Edition of:
October 15th, 2001

CHUTES MANUAL

FOR THE SUPERCHUTE® DEBRIS CHUTE SYSTEM

When properly used, meets OSHA 1926.852 and CCMC 12270-R

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- This edition of the "Chutes Manual" contains important new information.
- The instructions within are current and supersede any instruction found in a prior edition.
- Avoid confusion: discard old instruction booklets concerning chute section installation. Old booklet titles: "Installation Manual", or "Safety Pack", or "Chutes Manual".
- If at any time you are unsure of how to proceed please call Superchute® toll free:

1-800-363-2488

IT IS THE RESPONSIBILITY OF COMPANIES THAT SELL, RENT OR USE THE SUPERCHUTE® PRODUCT TO FREELY SUPPLY THIS MANUAL TO THE FOLLOWING PERSONS:

- **THE PLANNERS AND SUPERVISORS OF THE CHUTE SYSTEM**
- **THE INSTALLERS OF THE CHUTE SYSTEM**
- **THE USERS OF THE CHUTE SYSTEM**

⚠ WARNING

- The installation and use of a Superchute® chute system involves work at heights, suspended loads of considerable weight, and falling debris.
- Serious injury or death can result from improper installation, use, or maintenance of the Superchute® product.
- Before the chute system is rigged or used, the following persons must read and understand the instructions contained in this manual:
    1. The planners and supervisors of the chute system
    2. The installers of the chute system
    3. The users of the chute system
- If one or more Superchute® chute hoists will be used in the chute system, then the above mentioned persons must also read and understand the applicable "Chute Hoist Installation Manual(s)".

If you have any questions or comments concerning this manual, please feel free to contact Superchute Ltd.

This manual refers to the following products, which are protected by international patent laws:

Door Sections	Wraparound® Regular Sections	Chute Hoists (Bolt-Downs, Roofers, Hoisters)
U.S. Pat. No. Des. 328,174 Can. Ind. Des. 1990 RD 66842	U.S. Pat. 5,472,768 Can. Pat. Application 2,119,108 U.K. Pat. 2,276,151	U.S. Pat. 5,934,437 Can. Pat. Application 2,177,741

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1. GLOSSARY

Breaking Strain: The average load at which a new component (for example: a cable or chain assembly) will fail. The breaking strain is obtained by applying direct tension to a component at a uniform rate of speed, in a testing machine.

Chute: A series of linked chute sections that are used to convey debris.

Chute Hoist: An engineered device that has been designed specifically to raise, anchor, and lower a chute. A chute hoist consists of a support frame and a winch apparatus. The support frame, with the winch apparatus removed, can also be referred to as a chute hoist.

Chute Sections: Modular conical tubes that can be linked together in series to form a chute.

Chute System: A suspended chute and the anchors (including chute hoists) that support it.

Design Factor: Also known as the "safety factor", it is a product's theoretical reserve capacity. The design factor is calculated by dividing the Breaking Strain by the Working Load Limit. The design factor is generally expressed as a ratio, for example: 10 to 1, or 10:1.

Working Load Limit:
The maximum load which can be applied to the component, when the component is new, or in "good as new" condition, and when the load is applied in-line, with respect to the centerline of the component. This term can be abbreviated to WLL.

2. WARNING ELEMENTS

Let's examine the tools used in this manual* to alert planners, supervisors, installers, and users of potential hazards inherent in the use of the Superchute® product.

THE SAFETY ALERT SYMBOL

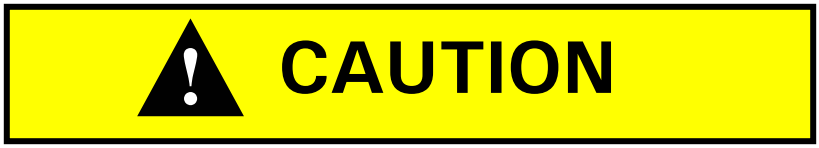
This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

SIGNAL WORDS

A signal word is used to attract your attention to the warning. As indicated below, another purpose of the signal word is to identify the level of risk or hazard involved. The following signal words may be used:

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

* Based on the guidelines of the American National Standards Institute.

WARNING ELEMENTS (continued)

WARNING FORMAT

Warnings are usually displayed in a box to set them apart from other information. The box consists of two or three panels, specifically:

- The signal word appears in the upper panel of the box.
- The hazard statement, consequence statement, and instruction statement(s) appear in the lower panel of the box.
- In a warning that uses three panels, the third panel is pictorial, and identifies the hazard or indicates how to avoid the hazard.

Here is an example of a Superchute® warning with three panels:

Signal word with alert symbol

Hazard

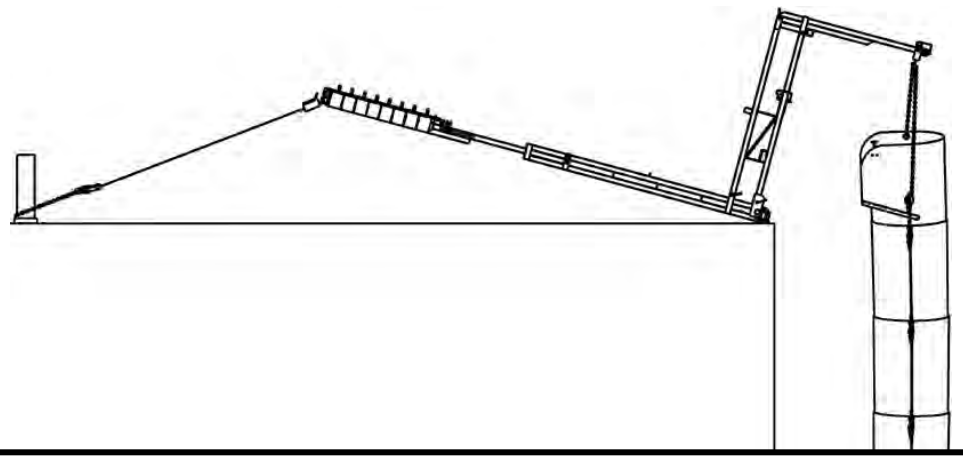
Consequence

Instruction

Pictorial (optional)

WARNING

- If the lifting device is overloaded it could fail and the chute system could collapse.
- A falling chute system can seriously injure or kill.
- Do NOT overload the lifting device. Use the Forms and Weight Charts of Section X to calculate the weight of your chute system.



3. IMPORTANT INFORMATION

- Planners, supervisors, installers and users of the chute system must be able to refer to this manual at any time. Copies of this manual are available from Superchute Ltd. free of charge, **by mail or fax, and can be downloaded from the Superchute® web site at:** www.superchute.com. If this manual is not with the chute system on the job site, postpone installation and use of the chute system until a manual is obtained.

- Before rigging or using the chute system, planners, supervisors, installers and users should be familiar with applicable federal, state, and local safety regulations.

- Use engineered rigging equipment to install and anchor chute sections (for example, a Superchute® chute hoist).

- Do not replace original Superchute® parts with non-Superchute® parts.

- Do not mix Superchute® chute sections with chute sections of another brand.

- Superchute® equipment should only be used by workers who are fit to operate it in a responsible manner.

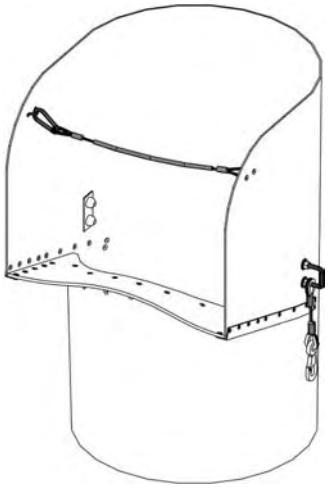
- The Superchute® system is designed to assist in the removal of construction debris. Do not use as a permanent garbage or laundry chute, nor for any other permanent application.

- This manual should not be taken as an overall survey on rigging technique, fall protection, or structure appraisal. Whenever these considerations arise, the planners, supervisors, installers and users of the chute system should secure the services of trained professionals.

- A one-day training seminar is offered free of charge at the Superchute® factory. The seminar examines the proper installation and use of Superchute® chute sections and chute hoists. Call 1-800-363-2488 for details.

4. CHUTE SECTIONS

Superchute® chute sections are conical polyethylene tubes that measure 4 feet (1.2 meters) in height. Two designs are available: Welded sections have a permanent tubular shape, while Wraparound® sections can be stored flat. Both designs provide an equally safe and easy debris removal solution.

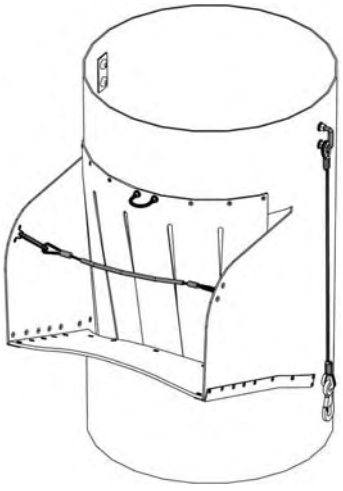


THE TOP HOPPER SECTION

- The Top Hopper is the uppermost section in a chute
- It is an entry point for debris
- Its scoop shape helps channel debris into the chute
- Must be used at the top of a chute

THE REGULAR SECTION

- The Regular Section is a tube
- A chute consists mainly of these sections



THE DOOR SECTION

- The Door Section is an entry point for debris
- It allows for debris removal from many levels
- A chute may contain many Door Sections
- The debris deflection curtain is replaceable
- Adjust the height using a Door Adjustment Kit

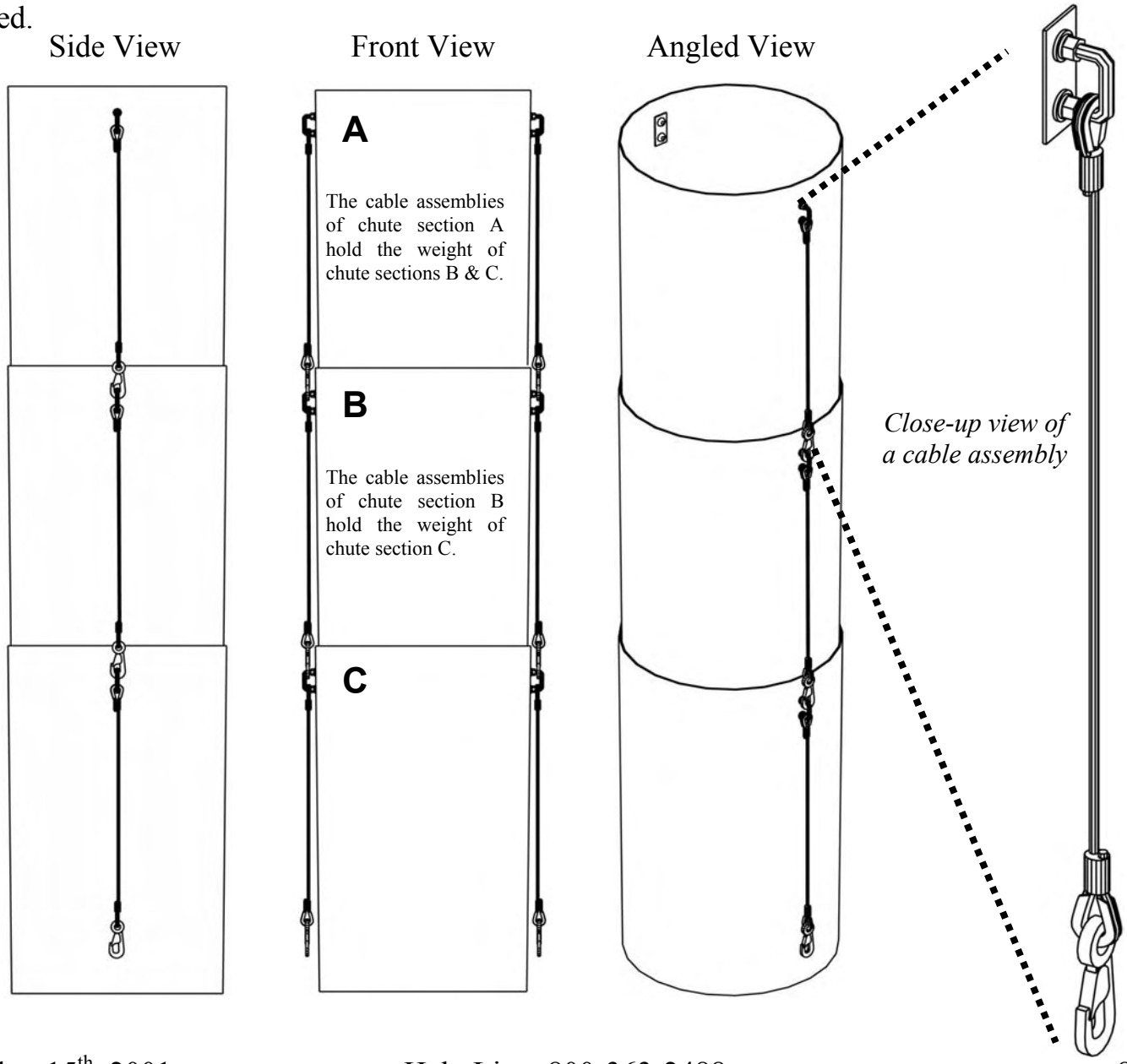
5. THE CABLE ASSEMBLY

THE VITAL COMPONENT

Every Superchute® chute section is equipped with two strong, lightweight cable assemblies that are used to link one chute section to the next.

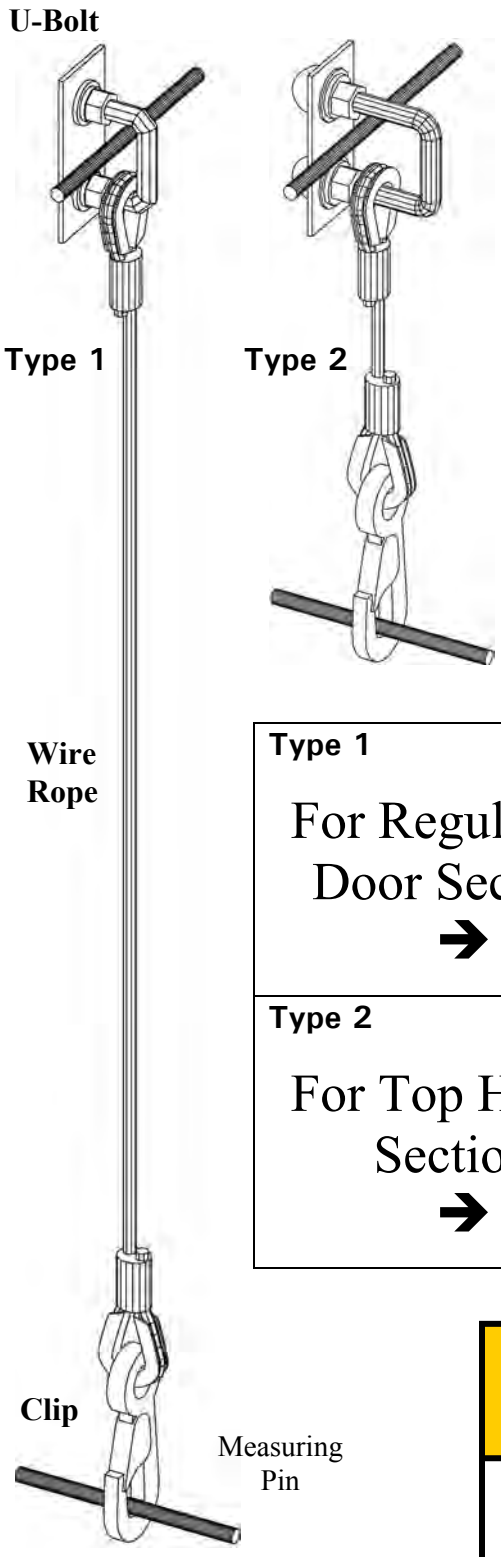
The cable assembly pair is the vital component of a chute section. Each pair supports the weight of the chute sections beneath. Therefore, the uppermost pairs on a suspended chute support more weight than cable assembly pairs located lower down on the chute.

