# Development Services

## From Concept to Construction

Phone: 503-823-7300 Email: bds@portlandoregon.gov 1900 SW 4th Ave, Portland, OR 97201
More Contact Info (http://www.portlandoregon.gov//bds/article/519984)

## APPEAL SUMMARY

**Status:** Decision Rendered

| | |
|---|---|
| **Appeal ID:** 21904 | **Project Address:** 2389 NW WIlson St |
| **Hearing Date:** 9/18/19 | **Appellant Name:** Jeff Erwin |
| **Case No.:** B-014 | **Appellant Phone:** 503-998-9434 |
| **Appeal Type:** Building | **Plans Examiner/Inspector:** Renay Raktke Butts |
| **Project Type:** commercial | **Stories:** 2 **Occupancy:** F-1, S-1, B **Construction Type:** V-B sprinklered |
| **Building/Business Name:** | **Fire Sprinklers:** Yes - throughout |
| **Appeal Involves:** Alteration of an existing structure,occ Change from F-1 to B, S-1 | **LUR or Permit Application No.:** 19-191282-CO |
| **Plan Submitted Option:** mail [File 1] [File 2] | **Proposed use:** brewery |

## APPEAL INFORMATION SHEET

### Appeal item 1

| | |
|---|---|
| **Code Section** | OSSC (2014) Sections 307.1.1 and 307.4 |
| **Requires** | Requires High Hazard, H2 Occupancy, for occupancies where combustible dusts are generated in such a manner that conditions or concentrations create a fire or explosion hazard. |
| **Proposed Design** | Mitigation of dust amounts and fines and removal of ignition sources that could contribute to conditions leading to a fire or explosion.<br>(See the attached OSSC 414.1.3 Report and attachments for details.) |
| **Reason for alternative** | The approach to mitigate the combustible dust hazard by controlling dust and ignition sources. Given the small scale of the milling operation, the procedure outlined in the attached Report will allow the brewery to safely grind and convey grains. Mitigation of combustible dust amounts and ignition sources is a safer approach than constructing a H2 occupancy where mitigation does not occur. |

### Appeal item 2

| | |
|---|---|
| **Code Section** | OSSC (2014) Section 1105.1 Accessible Entrances |
| **Requires** | Public Entrances: In addition to accessible entrances required by section 1105.1.1 through 1105.1.6, at least 60 percent of all public entrances shall be accessible. |
| **Proposed Design** | The Finish floor elevation of the existing building is approximately 48" above the level of the accessible parking stall and entry. An existing interior platform lift serves as the only accessible |

| | |
|---|---|
| | entry to the building. This lift is located within the building and served by the closest available door from the accessible parking stall.<br><br>Two other doors are proposed onto a proposed exterior deck. Both are required exits out of the taproom & brewery spaces. An exterior area for assisted rescue is shown on the deck. |
| **Reason for alternative** | Two of the three entries to the proposed tenant improvement are located at the finish floor of the space, roughly 48" above exterior grade. Provisions have been made to provide accessible exiting out of these doors, but accessible entry is prohibitive due to the grade difference. Furthermore, the location of the trash enclosure makes an accessible ramp 48' long prohibitive with required number of exits from the deck and exit separation requirements. |

## Appeal item 3

| | |
|---|---|
| **Code Section** | OSSC (2014) Section 1104.6 |
| **Requires** | Location: Accessible routes shall coincide with or be located in the same area as a general circulation path. Where the circulation path is interior the accessible route shall also be interior. Where only one accessible route is provided, the accessible route shall not pass through kitchens, storage rooms, restrooms, closets, or similar spaces. |
| **Proposed Design** | The Finish floor elevation of the existing building is approximately 48” above the level of the accessible parking stall and entry. An existing interior platform lift serves as the only accessible entry to the building, and it is proposed that persons needing accessible accommodations be allowed to cross from this accessible entry through a keg storage area along a permanently striped path to access the taproom and other public functions. The permanently striped area will be kept clear at all times, and nothing other than beverages with<br>< 16% alcohol content held in metal containers is proposed to be stored within this area. |
| **Reason for alternative** | Due to existing overhead door & trench drain locations, the brewery operation is best-suited along the western edge of the tenant space, directly adjacent the accessible entry. A taproom in this location would pose significant operational & budgetary challenges to the primary brewery function.<br>Furthermore, the location of the trash enclosure makes an accessible ramp 48’ long prohibitive with required number of exits and exit separation requirements. |

## APPEAL DECISION

**1. Exemption from High Hazard occupancy classification in grist milling system: Granted as proposed per hazardous materials report, other provided appeal information and notes below.**

**Note: Approval is granted for this process and tenant only, provided there are no additional ignition sources in the grinding area not noted in the hazardous materials report subject to Fire Marshal verification.**
**At any time the Fire Marshal's Office finds that the manual housekeeping efforts have become ineffective in maintaining low level of accumulated dust, a mechanical dust collection system may be required.**
**Any changes in processes, equipment, or materials shall be approved by the Building Official in consultation with the Fire Marshal's Office prior to implementation.**

**2. Use of service entrance as second accessible entry: Denied. Proposal does not provide equivalent Life Safety protection.**

**3. Accessible route through storage / production area: Denied. Proposal does not provide equivalent Life**

**Safety protection.**

**Appellant may contact John Butler (503 823-7339) with questions.**

For the item granted, the Administrative Appeal Board finds that the information submitted by the appellant demonstrates that the approved modifications or alternate methods are consistent with the intent of the code; do not lessen health, safety, accessibility, life, fire safety or structural requirements; and that special conditions unique to this project make strict application of those code sections impractical.

Pursuant to City Code Chapter 24.10, you may appeal this decision to the Building Code Board of Appeal within 90 calendar days of the date this decision is published. For information on the appeals process, go to www.portlandoregon.gov/bds/appealsinfo, call (503) 823-7300 or come in to the Development Services Center.

Rich Miller
Miller Safety & Health Consulting
Cell: 503 891 5961
Message Phone: 503 243 1040
2010 NW Front #409; Portland, Or. 97209

Hammer & Stitch Brewing Company
2389 NW Wilson; Suite #3
Portland, Or. 97209 9/12/19

Attn.: Jeff Erwin; Project Architect

Re: Hazardous Materials Technical Opinion & Report; Rev. #1

Dear Jeff,

Following is a Technical Opinion and Report (Rev.1) as required by the Oregon Specialty Structural Code, Section 414.1.3, regarding hazardous materials related issues covering the proposed Hammer & Stitch Brewing Company facility in Portland, Oregon. This Report is based on a a review of plans and specifications for the Hammer & Stitch Brewing Company facility and discussions with yourself and information received from Hammer & Stitch Brewing Company and their equipment vendors.

## Facility Description

Hammer & Stitch Brewing Company is proposing to re-model a building located at 2389 NW Wilson, Suite #3, into a facility dedicated to the brewing of beer. Hammer & Stitch Brewing Company will use 55-pound bags of grain for introducing grains to the Grist Mill. The Grist Mill and related auger are to located in a small interior Grain Room approximately 90sf in size. This Grain Room will be classified as a F1 occupancy and is equipped with automatic sprinklers.

There will be the following areas or rooms, related to potential hazardous materials, discussed in this Report:

**Table A: Rooms and Areas related to Grain grinding and Storage**

| Room or Area # | Name of Room/Area | Occup-ancy* | Room/Area Size (sq. ft.) | Largest Container (pounds) |
|---|---|---|---|---|
| Grain Room | Grinding and Storage of Grains | F1 | 90 | 50-55 pound bags |

## Hazardous Materials Discussion and Purpose of Report

Combustible dust is a possible resultant of the Grinding process that occurs in the Grain Room. Typically, grains are crushed in a Grist Mill and then conveyed to a tank to begin

the brewing process. The grinding and conveying of grains is a Use-Closed operation. Any residual dust will removed via housekeeping measures.

The purpose of this Report, per OSSC 414.1.3, is to establish that the combustible dust hazard will be mitigated using a variety of measures listed in the Tables 1 and 2 below. Mitigation of the dust hazards, in my professional opinion, can allow the Grain Room to be a F1 occupancy.

**Process Description**

All grain handling will take place in a single enclosed room containing only the grain grinder (grist mill) and 50-55lb bags of whole grain with no other ignition sources within the space. This room will have negative pressure ventilation to the exterior to keep dust out of other spaces.

The grinder is a dust-tight enclosed assembly with an explosion proof electric motor that grinds grain into grist which is directly transported in an enclosed auger directly to the mash tun in the brew house. There is very little dust created in this enclosed system, and the volume of product processed is low enough to lower this risk even further.

The process creates a low amount of dust mostly because of the enclosed nature of the system therefore removing the fuel component. The grinding process is enclosed throughout the grinding and transportation of the grist material to the mash tun tanks.

**Table 1: Combustible Dust Mitigation Measures related to Equipment**

| # | Equipment | Mitigation Measure | Comments |
|---|---|---|---|
| 1 | Grist Mill | Sealed System to prevent leakage of dust particulates | see attached spec from mfg. |
| 2 | Grist Mill | Explosion Proof motor to remove potential ignition source | see attached spec from mfg. |
| 3 | Grist Mill | Magnet removes metal | see attached SOP from company.; insure operational adequacy |
| 4 | Milling System | Grounding and Bonding of augers and mill | To reduce static potential; to include auger, mill and tanks |

**Table 2: Combustible Dust Mitigation Measures in Grinding Room**

| # | Equipment | Requirement | Comments |
|---|---|---|---|
| 1 | Housekeeping | Remove residual dust per PFC Chapter 22 | See attached SOP from company |
| 2 | Lighting | Explosion proof lighting | To be installed |

| # | Equipment | Requirement | Comments |
|---|---|---|---|
| 3 | Switches and shut-offs | Explosion proof or outside of room | To be installed |
| 4 | Local Ventilation | No specific requirement | Install 1cfm/sf of room space or 90cfm minimum |
| 5 | Pallet jack | Non-sparking | Manual jack will be used |

**Conclusions and Attachments of Report**

**1.** If all of the Mitigation steps listed in the above Tables are instituted and adhered to, the Hammer & Stitch Brewing Company milling operation and storage shall constitute a safe operation due to the removal of ignition sources and the significant reduction of combustible dust fines. With simple best practices in housekeeping (see attached SOP) by the brewer, the potential hazard of combustible dust is mitigated to a degree allowing the occupancy of the Grain Room to be classified as a F1 occupancy.

2. Grist Mills, of contemporary design, are well sealed and typically do not typically grind grains small enough to constitute a combustible dust hazard.

3. Attached are the following specification letters, spec sheets and procedures:
- Grist Mill
- Auger/Conveyor
- Internal Housekeeping SOP

It has been a pleasure working with you. Feel free to contact me with any questions regarding this Rev. 1 Report.

Sincerely,

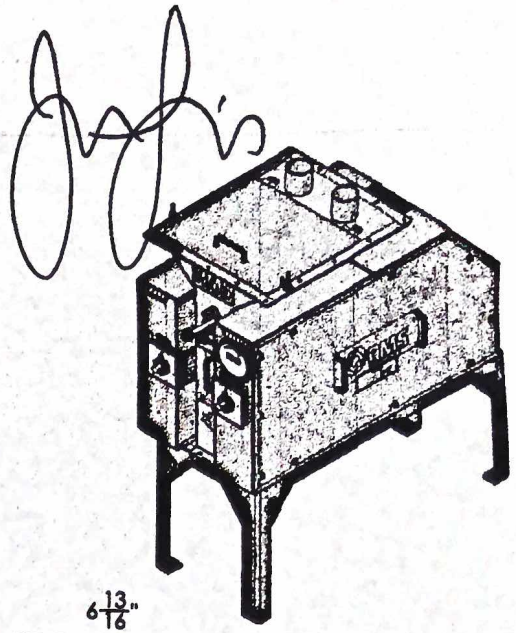
Richard M. Miller
Hazardous Materials Specialist
ICC Certified Fire Inspector II

Cc: via email; Hammer & Stitch Brewing Company personnel
Attachments: See list in Conclusion #3 above

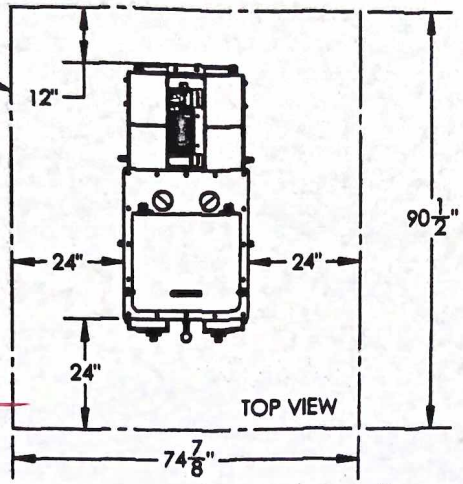
Revised 9/2/19

DATE: 8/29/19 CUSTOMER PRINT: Jon Lien

CUSTOMER SIGN:



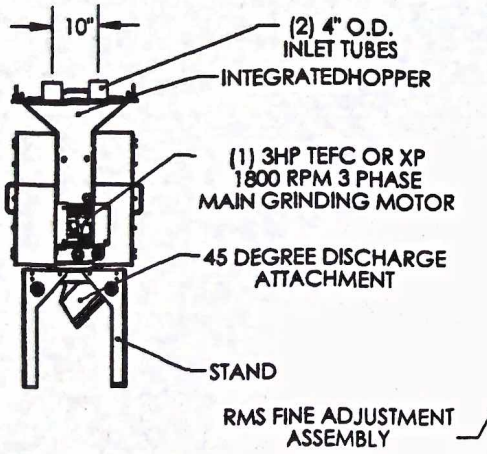
MINIMUM SPACE REQUIRED FOR PROPER MAINTENANCE

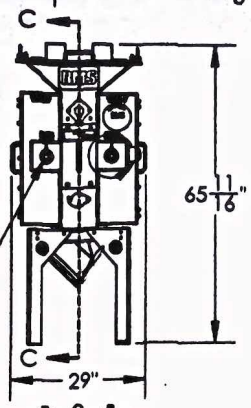


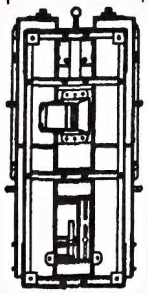

**MOTOR OPTIONS:**

- ☐ GENERAL PURPOSE (TEFC) MOTOR
- ☒ EXPLOSION PROOF MOTOR
- ☐ SPECIAL MOTOR REQUEST

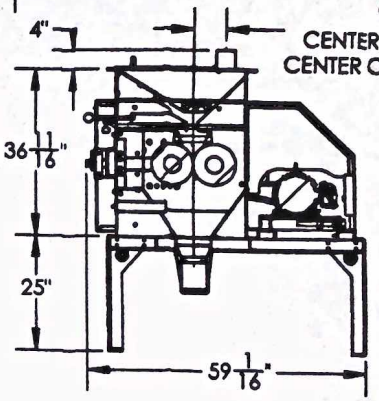
VOLTAGE/ HZ: ~~240~~ 3 phase 480 JPL



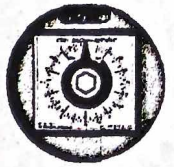



BOTTOM VIEW




SECTION C-C



DETAIL D
SCALE 1 : 10

**DISCHARGE OPTIONS:**

- ☒ RIGHT FACING DISCHARGE (AS SHOWN)
- ☐ LEFT FACING DISCHARGE

SIGNED APPROVAL

USE TOLERANCE BLOCK UNLESS OTHERWISE SPECIFIED:
.XX ± .02
.XXX ± .010
.XXXX ± .0005
FRACTIONS= ±1/16
ANGLES= ±1°

APPROXIMATE WEIGHT:
VENDOR:
VENDOR #:
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES.
DRAWING SIZE: A REVISION:
ANTICIPATED SHIP DATE:
WEIGHT:

ANTICIPATED BUILT START DATE:
DESCRIPTION:

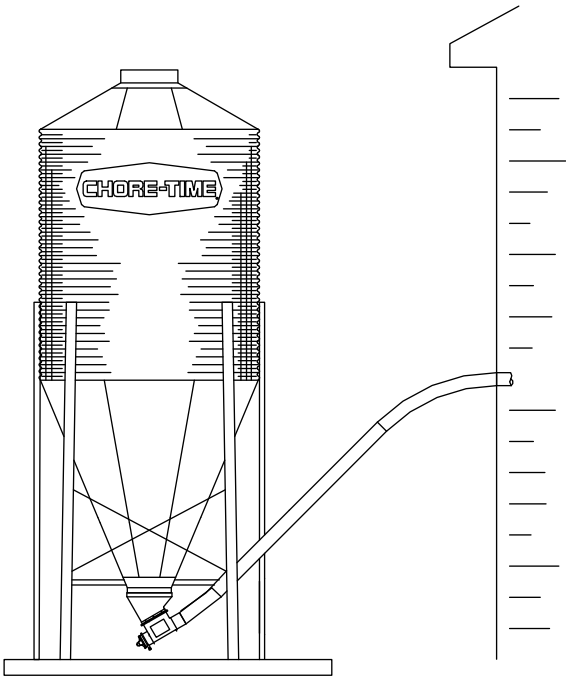
9X6 SINGLE PAIR
WITH 45 DEGREE DISCHARGE

DWG NO. 9X6SP
DRAWN BY:
DATE:
SCALE:1:35
SHEET 5 OF 14

GRINDING MILL

# Model 108 FLEX-AUGER®
# Feed Delivery System

Installation and Operators Manual




Installation and Operators Manual

**Contact your nearby Chore-Time distributor or representative for additional parts and information.**

Chore-Time Group
A division of CTB, Inc.
PO Box 2000
Milford, Indiana 46542-2000 USA
Phone (574) 658-4101 Fax (877) 730-8825
E-mail: poultry@choretime.com
Internet: www.choretimepoultry.com

**November 2017** **MA1714B**

# Limited Warranty

**LIMITED WARRANTY**

Chore-Time Group, a division of CTB, Inc. ("Chore-Time") warrants the new CHORE-TIME FLEX-AUGER® Feed Delivery System manufactured by Chore-Time to be free from defects in material or workmanship under normal usage and conditions, for One (1) year from the date of installation by the original purchaser ("Warranty"). Chore-Time provides for an extension of the aforementioned Warranty period ("Extended Warranty Period") with respect to certain Product parts. If such a defect is determined by Chore-Time to exist within the applicable period, Chore-Time will, at its option, (a) repair the Product or Component Part free of charge, F.O.B. the factory of manufacture or (b) replace the Product or Component Part free of charge, F.O.B. the factory of manufacture. This Warranty is not transferable, and applies only to the original purchaser of the Product.

**CONDITIONS AND LIMITATIONS**

THIS WARRANTY CONSTITUTES CHORE-TIME'S ENTIRE AND SOLE WARRANTY AND CHORE-TIME EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES, INCLUDING, BUT NOT LIMITED TO, EXPRESS AND IMPLIED WARRANTIES, INCLUDING, WIHTOUT LIMITATION, WARRANTIES AS TO MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSES. CHORE-TIME shall not be liable for any direct, indirect, incidental, consequential or special damages which any purchaser may suffer or claim to suffer as a result of any defect in the Product. Consequential or Special Damages as used herein include, but are not limited to, lost or damaged products or goods, costs of transportation, lost sales, lost orders, lost income, increased overhead, labor and incidental costs, and operational inefficiencies. *Some jurisdictions prohibit limitations on implied warranties and/or the exclusion or limitation of such damages, so these limitations and exclusions may not apply to you. This warranty gives the original purchaser specific legal rights. You may also have other rights based upon your specific jurisdiction.*

Compliance with federal, state and local rules which apply to the location, installation and use of the Product are the responsibility of the original purchaser, and CHORE-TIME shall not be liable for any damages which may result from non-compliance with such rules.

The following circumstances shall render this Warranty void:

- Modifications made to the Product not specifically delineated in the Product manual.
- Product not installed and/or operated in accordance with the instructions published by the CHORE-TIME.
- All components of the Product are not original equipment supplied by CHORE-TIME.
- Product was not purchased from and/or installed by a CHORE-TIME authorized distributor or certified representative.
- Product experienced malfunction or failure resulting from misuse, abuse, mismanagement, negligence, alteration, accident, or lack of proper maintenance, or from lightning strikes, electrical power surges or interruption of electricity.
- Product experienced corrosion, material deterioration and/or equipment malfunction caused by or consistent with the application of chemicals, minerals, sediments or other foreign elements.
- Product was used for any purpose other than for the care of poultry and livestock.

The Warranty and Extended Warranty may only be modified in writing by an officer of CHORE-TIME. CHORE-TIME shall have no obligation or responsibility for any representations or warranties made by or on behalf of any distributor, dealer, agent or certified representative.

Effective: **April 2014**

# Support Information

The Chore-Time FLEX-AUGER® Feed Delivery System is designed to convey poultry and livestock feed types. Using this equipment for any other purpose or in a way not within the operating recommendations specified in this manual will void the warranty and may cause personal injury and/or death.

This manual is designed to provide comprehensive planning, installation, wiring, operation, and parts listing information. The Table of Contents provides a convenient overview of the information in this manual.

Fill in the following information about your FLEX-AUGER® Feed Delivery System. Keep this manual in a clean, dry place for future reference.

**Distributor's Name**_____

**Distributor's Address**_____

**Distributor's Phone**_____ **Date of Purchase**_____

**Installer's Name**_____

**Installer's Address**_____

**Installer's Phone**_____ **Date of Installation**_____

**System Specifications** _____

**Feed Delivery System Supplying** _____

# Contents

# Safety and General Information

**Caution, Warning and Danger Decals** have been placed on the equipment to warn of potentially dangerous situations. Care should be taken to keep this information intact and easy to read at all times. Replace missing or damaged safety decals immediately.

## Safety–Alert Symbol

**This is a safety–alert symbol.** When you see this symbol on your equipment, be alert to the potential for personal injury. This equipment is designed to be installed and operated as safely as possible...however, hazards do exist.

### Understanding Signal Words

**Signal words** are used in conjunction with the safety–alert symbol to identify the severity of the warning.

**DANGER** indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.

**WARNING** indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.

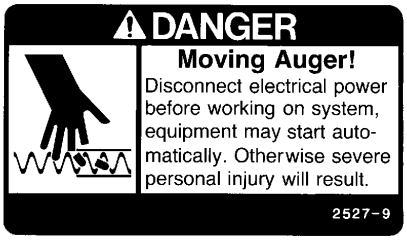
**CAUTION** indicates a hazardous situation which, if not avoided, MAY result in minor or moderate injury.

## Follow Safety Instructions

Carefully read all safety messages in this manual and on your equipment safety signs. Follow recommended precautions and safe operating practices.

Keep safety signs in good condition. Replace missing or damaged safety signs.

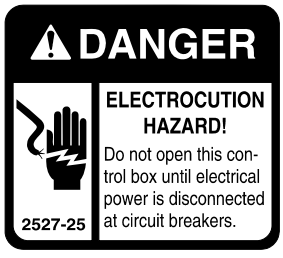
## Decal Descriptions




### DANGER: Moving Auger

This decal is placed on the Clean-Out Cover of the FLEX-AUGER® Control Unit.

Severe personal injury will result, if the electrical power is not disconnected, prior to servicing the equipment.




### DANGER: Electrical Hazard

Disconnect electrical power before inspecting or servicing equipment unless maintenance instructions specifically state otherwise.

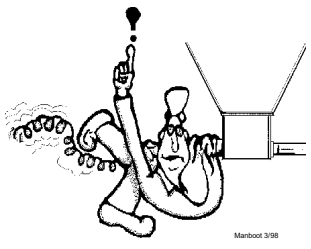
Ground all electrical equipment for safety.

All electrical wiring must be done by a qualified electrician in accordance with local and national electric codes.

Ground all non-current carrying metal parts to guard against electrical shock.

Electrical disconnects and over current protection are not supplied with the equipment.

