CITY OF PORTLAND, MAINE RESURGAM
Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 05/23/17

Foundations

FOUNDATIONS shall be placed on undisturbed soil or engineered backfill with bearing capacity of at least 3000 psf (pounds per square foot) *[14 647 kg/m·]* or special modification of foundations must be considered. If questions arise, contact a qualified soil engineer.

FOUNDATIONS 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.

FOUNDATIONS should be smooth and level to within 1/4" *[6.4]*.

CONCRETE IN FOOTINGS shall have a minimum compressive strength, fc' = 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 Grain Bin.

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]*.

* 12' *[3 658]* 60° 11-ring bins use 5/8 x 13" Gr. 5 Heavy Hex Head Bolt with Heavy Nut and Heavy Washer. These are included in the parts kit.

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.***

Item	Description
1	1 1/2" *[38]*
2	6 1/2" *[165]*
3	WWF must be at or above mid-depth of slab.
4	2" *[51]*
5	6 x 6 - W1.4xW1.4 Welded Wire Fabric *[152x152 - MW9xMW9]*
6	Anchor Bolt
7	Concrete

Figure 11. Anchoring Bolt Detail

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Alternate Anchoring

Install Anchor Bolts before setting the Hopper 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]*.

Dim.	Length
1	1 1/2" *[38]*
2	7 1/2" *[191]*

Figure 12. 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 13. 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 14. Hilti · HVA Adhesive Anchor and Capsule

CAUTION ***Layout locations and install anchors before setting the Hopper 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 Hopper Bin may not be round.

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Specifications

Item	Description
1	6' - 1 7/8" *[1 876]*
2	8 Legs: 56 35/64" *[1 436]* 12 Legs: 38 1/4" *[971]*
3	14' *[4 267]*
4	15' *[4 572]*
5	See Concrete Charts on Page 20.

Figure 15. 12' *[3 658]* Diameter Bin
Left: Square Foundation Right: Round Foundation

Figure 16. 15' *[4 572]* Diameter Bin

Item	Description
1	7' - 7 13/16" *[2 331]*
2	9' - 1 11/16" *[2 786]*
3	38 5/32" *[969]*
4	38 3/32" *[968]*
5	18' *[5 486]*
6	21' *[6 401]*
7	3 Bolt Chord 15' = 8' - 11 7/8" *[2 741]* 18' = 9' - 1 11/16" *[2 786]*
8	4" *[102]*
9	3' *[914]*
10	15' *[4 572]*
11	See Concrete Charts on Page 20.

Figure 17. 18' *[5 486]* Diameter Bin

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Item	Description
1	10' - 7 5/8" *[3 242]*
2	38 1/32" *[966]*
3	24' *[7 315]*
4	4" *[102]*
5	3' *[914]*
6	18' *[5 486]*
7	3-Bolt Chord: 9' - 2 3/4" *[2 813]*
8	See Concrete Charts on Page 20.

Figure 18. 21' *[6 401]* Diameter Bin Three Legs per Body Sheet (2-6 Rings)

Item	Description
1	10' - 7 5/8" *[3 242]*
2	28 9/16" *[725]*
3	24' *[7 315]*
4	4" *[102]*
5	3' *[914]*
6	18' *[5 486]*
7	4-Bolt Chord: 9' - 2 3/4" *[2 813]*
8	See Concrete Charts on Page 20.

Figure 19. 21' *[6 401]* Diameter Bin Four Legs per Body Sheet (7-8 Rings)

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Concrete Charts

SQUARE FOOTER Concrete Specs (English)		
Model Found. Size	12' Dia. Bin 14' X 14' (Figure 14)	
Rings	Thickness (inches)	Volume (cu. yds.)
1	9"	5.4
2	9"	5.4
3	10"	6.0
4	11"	6.7
5	11"	6.7
6	12"	7.3
7	12"	7.3
8	13"	7.9
9	14"	8.5
10	14"	8.5
11	16"	9.7

SQUARE FOOTER Concrete Specs (Metric)		
Model Found. Size	12' Dia. Bin 4 267 x 4 267mm (Figure 14)	
Rings	Thickness *[mm]*	Volume *[cu. m]*
1	229	4.2
2	229	4.2
3	254	4.6
4	279	5.1
5	279	5.1
6	305	5.6
7	305	5.6
8	330	6.0
9	356	6.5
10	356	6.5
11	406	7.4

ROUND Footer Concrete Specs (English)										
Model Found. Size	12' Dia. Bin 15' Dia. (Figure 15)		15' Dia. Bin 18' Dia. (Figure 16)		18' Dia. Bin 21' Outside Dia. 15' Inside Dia. (Figure 17)			21' Dia. Bin 24' Outside Dia. 18' Inside Dia. (Fig. 18-19)		
Rings	Thickness (inches)	Volume (cu. yds.)	Thickness (inches)	Volume (cu. yds.)	Outside Thickness (inches)	Inside Thickness (inches)	Volume (cu. yds.)	Outside Thickness (inches)	Inside Thickness (inches)	Volume (cu. yds.)
1	9"	4.9								
2	10"	5.5	10"	7.9	10"	4"	7.4	11"	4"	9.9
3	11"	6.0	10"	7.9	11"	4"	7.9	11"	4"	9.9
4	12"	6.5	11"	8.6	11"	4"	7.9	12"	4"	10.5
5	12"	6.5	11"	8.6	12"	4"	8.5	13"	4"	11.1
6	13"	7.1	12"	9.4	12"	4"	8.5	13"	4"	11.1
7	14"	7.6	12"	9.4	13"	4"	9.0	14"	4"	11.7
8	14"	7.6	13"	10.2	14"	4"	9.5	15"	4"	12.3
9	14"	7.6	13"	10.2	14"	4"	9.5			
10	14"	7.6	13"	10.2						
11	16"	8.7								

ROUND Footer Concrete Specs *[Metric]*										
Model Found. Size	*3 658 Dia. Bin 4 572 Dia.*		*4 572 Dia. Bin 5 486 Dia.*		*5 486 Dia. Bin 6 401 Outside Dia. 4 572 Inside Dia.*			*6 401 Dia. Bin 7 315 Outside Dia. 5 486 Inside Dia.*		
Rings	Thickness *[mm]*	Volume *[cu. m]*	Thickness *[mm]*	Volume *[cu. m]*	Outside Thickness *[mm]*	Inside Thickness *[mm]*	Volume *[cu. m]*	Outside Thickness *[mm]*	Inside Thickness *[mm]*	Volume *[cu. m]*
1	229	3.8								
2	254	4.2	254	6.0	254	102	5.7	279	102	7.6
3	279	4.6	254	6.0	279	102	6.1	279	102	7.6
4	305	5.0	279	6.6	279	102	6.1	305	102	8.0
5	305	5.0	279	6.6	305	102	6.5	330	102	8.5
6	330	5.4	305	7.2	305	102	6.5	330	102	8.5
7	356	5.8	305	7.2	330	102	6.9	356	102	8.9
8	356	5.8	330	7.2	356	102	7.3	381	102	9.4
9	356	5.8	330	7.8	356	102	7.3			
10	356	5.8	330	7.8						
11	406	6.7								