Consequently, if your chute will mix Superchute® sections with older and newer cable assemblies, plan to put the sections with the older cable assemblies at the base of the chute. This action will put the stronger cable assemblies at the top of the chute, where they are most needed.



THE CABLE ASSEMBLY (continued)

STRENGTH OF THE CURRENT CABLE ASSEMBLY



New, undamaged cable assemblies that were manufactured in February 1999 or later have the following specification*:

- The **Breaking Strain** of a cable assembly is 10,000 lb. (4500 kg).
- The **Working Load Limit** of a cable assembly is 1000 lb. (450 kg). The design factor is 10 to 1.
- Because there are two cable assemblies per chute section, a chute section has a Working Load Limit of 2000 lb. (900 kg).

Physical descriptions of the cable assembly types are provided below:

Type 1 For Regular and Door Sections ➔	• ½" (12.5 mm) diameter steel U-bolt • Forged steel clip with gate • 5/16" (8 mm) diameter galvanized wire rope • Working length: 40” (102 cm) pin-to-pin (see sketch).
Type 2 For Top Hopper Sections ➔	• 5/8” (15.5 mm) diameter steel U-bolt • Forged steel clip with gate • 5/16" (8 mm) diameter galvanized wire rope • Working length: 16” (41 cm) pin-to-pin (see sketch).

⚠ WARNING

Abuse or wear and tear will reduce the strength of the cable assembly.

* Height & weight limits for chute sections equipped with older cable assemblies are explained on the next page.

THE CABLE ASSEMBLY (continued)

NEW HEIGHT & WEIGHT LIMITS OF CHUTE SECTIONS

Over time changes have been made to the cable assembly. As well, new height and weight limits are in effect. Check the date stamp on every chute section to understand your new height & weight limit: [1]

a) If the chute section was manufactured in February 1999 or later, and is equipped with the original cable assemblies, it can carry a maximum of **60 sections (200 feet, 60 meters) or 2000 lb. (900 kg) of chute, whichever is reached first.**[2]

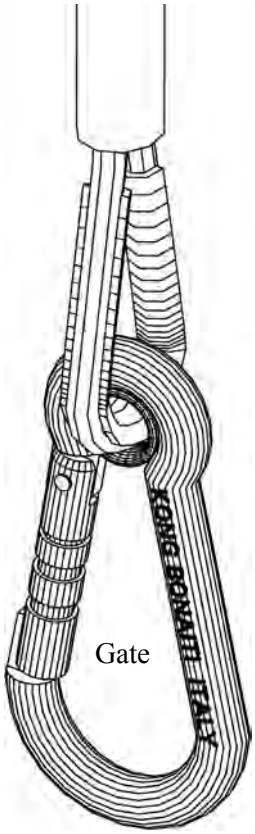
b) If the chute section was manufactured between June 1996 and February 1999, and is equipped with the original cable assemblies, it can carry a maximum of **30 sections (100 feet, 30 meters) or 1000 lb. (450 kg) of chute, whichever is reached first.**[3] If you would like to be able to build a taller chute (up to the limits described in "a)" above), contact the factory for retrofitting of the cable assemblies.

c) If the chute section was manufactured prior to June 1996, and is equipped with the original cable assemblies, it can carry a maximum of **15 sections (50 feet, 15 meters) or 500 lb. (225 kg) of chute, whichever is reached first.**[4] The cable assemblies of these sections feature lightweight, metal alloy clips stamped with the words "KONG – BONAITI - ITALY" (shown on the right). The KONG clip is **<u>much weaker</u>** than the forged ones currently used. The three possible colors of the KONG clip are:

1. blue frame with red gate
2. purple frame with blue gate
3. silver frame with silver gate

If you have chute sections equipped with cable assemblies that use KONG clips, and would like to be able to build a taller chute (up to the limits described in "a)" above), contact the factory for retrofitting of the cable assemblies.

THE GATE OF THE "KONG" CLIP MUST CLOSE FULLY. If the gate is not fully closed, its strength is greatly reduced. Oil the gate hinge and spring regularly. Discard cable assemblies whose clip gates do not spring shut.



The above information applies to new, undamaged cable assemblies working together in pairs. Abuse or wear and tear will reduce the strength of the cable assembly. If you are unsure of the strength of your cable assemblies, please call the Superchute® factory (800-363-2488).

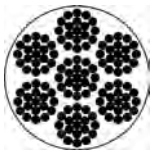
Notes:

[1] As of June 1996 the month and year of manufacture have been branded into every chute section.

[2, 3, 4] Superchute® makes 6 diameters of chute. The larger diameter chute sections weigh more, so they will reach the weight limit before the height limit. Before each installation, calculate the precise weight of your chute using the instructions and charts in Sections 7 and 8.

THE CABLE ASSEMBLY (continued)

WHY IS WIRE ROPE USED IN THE CABLE ASSEMBLY?

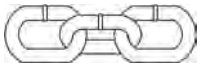


Cross sectional view of a wire rope

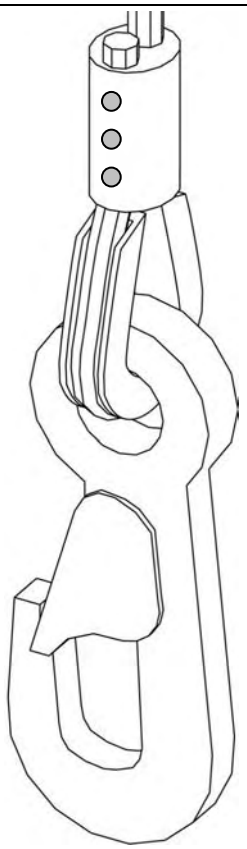
"For general construction rigging never use a chain when it is possible to use wire rope. The failure of a single link of chain can result in a serious accident but wire rope on the other hand is frequently composed of 114 wires, all of which must fail before the rope breaks. Wire rope gives you reserve strength and a chance to notice a hazard, chains do not."

Rigging Manual, CSAO, 1996

There are many advantages to wire rope:

Wire Rope	**Chain** 
Provides warning when worn	No visible warning before failure
Consistent strength	Inconsistent strength – except the high quality grades
Lightweight	Heavy and bulky
The many strands create a multiple point suspension system	Single point suspension: Lose a link – lose it all. Chain is only as strong as its weakest link.

Occasionally Superchute® will use chain in cases where adjustment is required. For example: Door Adjustment Kits and chute hoists. However, only high quality Grade 70 and Grade 80 chains are ever used.



The three dots on the pressed sleeve are Superchute's® identifying mark. This mark has been in effect since March 1998.

Close up view of the forged clip used on cable assemblies since June 1996.

THE CABLE ASSEMBLY (continued)

ATTACHMENT TO THE CHUTE WALL

Prior to installing a chute section, ensure that two cable assemblies are fastened securely to the chute wall.

Please note that Wraparound® sections are usually shipped flat (from the factory), without the cable assemblies attached to the chute wall. This shipping method keeps the sections from shifting in transport.

Attach cable assemblies to the chute wall using the instructions shown below and on the next page (these instructions are included with every pair of packaged cable assemblies).

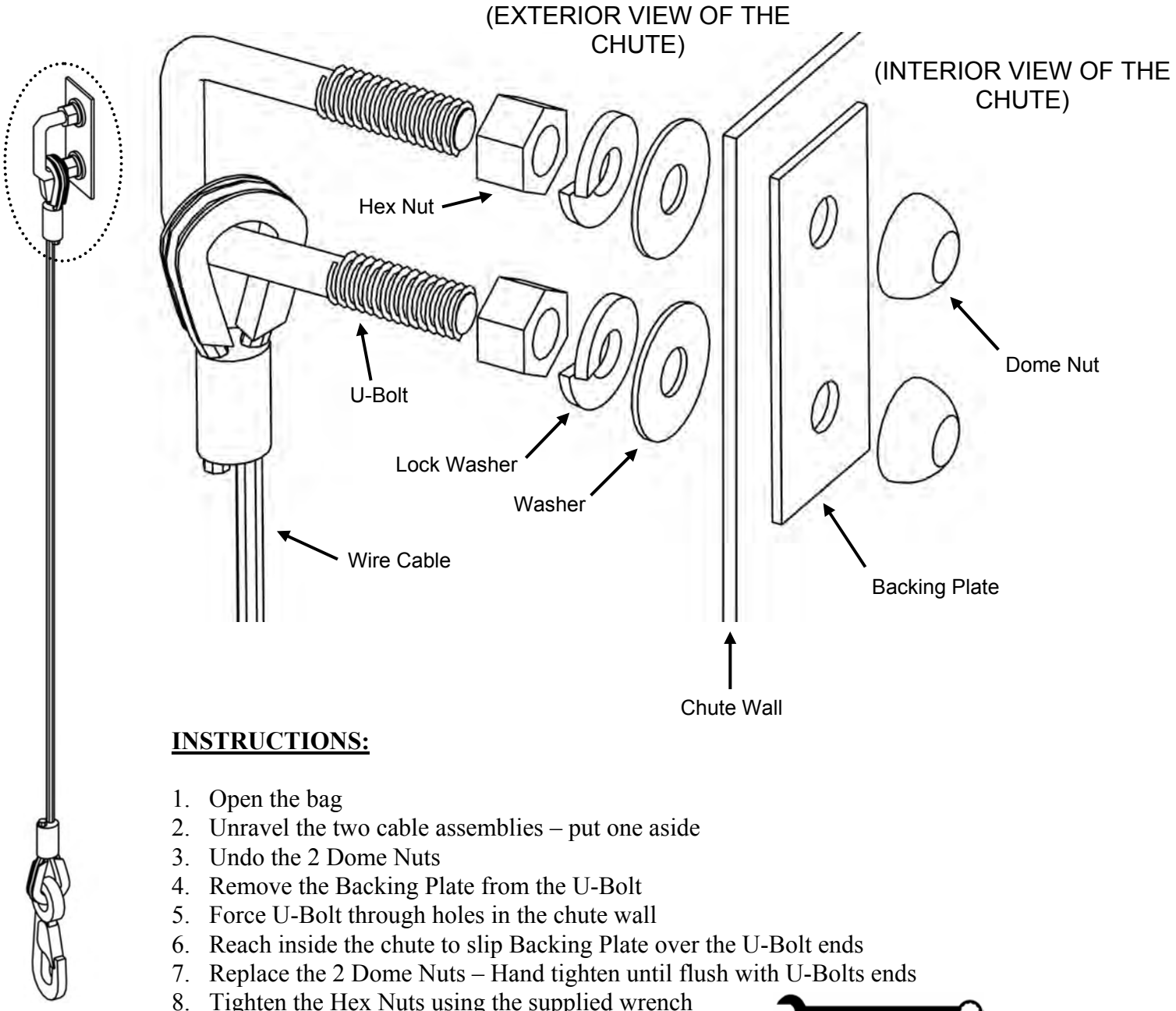
⚠ WARNING

- A loosely attached U-Bolt could undo and cause the failure and collapse of the chute.
- A falling chute system can cause serious injury and death.
- Attach each cable assembly to the chute wall, per the diagram enclosed with every cable assembly bag (see next page).
- **To further demonstrate the correct attachment, factory staff have fitted the uppermost chute section in the crate with its cable assemblies.**

THE CABLE ASSEMBLY (continued)

ATTACHMENT TO THE CHUTE WALL (continued)

U-Bolt Installation Instructions



INSTRUCTIONS:

1. Open the bag
2. Unravel the two cable assemblies – put one aside
3. Undo the 2 Dome Nuts
4. Remove the Backing Plate from the U-Bolt
5. Force U-Bolt through holes in the chute wall
6. Reach inside the chute to slip Backing Plate over the U-Bolt ends
7. Replace the 2 Dome Nuts – Hand tighten until flush with U-Bolts ends
8. Tighten the Hex Nuts using the supplied wrench
9. Repeat steps 3 to 8 with the second cable assembly

LEAVE CABLE ASSEMBLIES FASTENED TO THE CHUTE SECTION UNTIL THEY REQUIRE REPLACEMENT DUE TO WEAR & TEAR OR ABUSE

THE CABLE ASSEMBLY (continued)

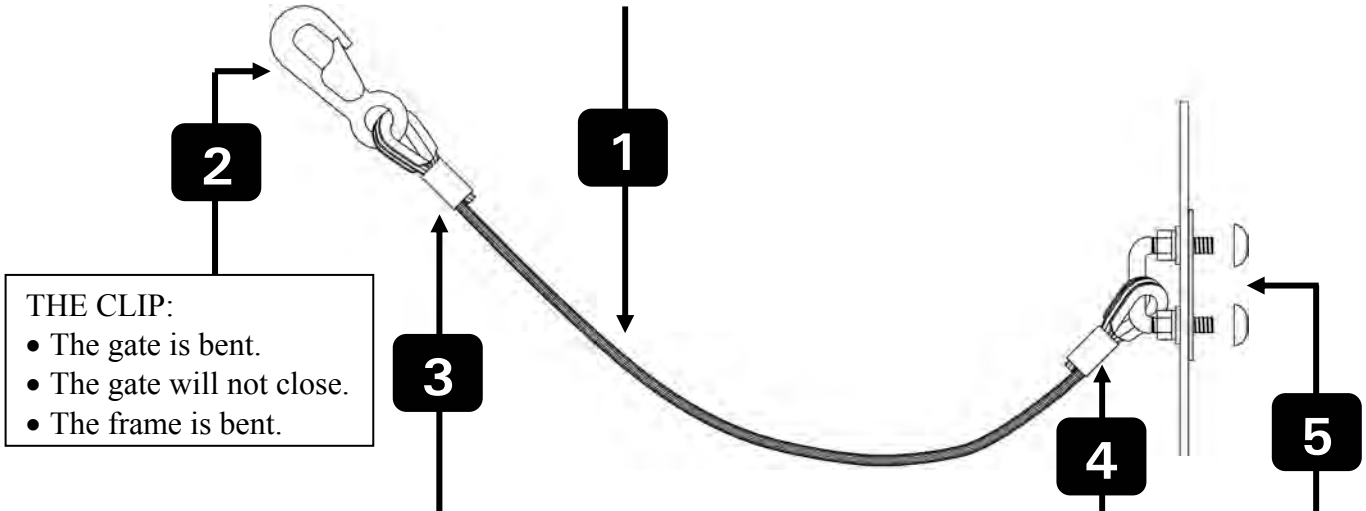
MAINTENANCE

Check the condition of the cable assemblies on each chute section regularly:

- Replace cable assemblies that show signs of wear.
- Replace cable assemblies that have been strained.
- Oil the clip's gate hinge and spring regularly. The gate must spring closed.
- For forged clips, spare gate springs can be purchased from Superchute® Ltd.
- Replace damaged cable assemblies with new, authentic Superchute® cable assemblies.
- Always change the full cable assembly, not just a part of it.
- Keep a written register, with dates and signatures, of all maintenance operations: record and identify chute sections whose cable assemblies have been upgraded (or downgraded). Engrave a code or date into the plastic chute wall adjacent the cable assembly, or attach a durable identifying tag to the cable assembly.