**CAUTION** indicates a hazardous situation which, if not avoided, MAY result in minor or moderate injury.



# General Information

Please read the installation instructions in this manual prior to beginning the installation. This manual is designed to provide the information necessary for the installation, operation, and maintenance of the Model 108 Feed Delivery System.

Please pay special attention to the danger decals and caution information, they are there for YOUR PROTECTION.

## Capacities and Specifications of the 108 FLEX-AUGER® Feed Delivery System

The Model 108 FLEX-AUGER® Feed Delivery System is available with either PVC or steel auger tubes. PVC and steel tubes should not be mixed in a system.
DO NOT USE PVC AUGER TUBING WITH FEEDS CONTAINING CALCIUM. The steel auger tubes should be used for feeds with calcium.

The Model 108 FLEX-AUGER® Feed Delivery System has an approximate conveying capacity* of 220 pounds per minute (100 kg per minute), or 13,200 pounds per hour (6,000 kg per hour). A high capacity Model 108 system may be ordered for applications requiring up to 250 pounds per minute (113 kg per minute). The maximum recommended running time per day is 4 hours.

*Carrying capacities are based on feed density of 40 pounds per cubic foot or 640 kg per cubic meter.
The Model 108 is designed to carry feeds such as mash, crumbles, shelled corn, high moisture corn, or pellets up to approximately 3/16” x 1/2" (4.7 x 12.7 mm) in size. Applications other than conveying poultry and livestock rations will void the warranty.

Adequate support must be provided to prevent the tubes from sagging and support the weight of the Control Unit. The auger, tubes, and feed weigh approximately 8 lbs/ft. (12 kg/m). The Control Unit weighs approximately 100 lbs. (45 kg).

**MAXIMUM MOISTURE CONTENT OF CORN FOR THE MODEL 108 FLEX-AUGER® IS 27%.**
**MAXIMUM MOLASSES CONTENT IS 2%.**

# Planning

## Planning the Feed Delivery System

Carefully plan the Model 108 Fill System installation. Make sure the system will not interfere with other equipment, doors, windows, etc.

The charts below provide power unit recommendations and maximum system line lengths. The top chart applies to standard 348 RPM systems. The lower chart applies to (optional) High Capacity 425 RPM systems.

**Maximum Line Lengths* for standard 348 RPM Systems**

| Motor HP | Standard System | Extended System |
|---|---|---|
| 3/4 | 50 Ft. (15.2 m) | 75 Ft. (22.8 m) |
| 1 | 100 Ft. (30.5 m) | 135 Ft. (41.1 m) |
| 1-1/2 | 150 Ft. (45.7 m) | 185 Ft. (56.4 m) |

***High Moisture Corn Installations:***

Reduce the line length capacity for each Power Unit by 50% in high moisture corn applications

**Maximum Line Lengths* for High Capacity 425 RPM Systems**

| Motor HP | Standard System | Extended System |
|---|---|---|
| 1 | 50 Ft. (15.2 m) | 75 Ft. (22.8 m) |
| 1-1/2 | 100 Ft. (30.5 m) | 135 Ft. (41.1 m) |
| 2 | 150 Ft. (45.7 m) | 185 Ft. (56.4 m) |

***Straight-Thru Tandem Installations:***

Reduce the line length by 50 ft. (15.2 m) for Straight-Through Tandem Systems.

*Maximum line lengths should be reduced for elevations over 8’ (2.4 m) and/or inclines steeper than 45 degrees.

Maximum lengths for 108 systems include use of two PVC elbows. If additional elbows are used, decrease line length by 30 ft. (9 m) per elbow. Length of extension systems do not include elbows. Decrease maximum extension system lengths by 30 ft. (9 m) per elbow if used in the system.

Horsepower requirements are based on length of the Model 108 FLEX-AUGER® system and type of system installed--i.e. number of turns.

See the sections starting with **“Model 108 Flex-Auger® Systems Bin Placement Chart” on page 10** for typical bin to building placement using various elevations, boots, and screener options.

1. For the easiest installation and most trouble-free operation, locate the feed bin in a direct line with the FLEX-AUGER® Feed Delivery System. The layout charts on Pages 10 and 11 provide some points of reference for bin placement according to the height at which the FLEX-AUGER® tube enters the building. Remember, these are only examples. The layouts can be modified by changing the elbows, the tube sections, and/or the distance from the bin to the building.

   FLEX-AUGER® Feed Delivery Systems operate best at an angle of no more than 60 degrees from horizontal to the entry of the building at the desired height. **Chore-Time considers a 45 degree elevation to be standard. The lower the angle, the more reliable the system.**

2. Lay out the system as straight as possible. Avoid extra elbows and curves by locating the feed bin in line with the feeders. One horizontal 90 degree turn is permissible inside the building. **180 degree turns are not recommended under any conditions.**
   If additional turns or elbows are required, use an Extension Boot. **Remember: one 90 degree elbow requires the same power as 30' (9.1 m) of straight line.**
3. Plan the system so that the auger tubes are directly over the feeders or hoppers to be filled, if possible. The drop tubes may be angled to a maximum of 45 degrees from the vertical if necessary. At angles greater than 45 degrees, bridging in the drop tubes may occur.
4. The control unit must be located over a feeder or hopper that will require as much or more feed than any of the other feeders or hoppers. If frequent filling is desired, mount the drop tube switch or hopper level switch low so that this feeder or hopper will have a low feed level. This allows the feeder to call for feed more often, the system will restart, and the other feeders will be refilled sooner.
5. Do not locate outlet drops on or just before an elbow. Install the drop after the elbow so feed will cushion the auger through the curve. If there is some reason why the outlet drop cannot be moved, it must have some "feed bypass" to cushion the auger through the elbow.
6. Avoid horizontal left-hand turns if possible. The elbow in a left-hand turn is not cushioned by the feed and will wear faster. On systems with a 90 degree horizontal left-hand turn, reduce the stretch to reduce wear.

**NOTE: A rule of thumb for left-hand turns is to reduce stretch to 6" per 50' (150 mm per 15 m) of auger on initial installation. After the system has been broken in, it may be necessary to increase the auger stretch to prevent auger surging.**

7. On any Extended Length System, balance the power requirements between the power unit that takes feed from the bin and the power unit on the Extended Length System.

   To do this, determine the total length of the system and divide by two. Subtract 20' (6.1 m) from the standard system and add 20' (6.1 m) to the extended system.

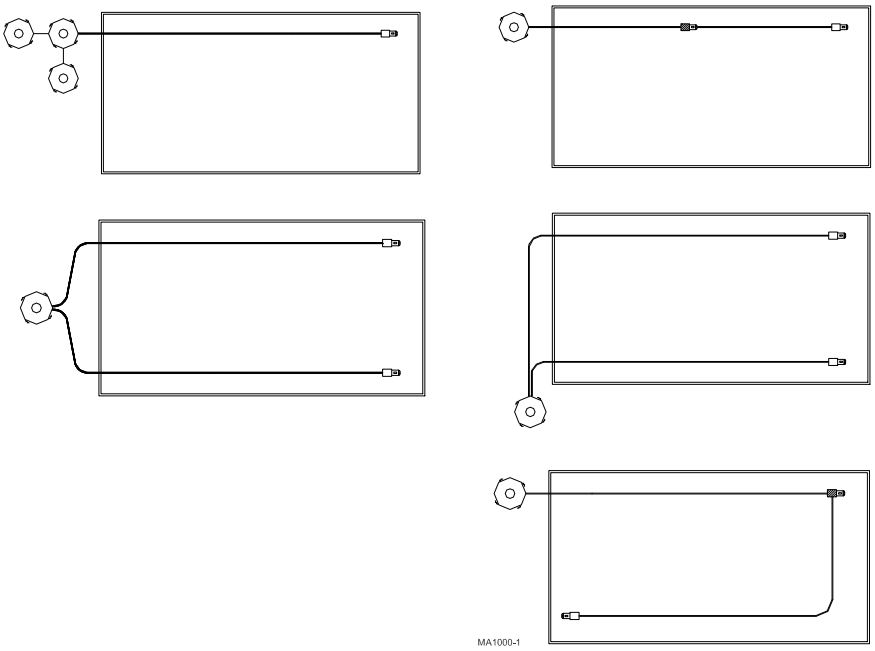
   **Example:** On a 240' (73 m) system, the center of the system would be 120' (36.5 m). Subtract 20' (6.1 m) from standard system, and add it to the extended length system. The first power unit should be located approximately 100' (30 m) down the system. Locate the second power unit approximately 140' (42.7 m) from the first power unit.

## Typical System Installations

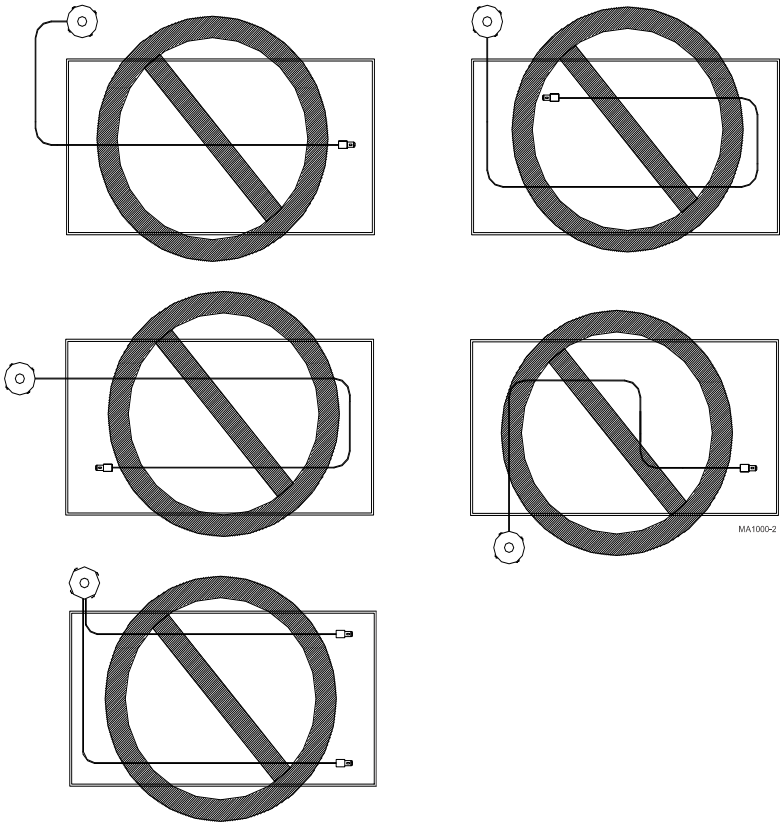
The FLEX-AUGER® Delivery Systems may be readily adapted to most feed delivery applications. The systems illustrated below show the most common types of FLEX-AUGER installations. These diagrams provide guidelines for laying out your system.

There are Five Recommended and Non Recommended Layouts shown below. Possible alternate systems are provided with each non-recommended system.

Recommended Layouts




**Non** Recommended Layouts



# Model 108 Flex-Auger® Systems Bin Placement Chart

Use this chart to determine the distance from building to center of bin ("X") at the various entrance heights ("H") and degrees of elevations listed below.

Degree of elevation = Angle at which the system is installed, including the 30 degree or straight-out Upper Boot.

These layout charts are for planning and reference purposes only. A combination of elbows and straight tube may be required for your installation, depending on the distance from the bin to the building and the height at which the auger tubes are to enter the building. The elbows may be easily cut to any angle required.

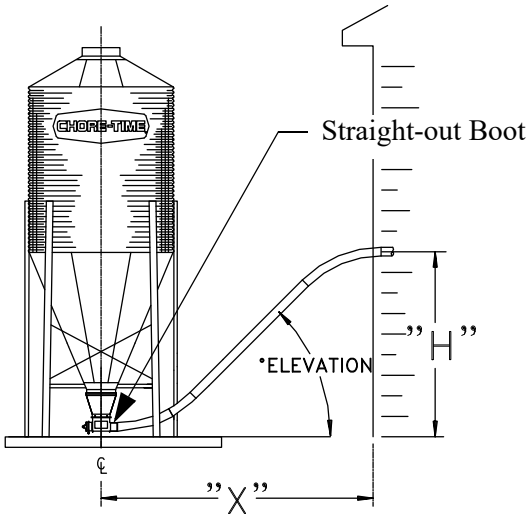
PAY PARTICULAR ATTENTION TO THE MINIMUM DISTANCE BETWEEN THE BIN AND THE BUILDING.

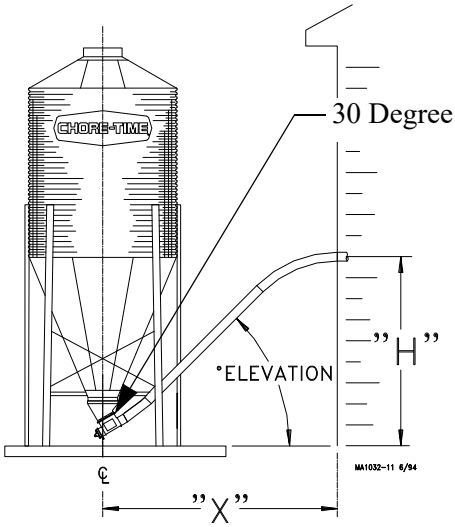
Many installation and operational difficulties can be avoided if the bin is located farther from the building. If in doubt, it is BETTER TO BE TOO FAR AWAY THAN TOO CLOSE.

The maximum recommended angle of elevation above the horizontal is 60 degrees. The maximum elevation is 30 feet (9.1 m) . . . if the angle of elevation is no more that 45 degrees.

All systems require adequate support of the auger tubes to prevent sagging and/or excessive forces being transmitted to the bin boot.

| | | Distance from Center of Bin to the Building "X" | | | | | |
|---|---|---|---|---|---|---|---|
| System Model | Entrance Height | 30 Degree Upper Bin Boot (part no. 4347) | | | Straight-Out Upper Bin Boot (part no. 6093) | | |
| | "H" | 30 Degree | 45 Degree | 60 Degree | 30 Degree | 45 Degree | 60 Degree |
| Model 108 | 5’ (1.5 m) | 9’ (2.7 m) | - - - - - - | - - - - - - | 11.5’ (3.5 m) | 10’ (3 m) | - - - - - - |
| | 6’ (1.8 m) | 11’ (3.4 m) | 8.5’ (2.6 m) | 8’ (2.4 m) | 13.5’ (4.1 m) | 11’ (3.4 m) | 10’ (3 m) |
| | 7’ (2.1 m) | 12.5’ (3.8 m) | 9.5’ (2.9 m) | 8.5’ (2.6 m) | 15’ (4.6 m) | 12’ (3.7 m) | 11’ (3.4 m) |
| | 8’ (2.4 m) | 14.5’ (4.4 m) | 10.5’ (3.2 m) | 9’ (2.7 m) | 17’ (5.2 m) | 13’ (4 m) | 11.5’ (3.5 m) |
| | 9’ (2.7 m) | 16’ (4.9 m) | 11.5 (3.5 m) | 9.5’ (2.9 m) | 18.5’ (5.6 m) | 14’ (4.3 m) | 12’ (3.7 m) |
| | 10’ (3 m) | 17.5’ (5.3 m) | 12.5’ (3.8 m) | 10’ (3 m) | 20’ (6.1 m) | 15’ (4.6 m) | 12.5’ (3.8 m) |
| | 11’ (3.4 m) | 19.5’ (5.9 m) | 13.5’ (4.1 m) | 10.5’ (3.2 m) | 22’ (6.7 m) | 16’ (4.9 m) | 13’ (4 m) |
| | 12’ (3.7 m) | 21’ (6.4 m) | 14.5’ (4.4 m) | 11.5’ (3.5 m) | 23.5’ (7.2 m) | 17’ (5.2 m) | 13.5’ (4.1 m) |
| | 13’ (4 m) | 23’ (7 m) | 15.5’ (4.7 m) | 12’ (3.7 m) | 25.5’ (7.8 m) | 18’ (5.5 m) | 14’ (4.3 m) |
| | 14’ (4.3 m) | 24.5’ (7.5 m) | 16.5’ (5 m) | 12.5’ (3.8 m) | 27’ (8.2 m) | 19’ (5.8 m) | 15’ (4.6 m) |
| | 15’ (4.6 m) | 26.5’ (8.1 m) | 17.5’ (5.3 m) | 13’ (4 m) | 29’ (8.8 m) | 20’ (6.1 m) | 15.5’ (4.7 m) |
| | 16’ (4.9 m) | 28’ (8.5 m) | 18.5’ (5.6 m) | 13.5’ (4.1 m) | 30.5’ (9.3 m) | 21’ (6.4 m) | 16’ (4.9 m) |
| | 17’ (5.2 m) | 30’ (9.1 m) | 19.5’ (5.9 m) | 14’ (4.3 m) | 32.5’ (9.9 m) | 22’ (6.7 m) | 16.5’ (5 m) |
| | 18’ (5.5 m) | 31.5’ (9.6 m) | 20.5’ (6.2 m) | 14.5’ (4.4 m) | 34’ (10.4 m) | 23’ (7 m) | 17’ (5.2 m) |
| | 19’ (5.8 m) | 33.5’ (10.2 m) | 21.5’ (6.5 m) | 15.5’ (4.7 m) | 36’ (11 m) | 24’ (7.3 m) | 17.5’(5.3 m) |
| | 20’ (6.1 m) | 35’ (10.7 m) | 22.5’ (6.8 m) | 16’ (4.9 m) | 37.5’ (11.4 m) | 25’ (7.6 m) | 18.5 (5.6 m) |



# Model 108 FLEX-AUGER® Systems Bin Placement Chart

## (with In-Line or Rotated Screeners)

Use this diagram and chart to determine proper feed bin placement when using screener.

"X" = distance from center of bin to where fill system enters the building.

"H" = height from top of bin pad to where fill system enters the building.

Degree of elevation = Angle at which the system is installed (from horizontal).

System shown with screener boot installed in-line; system may also be installed with the screener boot rotated 90 degrees.

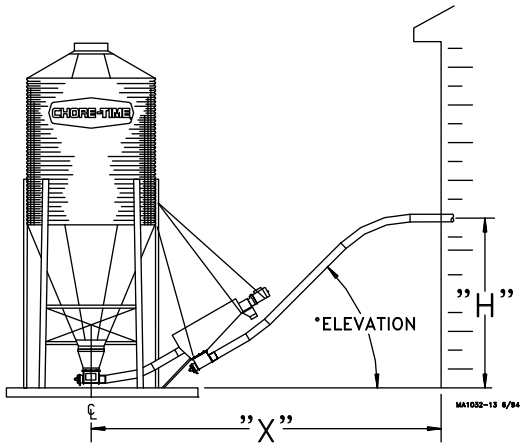
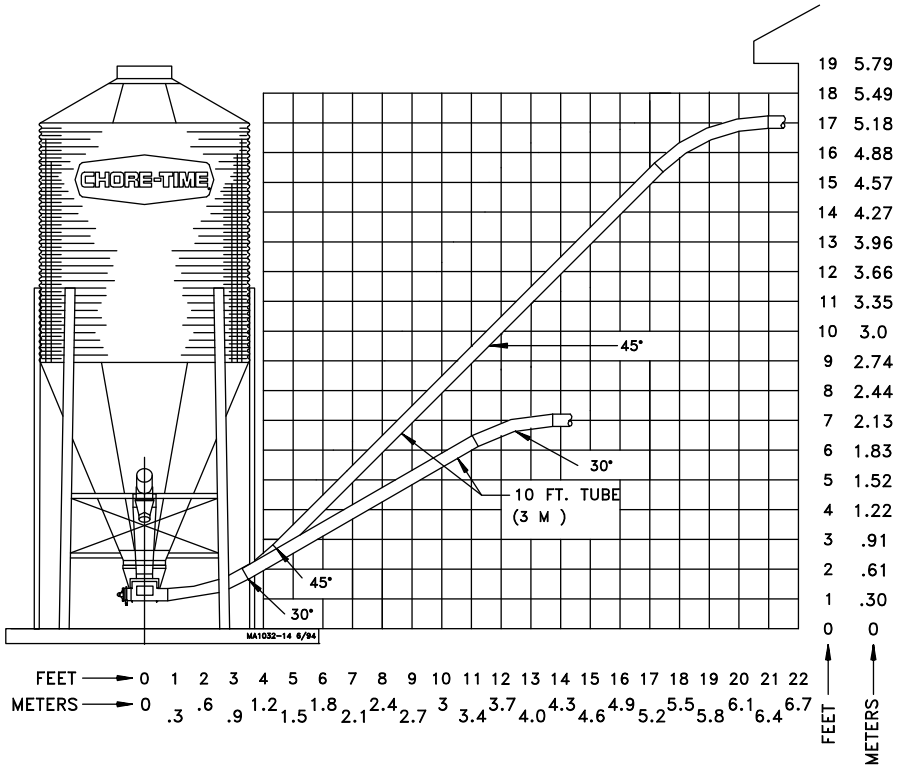


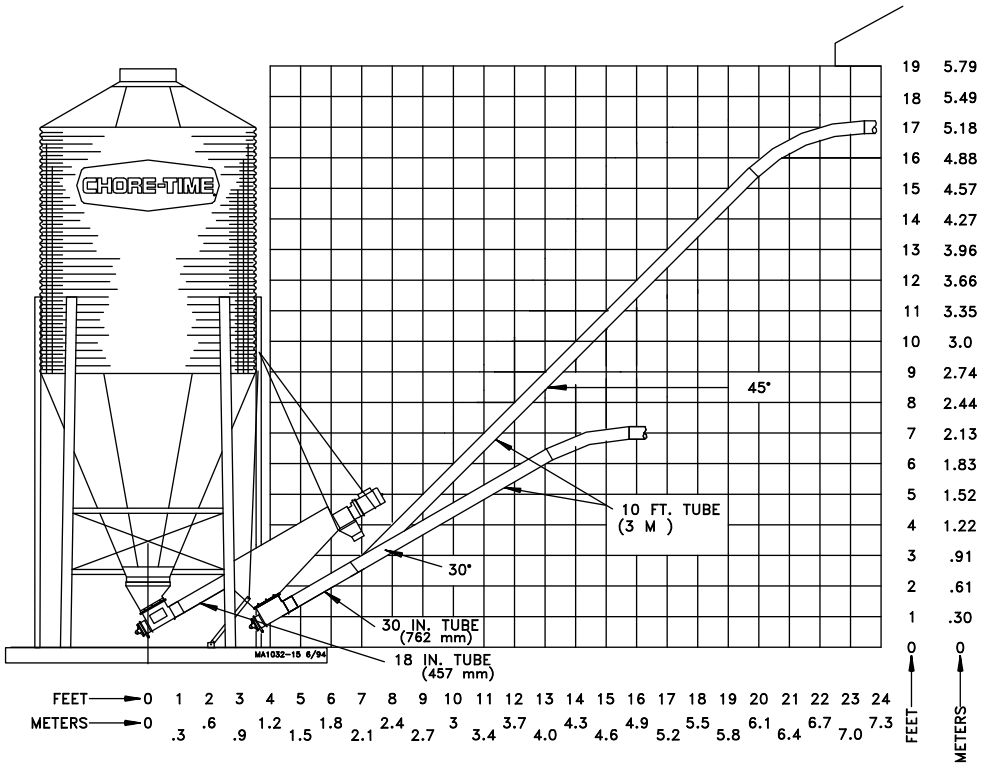

Chart for minimum distances ("X") from building to center of bin using the various entrance heights ("H"), upper boots and elevations listed below.

