 254                         | 1.5               | 305                         | 2.2               | 279                         | 2.9               |
|                                | 305                         | 1.8               | 330                         | 2.4               | 305                         | 3.2               |
| 7                              | 356                         | 2.1               | 381                         | 2.8               | 305                         | 3.2               |
|                                | 406                         | 2.4               | 432                         | 3.1               | 330                         | 3.4               |
|                                |                             |                   |                             |                   | 381                         | 4.0               |
| 10                             |                             |                   |                             |                   | 432                         | 4.5               |
|                                |                             |                   |                             |                   | 432                         | 4.5               |