Discard The Entire Cable Assembly If Any Of The Following Conditions Are Discovered:

THE WIRE ROPE:
- There are 3 or more protruding broken wires within a 2 inch (5 cm) interval.
- There are broken wires near attached fittings.
- The wire rope has kinks, birdcages, twists, or other distortions.
- The wire rope has been stretched.
- The wire rope is corroded.
- The wire has been damaged by heat, as evidenced by discolored wires.



THE CLIP:
- The gate is bent.
- The gate will not close.
- The frame is bent.

THE WIRE ROPE FITTINGS:
- The thimble is loose and rattles in cable eye.
- The pressed sleeve is cracked, loose, or damaged.

THE U-BOLT GROUP:
• The U-bolt is bent, cracked, or damaged. • Pieces are missing from the U-Bolt Group.

THE CABLE ASSEMBLY (continued)

⚠ WARNING

Certain factors can be abusive and lessen the load that the cable assembly (and by extension, the chute section) can withstand. Some examples are:

- twisting of the cable assembly
- disfigurement, deterioration by straining, usage, weathering, heat, and corrosion
- rapid application of load or jerking
- the application of excessive loads

Keep corrosive substances away from the cable assemblies, and do not weld near the chute system.

Some types of damage may not be visible to the eye. Consider the following example:

Incident: A blockage occurred in a tall chute. The blockage went unnoticed and workers continued to introduce debris into the chute. The installers had calculated the weight of the unblocked chute to be 1500 lb. (680 kg).

Debris continued to accumulate in the chute until the blockage was finally discovered by the inattentive safety monitor. A crane was called in and the entire chute was lowered to the ground. The crane's load indicator showed the total weight of the chute and blocked debris to be 15,000 lb. (6800 kg).

Upon inspection of the cable assemblies, no obvious signs of strain were noted. The chute sections were equipped with cable assembly pairs having a combined working load limit of 2000 lb. (900 kg). The breaking strain of the cable assembly pairs is 20,000 lb. (9000 kg).

Action: Although the cable assemblies showed no obvious sign of strain, the working load limits were greatly exceeded. All the cable assemblies should be replaced.

Conclusion: If, during the course of your job, the working load limits of the cable assemblies are accidentally exceeded, consult a structural engineer and the Superchute® factory to determine whether the chute sections in that system must be refitted with new cable assemblies.

6. SELECT AN INSTALLATION AREA

Choose the installation area carefully. A poor choice can create a hazardous chute system.

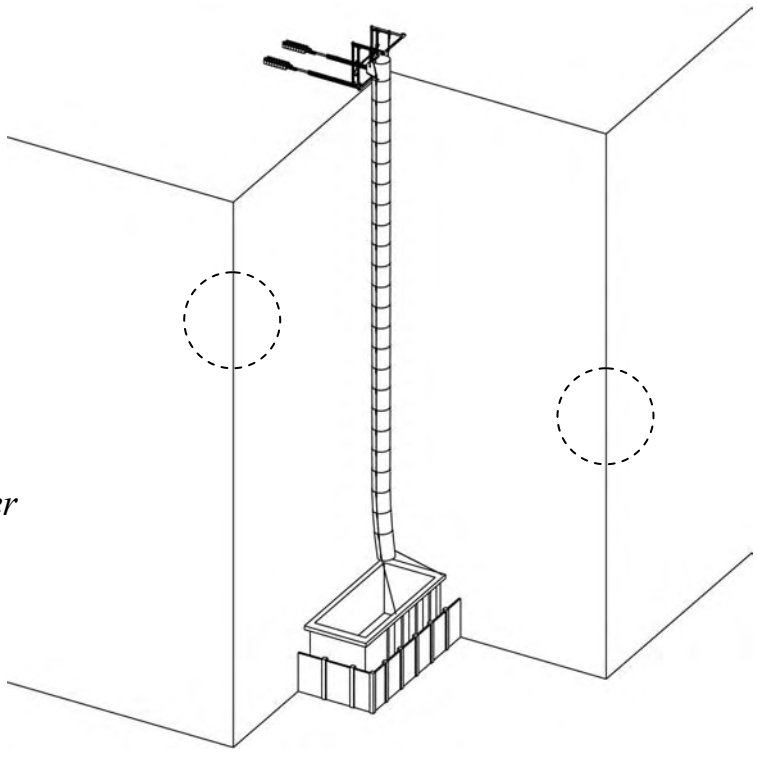
Use the following guidelines when choosing the site for your chute installation.

1) **SAFETY OF THE PUBLIC:** The chute should be located in an area far from the public. Always consider the consequences of a worst case scenario. For example:

   - If the chute collapsed (due to a blockage that overloaded the cable assemblies) would it fall across a high traffic area, over a road, over a pedestrian walkway?
   - If a worker tossed a brick into a top hopper or door section, but missed, what could be the consequence of the brick falling outside the chute?
   - If a hole wore through the chute wall, and debris escaped from the chute, would the debris shower the public below?

2) **SHELTER FROM THE WIND:**

   - Select an area that provides shelter from the PREVAILING wind.
   - Building corners that protrude outwards tend to accelerate the wind. Due to this effect, do not place the chute within 20 feet (6 meters) of a protruding building corner.
   - Inset corners generally provide excellent shelter from the wind. Whenever possible, install the chute in an inset corner (see sketch).
   - The effect of wind on the chute is discussed in Section 10: Installation, under the heading: "Wind & Restraint Issues".



A chute shown installed in an inset corner

Note the protruding corners (circled)

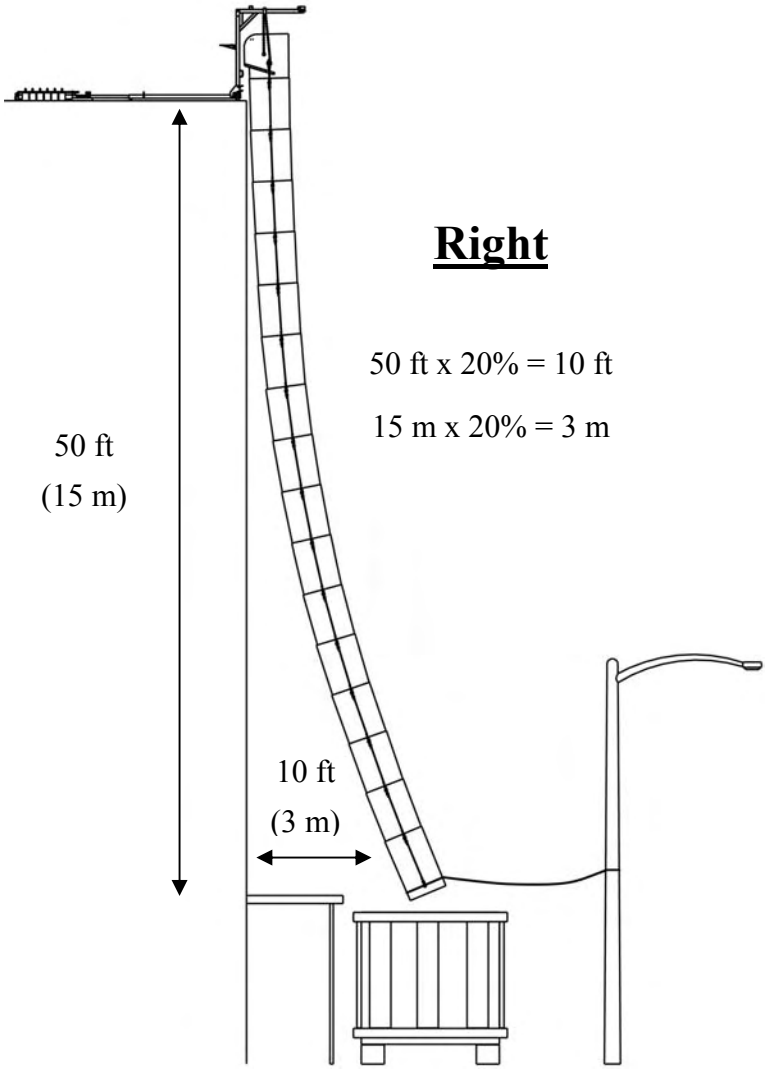
SELECT AN INSTALLATION AREA

(continued)

3) **ELECTROCUTION**: Prevent electrocution by choosing an area that is free of electric cables. If cables are present, contact your local electrical authority before proceeding.

4) **THE CHUTE MUST HANG VERTICALLY:** To reduce the risk of a blockage, choose an area where the chute will hang vertically. Horizontal displacement of the chute must not exceed 20% of the chute's height. See the sketch below.

If the chute does not hang vertically, debris will rub against the chute wall. This friction will cause the speed of the moving debris to decrease, possibly to the point where debris stops moving, thereby creating a blockage.



5) **PROTRUSIONS THAT CONSTRICT THE CHUTE:** Choose an area that will not force the chute to bend over balconies, ledges or any other kind of large structural protrusion that will constrict the chute. The next page provides further information on this subject.

SELECT AN INSTALLATION AREA

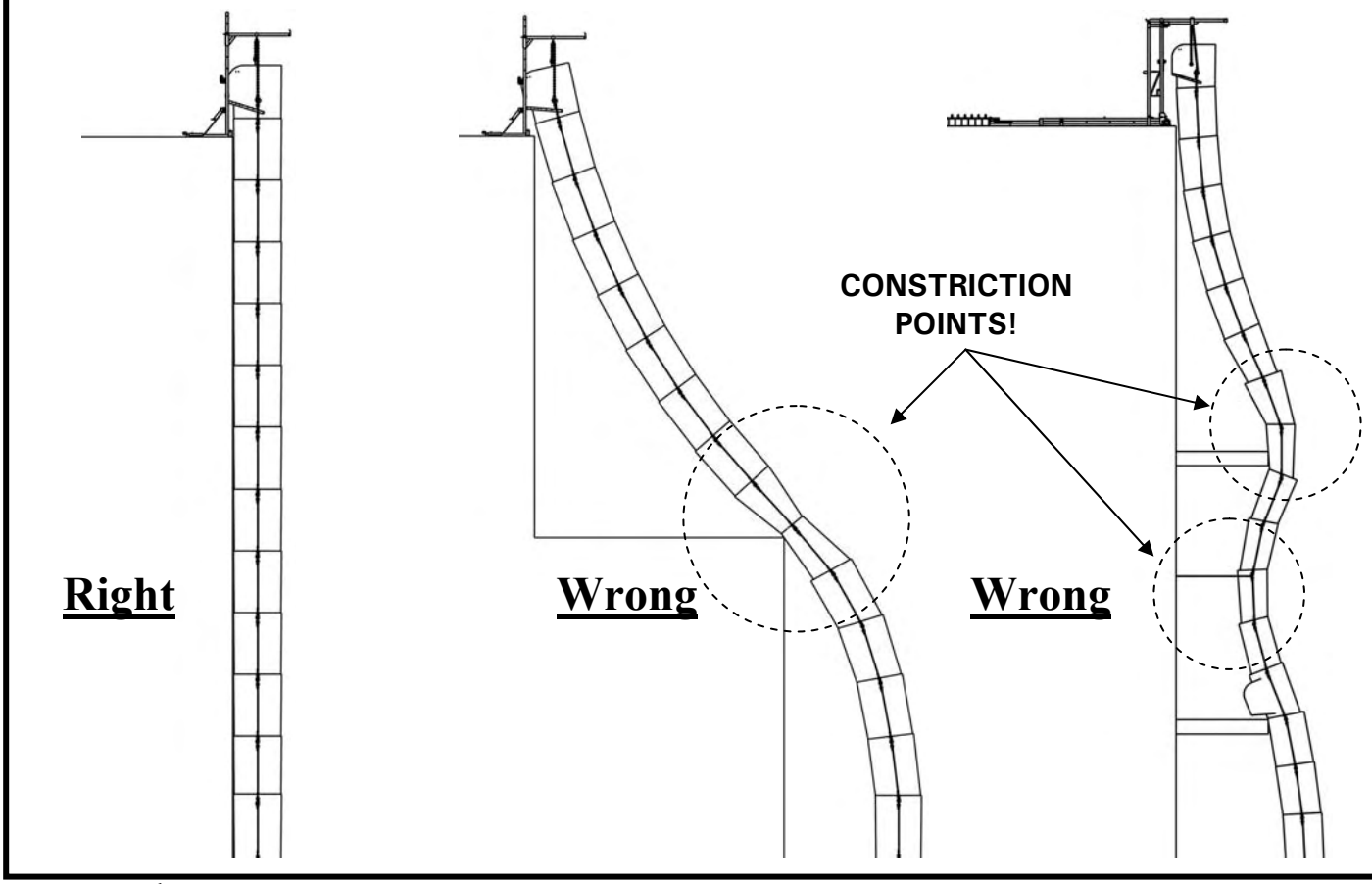
(continued)

BLOCKAGE HAZARDS

⚠ WARNING

- If the chute is not hung vertically, there will be a bend in it.
- If the bend is too sharp, when users introduce debris they will clog the chute. If the blockage is not noticed and more debris is introduced, the total weight of the chute will rapidly increase, and the chute system could collapse.
- A collapsing chute system can cause serious injury and death.
- Do not create a blockage hazard:

1. Choose a location that will allow the chute to hang vertically.
2. Choose a location that will not crimp or constrict the chute.