| System Model | Entrance Height "H" | 30 Degree Upper Bin Boot (part no. 4347) | | Straight-Out Upper Bin Boot (part no. 6093) | |
|---|---|---|---|---|---|
| | | 30 Degree | 45 Degree | 30 Degree | 45 Degree |
| Model 108 using Screener<br><br>Screener Boot is in-line with System | 5' (1.5 m) | 12.5' (3.8 m) | 11.5' (3.5 m) | 15' (4.6 m) | 14' (4.3 m) |
| | 6' (1.8 m) | 14' (4.3 m) | 12.5' (3.8 m) | 16.5' (5 m) | 15' (4.6 m) |
| | 7' (2.1 m) | 16' (4.9 m) | 13.5' (4.1 m) | 18.5' (5.6 m) | 16' (4.9 m) |
| | 8' (2.4 m) | 17.5' (5.3 m) | 14.5' (4.4 m) | 20' (6.1 m) | 17' (5.2 m) |
| | 9' (2.7 m) | 19.5' (5.9 m) | 15.5' (4.7 m) | 22' (6.7 m) | 18' (5.5 m) |
| | 10' (3 m) | 21' (6.4 m) | 16.5' (5 m) | 23.5' (7.2 m) | 19' (5.8 m) |
| | 11' (3.4 m) | 23' (7 m) | 17.5' (5.3 m) | 25.5' (7.8 m) | 20' (6.1 m) |
| | 12' (3.7 m) | 24.5' (7.5 m) | 18.5' (5.6 m) | 27' (8.2 m) | 21' (6.4 m) |
| | 13' (4 m) | 26.5' (8.1 m) | 19.5' (5.9 m) | 29' (8.8 m) | 22' (6.7 m) |
| | 14' (4.3 m) | 28' (8.5 m) | 20.5' (6.2 m) | 30.5' (9.3 m) | 23' (7 m) |
| | 15' (4.6 m) | 29.5' (9 m) | 21.5' (6.5 m) | 32.5' (9.9 m) | 24' (7.3 m) |
| | 16' (4.9 m) | 31.5' (9.6 m) | 22.5' (6.8 m) | 34' (10.4 m) | 25' (7.6 m) |
| | 17' (5.2 m) | 33' (10 m) | 23.5' (7.2 m) | 35.5' (10.8 m) | 26' (7.9 m) |
| | 18' (5.5 m) | 35' (10.7 m) | 24.5' (7.5 m) | 37.5' (11.4 m) | 27' (8.2 m) |
| | 19' (5.8 m) | 36.5' (11.1 m) | 25.5' (7.8 m) | 39' (11.9 m) | 28' (8.5 m) |
| | 20' (6.1 m) | 38.5' (11.7 m) | 26.5' (8.1 m) | 41' (12.5 m) | 29' (8.8 m) |
| | | | | | |
| Model 108 using Screener<br><br>Screener Boot is Rotated 90 degrees to System | 5' (1.5 m) | 11' (3.4 m) | 9.5' (2.9 m) | 11' (3.4 m) | 9.5' (2.9 m) |
| | 6' (1.8 m) | 13' (4 m) | 10.5' (3.2 m) | 13' (4 m) | 10.5' (3.2 m) |
| | 7' (2.1 m) | 14.5' (4.4 m) | 11.5 (3.5 m) | 14.5' (4.4 m) | 11.5' (3.5 m) |
| | 8' (2.4 m) | 16' (4.9 m) | 12.5' (3.8 m) | 16' (4.9 m) | 12.5' (3.8 m |
| | 9' (2.7 m) | 18' (5.5 m) | 13.5' (4.1 m) | 18' (5.5 m) | 13.5' (4.1 m) |
| | 10' (3 m) | 19.5' (5.9 m) | 14.5' (4.4 m) | 19.5' (5.9 m) | 14.5' (4.4 m) |
| | 11' (3.4 m) | 21.5' (6.5 m) | 15.5' (4.7 m) | 21.5' (6.5 m) | 15.5' (4.7 m) |
| | 12' (3.7 m) | 23' (7 m) | 16.5' (5 m) | 23' (7 m) | 16.5' (5 m) |
| | 13' (4 m) | 25' (7.6 m) | 17.5' (5.3 m) | 25' (7.6 m) | 17.5' (5.3 m) |
| | 14' (4.3 m) | 26.5' (8.1 m) | 18.5' (5.6 m) | 26.5' (8.1 m) | 18.5' (5.6 m) |
| | 15' (4.6 m) | 28.5' (8.7 m) | 19.5' (5.9 m) | 28.5' (8.7 m) | 19.5' (5.9 m) |
| | 16' (4.9 m) | 30' (9.1 m) | 20.5' (6.2 m) | 30' (9.1 m) | 20.5' (6.2 m) |
| | 17' (5.2 m) | 32' (9.8 m) | 21.5' (6.5 m) | 32' (9.8 m) | 21.5' (6.5 m) |
| | 18' (5.5 m) | 33.5' (10.2 m) | 22.5' (6.8 m) | 33.5' (10.2 m) | 22.5' (6.8 m) |
| | 19' (5.8 m) | 35.5' (10.8 m) | 23.5' (7.1 m) | 35.5' (10.8 m) | 23.5' (7.2 m) |
| | 20' (6.1 m) | 37' (11.3 m) | 24.5' (7.4 m) | 37' (11.3 m) | 24.5' (7.5 m) |

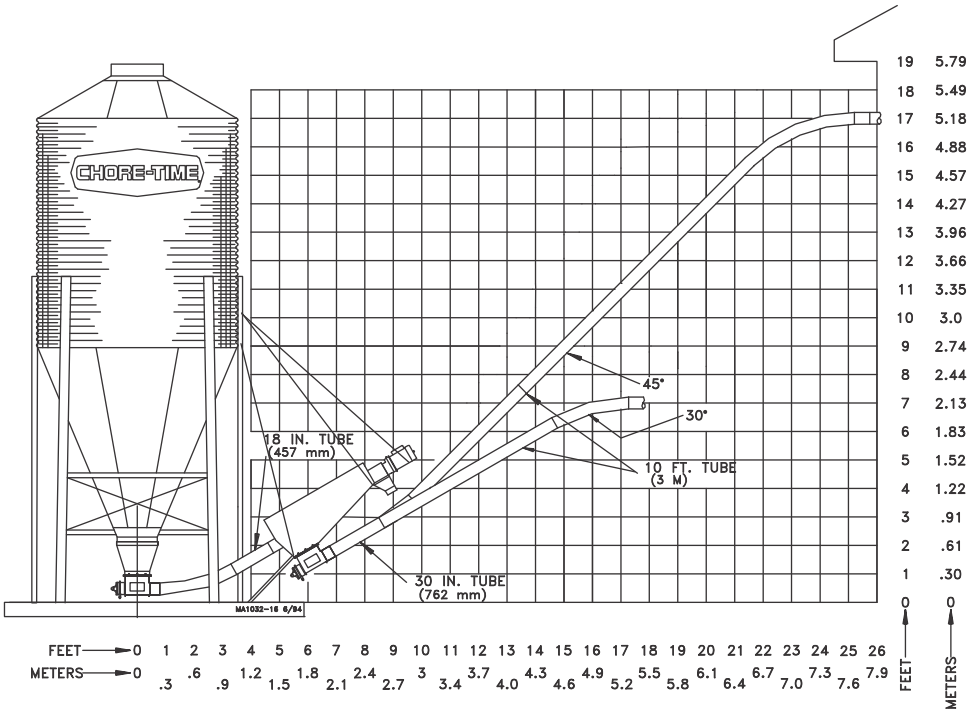
## Straight-Out Bin Boot with Feed Screener (Boot Rotated 90°)




## 30° Bin Boot with Feed Screenter



# Straight-Out Bin Boot with Feeder Screener



# Installation

## Bin Location Information

For easiest installation and most trouble-free operation, locate the feed bin directly in line with the FLEX-AUGER® System. The **"Model 108 Flex-Auger® Systems Bin Placement Chart" on pages 10-13** provide some points of reference for bin placement according to the height at which the system enters the building. The 30 degree or straight-out boots combined with various elbow hookups offer a wide range of possibilities. The charts are only for reference. Modify and adjust elbows and tube sections as needed.

NOTE: Two 45 degree PVC elbows are standard with Model 108 FLEX-AUGER® Delivery Systems. If additional elbows are required they must be ordered separately.

The bin collar is installed during bin assembly. Chore-Time bins have a welded collar. Bin Adapter Kits are available to modify existing bins so that the welded collar can be used. In addition, a Universal Adapter Plate is available to allow the FLEX-AUGER® boot to be installed to other manufacturers' bins.

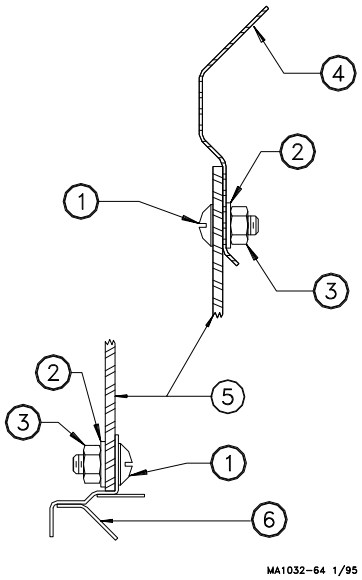
Tighten all bin-seal bolts from the nut side. This prevents cutting and "spinning out" of the plastic washer.

## Boot Installation

1. Insert the upper boot into the bin collar and turn it to line up with the direction that the auger line will go. The boot must be as far up into the opening as it will go. Use the holes in the ring for drilling guides and drill 11/32" (8.8 mm) holes in the upper rim of the boot. Attach the boot to the bin collar with the hardware provided. **See Figure 1.**

**MPORTANT: Failure to install the hardware as shown in Figure 1 may cause breakage of the red boot body.**

2. Attach the transfer plate to the upper boot. Use truss head bin-seal bolts installed from the inside of the plate, with flat washers placed under the nuts.
3. Insert the slide into the transfer plate slot so that it is in its operating position before bolting the slide shield in place. Remove the paper backing from the sealing strip before fastening the slide shield to the transfer plate. Use two 5/16-18x3/4" hex head machine screws to secure the shield.
4. Bolt the lower boot to the transfer plate using four 5/16-18x3/4" hex head machine screws.
5. After the auger tubes and auger have been installed, attach the 6197 Clean-Out Cover Plate or the optional Proximity Boot Switch to the lower boot.

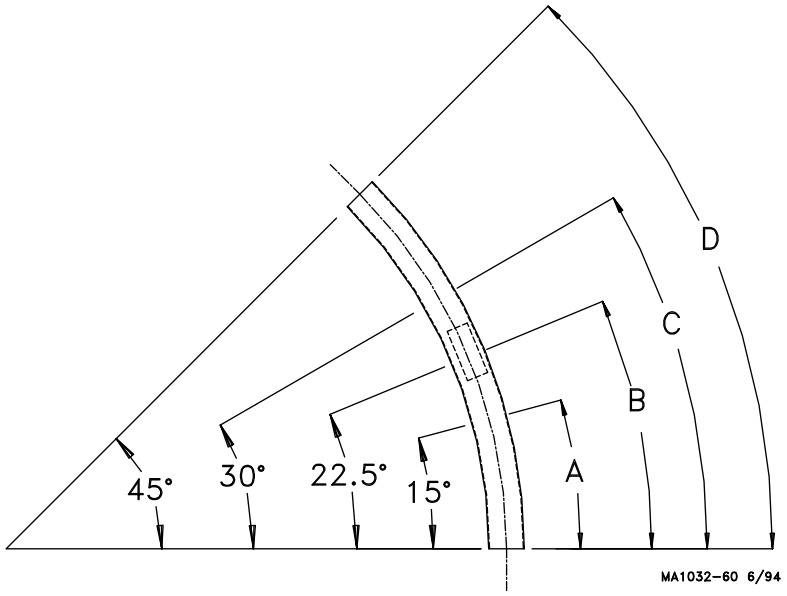



| KEY | DESCRIPTION | PART NO. |
|---|---|---|
| 1 | 5/16-18 X 3/4" Truss Hd. MS | 7943-1 |
| 2 | 5/16" Nylon Washer | 7946 |
| 3 | 5/16-18 Nylon Hex Nut | 7945 |
| 4 | Hopper Collar | - |
| 5 | Boot Body | - |
| 6 | Transfer Plate | - |

**Figure 1.Boot Installation Diagram (Side View)**

## Auger Tube Installation

The FLEX-AUGER® Delivery System includes two 45 degree elbows as standard equipment. These elbows are used to make up the sloping portion of the auger line at the feed bin, and elsewhere in the system if necessary. If additional elbows are required they should be ordered separately. **Figure 2** shows how the elbow can be cut into shorter sections.




| Dimension | PVC | Steel |
|---|---|---|
| "A" | 16.8" (43 cm) | 16.3" (41 cm) |
| "B" | 25.2" (64 cm) | 24.4" (62 cm) |
| "C" | 33.6" (85 cm) | 32.5" (83 cm) |
| "D" | 50.3" (128 cm) | 48.8" (124 cm) |

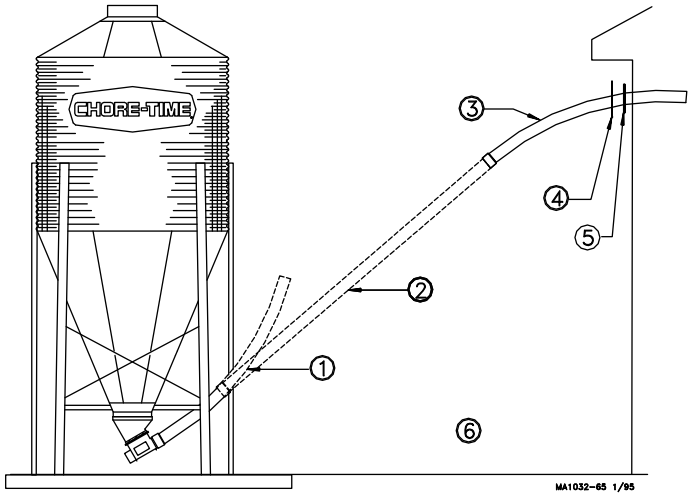
**Note:** All measurements are along the outside edge of the elbow.
**Note:** PVC elbows are belled. Dimensions shown do not include bell.

**Figure 2.PVC Elbow Cutting Guidelines (Side View)**

1. Determine where the entrance hole for the auger tube must be located on the building and cut it.
2. If necessary, cut the elbow used where the auger enters the building. Slide the seal ring and neoprene seal over the straight end of the elbow and place it in the hole cut in the building, with the belled end outside the building. See Figure 3.
3. Clamp the belled end of the second elbow on the outlet end of the boot on the feed bin.
4. Place the straight end of a tube section inside the belled end of the elbow in the building. Hold the straight section of auger tube so that it touches the elbow on the boot. Mark the spot where the tube touches the boot elbow and cut the elbow at that point.
5. Place the belled end of the auger tube over the end of the elbow just cut, and hold the tube against the top elbow. Mark and cut the straight auger tube so that it will fit between the two elbows.

**Remember to cut the auger tube long enough to fit inside the belled end of the elbow in the building.**

**NOTE: In some installations it may be possible to eliminate the elbow on the boot, using only a straight auger tube and one elbow where the auger tube enters the building.**




| Key | Description |
|---|---|
| 1 | 45° Elbow |
| 2 | Auger Tube |
| 3 | 45° Elbow |
| 4 | Seal Ring |
| 5 | Neoprene Seal |
| 6 | Note: Belled end of elbows and auger tubes should be towards boot. |

**Figure 3.Elbow Installation outside the building.**

6. Dry-fit all parts. When satisfied that elbows and tubes fit together smoothly, glue with PVC cement according to the following instructions.

   The auger tubes and elbows for the FLEX-AUGER® systems are made of specially formulated PVC tubing. Use the PVC solvent cement to make strong, reliable bonds.

   Follow the Directions on the can for Safe handling of cement

   1. Be sure tube is cut off squarely. Remove burrs from outside and inside the end of the tube.

   2. Dry fit all parts. Tube should fit inside belled end of next tube to full depth without excess force.

   3. Clean surfaces to be joined. SURFACES MUST BE FREE OF DIRT OR GREASE!

   4. Apply a generous coat of cement to both the inside of the belled end and outside of the other tube. Be sure cement covers all of the joint area so there are no bare spots.

   5. Quickly join the tubes, giving them a twisting motion to bring them into alignment as they are joined.

   6. Keep pressure on the joint until the PVC cement sets up.

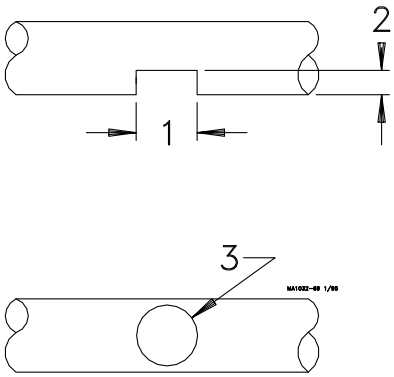
7. ALL TUBE JOINTS EXPOSED TO MOISTURE AND WEATHER MUST BE SEALED OR CAULKED TO WATERPROOF THEM IN ADDITION TO CEMENTING OR CLAMPING THE JOINT.
8. If there are more than 15 feet (4.5 meters) of auger tube between the boot and the building, provide additional support for the tubes so that the boot does not carry the weight of the auger. Extra support can be achieved with cables or chain fastened to the bin legs and the auger tube.
9. Locate and cut the outlet holes as required and specified in **Figure 4. on page 17**.
10. Slide (2) Outlet Insert Rings onto the pipe at each outlet hole location. Each Outlet Assembly is shipped with Insert Rings for both steel and PVC pipes. The 3/8" (10 mm) thick rings are for steel tube systems. The 1/4" (6 mm) thick rings are for PVC tube systems. Be sure to use the appropriate Insert Rings for your system.
11. Install the remaining tubes in the system.
    The PVC auger tubes should be fastened together using PVC cement.
    Model 108 Tube connectors should be used to connect steel auger tubes.

## Outlet Drop Installation

Cut the outlet hole in the auger tube. A sabre saw or hacksaw is handy for making the cuts when total feed dropout is desired. See Figure 4. Use a file to remove burrs from opening.

Note: For total feed drop out, outlet holes should be 5-3/8" (137 mm). If some feed carry over is required, outlet holes should be 3-1/2" (90 mm).

**See Figure 5.** below for outlet drop installation.



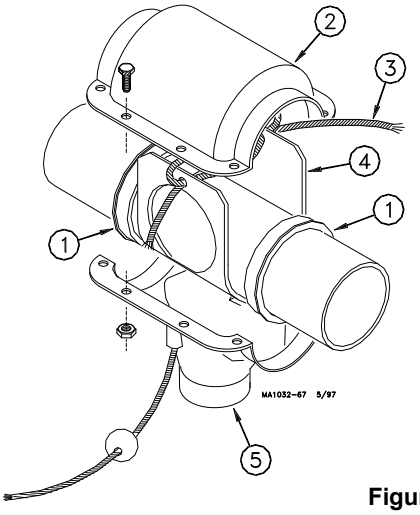

| Key | Description |
|---|---|
| 1 | 5-3/8" (137 mm) |
| 2 | 2" (50 mm) |
| 3 | 3-1/2" (90 mm) |

**Figure 4.Outlet holes provide total or partial feed dropout**

1. Wrap the rotary slide around the auger tube. POSITION SLIDES IN SAME DIRECTION FOR ALL DROPS SO THAT THE SLIDES WILL ALL OPERATE THE SAME WHEN ROPES ARE PULLED.
2. Thread the rope through the ends of the rotary slide.
3. Tie the ends of the rotary slide together so that the ends of the rope are the same length.
4. Open rope guide holes molded into the drop halves. Use a 3/16" (5 mm) drill bit and power drill to make a good hole for the rope.
   NOTE: DO NOT OPEN THESE HOLES IF THE ROTARY SLIDE WILL NOT BE INSTALLED.
5. Thread the rope ends through the guide holes in the drop halves.
6. Position drop halves over the rotary slide and fasten the two halves together using hardware provided. **See Figure 5.**

Insert Rings are provided for both Steel Systems (Thicker Rings) and PVC Systems (Thinner Rings).

Slide the Insert Rings (with Flanges out) into position between the outlet halves to serve as spacers. **See Figure 5.**



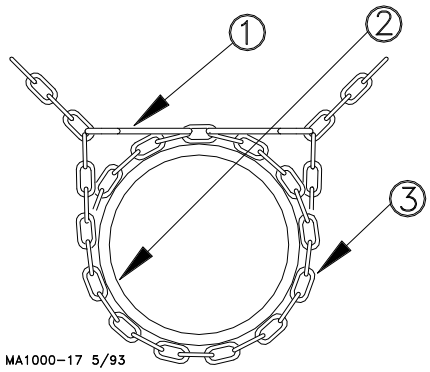

| Key | Description |
|---|---|
| 1 | Insert (For Steel or PVC System) |
| 2 | Top Half |
| 3 | Rope |
| 4 | Rotary Slide |
| 5 | Bottom Half w/Spout |

**Figure 5.Model 108 Outlet Drop Assembly**

7. Test the operation of the rotary slide by pulling on the ends of the rope. Be sure the outlet drop is centered over the outlet hole, then move the rotary slide to the open position (check by looking up through the drop opening) and mark the short end of the rope where it goes through the guide hole.
   Tie a knot in the rope at the marked spot to act as a stop for the rotary slide.
8. Install green and red indicator balls on the ends of the rope. Tie knots in the rope to hold the balls in place. Use the green ball on the rope used to open the outlet drop. Use the red ball on the rope used to close the drop. This will indicate if the Outlet Drop is open or closed.
9. Dab PVC cement around the auger tube to prevent the drop from shifting on the tube.
10. Two screws are supplied for use in the bottom of the drop to attach a drop tube to the system.

## Supporting the System Inside the Building

Support the Auger Tubing with chain and "S" Hooks every 5 feet [1.5m]. Steel Tube systems require support every 10 feet [3m]. The system should be restrained from swinging by using chain and "S" hooks to brace the auger tube, every 20 feet [6m], as shown in **Figure 6**.




| Key | Description |
|---|---|
| 1 | "S" Hook |
| 2 | Auger Tube |
| 3 | Chain |

**Figure 6.Supporting the Auger Tubes**

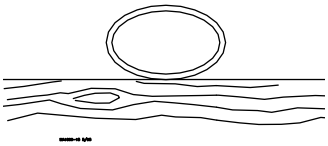
Horizontal elbows need to be supported in at least two places. Chain, screw hooks, and "S" hooks are supplied as a suspension kit for supporting the equipment. Keep the line as level and straight as possible.

If Extension Hoppers, Outlet Drops with long angled Drop Tubes, or other loads are imposed on the system, extra support will be required.

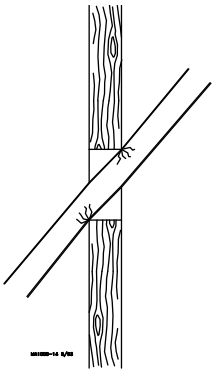
Power Units require extra support to resist the twisting encountered when the motor starts and stops. Use the motor mount base, all of the "ears" on the gearhead as well as the suspension point provided on the 46800 Control Unit Box to support the Power Unit.

Adequate chain and "S" hooks are provided with each system to properly support it. Other means of supporting the system are permissible as long as the system receives the correct support and the auger tube is not dented or flattened.

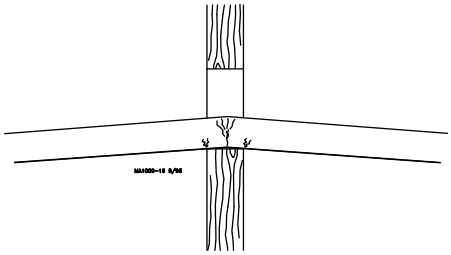
When the auger tube passes through a side wall or partition, especially where it enters the building, the opening should be made large enough so the auger tube can be supported without resting on the wall. If the auger tube rests on the wall or partition, the auger tube may flatten out or become kinked--causing excessive wear. **See Figure 7.**



Auger tube kinked because the supports are not high enough to keep the weight of the auger tube off the wall.



Tube pinched because auger tube is not in line with hole in wall.



Auger tube flattened because supports are too far away from each side of the wall.