SELECT AN INSTALLATION AREA

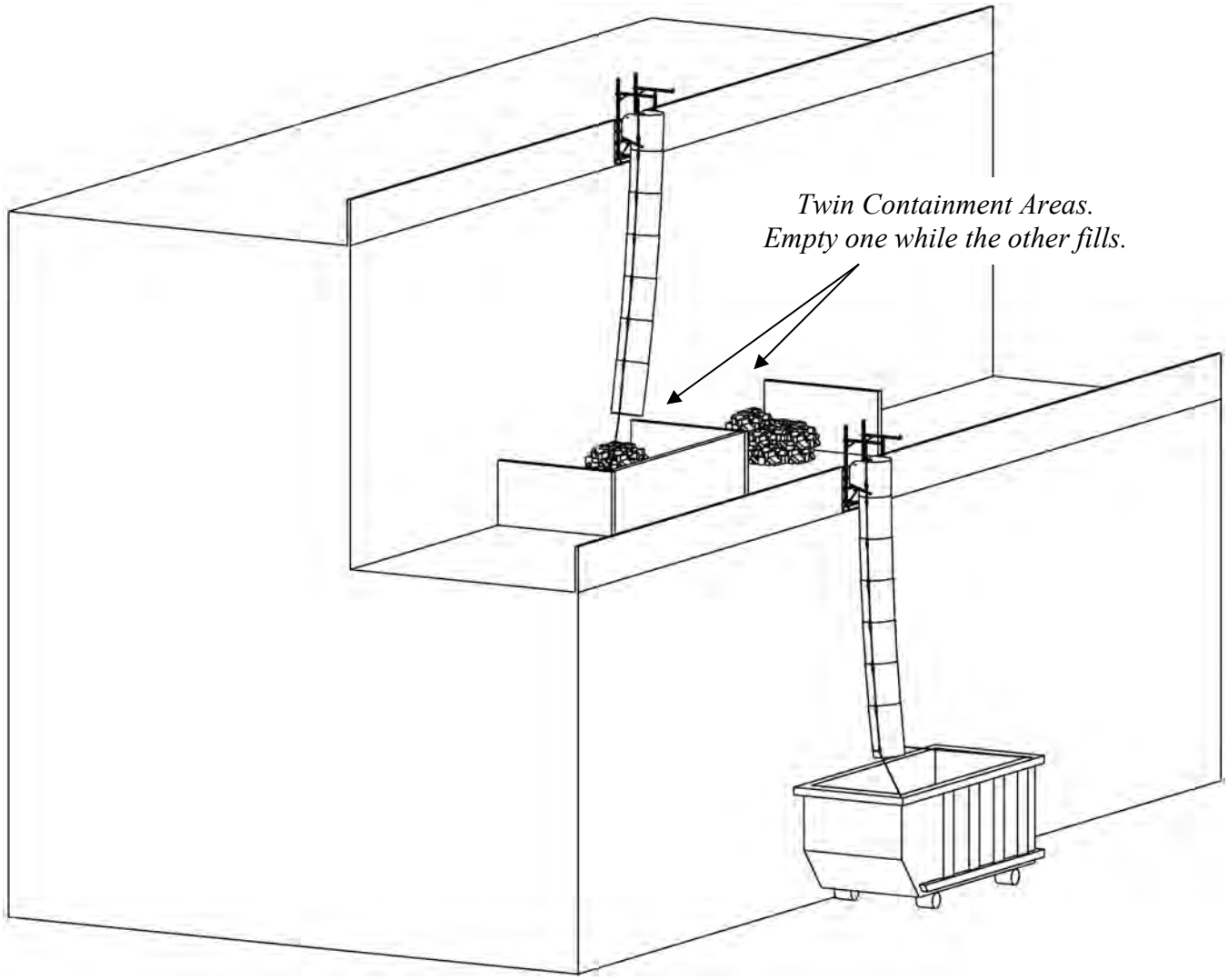
(continued)

SPECIAL CASES

In cases where the building exterior is stepped or irregular, consider the following options:

1. Can the chute be installed in an unused elevator shaft, inside the building? This option is usually feasible on new construction projects.

2. Can the chute be split into two or more vertical lengths? See the sketch below for clarification.



7. ASSESS CHUTE HEIGHT & WEIGHT

SAMPLE

- The first step in undertaking a chute installation is to formulate an installation plan.
- This page is a planning tool, which is used here to illustrate an imaginary chute job.
- The next page is clean and is for your own use. Photocopy it and use it to plan your chute installations.

JOB NAME: Hotel On First Ave. Measurements: Imperial or Metric?

1. What is the anticipated height of the chute? 70 feet feet or meters.
   Measure or calculate the drop that your chute will cover.

2. How many chute sections will be needed? 70 feet x 3 divided by 10 = 21
   Height in feet x 3 ÷ 10 = 21 sections needed.
   When linked, 3 chute sections of any type will create a 10 foot drop.
   or
   Height in metres = _____ sections needed.
   When linked, a chute section of any type creates a 1 meter drop.

3. How many entry sections will be needed? 3 sections.
   Many chutes are designed with a Top opening only. However, you may want to use Door sections if you will be working on several floors simultaneously.

4. What diameter of chute will be used? Circle: **[18"] [23"] [27"] [30"] [33"] [36"]**
   Every chute section is branded with its diameter.

5. Calculate the total weight of the chute using the form below:
   Every chute section is branded with its weight.
   Section Weights are also provided on pages 22, 23.

Chute Weight Calculation Form

	Quantity			Weight in lb. or kg.		Weight in lb. or kg.
A)	1	Top Hopper Wraparound	x	41 lb. each	=	41 lb.
B)	2	Door Sections Wraparound	x	50 lb. each	=	100 lb.
C)	18	Regular Sections Wraparound – 3/16" wall	x	39 lb. each	=	702 lb.
D)	2	Steel Liners	x	40 lb. each	=	80 lb.
A+B+C+ D	=	**TOTAL WEIGHT OF THE CHUTE**			=	923 lb.

ASSESS CHUTE HEIGHT & WEIGHT (continued)

Before the chute is rigged it's height and weight must be calculated. Photocopy this form and use it with the weight charts provided on the next two pages. Knowing the total weight of the chute allows the installer(s) to choose an appropriate lifting device and suitable anchors. If at any time you would like to discuss the particulars of your job situation, please feel free to call the Superchute® factory: 1-800-363-2488.

JOB NAME: _____ Measurements: Imperial or Metric?

1. What is the anticipated height of the chute? _____ feet or meters.
   Measure or calculate the drop that your chute will cover.

2. How many chute sections will be needed?

   Height in feet x 3 ÷ 10 = _____ sections needed.
   When linked, 3 chute sections of any type will create a 10 foot drop.

   or

   Height in metres = _____ sections needed.
   When linked, a chute section of any type creates a 1 meter drop.

3. How many entry sections will be needed? _____ sections.
   Many chutes are designed with a Top opening only. However, you may want to use Door sections if you will be working on several floors simultaneously.

4. What diameter of chute will be used? Circle: **[18"] [23"] [27"] [30"] [33"] [36"]**
   Every chute section is branded with its diameter.

5. Calculate the total weight of the chute using the form below:
   Every chute section is branded with its weight.
   Section Weights are also provided on pages 22, 23.

Chute Weight Calculation Form

	Quantity		Weight in lb. or kg.		Weight in lb. or kg.
A)	1	Top Hopper	x _____ each	=	_____
B)	_____	Door Sections	x _____ each	=	_____
C)	_____	Regular Sections	x _____ each	=	_____
D)	_____	Steel Liners	x _____ each	=	_____
A+B+C+ D =		**TOTAL WEIGHT OF THE CHUTE**		=	_____

8. CHUTE SECTION WEIGHT CHARTS

IMPERIAL WEIGHTS

THE WEIGHTS ON THIS PAGE ARE GIVEN IN POUNDS (LB).

- For metric weights, see the next page.
- An "X" signifies that no such section exists.
- If using steel liners, do not forget to account for their weight.

WELDED SECTION WEIGHTS (in lb.)

Diameter	Wall Thickness	Regular	Top Hopper	Door
18"	**3/16" (5 mm)**	23	24	29
23"	**3/16" (5 mm)**	27	29	36
27"	**3/16" (5 mm)**	32	34	41
30"	**3/16" (5 mm)**	36	39	47
30"	**5/32" (4 mm)**	27	X	X
30"	**1/8" (3.2 mm)**	X	X	X
33"	**3/16" (5 mm)**	X	40	50
36"	**3/16" (5 mm)**	X	46	57

WRAPAROUND® SECTION WEIGHTS (in lb.)

Diameter	Wall Thickness	Regular	Top Hopper	Door
18"	**3/16" (5 mm)**	X	X	X
23"	**3/16" (5 mm)**	30	30	40
27"	**3/16" (5 mm)**	34	41	47
30"	**3/16" (5 mm)**	39	41	50
30"	**5/32" (4 mm)**	31	X	X
30"	**1/8" (3.2 mm)**	28	X	X
33"	**3/16" (5 mm)**	43	48	57
36"	**3/16" (5 mm)**	46	55	64

LINER WEIGHTS (in lb.)

For 18" dia.	For 23" dia.	For 27" dia.	For 30" dia.	For 33" dia.	For 36" dia.
23 lb.	32 lb.	37 lb.	40 lb.	48 lb.	53 lb.

WEIGHT CHARTS (continued)

METRIC WEIGHTS

THE WEIGHTS ON THIS PAGE ARE GIVEN IN KILOGRAMS (KG).

- For imperial weights, see the previous page.
- An "X" signifies that no such section exists.
- If using steel liners, do not forget to account for their weight.

WELDED SECTION WEIGHTS (in kg.)

Diameter	Wall Thickness	Regular	Top Hopper	Door
46 cm (18")	**5 mm**	10.5	11.0	13.0
58 cm (23")	**5 mm**	12.5	13.0	16.5
69 cm (27")	**5 mm**	14.5	15.5	19.0
76 cm (30")	**5 mm**	16.5	18.0	21.5
76 cm (30")	**4 mm**	12.5	X	X
76 cm (30")	**3.2 mm**	X	X	X
84 cm (33")	**5 mm**	X	18.0	23.0
91 cm (36")	**5 mm**	X	21.0	26.0

WRAPAROUND® SECTION WEIGHTS (in kg.)

Diameter	Wall Thickness	Regular	Top Hopper	Door
46 cm (18")	**5 mm**	X	X	X
58 cm (23")	**5 mm**	14.0	14.0	18.0
69 cm (27")	**5 mm**	15.5	19.0	21.5
76 cm (30")	**5 mm**	18.0	19.0	23.0
76 cm (30")	**4 mm**	14.0	X	X
76 cm (30")	**3.2 mm**	13.0	X	X
84 cm (33")	**5 mm**	19.5	22.0	26.0
91 cm (36")	**5 mm**	21.0	25.0	29.0

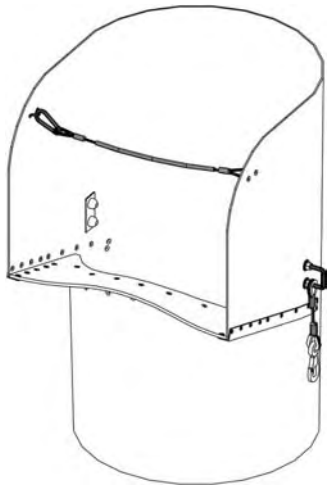
LINER WEIGHTS (in kg.)

For 18" dia.	For 23" dia.	For 27" dia.	For 30" dia.	For 33" dia.	For 36" dia.
10.5 kg.	14.5 kg.	17.0 kg.	18.0 kg.	22.0 kg.	24.0 kg.

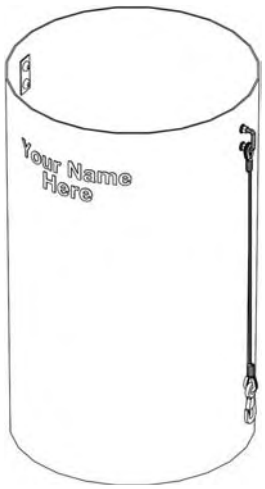
9. ON THE SITE

PREPARATION OF WELDED STYLE SECTIONS FOR USE

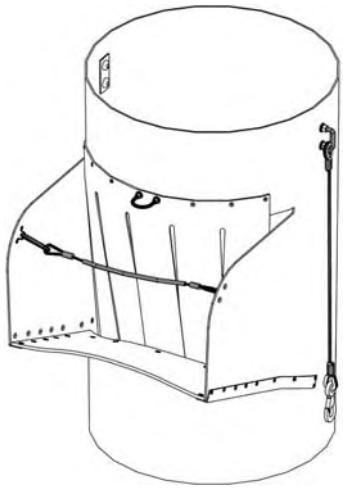
Welded style sections are permanent tubes. Sketches are shown below. No assembly of this section style is needed, providing the cable assemblies are properly attached.



Top Hopper Section

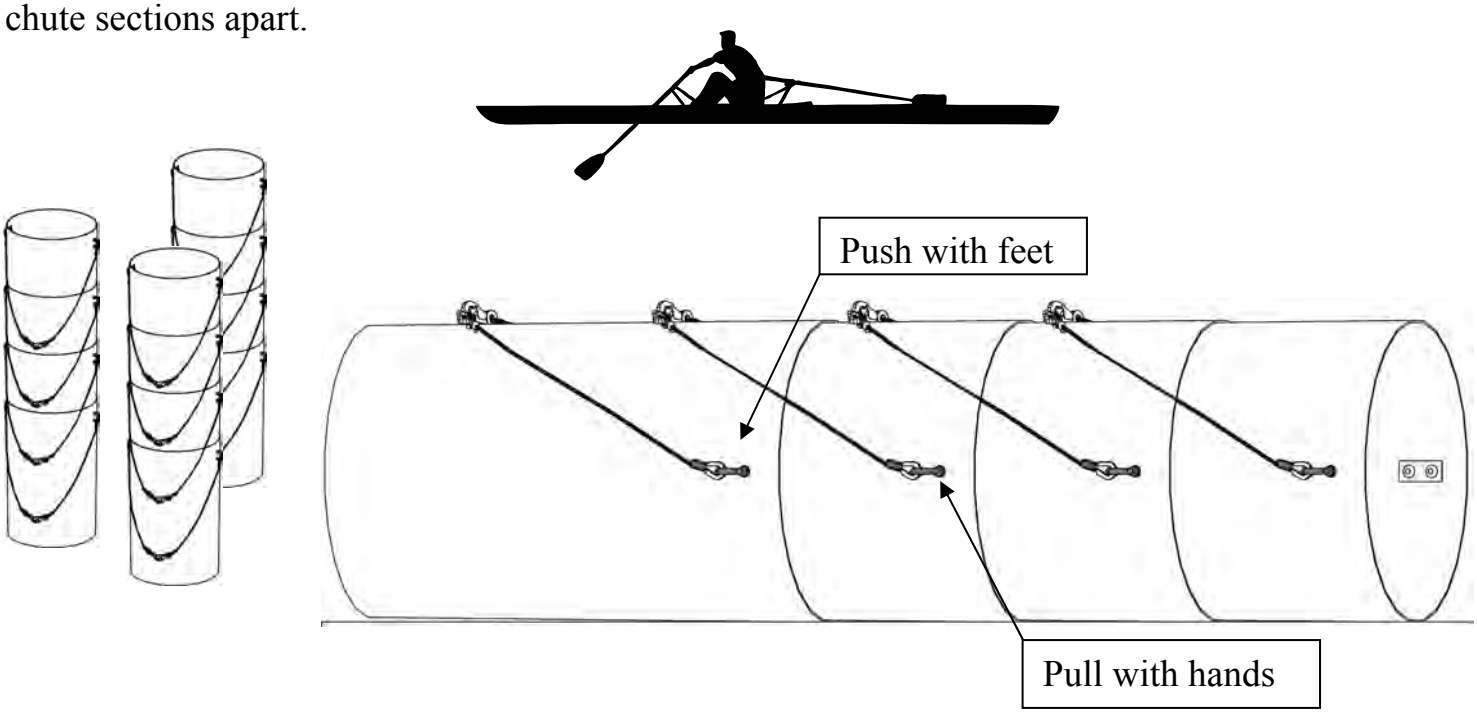


Regular Section



Door Section

Occasionally, Welded style regular sections that have been stacked for storage or transport can get stuck together. To get them apart, lie the bundle on its side and have two people "row" the chute sections apart.