**Figure 7.Incorrectly supported Auger Tubes**

# Supporting the System Outside the Building

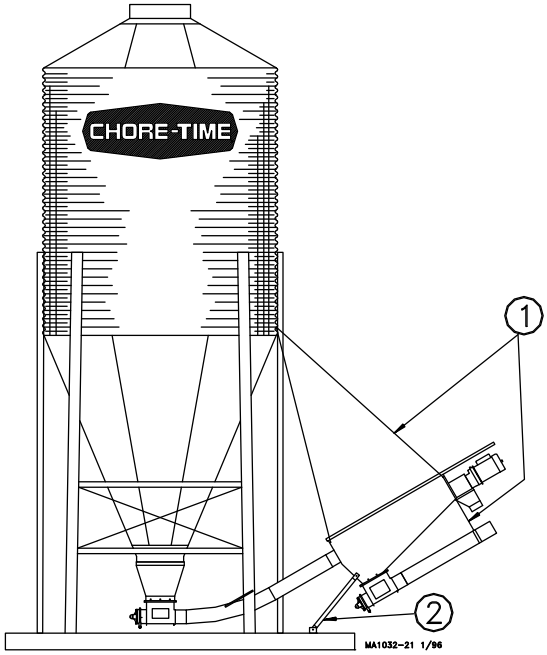
Some systems require additional support to avoid sagging auger tubes. This support must be adequate to support the weight of the auger tubes filled with feed. Special attention should be given to avoid excessive pressure from the auger being transferred to boot. Chain or cable suspended from the bin or building will not provide adequate support for these systems.

Some common systems are shown in Figures 8 through 12, with the recommended supports.

Note:Supports must be designed to prevent (weight) loads from being transferred back onto the boot.

The auger tubes must be supported every 4-5 feet (1.2 to 1.5 m) for PVC systems and every 10 feet (3 m) for steel systems.

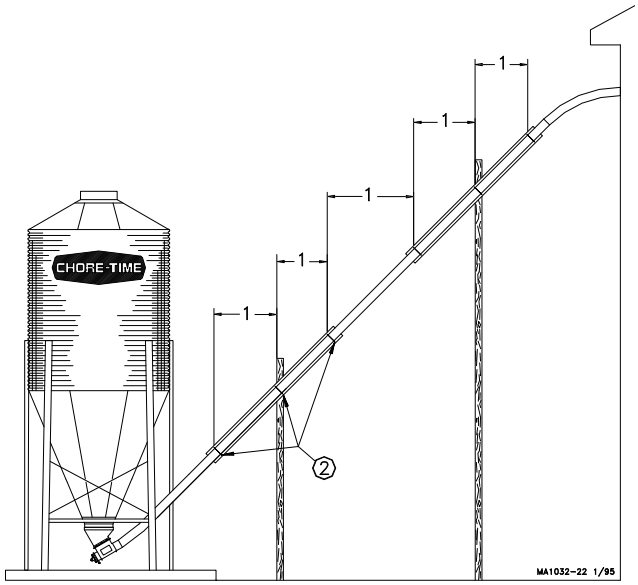
## Screener Support




| Key | Description |
|---|---|
| 1 | 5’(1.5 m) for PVC Systems<br>10’(3 m) for Steel Systems |
| 2 | Screener Brace. |

**Figure 8.Screener Support**

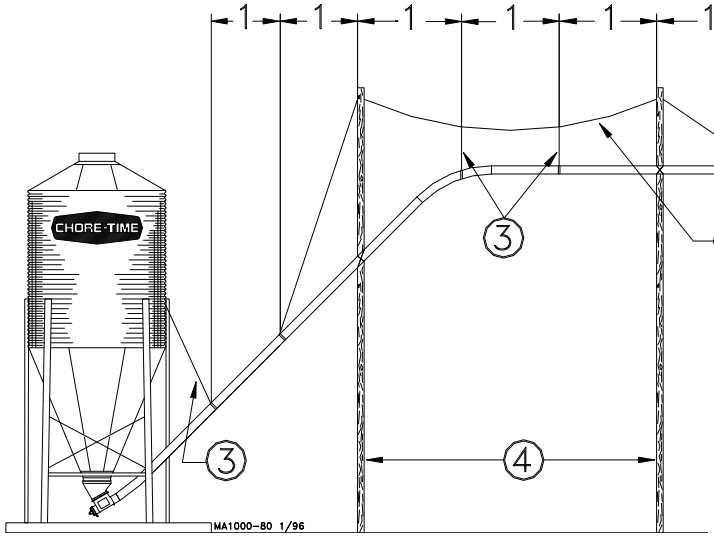
## High Rise Auger Tube Support




| Key | Description |
|---|---|
| 1 | 5’ (1.5 m) for PVC Systems<br>10’ (3 m) for Steel Systems |
| 2 | Place clamps here. |

**Figure 9.High Rise Auger Tube Support**

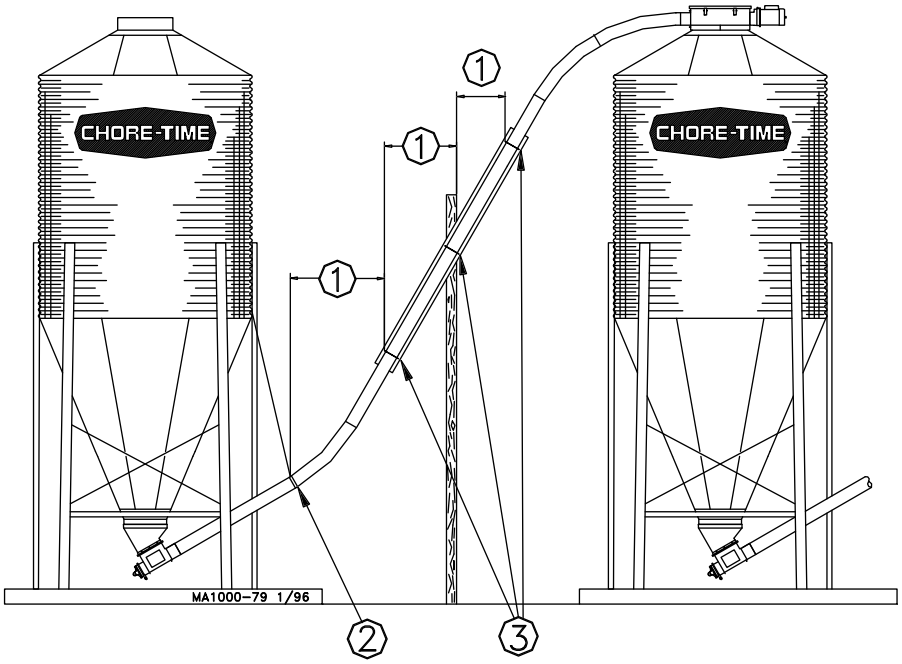
## Long, Elevated Systems




| Key | Description |
|---|---|
| 1 | 5’ (1.5 m) for PVC Systems<br>10’ (3 m) for Steel Systems |
| 2 | Master Cable |
| 3 | Chain or Cable |
| 4 | 20’ (6 m) Maximum |

**Figure 10.Long, Elevated Systems**

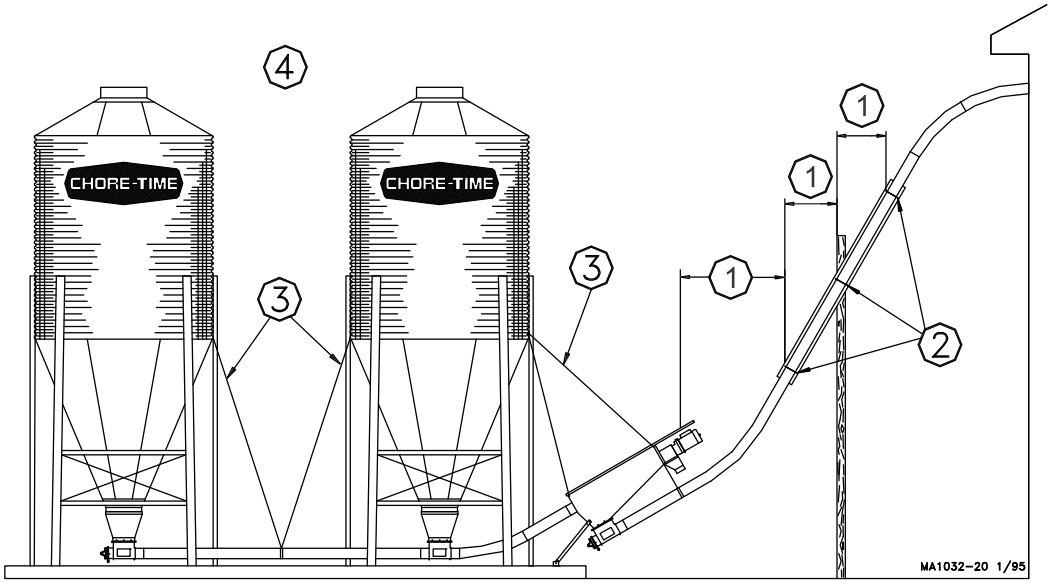
## Bin to Bin Support System




| Key | Description |
|---|---|
| 1 | 5’ (1.5 m) for PVC Systems<br>10’ (3 m) for Steel Systems |
| 2 | Chain or Cable |
| 3 | Place clamps here. |

**Figure 11.Bin to Bin Support System**

## Straight Through Tandem Systems

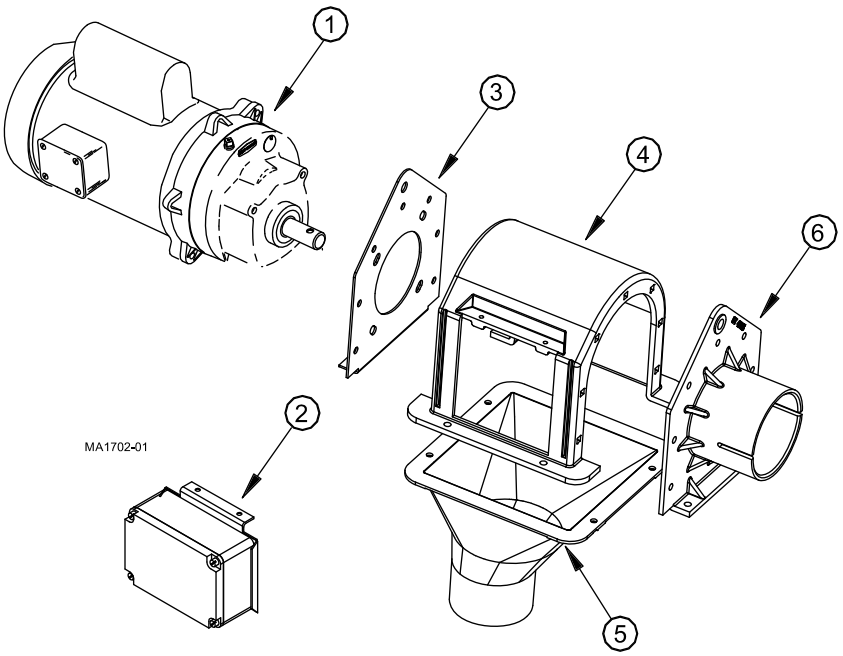



| Key | Description |
|---|---|
| 1 | 5’ (1.5 m) for PVC Systems<br>10’ (3 m) for Steel Systems |
| 2 | Place clamps here. |
| 3 | Chain or Cable |
| 4 | Tandem Feed Bins |

**Figure 12.Straight Through Tandem Systems**

## Control Unit & Power Unit Installation

1. Attach the tube anchor to the appropriate end (determine the best side of control unit for switch placement) of the control unit body by inserting the 1/4-20x.75 carriage bolts from the inside of the control unit through the tube anchor and attach 1/4-20 flange hex nut.




| Key | Description |
|---|---|
| 1 | Power Unit |
| 2 | Switch Assembly |
| 3 | Gearhead End Plate |
| 4 | Control body |
| 5 | Control Unit Funnel |
| 6 | Tube Anchor End |

**Figure 13.Control Unit/Power Unit Assembly Procedure**

2. Connect the power unit to the gearhead end plate using the 5/16-18 machine screws and the flat washers packed with the control.
3. Attach the gearhead end plate to the control unit body the same as the tube anchor.
4. Insert the lower section of the switch assembly into the control unit and secure the top with the 2 #10x.5 screws provided.

**For Single Phase Direct Drive Control Units:**

Connect the electrical wires on the power unit to the control unit.

**A. Drill bottom of control unit switch box with 7/8”(22.2mm) hole to receive the 90o connector and motor wire. Use caution not to disturb any wires or components of the switch box ass’y when drilling holes.**

**B. Attach the 90 degree connector& conduit to the control unit housing.**

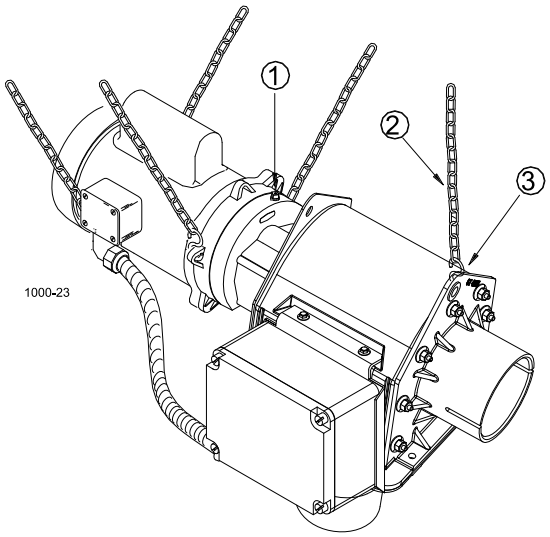
**C. Attach the insulated motor wires to the terminal block in the control housing: one wire to terminal "3" and one wire to terminal "4". Attach the bare grounding wire to one of the green colored screws provided for attaching the grounding wires.**

5. Place the adjustable tube clamp on the tube anchor and connect the control unit/power unit assembly to the end of the FLEX-AUGER® tube.

**Note: The switch in the control unit is a safety backup switch in case the hopper level switch or drop tube switch fails to shut off the system. DO NOT use the safety switch to control the FLEX-AUGER® System. This will cause feed to bridge in the control.**

6. Support the Power Unit and Control Unit securely. Points are provided at the gear head and the tube anchor for suspending the equipment with chain and “S” hooks supplied with the delivery system. See Figure 14.
   **Note: Other ways of supporting the delivery system can be used where it is practical, as long as the supports do not let the equipment sag or do not make flat spots in the auger tubes.**

   **Note: The motor should be fastened to keep it from twisting. "S" hooks and chain can be attached to the motor base to prevent the motor from shifting.**
7. Install the driver assembly on the power unit shaft. Start the socket head screws but leave the anchor clamp loose enough to slip in the auger.
8. Replace the plastic shipping plug in the gear head with the vent plug provided.




| Key | Description |
|---|---|
| 1 | Replace the plastic shipping plug with vent plug. |
| 2 | Chain |
| 3 | “S” Hook |

**Figure 14.Control Unit/Power Unit Suspension**

**Note: Other ways of supporting the delivery system can be used where it is practical, as long as the supports do not allow the equipment sag or do not make flat spots in the auger tubes.**

**Note: Unit must be protected from the elements. Unit as installed is not protected from direct rain or snow.**

## Belt Drive Control Unit Installation

The Belt Drive Control Unit installation is much the same as the direct drive unit. Mount the Belt Drive Adapter and Motor to the control unit, then proceed with installation to the auger tube as described in this manual. See **“Belt Drive Control Unit (Part No. 46138-2)” on page 38** for an assembly guide for the Belt Drive Control Unit.

**Figure 15.Belt Drive Control Unit. (Belt Guard not installed)**

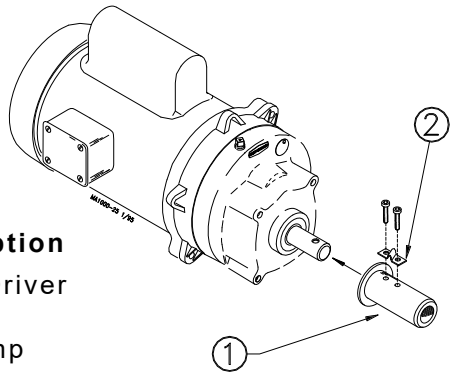
## Auger Installation


Use extreme caution when working with the auger. The auger is under tension and may spring causing injury. Always wear protective clothing and protective glasses when working with the auger.

Use extreme caution when pushing the auger into the auger tubes. Keep your hands away from the end of the auger tube to avoid injury.

Handle the FLEX-AUGER® carefully. Dropping the rolls of auger may cause the auger to kink. Do not install an auger that has a sharp kink in it. The kink will cause the auger to wear a hole in the tube at that spot. If the kink cannot be straightened with pliers, the kink must be cut out and the auger brazed back together. Refer to the "Auger Brazing" section in this manual for the correct brazing procedure.

1. Beginning at the boot, push the auger into the auger tube through the rear of the boot until the auger reaches the control unit end of the line.
   **Use extreme caution when pushing the auger into the auger tubes. Keep your hands away from the end of the Boot to avoid injury.**
2. Attach the auger to the Driver Assembly by rotating the driver and threading the auger through the Anchor Clamp.
3. Rotate the auger so that it is fully engaged on the Driver Assembly. Tighten the screws securely to clamp the auger to the Driver Assembly. See **Figure 16**
4. Attach the drop tube and install the slide cover on the control unit.
5. Pull on the loose end of the auger at the boot once or twice until it begins to stretch, then release it slowly. This will bring the auger to its natural length.




| Key | Description |
|---|---|
| 1 | Model 108 Driver Assembly |
| 2 | Anchor Clamp |

**Figure 16.Model 108 Auger Installation (Drive End)**

**Note: For ease of cutting, measure and mark the auger at the point where it is to be cut. Then, pull the auger an additional 6-8" (150-200 mm) and use locking pliers to clamp the auger while you cut it.**

**IMPORTANT: Stretch the auger 8 inches (200 mm) for every 50 feet (15.2 m) of length. Example: For a 150 ft. (45 m) system the auger should be cut 24 inches (610 mm) shorter than its natural length. Measure the amount of stretch from the rear edge of the boot and cut the auger at that point.**

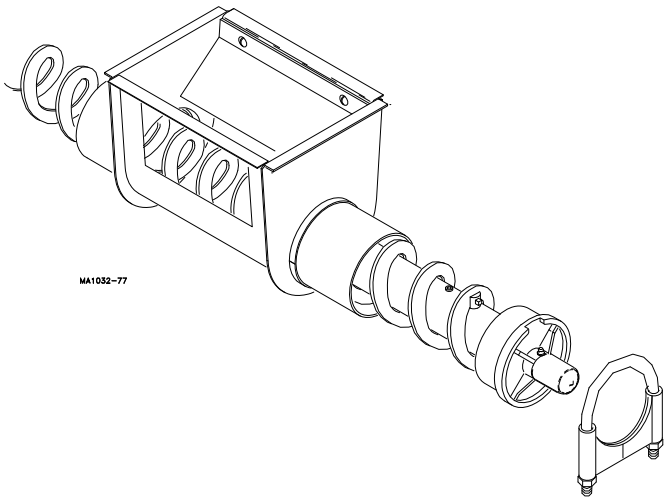



**Figure 17.Model 108 Anchor and Bearing Assembly**

6. **Figure 17** shows the proper assembly of the Model 108 boot components. Insert the Anchor Shaft into the auger until the auger touches the anchor flange. The auger must be threaded onto the Boot Anchor Assembly, through the clamp pin. Use a 5/16" open-end wrench to tighten the clamp pin setscrew on the auger.
7. **CAREFULLY remove the locking pliers while holding on to the Anchor and Bearing Assembly and auger securely.**
8. **CAREFULLY allow auger to draw the Anchor and Bearing Assembly back into the Lower Boot.** DO NOT ALLOW THE BEARING TO BE SLAMMED BACK INTO THE BOOT.
9. Attach the Anchor and Bearing Assembly to the Boot, using tube clamp provided.

## Cover Plate Installation

If the Cover Plate is to be used, install as shown in **Figure 18**.

1. Loosen wing nuts to end of studs
2. Start lower side of cover plate in boot opening.
3. Slide the cover plate up as far as possible so that plate catches top of boot opening.
4. Hold the cover securely while tightening the wing nuts.

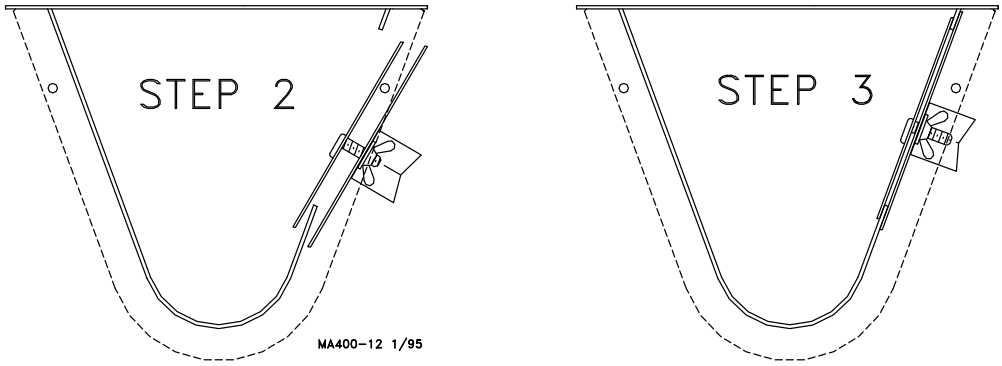
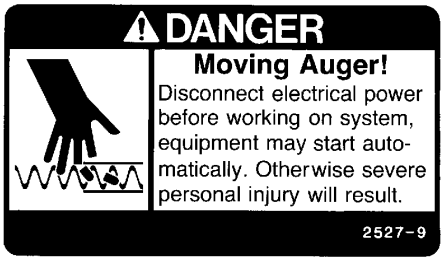



**Figure 18.Cover Plate Installation**

## Auger Brazing/Filing




If the auger needs to be spliced or lengthened, locate the brazed joint closer to the power unit to minimize feed flow restriction in the line.

To align the auger for brazing, lay it in an 18” (46 cm) piece angle iron and clamp securely.

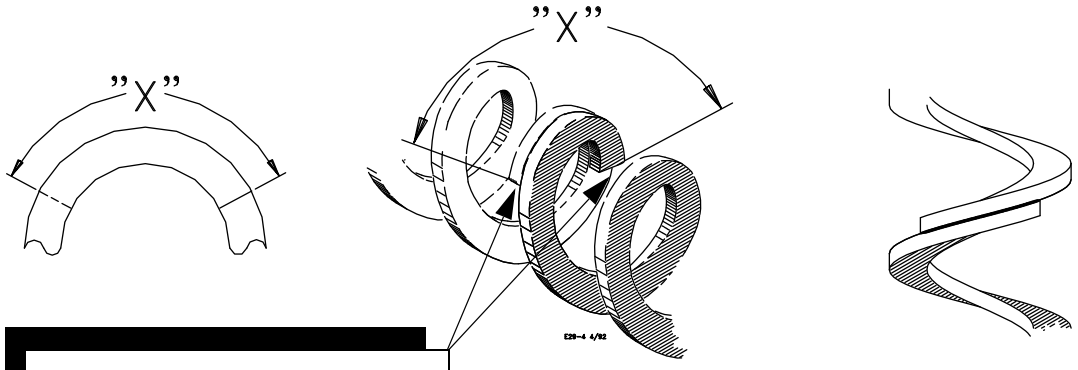
Rotate the auger to allow both the inside and outside edges of the augers to be brazed.

Butt the ends of the auger against each other. DO NOT SCREW ONE AUGER INSIDE THE OTHER--This restricts the feed flow.

Lap the augers approximately 2” (50 mm), as shown in **Figure 19**.

A bronze, flux-coated rod is recommended. The joint should be well filled and smooth so that it does not wear against the tube. Allow the joint to air cool.