If this technique does not work, use a winch to pull the sections apart.
If all of the sections you will be using are of the Welded style, then please proceed to page 29.

ON THE SITE (continued)

PREPARATION OF WRAPAROUND® STYLE SECTIONS FOR USE

Wraparound® style sections have the ability to go flat for storage and job-to-job shipping.

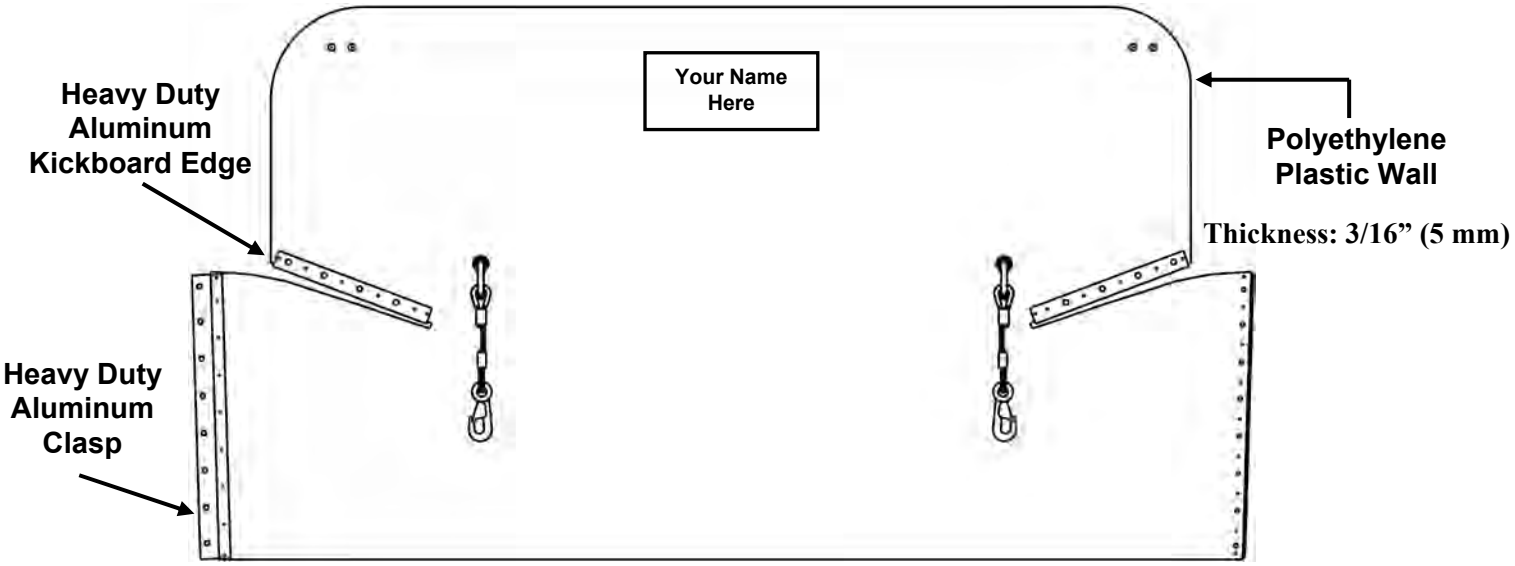
If all of the sections you will be using are of the Welded style, then please proceed to page 29.

Assembly Time:
- The assembly of a Regular section requires approximately 1 minute.
- The assembly of a Door or Top Hopper section requires approx. 10 minutes.

The following three pages show the assembly procedure.

ON THE SITE (continued)

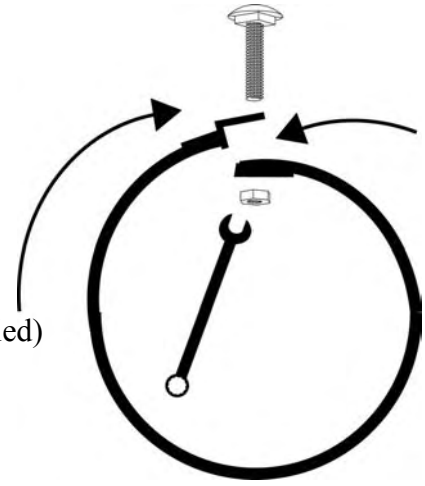
ASSEMBLY OF THE WRAPAROUND® TOP HOPPER SECTION

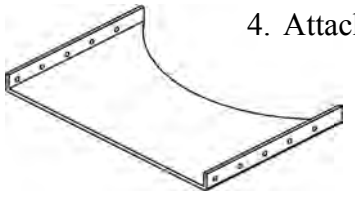


Flat: Ready for Transport / Storage

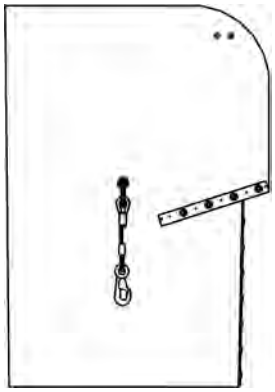
TO USE:

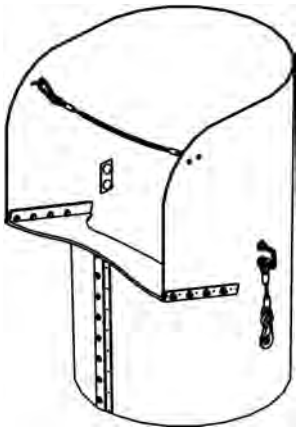
1. Lay down section with U-bolts facing the ground
2. Wrap the aluminum clasp edges together
3. Fasten clasp with carriage bolts & wrench (supplied)
4. Attach kickboard with hexhead bolts & wrench (supplied)



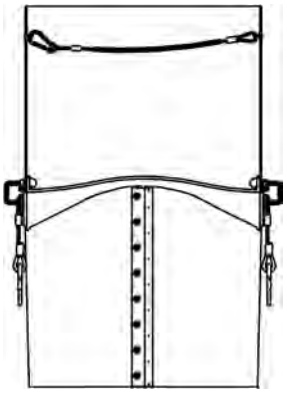


Polyethylene Kickboard
Thickness: 3/8" (9 mm)



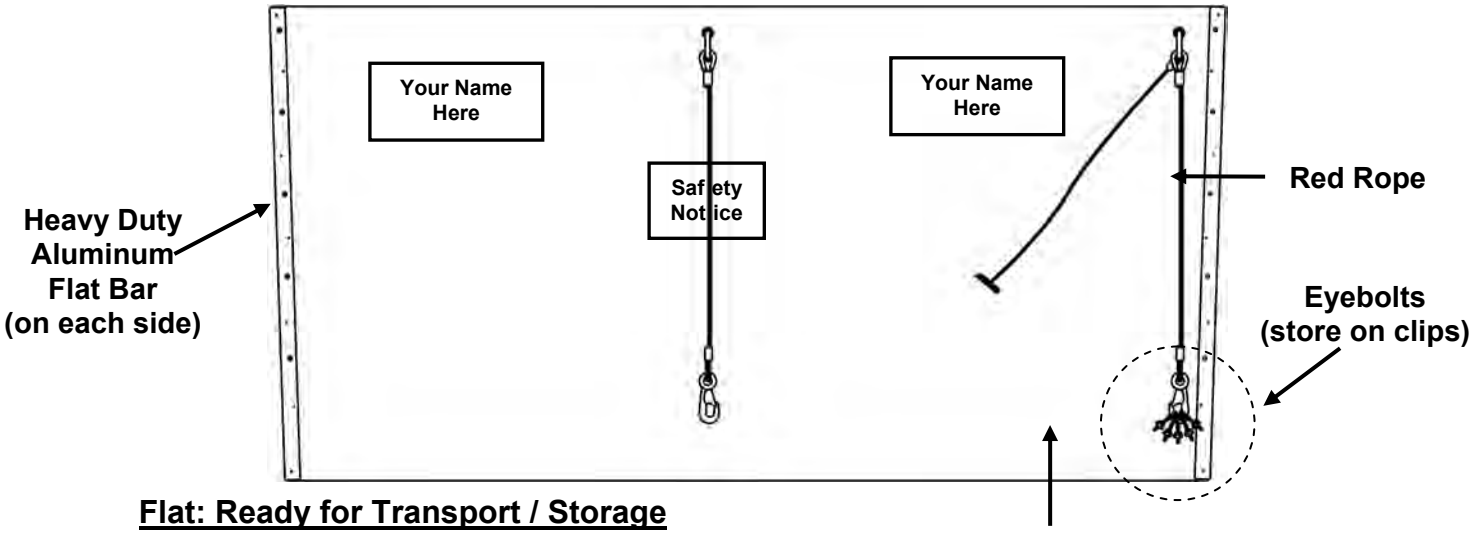


Assembled: Ready for Use



ON THE SITE (continued)

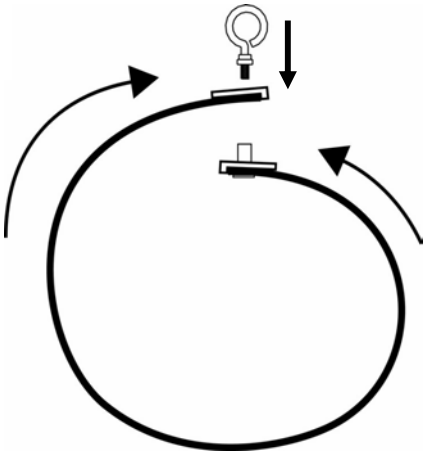
ASSEMBLY OF THE WRAPAROUND® REGULAR SECTION



Flat: Ready for Transport / Storage

Polyethylene Plastic Wall
Thickness (inches): 1/8", or 5/32", or 3/16"
Thickness (metric): 3.2 mm, or 4 mm, or 5 mm

TO USE:

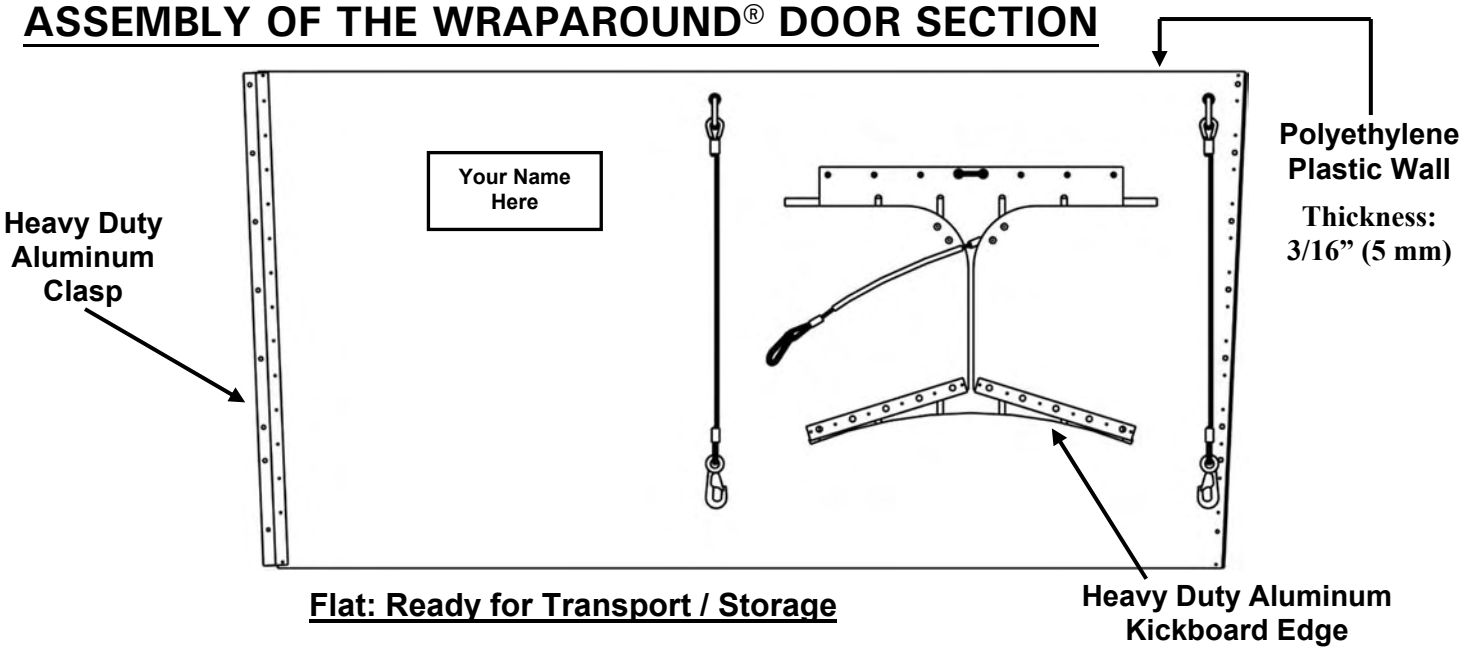


1. Remove 5 eyebolts from the cable assembly clip
2. Lay down section with U-bolts facing the ground
3. Wrap the ends of the section together
4. Align and mate the 5 studs with the 5 holes
5. Insert 5 supplied eyebolts into studs. Hand tighten
6. Pass the red elastic rope through all 5 eyebolts
7. Tie the elastic to the lowest eyebolt
8. With the elastic in place the eyebolts cannot vibrate out

Assembled: Ready for Use

ON THE SITE (continued)