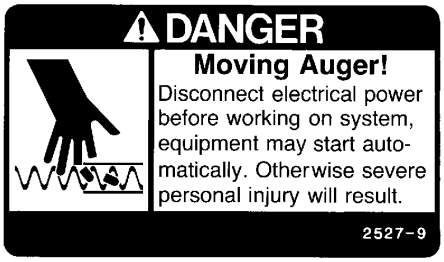
File the auger edges, as shown in **Figure 19**, to avoid damage to the auger tubes. Also, file off any brazing that extended beyond the outside radius of the auger flightings.




| Key | Description |
|---|---|
| X | 2” (50 mm) |

**Figure 19.Auger Brazing/Filing**

## Restrictor Adjustment



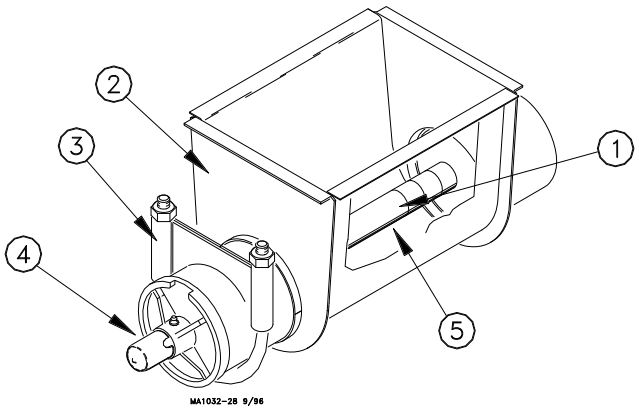

NOTE: The Model 108 feed delivery capacities may be increased by reducing the length of the Restrictor.

DO NOT ADJUST THE RESTRICTOR UNTIL THE SYSTEM HAS BEEN IN OPERATION AND THE SYSTEM IS BROKEN IN.

Note:Feed delivery capacities are based on 40 lbs/ ft.3 (640 kg/m3) feed density. Systems using lighter weight feeds may not be able to achieve the maximum capacities listed.

Note:Always refer to the motor amperage nameplate when increasing the feed flow capacity. Exceeding the nameplate amperage may result in nuisance motor overload tripping and/or damage to the system.

1. .Loosen the tube clamp on the back of the Lower Boot to remove the Anchor and Bearing Assembly from the boot.
   **Note: Use extreme caution when working with the auger under tension. Springing auger can cause personal injury.**
2. Pull enough of the auger out of the auger tube to allow the Restrictor Tube to be cut.
3. Use locking pliers to hold the auger outside the boot.
4. Use a hacksaw to cut 1" (25 mm) at a time off the end of the Restrictor Tube to increase feed flow. **See Figure 20.**
5. CAREFULLY remove the locking pliers while holding on to the Anchor and Bearing Assembly and auger securely.
6. CAREFULLY allow the auger to draw the Anchor and Bearing Assembly back into the Lower Boot. DO NOT ALLOW THE BEARING TO BE SLAMMED BACK INTO THE BOOT.




| Key | Description |
|---|---|
| 1 | Restrictor Tube |
| 2 | Lower Boot |
| 3 | Tube Clamp |
| 4 | Anchor and Bearing Ass'y |
| 5 | Cut off approximately 1" (25 mm) of the Restrictor Tube to increase feed flow. Repeat as required. |

**Figure 20.Anchor and Bearing Installation (Note: Auger not shown for clarity).**

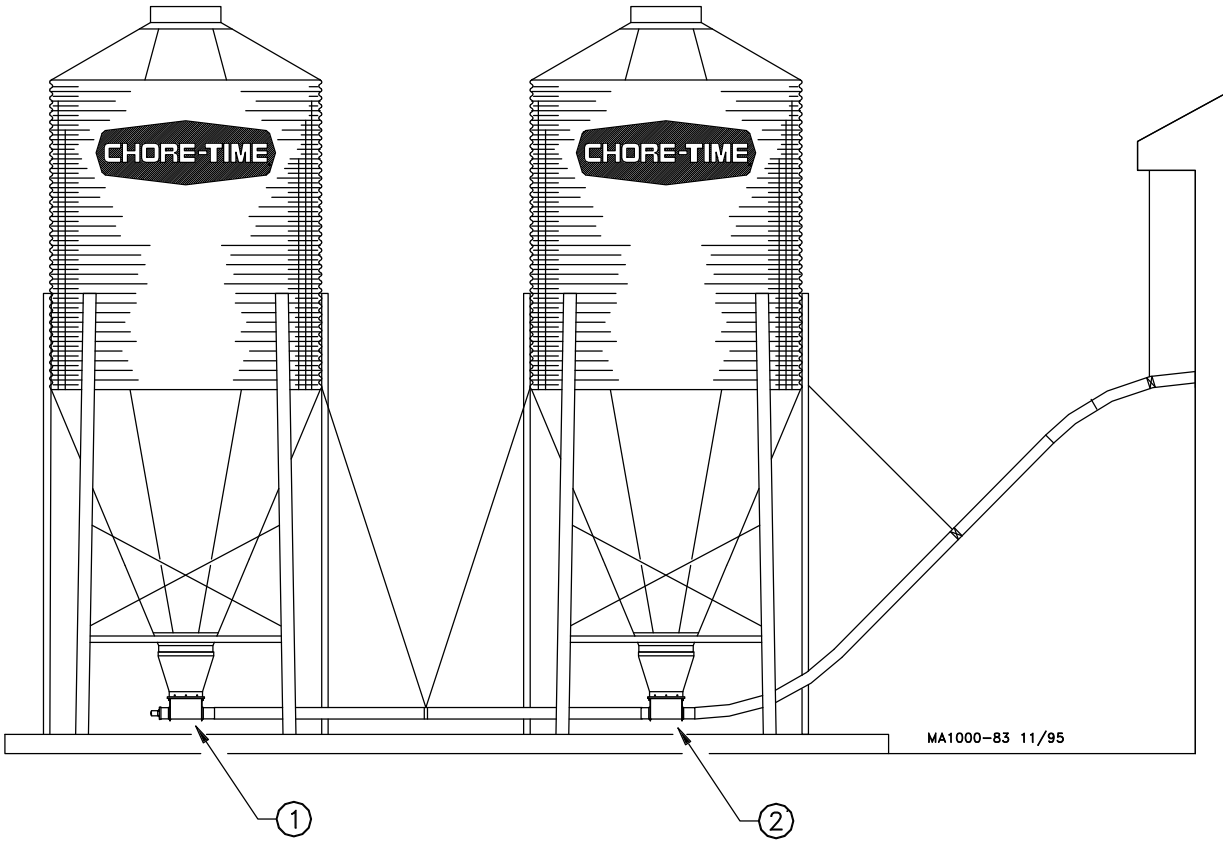
## Straight-Through Tandem Boot

The Straight-Through Tandem Boots allow a single auger to remove feed from two separate feed bins. Feed should only be drawn from one bin at a time.

Boot Baffles are required and included with the Straight-Out Boot Assembly.

Model 108 Straight-Through Tandem Systems do not use Feed Restrictors.

1. Install boots on both feed bins. **Figure 21** shows a typical Straight-Through Tandem System.

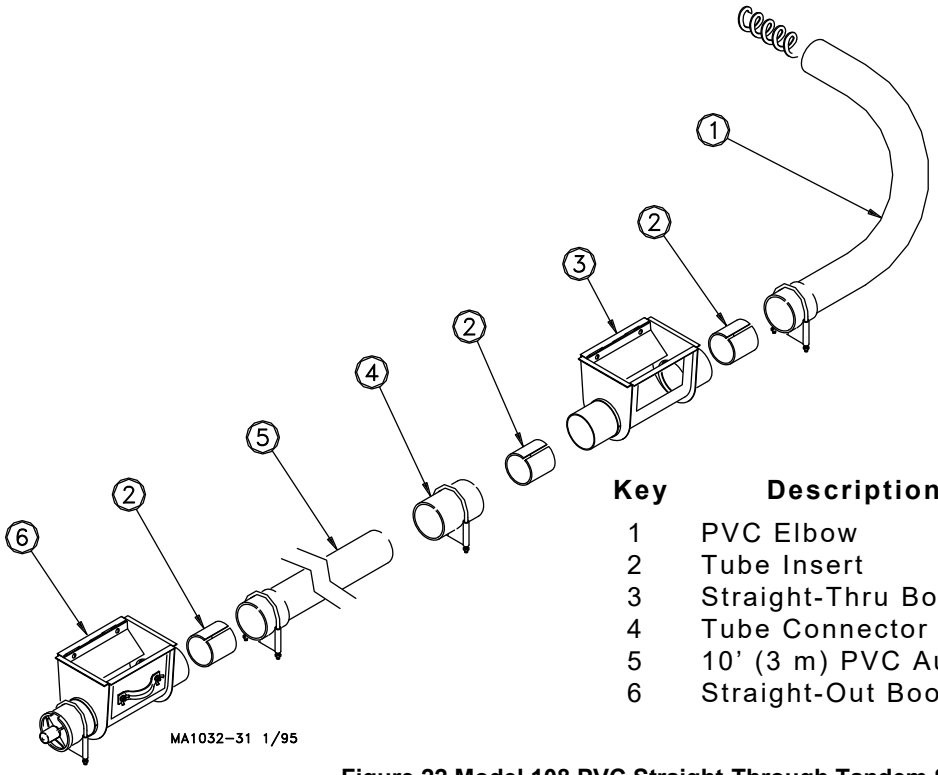



| Key | Description |
|---|---|
| 1 | Straight-Out Boot on Terminal Bin |
| 2 | Straight-Thru Boot (w/Baffle) on Intermediate Bin |

**Figure 21.Model 108 Straight-Through Tandem**

## PVC Model 108 FLEX-AUGER® Systems

1. Place an Insert in the belled end of the connecting auger tube. The Insert fits directly over the outlet end of the Terminal Boot.
2. Cut the straight end of the auger tube even with the stub tube on the Intermediate Boot. Slide an Insert into the end of the auger tube and over the inlet end of the intermediate boot.
3. Secure this joint using a Tube Coupler and clamp.
4. Place an Insert in the belled end of the Elbow before inserting over the outlet end of the Intermediate Boot.
5. Install tube clamps as shown to secure the boot components in place.




| Key | Description |
|---|---|
| 1 | PVC Elbow |
| 2 | Tube Insert |
| 3 | Straight-Thru Boot (Intermediate Bin) |
| 4 | Tube Connector |
| 5 | 10’ (3 m) PVC Auger Tube |
| 6 | Straight-Out Boot (Terminal) |

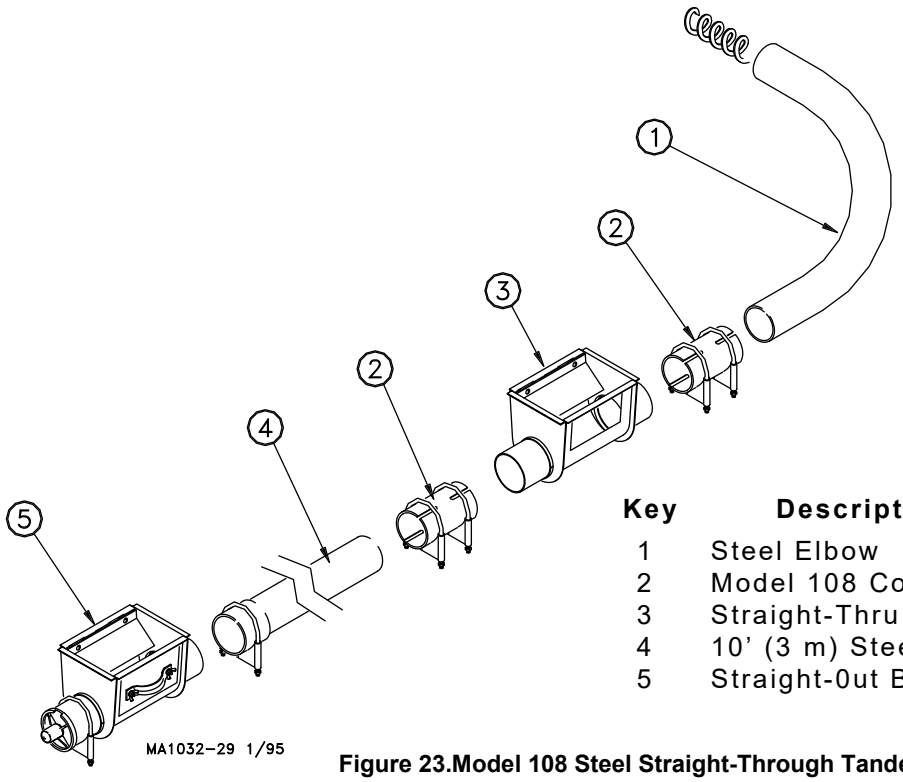
**Figure 22.Model 108 PVC Straight-Through Tandem System**

## Steel Model 108 FLEX-AUGER® Systems.

1. Slide the belled end of the pipe over the outlet end of the Straight-Out Boot.
2. Cut the straight end of the auger tube even with the inlet end of the Intermediate Boot. Secure this joint using a Connector and clamps.
3. Align one end of the Elbow to the outlet end of the Straight-Thru Boot. Secure in place using a Tube Coupler and clamps.
4. Install the remaining auger tubes in the system. Remember to caulk all tube joints exposed to the weather or moisture.
5. Install the auger and Anchor and Bearing Assembly as specified in the installation section of the standard Model 108 FLEX-AUGER® system.

**Important: Stretch the auger in the same manner you would for the standard installation except add 16" [406mm] of stretch per 50' [15.2m] and cut it even with the rear of the straight-out boot.**

6. Use a tube clamp to secure the bearing to the boot.



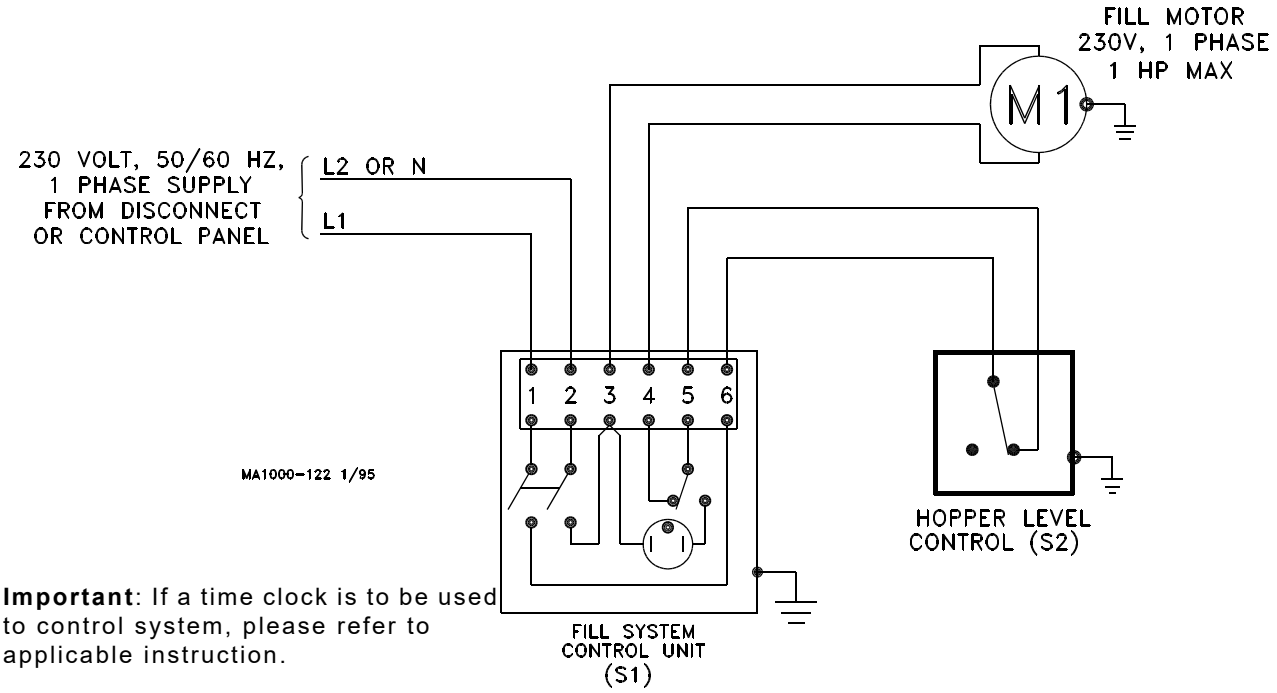

| Key | Description |
|---|---|
| 1 | Steel Elbow |
| 2 | Model 108 Connector |
| 3 | Straight-Thru Boot (Intermediate Bin) |
| 4 | 10' (3 m) Steel Auger Tube |
| 5 | Straight-0ut Boot (Terminal Bin) |

**Figure 23.Model 108 Steel Straight-Through Tandem System**

## Feed Level Control Installation

The Hopper Level Control (or Drop Tube Switch) is installed in the feed hopper (or on the drop tube over the feeder) at the power unit end of the line. This switch stops the FLEX-AUGER® Feed Delivery System when the last feeder is full. Install the hopper level control or drop tube switch according to instructions shipped with the unit. Wire the switch into the system as specified in the appropriate wiring diagram in this manual.

### Wiring Diagram for Model 108 System w/Hopper Control Switch (1 H.P. or smaller, Single Phase)

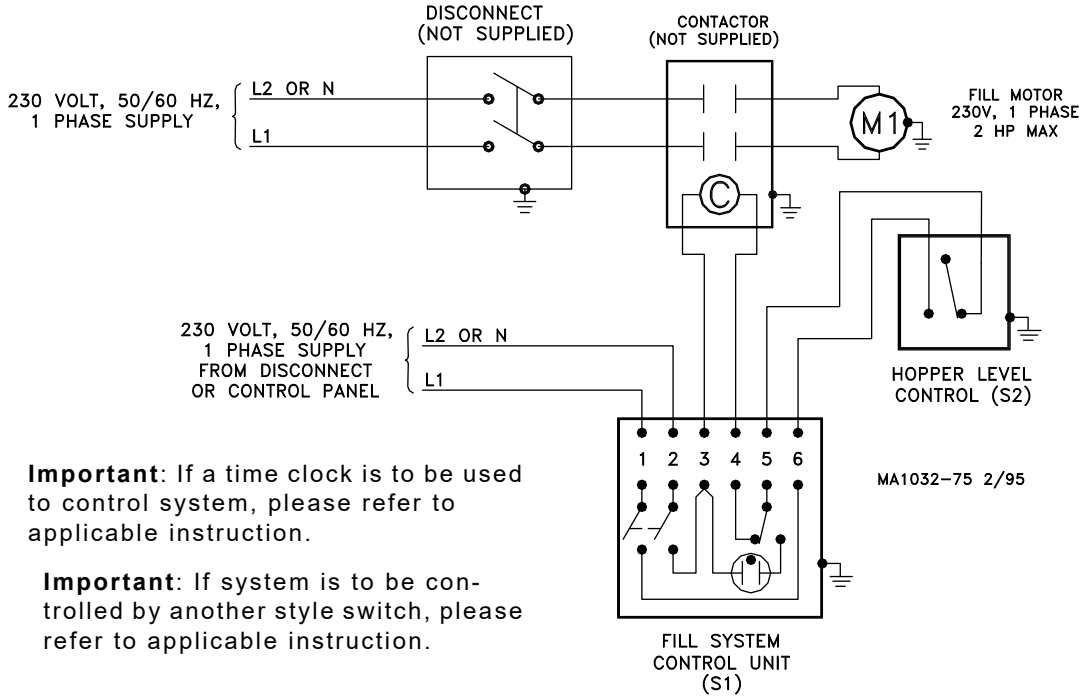



**Important**: If a time clock is to be used to control system, please refer to applicable instruction.

**Important**: If system is to be controlled by another style switch, please refer to applicable instruction.

**Figure 24.Model 108 (1 H.P. or smaller) Hopper Level Control Switch Wiring Diagram**

## Wiring Diagram for Model 108 w/Hopper Control Switch (1-1/2 H.P. or larger, 3 Phase)

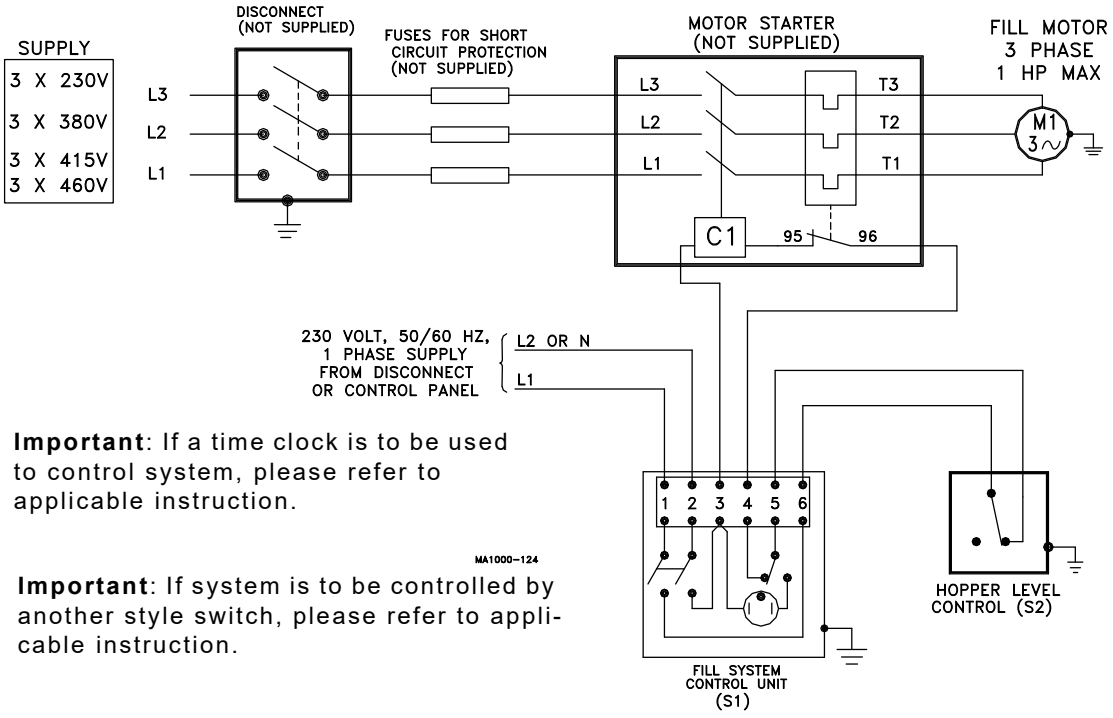



**Important**: If a time clock is to be used to control system, please refer to applicable instruction.

**Important**: If system is to be controlled by another style switch, please refer to applicable instruction.

**Figure 25.Model 108 Hopper Level Control Switch (1-1/2 HP or larger) Wiring Diagram**

## Wiring Diagram for Model 108 w/Hopper Control Switch




**Important**: If a time clock is to be used to control system, please refer to applicable instruction.

**Important**: If system is to be controlled by another style switch, please refer to applicable instruction.

**Figure 26.Model 108 Hopper Level Control Switch Wiring Diagram**

# Operation

1. During initial start-up, the boot slide should be only partially open to prevent the full length of auger from being charged with feed. After that, the boot slide must be fully open for delivery system operation.
2. Do not permit the FLEX-AUGER® system to operate empty. Use a time clock or Auger Timer with the system whenever possible. This reduces short cycling by operating on a preset schedule instead of on demand. It also prevents excessive running of the system if the bin becomes empty. If the optional boot switch is used, the fill system will shut down when the bin becomes empty.
3. Program the time clock to fill feeders often so the FLEX-AUGER® System does not have to run a long period of time to get feeders filled. Poultry feeders supplied by the FLEX-AUGER® System should be operated by a time clock so feeders start at the same time. This gives the FLEX-AUGER® System a better chance to keep up with them.