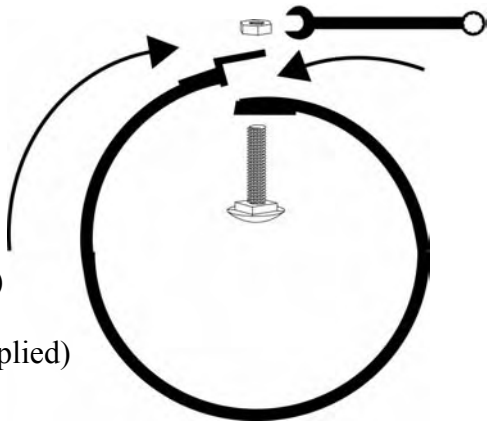
ASSEMBLY OF THE WRAPAROUND® DOOR SECTION

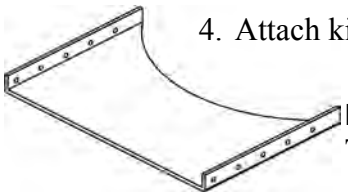


Flat: Ready for Transport / Storage

TO USE:

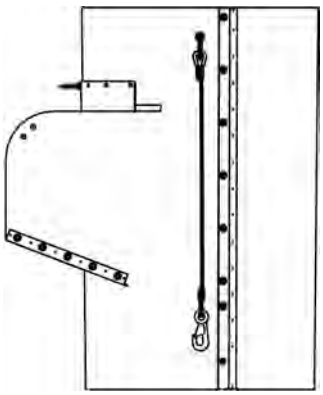
1. Lay down section with U-bolts facing the ground
2. Wrap the aluminum clasp edges together
3. Fasten clasp with carriage bolts & wrench (supplied)
4. Attach kickboard with hexhead bolts & wrench (supplied)

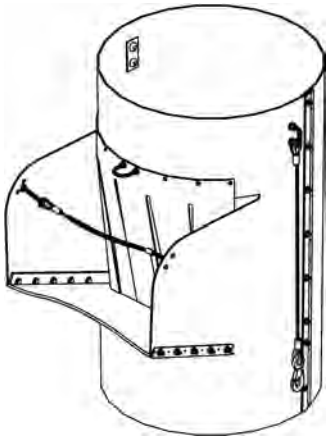




Polyethylene Kickboard
Thickness: 3/8" (9 mm)

Assembled: Ready for Use





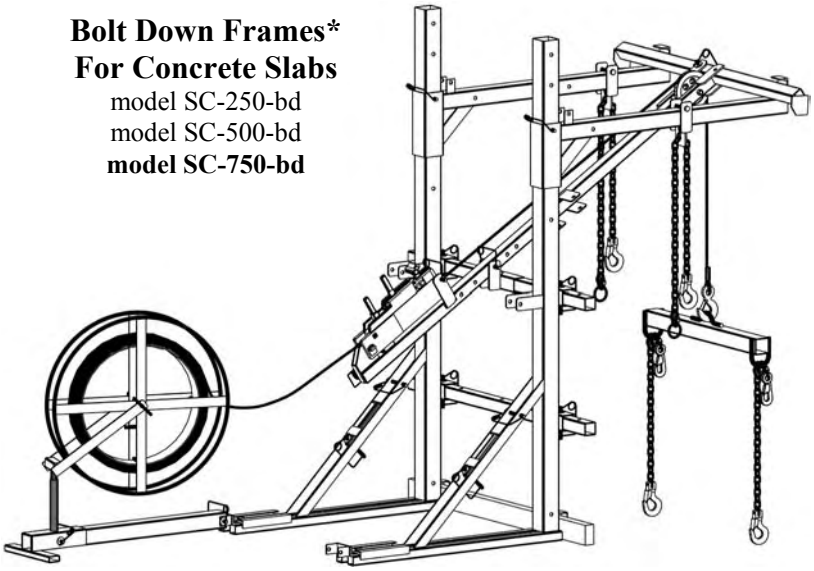
10. INSTALLATION

CHUTE HOISTS

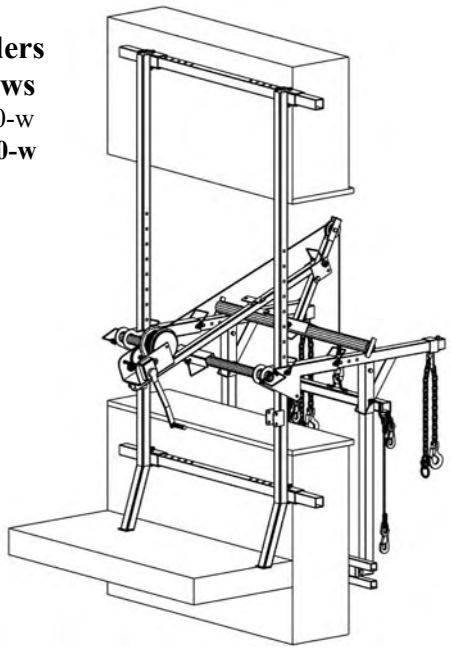
Safer chute installations can be achieved using engineered Superchute® chute hoists.

Superchute® hoists are designed specifically for RAISING, ANCHORING, & LOWERING the chute. Eleven models of hoist are available. The model name of a hoist refers to the max. weight it can manage in pounds, for example: the SC-500-bd can raise, anchor, & lower 500 lb. (225 kg).

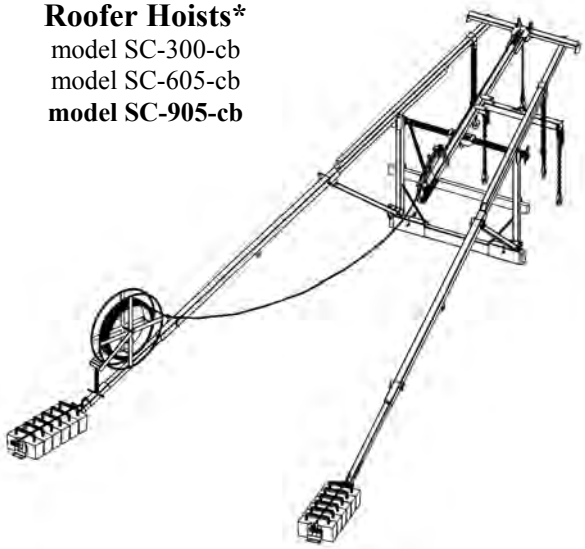
Bolt Down Frames*
For Concrete Slabs
model SC-250-bd
model SC-500-bd
model SC-750-bd



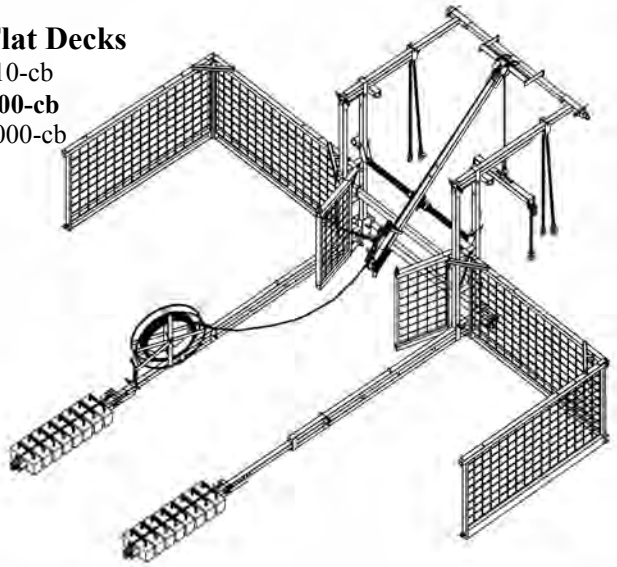
Loadspreaders
For Windows
model SC-350-w
model SC-600-w



Roofer Hoists*
model SC-300-cb
model SC-605-cb
model SC-905-cb



Hoisters* for Flat Decks
model SC-610-cb
model SC-900-cb
model SC-2000-cb



- assemble in 10 minutes with locking pins
- easy to transport & install
- only to be used for lifting chute sections
- galvanized steel construction

- The support frames feature a design factor of 3:1
- all use a removable Fishpole
- all designs work with cranes
- a "*" indicates a patented design U.S. Pat. 5,934,437

INSTALLATION (continued)

CHECK THE CONDITION OF THE COMPONENTS

Every time the chute is to be rigged or used, make sure the following items are in good condition: Superchute® hoist(s), Superchute® spreader bar, Superchute® cable assemblies, Superchute® chute sections, Superchute® steel liners, and any other ancillary Superchute® equipment, such as Door Adjustment Kits and Tie-Back Kits. Thorough overhaul servicing is available from Superchute® Ltd.

THE TWO INSTALLATION STEPS

The installation of a chute consists of two steps:

Step 1: Raise the chute sections
Step 2: Anchor the chute sections

The following pages explain how to best accomplish these tasks.

RAISE THE CHUTE SECTIONS

A chute can be raised using various devices. Although the sketches on the following pages show a Superchute® Hoist in use, other lifting devices, such as cranes, material hoists, or boom lifts, may be appropriate as long as they can safely manage the chute load.

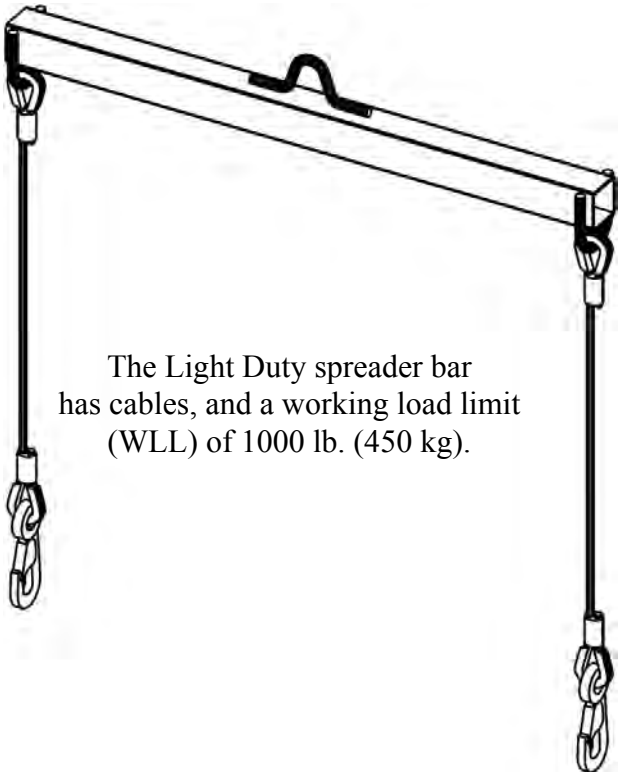
Respect the weight limitations of your lifting device – an accident may result if you attempt to lift beyond your capacity.

All lifting devices require the procedure shown on the following pages.

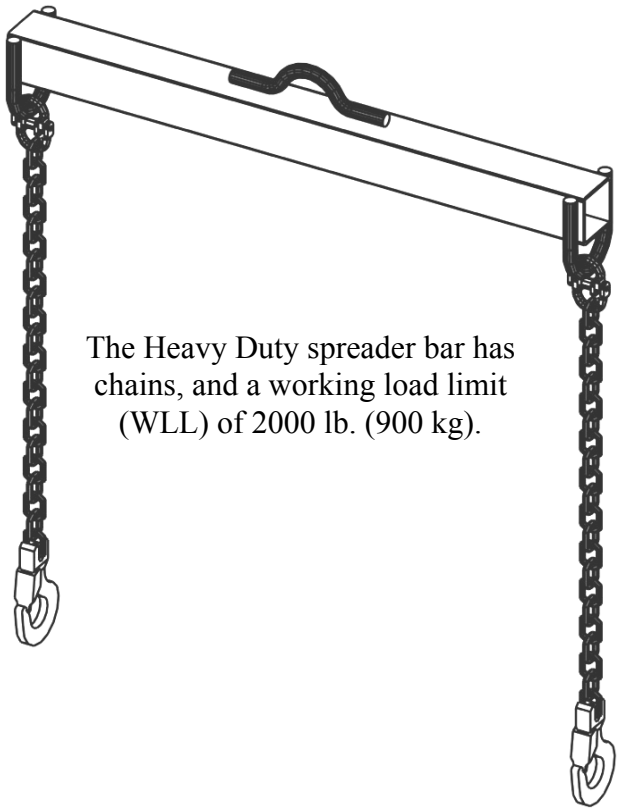
INSTALLATION (continued)

Attach a Spreader Bar to the hoisting cable. Superchute® manufactures two spreader bars to meet your needs: the Light Duty spreader bar, and the Heavy Duty spreader bar.

The Light Duty spreader bar has cables and features a working load limit of 1000 lb. (450 kg).
The Heavy Duty spreader bar has chains and features a working load limit of 2000 lb. (900 kg).



The Light Duty spreader bar has cables, and a working load limit (WLL) of 1000 lb. (450 kg).



The Heavy Duty spreader bar has chains, and a working load limit (WLL) of 2000 lb. (900 kg).

INSTALLATION (continued)

The lifting device used in this installation is a Superchute® Bolt-Down Frame.

- Attach a chute section to the Spreader Bar.

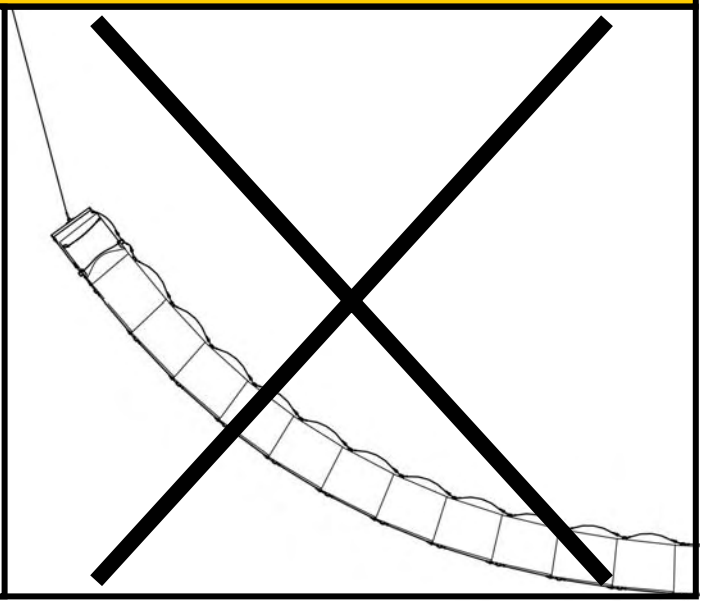
⚠ WARNING

GROUND WORKERS MUST WEAR HARDHATS

GROUND

⚠ WARNING

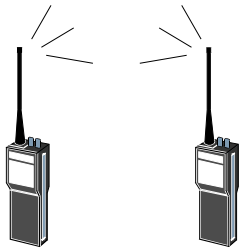
- Cable assemblies could be strained and damaged if the chute is first assembled completely on the ground and then hauled into the air.
- As well the chute could dig into the ground and act like an anchor, which could cause the lifting device to topple.
- Do not assemble the chute on the ground. Use the method shown on the following pages.



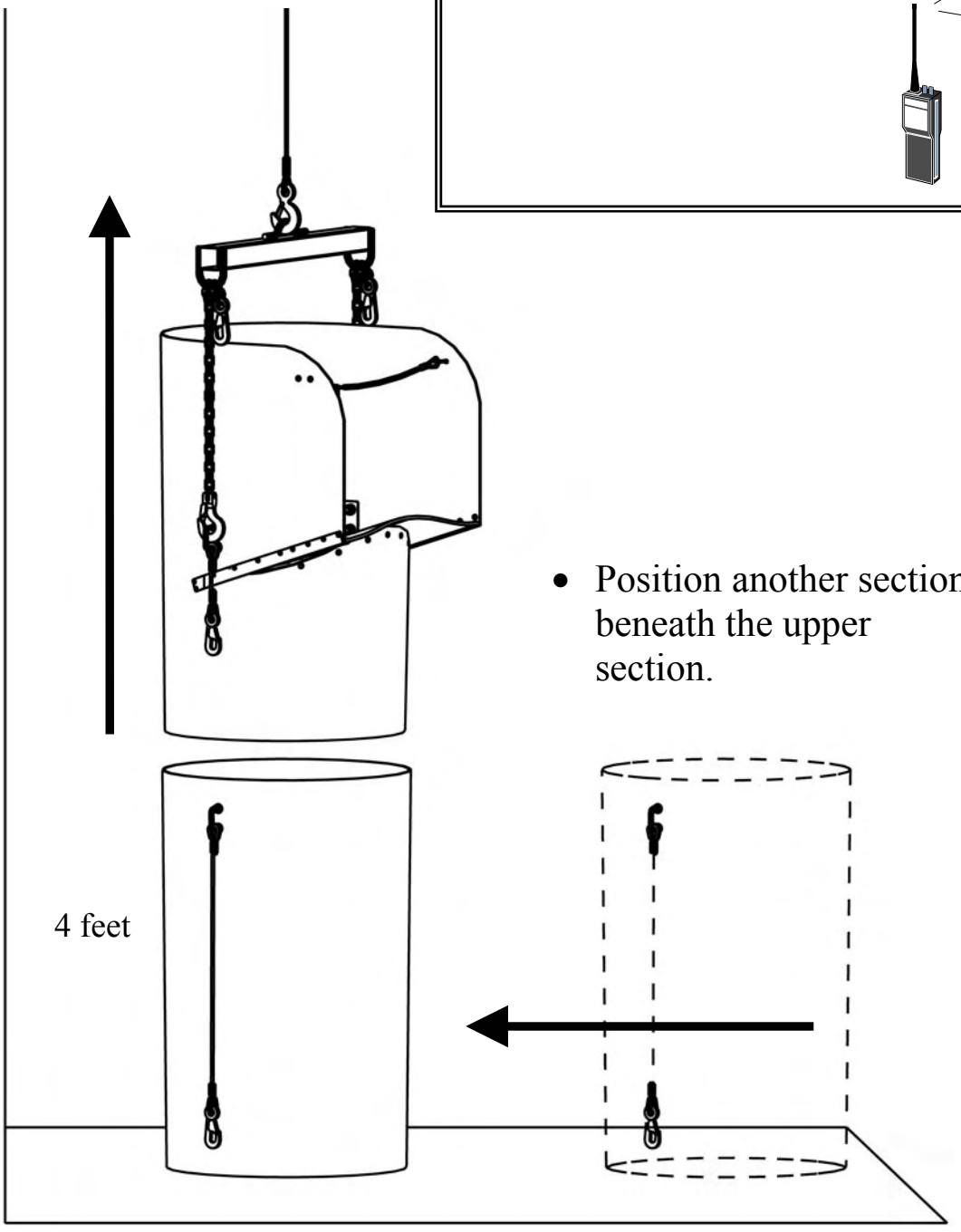
INSTALLATION (continued)

Communication:

Ground-level workers and hoist level-workers should use 2-way radios (walkie-talkies) to communicate with each other.



- Raise the section 4 feet. (1.2 meter)



- Position another section beneath the upper section.

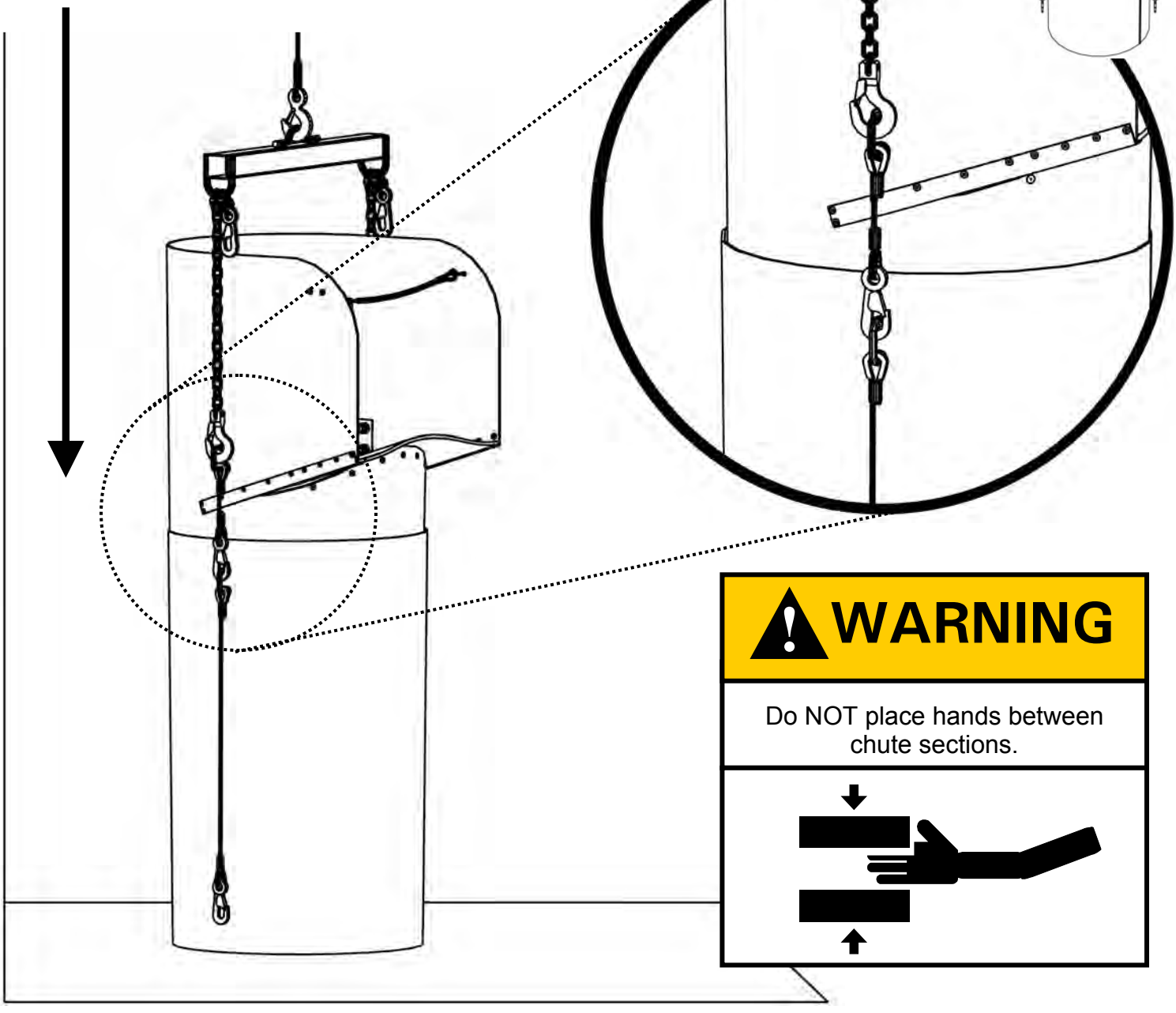
INSTALLATION (continued)

As you link Regular sections together, arrange them so that the plastic weld or Wraparound® clasp alternates from side to side, as depicted in the sketch on the right. Alternating the clasps will help the chute hang straight.

Align chute sections so that seams alternate from left to right.

- Lower the suspended section into the section beneath it.

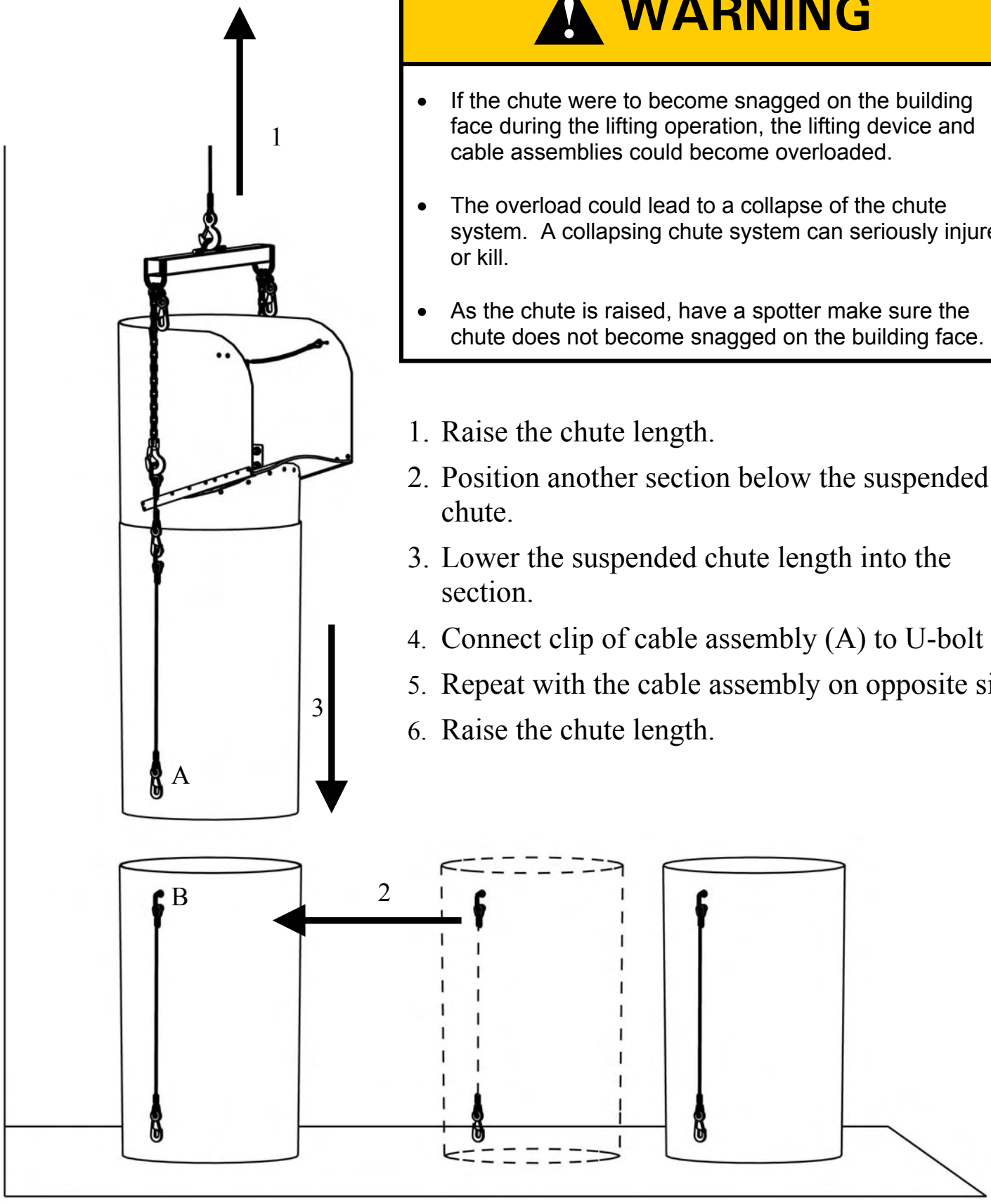
- Connect the two sections with the upper section's cable assemblies.



WARNING

Do NOT place hands between chute sections.

INSTALLATION (continued)



WARNING

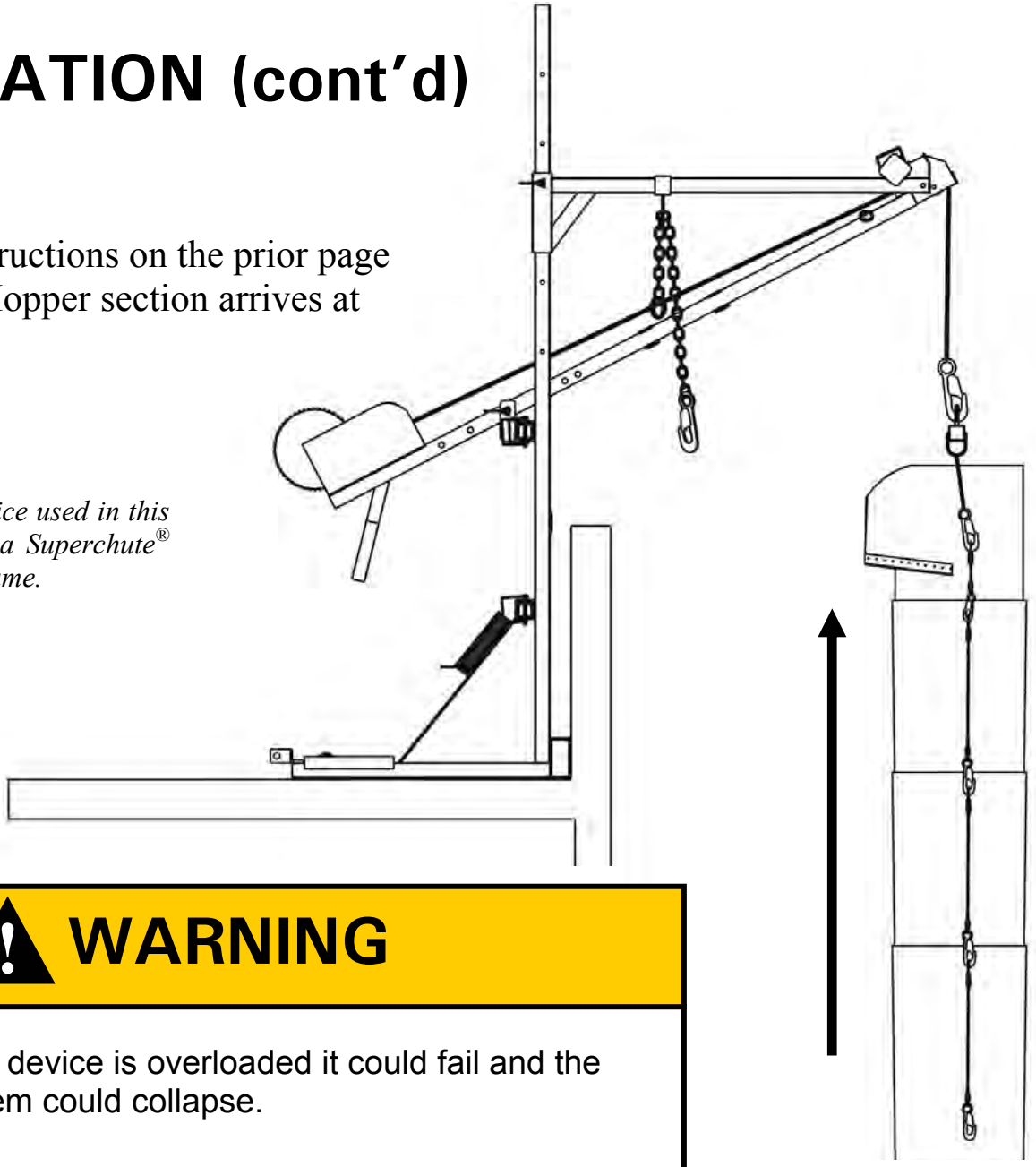
- If the chute were to become snagged on the building face during the lifting operation, the lifting device and cable assemblies could become overloaded.
- The overload could lead to a collapse of the chute system. A collapsing chute system can seriously injure or kill.
- As the chute is raised, have a spotter make sure the chute does not become snagged on the building face.