   **Note: The hopper level control must be positioned low in the last feeder hopper.**
4. The red light on the control unit will light if feed has packed inside. If this happens, remove feed from the drop tube and tap the side of the power unit to clear the safety switch. Keep the hopper level control in adjustment and positioned straight up and down so the paddle swings freely. The safety switch does not take the place of the hopper level control.
5. If the FLEX-AUGER® System must be used to convey high-moisture feed, empty the auger line completely after each running to prevent the feed from setting up in the tubes.
6. The Restrictor in the boot regulates the amount of feed flowing into the auger. Start a new system with the Restrictor installed as shipped--full length and flush with the front of the boot. Allow the system to polish out before adjusting the feed flow. Maximum restriction for the boots results when the restrictor is in this position. If more feed flow is desirable, the restrictor may be shortened. Refer to the section **“Restrictor Adjustment” on page 26**.
7. When operating the Straight-Through Tandem System, open the slide on only one bin at a time!
8. Model 108 High-Moisture Corn Applications only: Chore-Time recommends purging the system after the last feeding each day. Do not allow feed to set in the tubes for more than 24 hours. Additionally, do not allow the charged system to set idle in freezing conditions for extended periods of time.

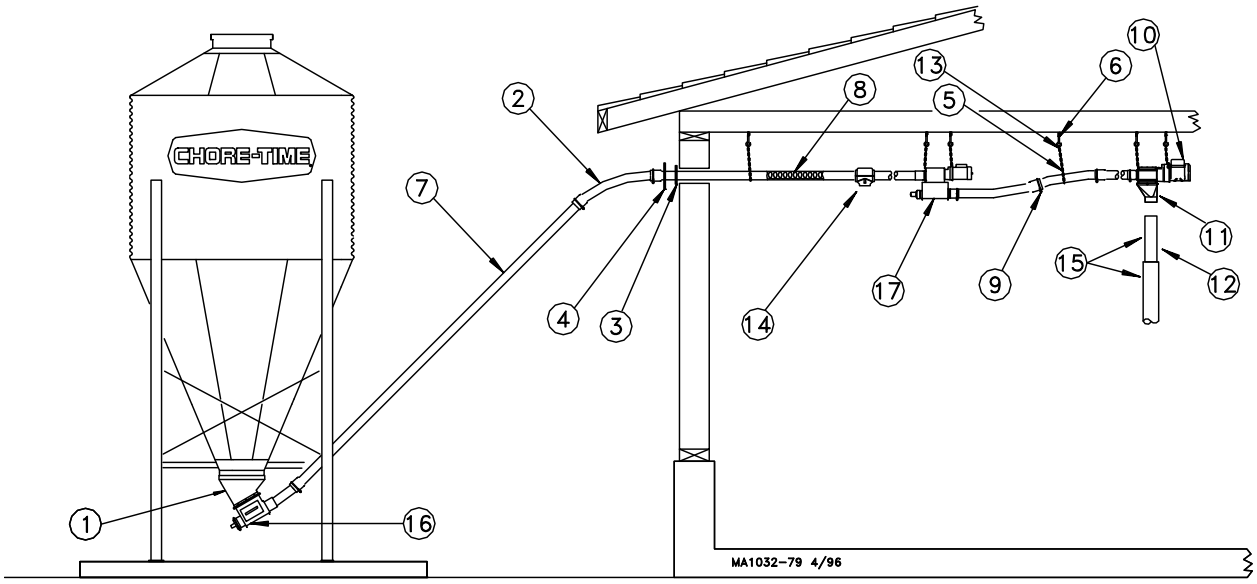
## Start-Up Procedure for New Systems

**Important!** DO NOT RUN FEED THROUGH A NEW SYSTEM UNTIL AFTER THIS PROCEDURE HAS BEEN FOLLOWED OR THE AUGER WILL PLUG AND BIND.

1. Close the Slide on the FLEX-AUGER® Boot.
2. Operate the system empty for one minute.
3. Open the slide on the FLEX-AUGER® boot no more than 1 inch (25 mm) to allow some feed into the boot.
4. Operate the system with the slide in this position until feed has reached the Control Unit. This removes the manufacturing grease and oil from the auger and tubes. If this grease and oil is not removed, the feed may bunch up causing the auger to plug and bind.
5. Now the slide can be fully opened and the system operated normally.

# Parts Listing

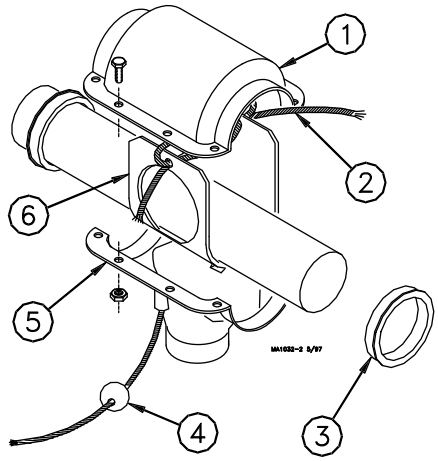
## Miscellaneous Line Components




| KEY | DESCRIPTION | PART NO. |
|---|---|---|
| 1 | Upper Boot (30 Degree) | 4347 |
| | Upper Boot (Straight-Out) | 6093 |
| 2 | PVC Elbow, 45 Degree | 34546 |
| | --Optional 15 Degree Hard. Steel Elbow | 34354 |
| | --Optional 45 Degree Hard. Steel Elbow | 34406 |
| | --Optional 30 Degree Hard. Steel Elbow | 34355 |
| 3 | Neoprene Seal | 34334 |
| 4 | Seal Ring | 8117 |
| 5 | Chain | 2128 |
| 6 | Screw Hook | 1214 |
| 7 | 10' (3 m) PVC Tube | 34547 |
| | 10' (3 m) Steel Tube | 34411 |
| 8** | Model 108 Auger | 30108-0 |
| 9 | Tube Clamp (for PVC systems) | 14373 |
| | Tube Clamp (for steel systems) | 34338 |
| 10 | Power Unit | See Individual Part Lists |
| 11 | Control Unit (Direct Drive) | 46800-5 |
| | Control Unit (Belt Drive) | 46800-15 |
| | Control Unit (Direct Drive, 3 Phs) | 46800-10 |
| 12 | Plastic Drop Tube | 9900 |
| 13 | S Hook | 2805 |
| 14 | Outlet Drop | 34358 |
| 15 | Telescoping Drop Tube | 14366-9900 |
| 16 | Lower Boot Assembly (30 Degree) | 34336 |
| | Lower Boot Assembly (Straight-Out) | 34341 |
| 17 | Extension Boot Kit | 34633 |
| - - | Connector w/clamps (for steel systems) | 34419 |
| - - | Connector (for steel systems) | 30277 |
| - - | Tube Connector (for PVC systems) | 34557 |

**Auger may be ordered in lengths from 20 ft. to 200 ft.
Ex. 30108-155 would be 155' of auger.

## Model 108 Drop Kit (34358)

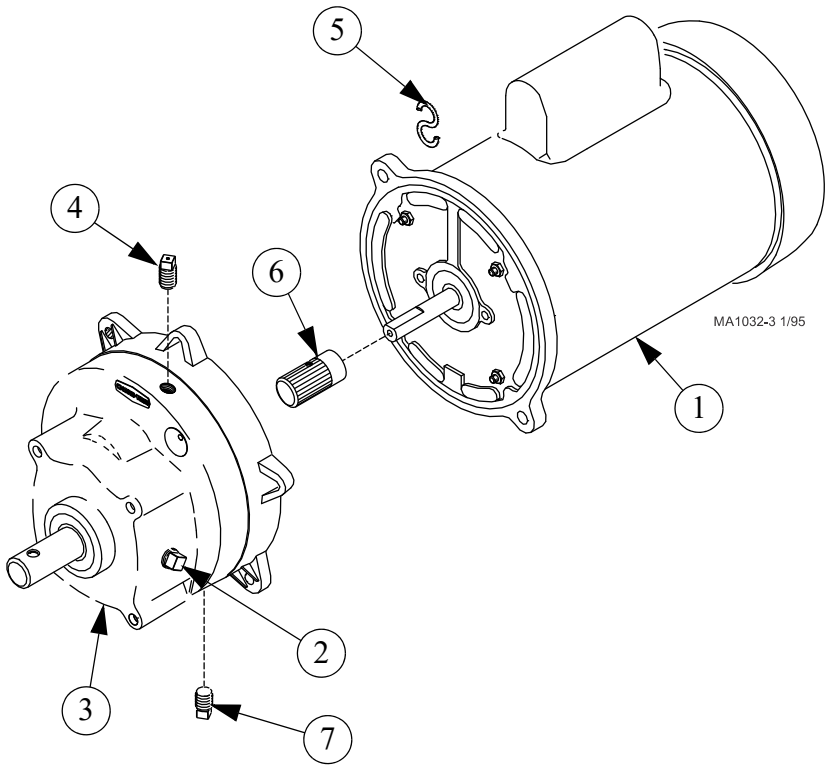



| KEY | DESCRIPTION | PART NO. |
|---|---|---|
| 1 | Drop Half (top) | 13780 |
| 2 | .150 Dia. Rope | 3085-4 |
| 3 | Ring Adapter (for PVC systems) | 34630 |
| | Ring Adapter (for STEEL systems) | 34360 |
| 4 | Indicator Ball (red) | 24393-1 |
| | Indicator Ball (green) | 24393-2 |
| 5 | Drop Half (bottom) | 13781 |
| 6 | Rotary Slide | 34359 |

## Power Unit Assembly Part Numbers

| Part Number | HP | RPM | Phase | Hz | Voltage |
|---|---|---|---|---|---|
| 3259-49 | 1 HP | 348 RPM | Single Phase | 60 Hz | 230 |
| 3259-52 | 3/4 HP | 348 RPM | Single Phase | 60 Hz | 230 |
| 3259-66 | 1-1/2 HP | 348 RPM | Single Phase | 60 Hz | 230 |
| 3259-79 | 1 HP | 425 RPM | Single Phase | 60 Hz | 230 |
| 3259-80 | 1-1/2 HP | 425 RPM | Single Phase | 60 Hz | 230 |
| 3259-121 | 2 HP | 425 RPM | Single Phase | 60 Hz | 230 |
| 3259-88 | 3/4 HP | 348 RPM | Single Phase | 50 Hz | 230 |
| 3259-89 | 1 HP | 348 RPM | Single Phase | 50 Hz | 230 |
| 3259-50 | 1/2 HP | 216 RPM | Single Phase | 60 Hz | 230 |
| 3259-90 | 1.5 HP | 348 RPM | Single Phase | 50 Hz | 220 |
| 3259-136 | 3/4 HP | 216 RPM | Single Phase | 60 Hz | 230 |
| 3259-105 | 1 HP | 348 RPM | Three Phase | 50 Hz | 220/380 |
| 3259-106 | 1-1/2 HP | 348 RPM | Three Phase | 50 Hz | 220/380 |
| 3259-104 | 3/4 HP | 348 RPM | Three Phase | 50 Hz | 220/380 |
| 3259-117 | 1.0 HP | 348 RPM | Three Phase | 60 Hz | 208-230/460 |
| 3259-118 | 1.0 HP | 425 RPM | Three Phase | 60 Hz | 208-230-460 |
| 3259-119 | 3/4 HP | 348 RPM | Three Phase | 60 Hz | 208-230/460 |
| 3259-139 | 1.5 HP | 348 RPM | Three Phase | 60 Hz | 208-230/460 |
| 3259-140 | 1.5 HP | 425 RPM | Three Phase | 60 Hz | 208-230/460 |
| 3259-170 | 2 HP | 425 RPM | Three Phase | 60 Hz | 208-230/460 |

# Power Units

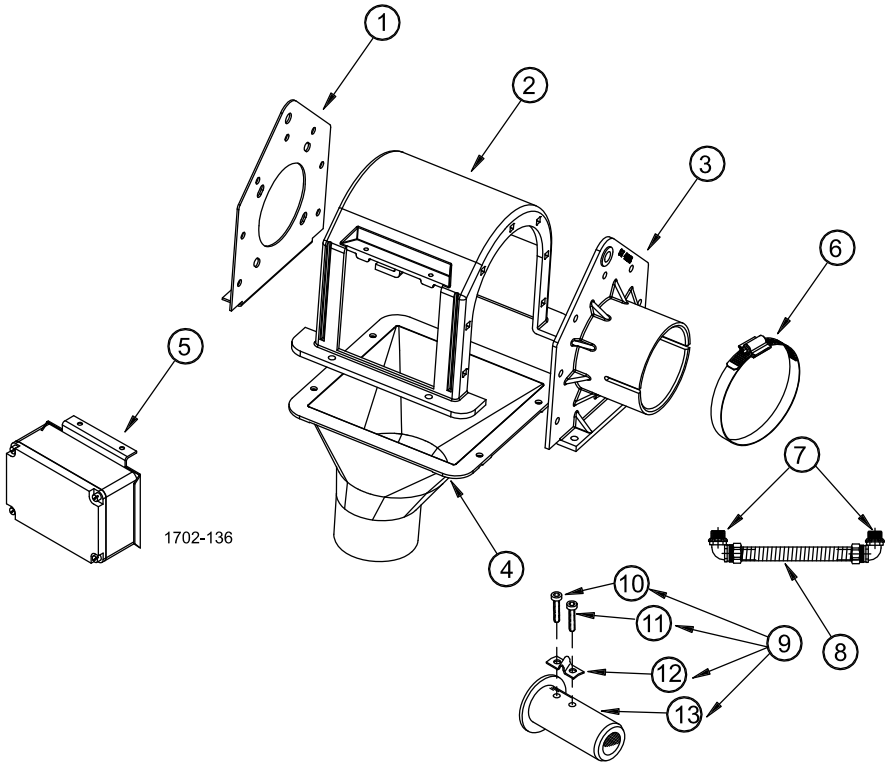



| Item | Description | 3259-49 Part No. | 3259-52 Part No. | 3259-66 Part No. | 3259-79 Part No. | 3259-80 Part No. | 3259-121 Part No. |
|---|---|---|---|---|---|---|---|
| 1 | Motor | 6857 | 5051 | 8782 | 6857 | 8782 | 34461 |
| 2 | Pipe Plug | 2755 | 2755 | 2755 | 2755 | 2755 | 2755 |
| 3 | Gearhead | 3261-7 | 3261-7 | 3261-7 | 3261-10 | 3261-10 | 3261-10 |
| 4 | Vent Plug | 3523 | 3523 | 3523 | 3523 | 3523 | 3523 |
| 5 | S Hook | 4270 | 4270 | 4270 | 4270 | 4270 | 4270 |
| 6 | Pinion Assembly | 6104 | 5046 | 6104 | 6104 | 6104 | 6104 |
| 7 | Magnetic Pipe Plug | 30160 | 30160 | 30160 | 30160 | 30160 | 30160 |

| Item | Description | 3259-88 Part No. | 3259-89 Part No. | 3259-105 Part No. | 3259-106 Part No. | 3259-50 Part No. | 3259-104 Part No. |
|---|---|---|---|---|---|---|---|
| 1 | Motor | 6305 | 26157 | 28035EUR | 28036EUR | 5050 | 28034EUR |
| 2 | Pipe Plug | 2755 | 2755 | 2755 | 2755 | 2755 | 2755 |
| 3 | Gearhead | 3261-10 | 3261-10 | 3261-10 | 3261-10 | 3261-6 | 3261-10 |
| 4 | Vent Plug | 3523 | 3523 | 3523 | 3523 | 3523 | 2523 |
| 5 | S Hook | 4270 | 4270 | 4270 | 4270 | 4270 | 4270 |
| 6 | Pinion Assembly | 5046 | 6104 | 6104 | 6104 | 3245 | 5052 |
| 7 | Magnetic Pipe Plug | 30160 | 30160 | 30160 | 30160 | 30160 | 30160 |

| Item | Description | 3259-90 Part No. | 3259-117 Part No. | 3259-118 Part No. | 3259-119 Part No. | 3259-136 Part No. | 3259-139 Part No | 3259-140 Part No. | 3259-170 Part No. |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Motor | 25782 | 34101 | 34101 | 34102 | 5051 | 39589 | 39589 | 56218 |
| 2 | Pipe Plug | 2755 | 2755 | 2755 | 2755 | 2755 | 2755 | 2755 | 2755 |
| 3 | Gearhead | 3261-10 | 3261-7 | 3261-10 | 3261-7 | 3261-6 | 3261-7 | 3261-10 | 3261-10 |
| 4 | Vent Plug | 3523 | 3523 | 3523 | 3523 | 3523 | 3523 | 3523 | 3516 |
| 5 | S Hook | 4270 | 4270 | 4270 | 4270 | 4270 | 4270 | 4270 | 4270 |
| 6 | Pinion Assembly | 6106 | 6106 | 6106 | 5052 | 3245 | 6106 | 6106 | 6106 |
| 7 | Magnetic Pipe Plug | 30160 | 30160 | 30160 | 30160 | 30160 | 30160 | 30160 | 30160 |

## Single Phase Direct Drive Control Unit (Part No. 46800-5)

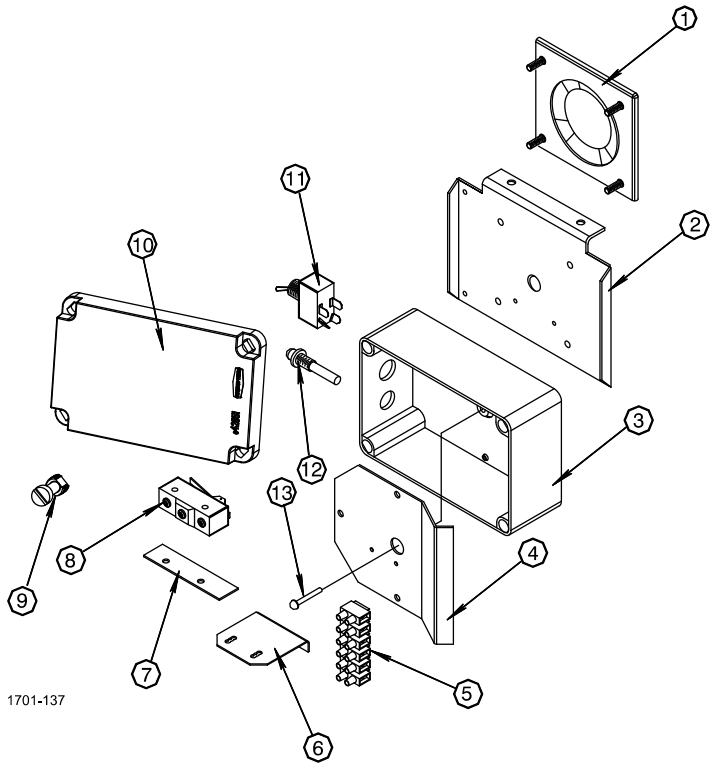



| KEY | DESCRIPTION | PART NO. |
|---|---|---|
| 1 | Gearhead End Plate | 43596 |
| 2 | Control Unit Body | 43601 |
| 3 | Tube Anchor Plate | 45927 |
| 4 | Control Unit Funnel | 45943-3 |
| 5 | Switch & Plate Assembly | 46051 |
| 6 | H.D. Adjustable Clamp | 47652-2 |
| 7 | Water Tight Connector | 23810 |
| 8 | Flex Conduit | 26982-10 |
| 9 | Driver Assembly | 30313 |
| 10 | Screw, SKTH CP 5/16-18X .875 | 6850-1 |
| 11 | Screw, SKTH CP 5/16-18X 2.75 | 6850-2 |
| 12 | Anchor Clamp | 7703 |
| 13 | Driver Weldment | 30312 |

## 3-Phase International Direct Drive Control Units (Part No. 46800-10)

Components - Same as Standard Direct Drive Control Units except does not include the 90° connectors and the flex conduit.

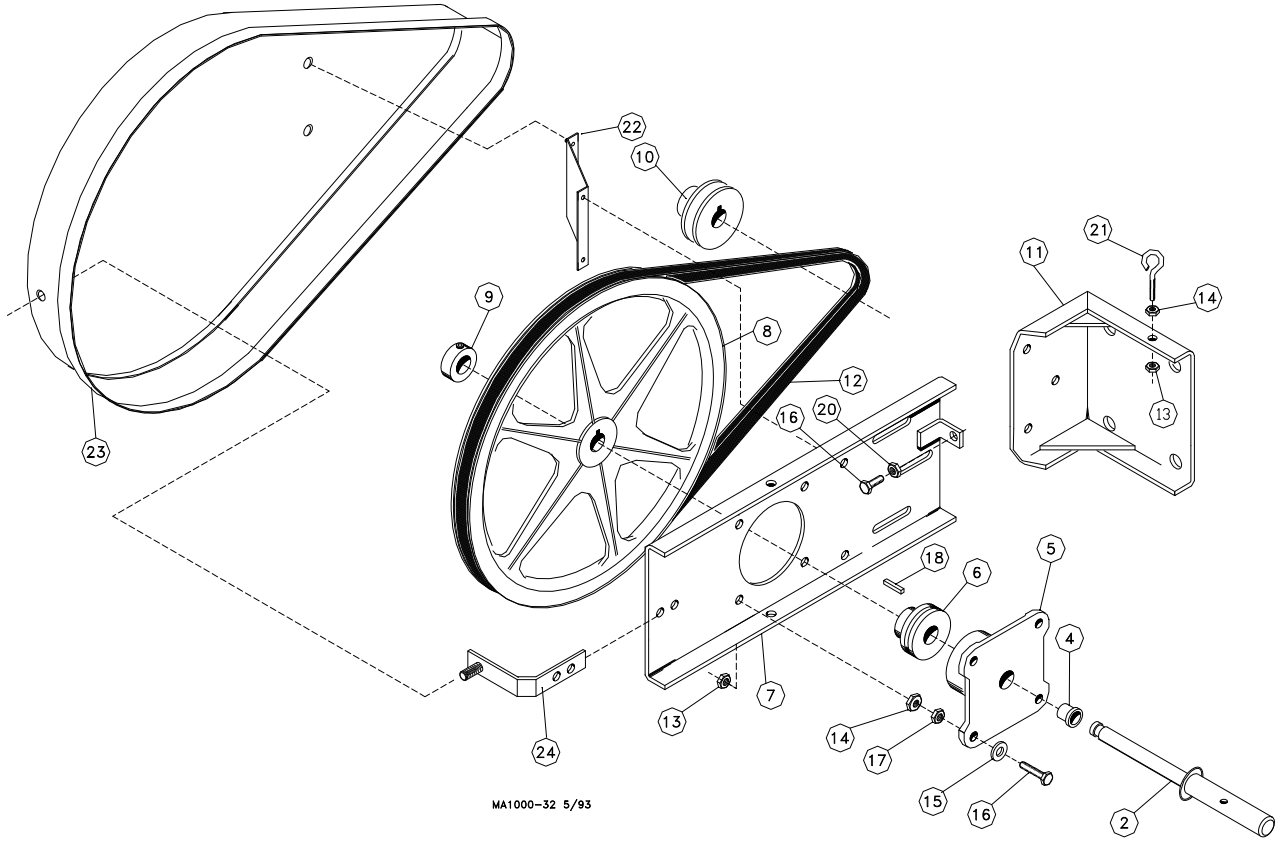
# Switch Plate & Assembly (Part No. 46051)




| KEY | DESCRIPTION | PART NO. |
|---|---|---|
| 1 | Diaphragm Assembly | 46159 |
| 2 | Switch Cover Plate | 46030 |
| 3 | 4x6 Electrical Box | 46070-1 |
| 4 | Mount Panel | 46072 |
| 5 | Terminal Block | 34925-6 |
| 6 | Switch Bracket | 46093 |
| 7 | Switch Insulation | 1907-5 |
| 8 | Micro Switch | 46091 |
| 9 | Plastic Screw | 42849 |
| 10 | 4x6 Elect Box Cover | 42851 |
| 11 | Toggle Switch | 7767 |
| 12 | Pilot Light | 46047 |
| 13 | Rivet, 3/16 x 1.00 round Head(S.S.) | 46905 |

# Belt Drive Control Unit (Part No. 46138-2)

**Note: The 46800-15 Belt Drive Control Unit includes the Direct Drive Control Unit Components, plus the following components:**



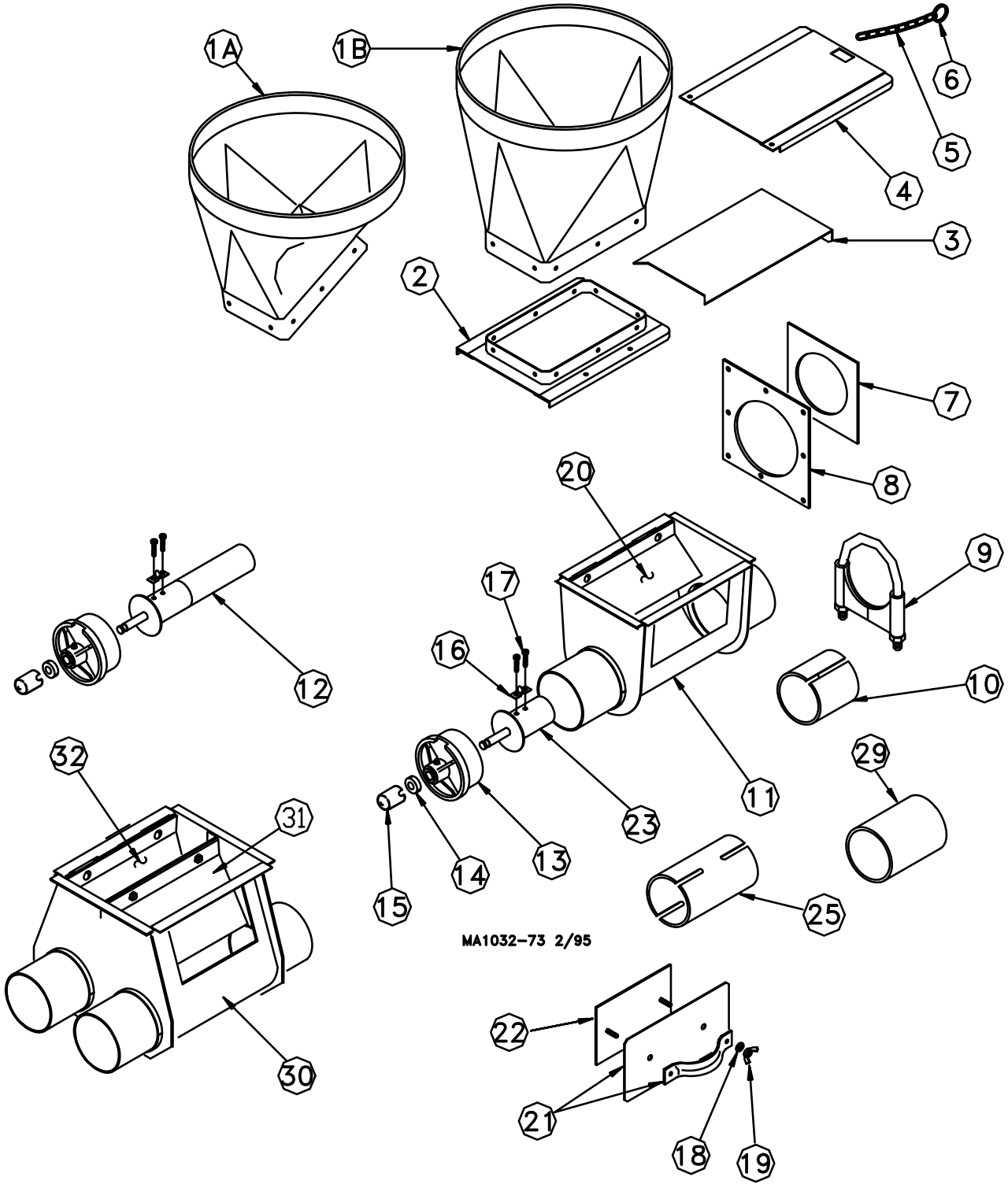

| Key | Description | Part No. |
|---|---|---|
| 2* | Drive Shaft | 46156 |
| 4* | Flange Bearing | 2196 |
| 5* | Front Plate Bearing Holder | 2047 |
| 6* | Ball Bearing | 5930 |
| 7 | Adjustment Bracket | 46301 |
| 8 | 11" Dia. Sheave | 46190 |
| 9* | 5/8" Set Collar | 1386 |
| 10 | 2.25" Dia. Sheave | 3208 |
| 11 | Motor Mount Weldment | 3058 |
| 12 | "V" Gripnotch Belt | 4409 |
| 13 | 5/16-18 Hex Locknut | 2148 |

| Key | Description | Part No. |
|---|---|---|
| 14 | 5/16-18 Jam Nut | 593 |
| 15 | 5/16 Flat Washer | 546 |
| 16 | 5/16-18x1-3/4" Hex Hd. M.S. | 4412-4 |
| 17 | 5/16-18 Hex Lock Nut | 2148 |
| 18* | 3/16" Key | 2112-1 |
| 19 | Anchor Clamp | 7703 |
| 20 | 5/16-18 Hex Nut | 2145 |
| 21 | Eyebolt | 1503-2 |
| 22 | Belt guard Mount | 46198 |
| 23 | Belt Guard | 46199 |
| 24 | Angle Guard Mount | 46299 |

*Item May be ordered as a Bearing & Shaft Assembly (Part No. 46157)

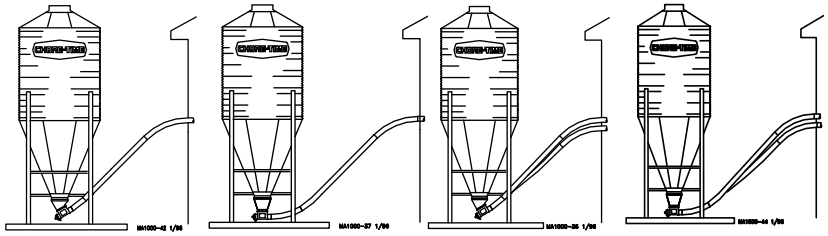
# Model 108 Boot Components

**The Item numbers below are associated with the following two pages.**



# Model 108 Boot Components

**The Item numbers below are associated with the parts list drawing on the following page.**



| Item | Description | 30 Degree Boot System | Straight Out Single Boot Syst. | 30 Degree Twin Boot Syst. | Straight Out Twin Boot System |
|---|---|---|---|---|---|
| -- | Complete System | 34339 | 34340 | 35625 | 35626 |
| --[2] | Lower Boot Assembly | 34336 | 34341 | 35613 | 35612 |
| 1A | 30 Degree Upper Boot | 4347 | - - - - | 4347 | - - - - |
| 1B | Straight Out Upper Boot | - - - - | 6093 | - - - - | 6093 |
| 2 | Transfer Plate Assembly | 4925 | 4925 | 4925 | 4925 |
| 3 | Slide | 4357 | 4357 | 4357 | 4357 |
| 4 | Slide Shield | 4876 | 4876 | 4876 | 4876 |
| 5 | Chain | 2128-1 | 2128-1 | 2128-1 | 2128-1 |
| 6 | Ring | 1706 | 1706 | 1706 | 1706 |
| 7 | Neoprene Seal | 34334 | 34334 | 34334 | 34334 |
| 8 | Seal Ring | 8117 | 8117 | 8117 | 8117 |
| 9 | Tube Clamp (for STEEL systems) | 34338 | 34338 | 34338 | 34338 |
| 9[3] | Tube Clamp (for PVC systems) | 14373 | 14373 | 14373 | 14373 |
| 10 | Tube Insert | 34337 | 34337 | 34337 | 34337 |
| 11 | Boot Body Weldment | 30386 | 30385 | - - - - | - - - - |
| 12[5] | Anchor Weldment | 30311 | - - - - | 30311 | - - - - |
| 13[5] | Bearing Cap Assembly | 30314 | 30314 | 30314 | 30314 |
| 14[5] | 5/8" Set Collar | 1386 | 1386 | 1386 | 1386 |
| 15[5] | Safety Cap | 29702 | 29702 | 29702 | 29702 |
| 16[5] | Anchor Clamp | 7703 | 7703 | 7703 | 7703 |
| 17[5] | 5/16-18 x 7/8 Soc.Hd Cap Screw | 6850-1 | 6850-1 | 6850-1 | 6850-1 |
| 18[1] | Sealing Washer | 8491 | 8491 | 8491 | 8491 |
| 19[1] | 5/16-18 Wing Nut | 2146 | 2146 | 2146 | 2146 |
| 20 | Baffle | - - - - | 14239 | - - - - | - - - - |
| 21[1] | Cover Weldment | 6301 | 6301 | 6301 | 6301 |
| 22[1] | Back Plate Assembly | 6298 | 6298 | 6298 | 6298 |
| 23[5] | Anchor Weldment | - - - - | 34369 | - - - - | 34369 |
| 25[4,3] | Model 108 Connector | 30277 | 30277 | 30277 | 30277 |
| 29[3] | Tube Connector (for PVC systems) | 34557 | 34557 | 34557 | 34557 |
| 30 | Twin Boot Body Weldment | - - - - | - - - - | 35617 | 35617 |
| 31 | Center Baffle Plate | - - - | - - - - | - - - - | 35624 |
| 32 | Baffle Weldment | - - - - | - - - - | - - - - | 35615 |

[1]These components may be ordered under Chore-Time Part No. 6197 Clean-Out Cover Assembly.

[2]Items 2 through 32 make up the Lower Boot Assemblies.

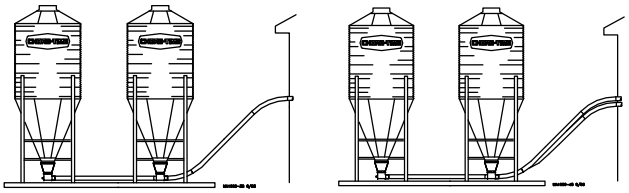
[3]These items are not included in the package and must be ordered separately.

[4]The Model 108 Connector may be ordered with (2) 34338 Tube Clamps under Chore-Time Part No. 34419 Connector w/Clamps.

[5]Items 12 - 17 may be ordered as an Anchor & Bearing Assembly (Restricted) under Chore-Time Part No. 35767. Items 13 - 17 and item 23 may be ordered as an Anchor & Bearing Assembly (Unrestricted) under Chore-Time Part No. 35766.

## Model 108 Boot Components (Continued)

**The Item numbers below are associated with the parts list drawing on the next page.**



| Item | Description | Single Boot System | Twin Boot System |
|---|---|---|---|
| -- | Complete System | 34333 | 35616 |
| --[1] | Straight-Out Lower Boot Assembly | 34341 | 35612 |
| --[2] | Straight-Thru Lower Boot Assembly | 34335 | 35611 |
| 1B | Straight Out Upper Boot | 6093 | 6093 |
| 2 | Transfer Plate Assembly | 4925 | 4925 |
| 3 | Slide | 4357 | 4357 |
| 4 | Slide Shield | 4876 | 4876 |
| 5 | Chain | 2128-1 | 2128-1 |
| 6 | Ring | 1706 | 1706 |
| 10 | Tube Insert | 34337 | 34337 |
| 11 | Boot Body Weldment | 30385 | - - - - |
| 18[3] | Sealing Washer | 8491 | 8491 |
| 19[3] | 5/16-18 Wing Nut | 2146 | 2146 |
| 20 | Baffle | 14239 | - - - - |
| 21[3] | Cover Weldment | 6301 | 6301 |
| 22[3] | Back Plate Assembly | 6298 | 6294 |
| 30 | Twin Boot Weldment | - - - - | 35617 |
| 31 | Center Baffle Plate | - - - | 35624 |
| 32 | Baffle Weldment | - - - - | 35615 |

[1]Refer to the Straight-Out Boot Systems on the previous page for miscellaneous Straight-Out Lower Boot Assembly components.

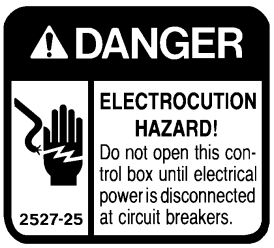
[2]Items 2 through 32, as listed above, make up the Straight-Thru Lower Boot Assemblies.

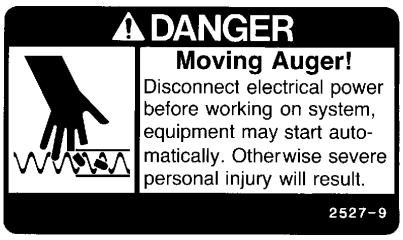
[3]These items may be ordered as an assembly under Chore-Time Part No. 6197.

# Troubleshooting

**ALWAYS DISCONNECT POWER TO THE SYSTEM WHEN SERVICING OR MAINTAINING THE EQUIPMENT. FAILURE TO DISCONNECT POWER MAY CAUSE INJURY OR DEATH.**

**Service and maintenance work should be done by a qualified technician only.**




| Problem | Possible Cause | Corrective Action |
|---|---|---|
| Delivery system will not run. | No power to the system. | Check circuits, fuses, and on-off switches on the equipment. |
| | Bin level switch has stopped the system due to lack of feed in the boot. | Check feed supply and for possible bridging. |
| | Motor overloaded and stopped. | Check for foreign material in the line. Push the motor reset button. |
| | Safety switch actuated in the Control Unit (red pilot light will be lit). | Determine reason for feed packing in the Control Unit. Feed level switch out of adjustment? |
| Motor overloads after running briefly. | Motor too small. | Use recommended size motor for line length. |
| | Low voltage (motor runs slow and overheats). | Check line voltage at the motor; use adequate size wire in circuits. |
| | Foreign object in the auger (motor runs, stalls, then auger spins in reverse). | Check auger line, pull auger to remove objects. |
| | Motor wired in reverse (motor runs, stalls, no feed conveyed). | Disconnect power and change wire connections (direct drive power unit shaft at rear of motor turns clockwise). |
| | Boot Anchor tight. | Check for Anchor binding. |
| | Wet feed being conveyed or allowed to stand in auger tubes. Defective motor (over heats without load). | Clean auger and tubes; avoid conveying wet feed or empty line after each feeding. Replace motor. |

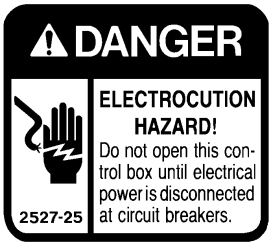
| Problem | Possible Cause | Corrective Action |
|---|---|---|
| Motor runs, but auger does not turn. | Sheared driver bolt at Control Unit. | Replace driver bolt. |
| | Broken power unit pinion. | Examine pinion on motor shaft; replace BOTH gear head and pinion in pinion is damaged. |
| Auger wears holes in tubes. | Auger kinked or poorly brazed. | See Auger Brazing section in this manual |
| Elbows wear out. | Auger is stretched too tight; horizontal L.H. turn; auger has been run dry. | Lengthen auger; Install an Extension Hopper; wire Boot Switch into system. |
| Excessive auger vibration and noise. | System has been operated too often without feed (auger has scored the auger tubes). | Wire a Boot Switch to stop the system when the feed bin is empty; replace damaged auger tubes; be sure auger has proper amount of stretch. |
| | Tubes inadequately supported. | Support the tubes every 5' (1.5 m) or closer. |
| | Horizontal L.H. turn. | No outlet drops on or just before an elbow; lengthen the auger; install an Extension Hopper ahead of elbows. |
| Fill system short cycles. | Control end feed level switch does not provide large enough feed differential. | Use a time clock to program operating cycles. Use Control end feed level switch w/lockout and time clock. |
| Extension Boot packs full of feed. | Too much Restrictor in the Boot. | Shorten Restrictor. |
| Second portion of extended length system will not start. | Feed level control at end of line out of adjustment. | Examine and make necessary adjustments; see feed level switch adjustment instruction. |
| Second portion of extended length system short cycles. | Too much Restrictor in the Boot. | Shorten Restrictor. |
| | Too much feed is still dispensing from drops ahead of Extension Boot.<br>Trim Restricter on first portion to allow more incoming feed. | Last outlet drop before Extension Boot must have full feed drop out. NOTE: All feeders ahead of Extension Boot must complete filling before feed reaches hopper. |

# Maintenance

The FLEX-AUGER® Feed Delivery System requires minimum maintenance. However, a routine periodic inspection of the equipment will prevent unnecessary problems.

Maintenance should be done by a qualified technician.

ALWAYS DISCONNECT POWER TO THE SYSTEM WHEN SERVICING OR MAINTAINING THE EQUIPMENT. FAILURE TO DISCONNECT POWER MAY CAUSE INJURY OR DEATH.




## Oil Recommendation

Use: Mobil Glycoil 30, Shell-Tivela 220, Texaco-Synoil, SG-XP220, Esso-S220, Telesia Oil 150, BP-Energol SG -XP 220 Synthetic Oil.

1. Periodically check and tighten the delivery system hardware.
2. Grease boot bearings on grease fittings regularly, using an automotive or industrial type grease.
3. Keep the FLEX-AUGER® tubes level. Adjust if necessary. Wear increases at the points where tubes sag.
4. Replace the Plastic Shipping Plug in the power unit gear head with the Vented Plug during installation of the Power Unit.
5. Check the oil level in the gear heads at installation and every 6 months. The Pipe Plug, on the side of the gear head, indicates proper oil level. Add SAE 40W oil when necessary.
   The oil in the gear heads should be replaced every 12 months with new SAE 40W oil.
   A. Remove the bottom Pipe Plug to drain the oil. Discard used oil in accordance with local and national codes.
   B. Wipe any debris off the magnet on the bottom Pipe Plug and reinstall. Remove the side Pipe Plug and (top) Vent Plug.
   C. Set the power unit in the horizontal position.
   D. 2-Stage Gear Heads(3261-1,3261-2, 3261-5, 3261-6, 3261-7, 3261-8, 3261-10, 3261-11, 3261-13, 3261-16, 3261-17): Add approximately 9 oz. (266 ml) of SAE 40W oil through top hole. This should be just enough oil to reach the side Pipe Plug.

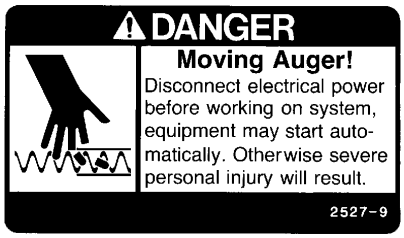
      3-Stage Gear Heads 3261-14, 3261-15, 3261-21, 3261-22): Add approximately 13 oz. (384 ml) of SAE 40W oil through top hole. This should be just enough oil to reach the side Pipe Plug.

   E. Install the side Pipe Plug and (top) Vent Plug.
6. If the system is not to be used for an extended period of time, remove all the feed from the auger lines.

   Disconnect power to the system to prevent accidentally starting the system.
7. If the system must be disassembled, extreme caution must be used to prevent injury from springing auger.
   A. Disconnect power to the entire system.
   B. Pull the Anchor and Bearing Assembly and approximately 18” (45 cm) of auger out of the boot.
   C. Place a clamp or locking pliers on the auger to prevent it from springing back into the auger tubes.
   D. Remove Anchor and Bearing Assembly.
   E. Carefully release the clamp securing the auger.

   **CAUTION: Stand clear...the auger will spring back into the tubes.**

   F. Remove the remaining system components in the opposite order they were installed, according to this manual.



# Livestock and Poultry Feed Consumption

## POULTRY

Poultry applications use automatic feeding systems sized for the building density. The FLEX-AUGER® Feed Delivery System's delivery rate should be sized to match or exceed the sum of the delivery rates of the automatic feeders supplied.

| CHORE-TIME Floor Feeding Systems | **Delivery Rates** |
|---|---|
| Model C, C2, H2, and G with 216 RPM Power Unit | 10.8 lbs or 4.89 kg/min.* |
| Model C, C2, H2, and G with 348 RPM Power Unit | 17.0 lbs or 7.71 kg/min.* |
| Model ATF | 18.0 lbs or 8.16 kg/min.* |
| Pan Breeder Feeder System | 35.0 lbs or 15.87 kg/min.* |
| ULTRAFLO Breeder Feeder (per Hopper) | 52.0 lbs or 23.58 kg/min.* |
| ULTRAPAN Feeding System (per Hopper) | 50.0 lbs or 22.68 kg/min.* |
| *Based on 40 lbs/ft3 density (64 kg/m3) | |
| Genesis Loop (Per Inlet Boot) | 65.0 lbs or 29.48 kg/min.* |
| Genesis Straight-Line | 35.0 lbs or 15.9 kg/min.* |

## HOGS

| Live weight-lbs/Hog | **Total Average Daily Feed-lbs/Head** |
|---|---|
| 10-25 (4.5-11.3 kg) | 1.2 (.54 kg) |
| 25-50 (11.3-22.7 kg) | 2.5 (1.13 kg) |
| 50-75 (22.7-34 kg) | 4.0 (1.81 kg) |
| 75-125 (34-56.7 kg) | 5.2 (2.35 kg) |
| 125-175 (56.7-79.4 kg) | 6.7 (3.04 kg) |
| 175-225 (79.4-102 kg) | 7.8 (3.54 kg) |
| Gestating Sows | 5 (2.26 kg) |

## DAIRY

| Milk/Cow/Day-lbs Average | **Concentrates*/Cow/Day-lbs Average** |
|---|---|
| 30 (13.61 kg) | 10 (4.53 kg) |
| 50 (22.68 kg) | 20 (9.07 kg) |
| 70 (31.75 kg) | 30 (13.61 kg) |
| 80 (36.28 kg) | 40 (18.14 kg) |

TO DETERMINE THE RUNNING TIME PER DAY-Multiply the number of animals by the feed consumption/head figures from the charts to get Total Feed Consumption.

-Divide Total Feed Consumption by the stated delivery rate of the FLEX-AUGER® Feed Delivery System to get running time per day in minutes. Divide this by 60 to get running time per day in hours.

**MADE TO WORK.**

**BUILT TO LAST.®**

## Revisions to this Manual

| Page No. | Description of Change | ECO |
|---|---|---|
| Various | Updated Manual to Book form Various updates to manual | 33157 |

**Contact your nearby Chore-Time distributor or representative for additional parts and information.**

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Internet: poultry@choretime.com

September, 2019

## Grain System Standard Operating and Cleaning Procedure

- To be cracked grains will be manually pallet jacked in to grain cracking room.
- Bag size will be 50-55lbs.
- Bags will be opened and dumped in to grain cracker.
- Upon completion of grain cracking, the machine will be turned off, and locked out via lock out/tag out.
- Machine will be swept and vacuumed of any particulate.
- Magnet will be inspected for any debris.
- Grain cracking room, will be wiped down, swept and vacuumed of any grain particulate.
- Lock out/tag out will be removed and system will be ready for next batch.

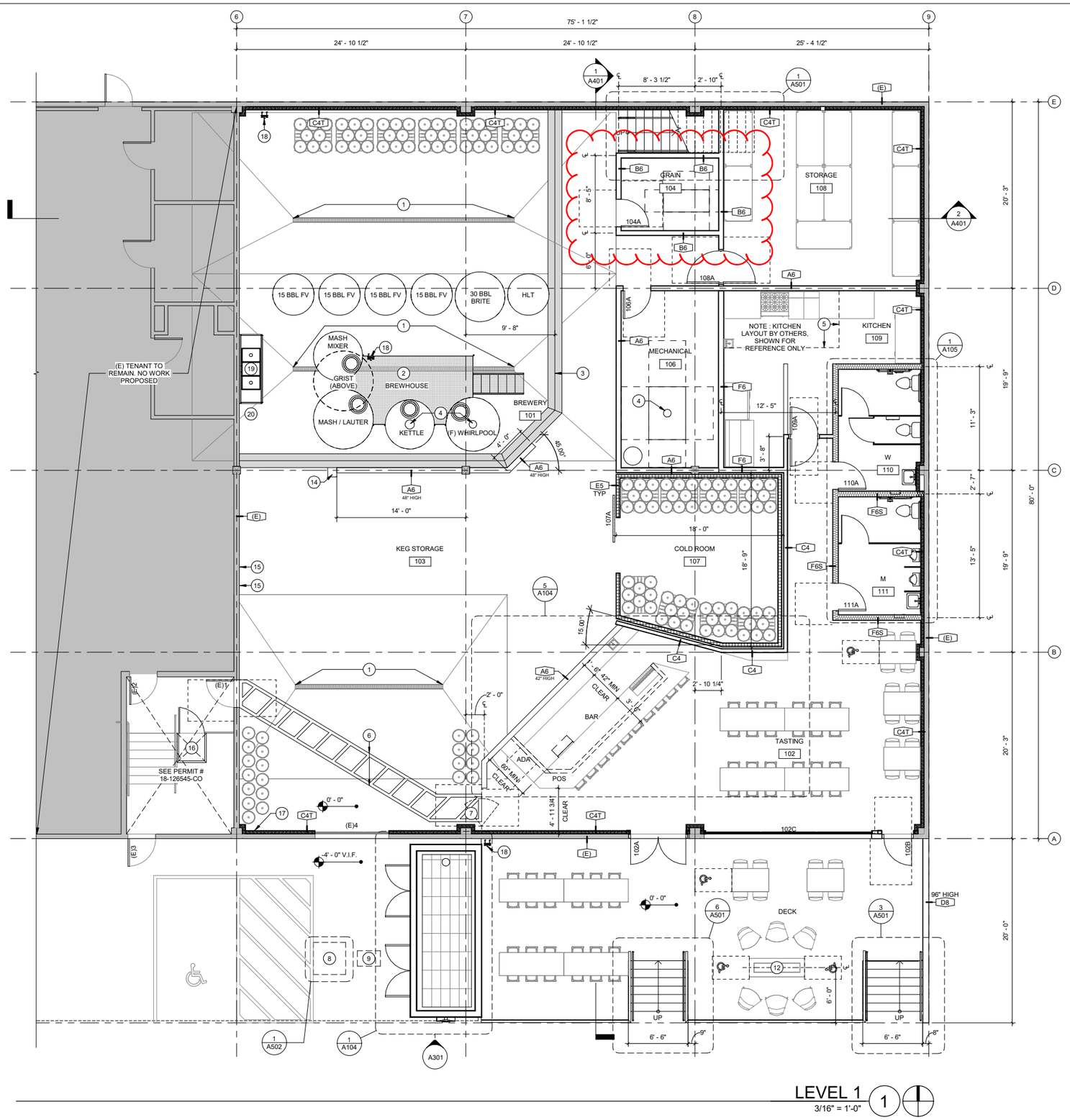
## RMS 6x9 SOP

- As stated above, the machine will be wiped down and cleaned after each use.
- Once a week the machine will be lock out/tag out and greased with food grade grease as per manufacture's recommendation.
- Once a month, the mill will be lock out/tag out. The rollers will be inspected as per manufacture's recommendation and cleaned of any excess debris.
- Once a month all drive motors, chains and or belts will be inspected as per the manufacture's recommendation.

## Flex Auger System

- Weekly inspection of auger system, housing, and motors will be performed as per the manufacture's recommendation. Motors will be greased using a food grade grease.
- Weekly wipe down and cleaning of any excess debris will be performed.

SHEET SIZE : 24" x 36"




LEVEL 1
3/16" = 1'-0"

## GENERAL NOTES - FLOOR PLANS

1. ALL DIMENSIONS INDICATED ARE TO FACE OF STUD AT EXTERIOR WALLS, CENTERLINE OF STUD AT INTERIOR WALL, UNLESS NOTED OTHERWISE.

2. CONTRACTOR TO FIELD VERIFY ALL EXISTING DIMENSIONS PRIOR TO BEGINNING WORK TO CONFIRM SIGNIFICANT DISCREPANCIES WITH ARCHITECTURAL DIMENSIONS.

3. SEE STRUCTURAL DRAWINGS & CALCULATIONS FOR ALL STRUCTURAL INFORMATION NOT INDICATED HERE.

4. ALL FURNITURE AND FURNISHINGS ARE OFOI UNLESS OTHERWISE NOTED.

5. ALL EQUIPMENT IS OFOI, UNLESS OTHERWISE NOTED.

6. SHUT OFF VALVE FOR DRAIN WITHIN CONTAINMENT AREA TO REMAIN IN CLOSED POSITION UNDER NORMAL OPERATING CONDITIONS. DRAIN WITHIN CONTAINMENT AREA SHALL DISCHARGE TO SANITARY SEWER. SHUT OFF VALVES ARE NOT NECESSARY FOR FLOOR DRAINS OUTSIDE OF CONTAINMENT AREA

## SYMBOLS LEGEND

- EXISTING WALLS TO REMAIN
- EXISTING POSTS TO REMAIN
- NEW FRAMED WALLS, SEE WALL TYPES
- NEW CMU WALLS, SEE WALL TYPES
- NEW POST, SEE STRUCTURAL
- NEW HSS COLUMN, SEE STRCTURAL
- TD TRENCH DRAIN
- FDC — FIRE DEPARTMENT CONNECTION
- HB — HOSE BIB

## KEYNOTES - FLOOR PLAN

| | |
|---|---|
| 1 | (E) TRENCH DRAIN CONNECTED TO SHUTOFF VALVE |
| 2 | BREWHOUSE TANKS & PLATFORM BY OTHERS, SHOWN FOR REFERENCE ONLY |
| 3 | 1 7/8" TALL SECONDARY CONTAINMENT BERM. BASIS OF DESIGN : RUBBERFORM 1.875"x18" MINIBERM. SEE SHEET G005 FOR SECONDARY CONTAINMENT AREA SPREADSHEET & CALCULATIONS |
| 4 | APPROXIMATE LOCATION OF PROPOSED EQUIPMENT VENT STACK. COORDINATE W/ MFR |
| 5 | COMMERCIAL KITCHEN VENT HOOD |
| 6 | 44" MIN. WIDE PERMANENT FLOOR STRIPING. AREA TO REMAIN CLEAR AT ALL TIMES DURING BUSINESS HOURS |
| 7 | 48" WIDE GATE RAIL. FREE TO OPEN IN DIRECTION OF TRAVEL AT ALL TIMES |
| 8 | 36" x 36" MIN. CLEAR SAMPLING VAULT PER BES REQUIREMENTS |
| 9 | GREASE INTERCEPTOR |
| 10 | WALL TO EXTEND TO STRUCTURE ABOVE |
| 11 | HATCH INDICATES ACOUSTIC INSULATION BETWEEN CEILING FRAMING. NO DECK IS PROPOSED OVER FRAMING, TYPICAL THIS SHEET |
| 12 | GAS FIRE TABLE (BASIS OF DESIGN: PALOFORM ROBATA) |
| 13 | 75 GALLON WATER HEATER, PROVIDE SEISMIC STRAPPING TO WALL |
| 14 | PROPOSED LOCATION OF TRENCH DRAIN SHUTOFF VALVE |
| 15 | LONG-TERM BIKE PARKING STALL, WALL MOUNTED. PROVIDE BLOCKING. (BASIS OF DESIGN : HUNTCO, BANTAM) |
| 16 | (E) ACCESSIBLE LIFT |
| 17 | APPROXIMATE LOCATION OF PREMISIS ISOLATION RPBA. INSTALL PER WATER BUREAU REQUIREMENTS |
| 18 | HOT/COLD HOSE BIB |
| 19 | 3-COMPARTMENT SINK |
| 20 | MOP SINK |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REGISTERED ARCHITECT
JEFF W. ERWIN
PORTLAND, OREGON
STATE OF OREGON


HAMMER & STITCH BREWING CO.

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PORTLAND, OR 97210

PERMIT SET

REVISIONS:

| # | DATE | DESCRIPTION |
|---|---|---|
| 1 | 9.13.19 | PERMIT REVISIONS |

SHEET TITLE:

FIRST FLOOR PLAN

PROJECT # 19016

PERMIT DATE: -

DATE: 09.10.2019

A101

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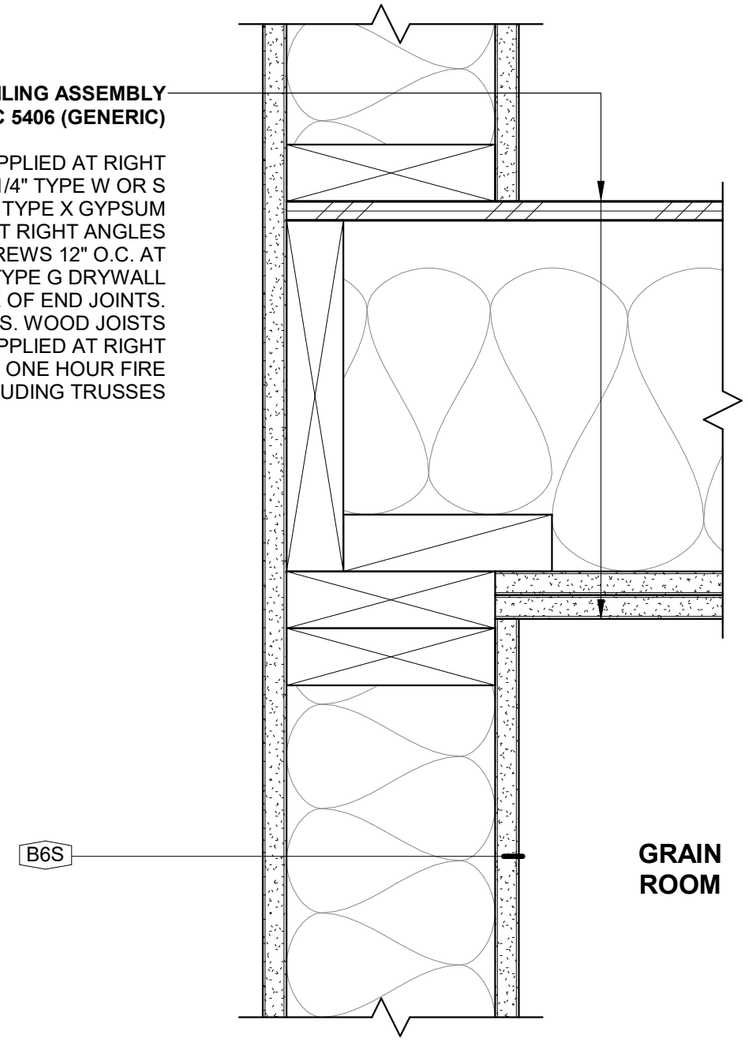
**1 HOUR FLOOR / CEILING ASSEMBLY**
**GA FILE NO. FC 5406 (GENERIC)**

BASE LAYER 5/8" TYPE X GYPSUM WALLBOARD APPLIED AT RIGHT ANGLES TO 2 x 10 WOOD JOISTS 24" O.C. WITH 1 1/4" TYPE W OR S DRYWALL SCREWS 24" O.C. FACE LAYER 5/8" TYPE X GYPSUM WALLBOARD OR GYPSUM VENEER BASE APPLIED AT RIGHT ANGLES TO JOISTS WITH 1 7/8" TYPE W OR S DRYWALL SCREWS 12" O.C. AT JOINTS AND INTERMEDIATE JOISTS AND 1 1/2" TYPE G DRYWALL SCREWS 12" O.C. PLACED 2" BACK ON EITHER SIDE OF END JOINTS. JOINTS OFFSET 24" FROM BASE LAYER JOINTS. WOOD JOISTS SUPPORTING 1/2" PLYWOOD WITH EXTERIOR GLUE APPLIED AT RIGHT ANGLER TO JOISTS WITH 8d NAILS. CEILING PROVIDES ONE HOUR FIRE RESISTANCE PROTECTION FOR FRAMING, INCLUDING TRUSSES




# WALL / CEILING AT GRAIN ROOM

3" = 1'-0"

2

## LEGEND

PROPERTY LINE

1 HOUR FIRE BARRIER - 1 HOUR DOOR

2 HOUR FIRE BARRIER - 1 1/2 HOUR DOOR

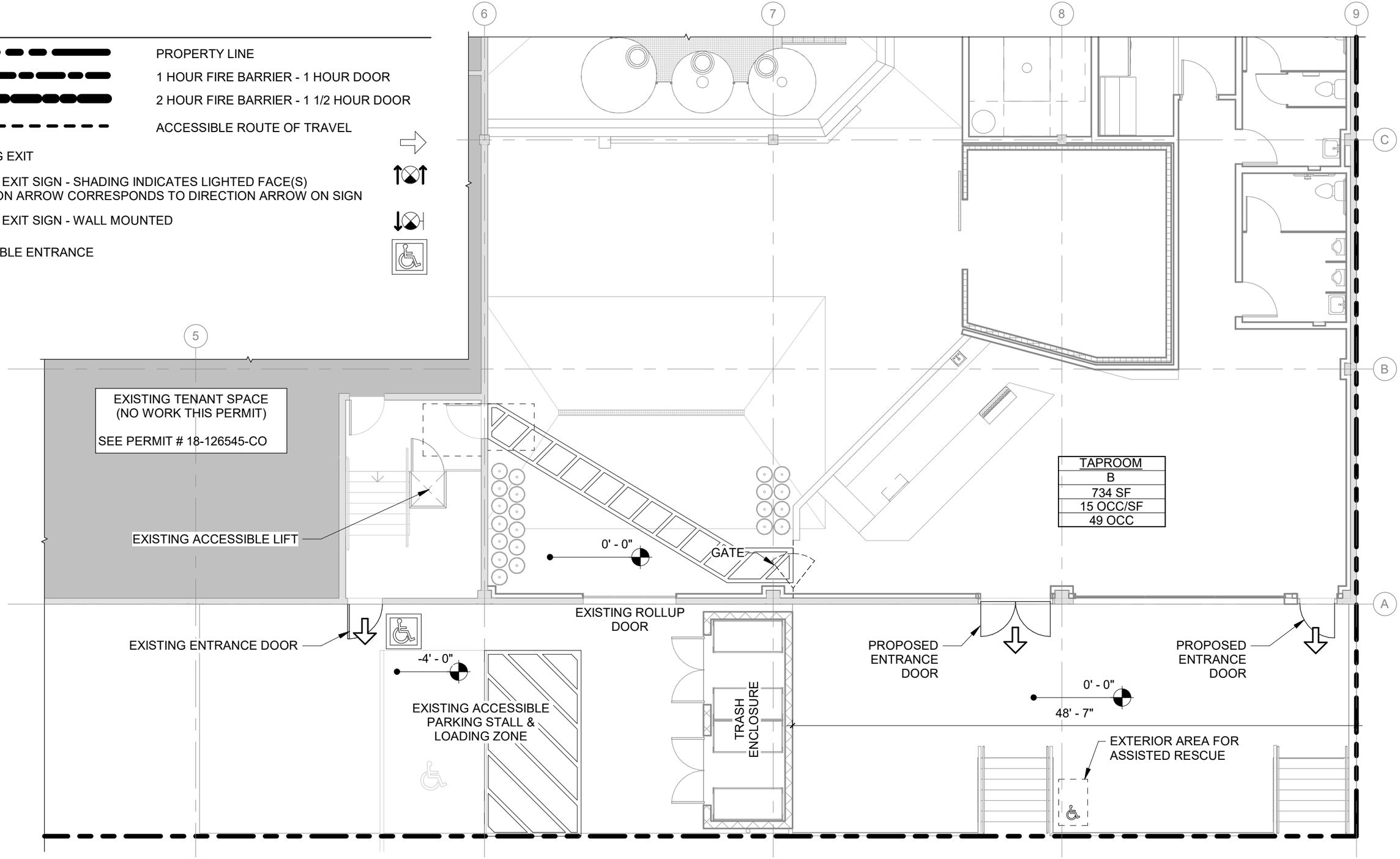
ACCESSIBLE ROUTE OF TRAVEL

BUILDING EXIT

LIGHTED EXIT SIGN - SHADING INDICATES LIGHTED FACE(S)
DIRECTION ARROW CORRESPONDS TO DIRECTION ARROW ON SIGN

LIGHTED EXIT SIGN - WALL MOUNTED

ACCESSIBLE ENTRANCE

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# CODE APPEAL PLAN - LEVEL 1

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APP.1.3

## LEGEND

PROPERTY LINE

1 HOUR FIRE BARRIER - 1 HOUR DOOR

2 HOUR FIRE BARRIER - 1 1/2 HOUR DOOR

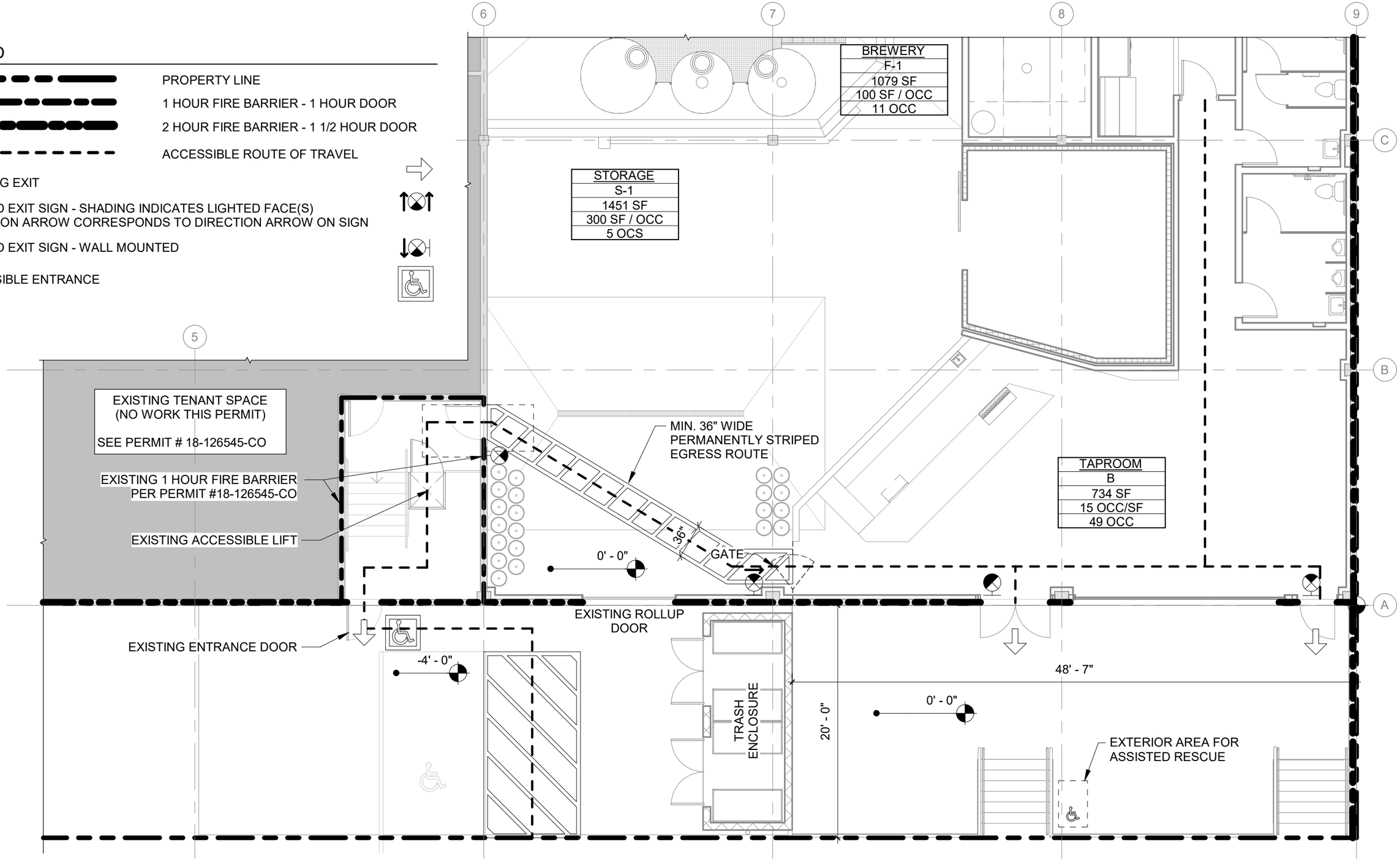
ACCESSIBLE ROUTE OF TRAVEL

BUILDING EXIT

LIGHTED EXIT SIGN - SHADING INDICATES LIGHTED FACE(S)
DIRECTION ARROW CORRESPONDS TO DIRECTION ARROW ON SIGN

LIGHTED EXIT SIGN - WALL MOUNTED

ACCESSIBLE ENTRANCE

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# CODE APPEAL PLAN - LEVEL 1

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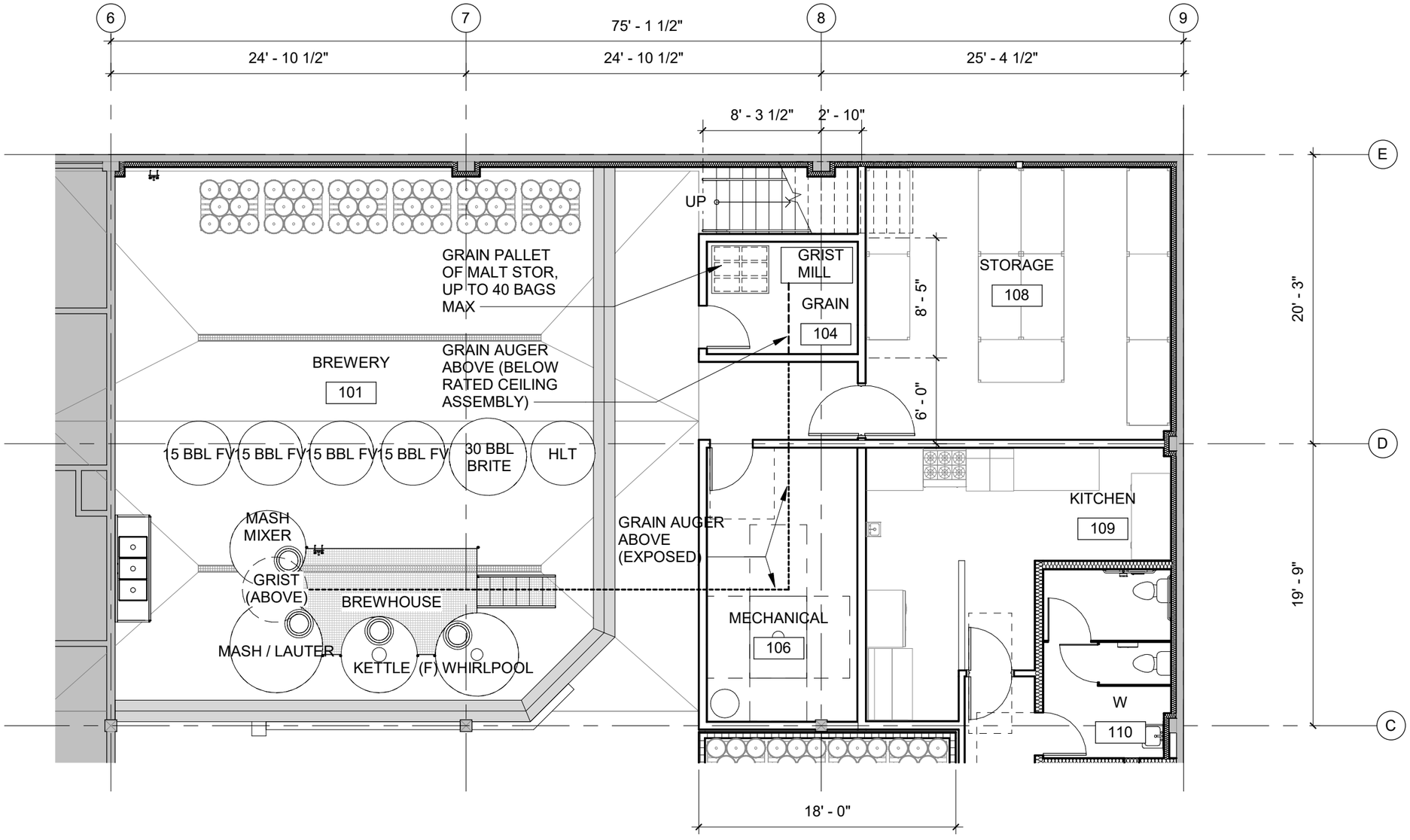


# LEVEL 1 - CODE APPEAL 01

1/8" = 1'-0"

1

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## CODE APPEAL PLAN - LEVEL 1 GRAIN RM

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09.13.2019
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