1. Raise the chute length.
2. Position another section below the suspended chute.
3. Lower the suspended chute length into the section.
4. Connect clip of cable assembly (A) to U-bolt (B).
5. Repeat with the cable assembly on opposite side.
6. Raise the chute length.

INSTALLATION (cont'd)

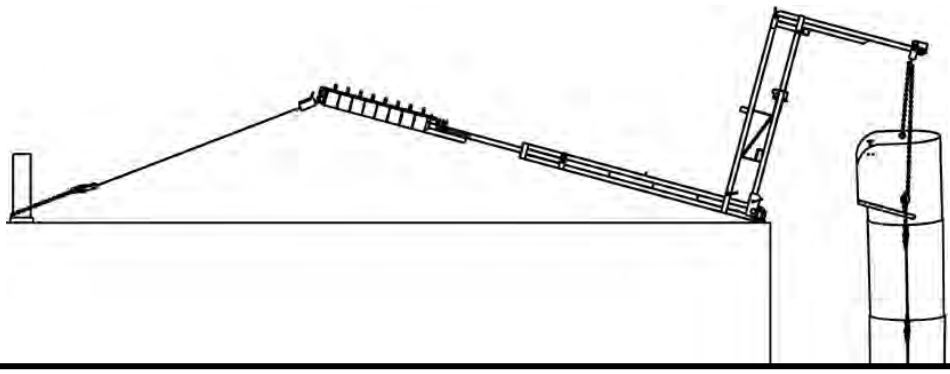
- Repeat the instructions on the prior page until the Top Hopper section arrives at the hoist level.

The lifting device used in this installation is a Superchute® Bolt-Down Frame.



⚠ WARNING

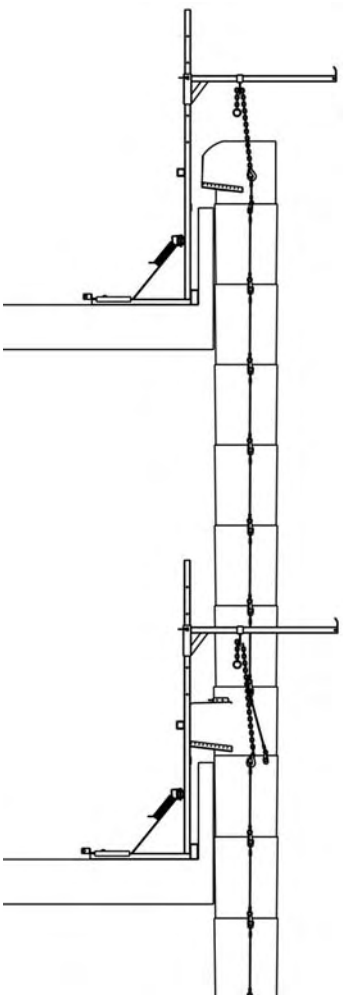
- If the lifting device is overloaded it could fail and the chute system could collapse.
- A falling chute system can seriously injure or kill.
- Do NOT overload the lifting device. Use the Forms and Weight Charts of **Sections 7 and 8** to calculate the weight of your chute system.



INSTALLATION (continued)

ANCHOR THE CHUTE SECTIONS

Superchute® chute hoists can be used to safely anchor a chute. If you wish to anchor your chute using your own method, please be advised of the following guidelines:



- A sufficiently strong anchorage must be present in order to anchor the chute to the building. At the window, roof, or floor slab level, locate structural members of the building that are strong enough to anchor your chute.
- The anchors must be able to support at least three times the weight of the chute.
- A structural engineer must verify the adequacy of the anchors and supporting structure.
- Use rated rope to anchor the chute. 5/8" (16 mm) diameter nylon rope, rated to 10,000 lbs. (4500 kg), works well for this task.
- Use recognized safety knots, such as the bowline or the figure eight, for all rope work.
- Anchor the chute to structural members of the building according to instructions provided in the sub-section: Wind & Restraint Issues.

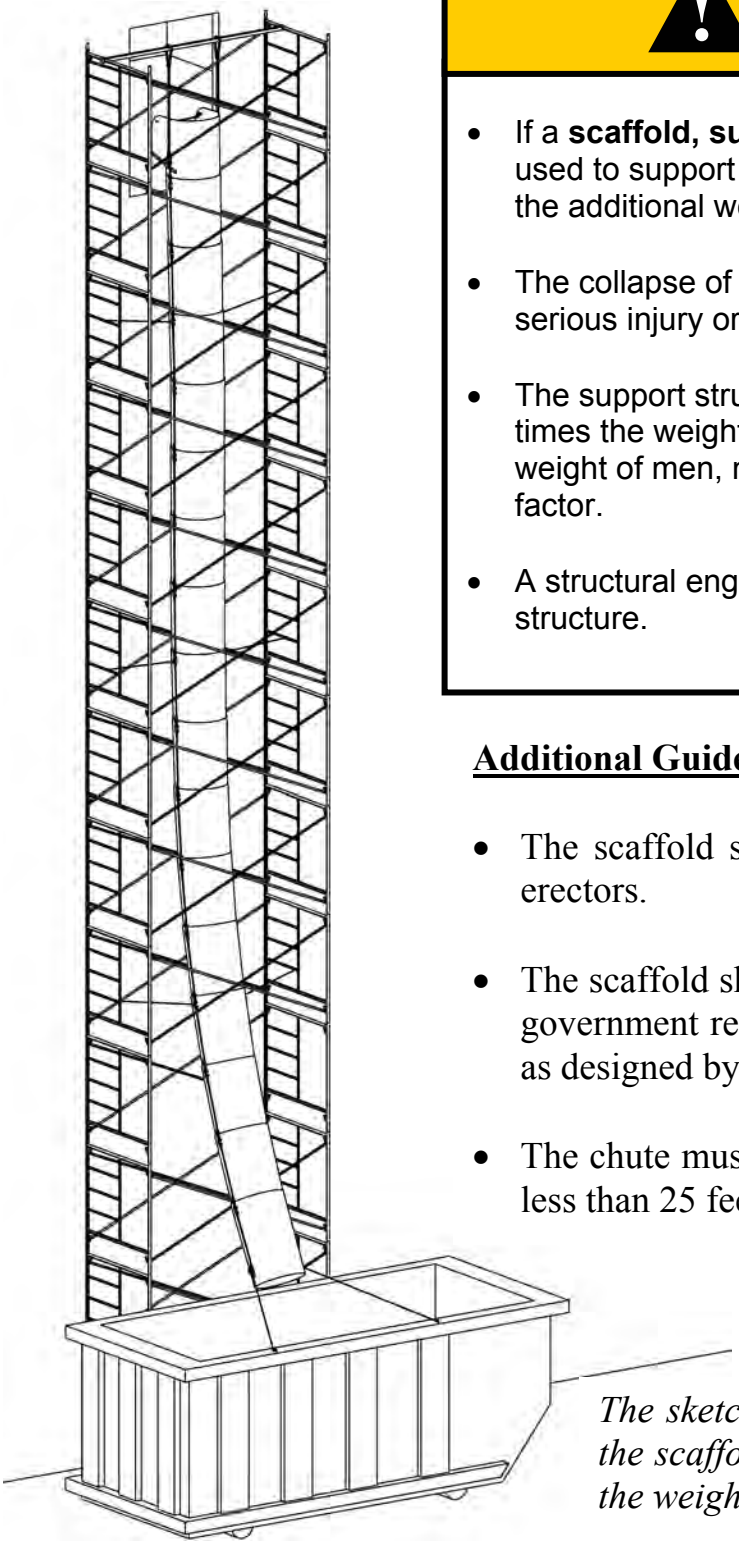
In the sketch above, two "piggybacked" Bolt-Down Frames are used to anchor the chute.

Superchute® hoists are simple to use, effective, and above all, engineered for safety.

Don't take chances. Use Superchute® hoists!

INSTALLATION (continued)

USING A SCAFFOLD, STAGE, OR PLATFORM AS AN ANCHOR



⚠ WARNING

- If a **scaffold, suspended stage, platform** or similar structure is used to support the chute, and a blockage occurs in the chute, the additional weight could cause the structure to topple or fail.
- The collapse of the support structure and chute could cause serious injury or death.
- The support structure must be capable of holding at least five times the weight of the chute, in addition to being able to hold the weight of men, machinery, and materials with an adequate safety factor.
- A structural engineer must verify the adequacy of the support structure.

Additional Guidelines For Chutes Anchored To Scaffolds:

- The scaffold should be installed by professional scaffold erectors.
- The scaffold should be erected and tied in accordance with government regulations and manufacturer's instructions or as designed by an engineer.
- The chute must be restrained to the scaffold at intervals of less than 25 feet (8 meters), in order to prevent wind sway.

The sketch on the left shows the chute installed inside the scaffold. This arrangement is best as it distributes the weight of the chute evenly on the scaffold.

INSTALLATION (continued)

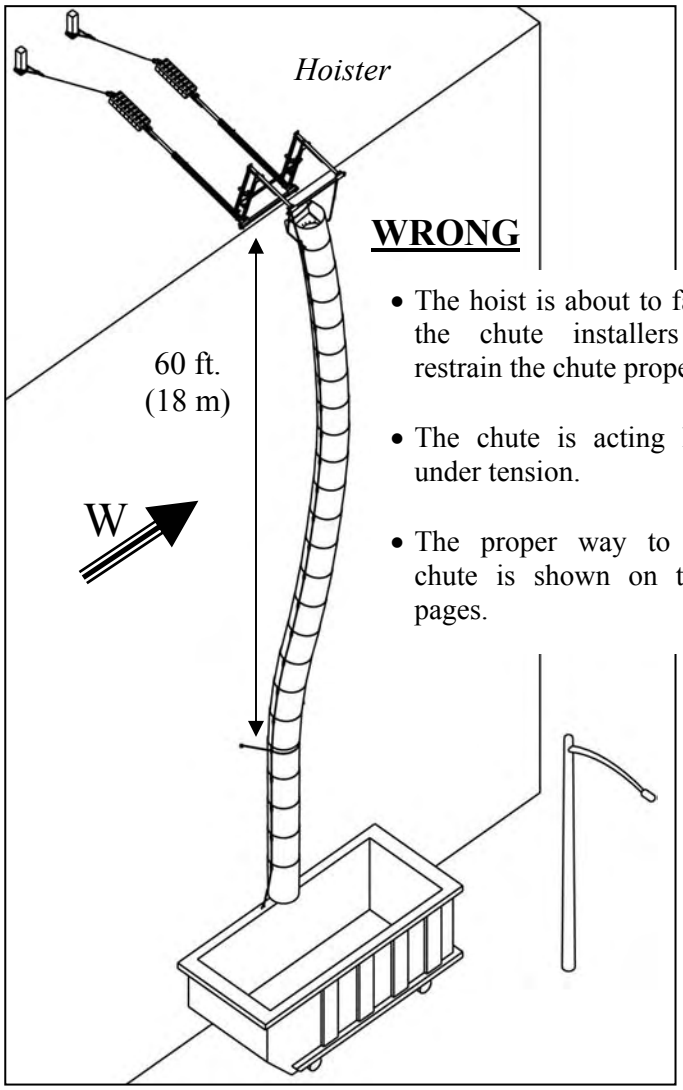
WIND & RESTRAINT ISSUES

Because a chute installation may remain in place for days, weeks, or months, the installers must consider how the chute will be affected by winds. Installers should also expect that strong winds could arrive at times when there are no supervisors or workers on the job (ie: overnight or on the weekend).

The way in which the chute will react to winds depends on how it was restrained, and the spacing interval between restraints.

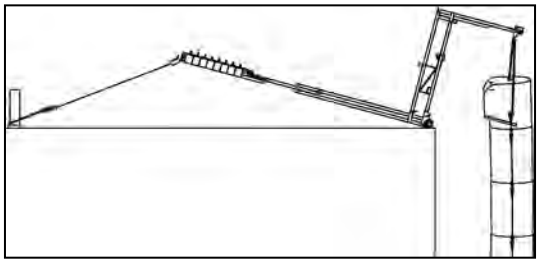
The installer can use either taut restraints or slack restraints based on the spacing between restraints. The following two pages explain this concept further.

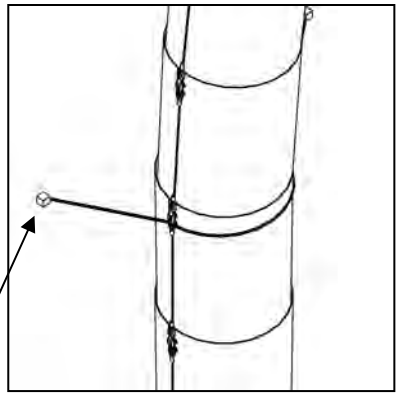
But first, take a look at the sketch below. It shows the potential effect of using the wrong type of restraint. Why is the hoist pulled over? Note the hoist tie-backs, and their help in this instance.



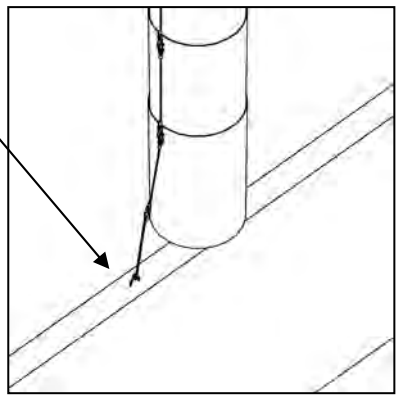
WRONG

- The hoist is about to fail because the chute installers did not restrain the chute properly.
- The chute is acting like a sail under tension.
- The proper way to restrain a chute is shown on the next 2 pages.





Taut restraints



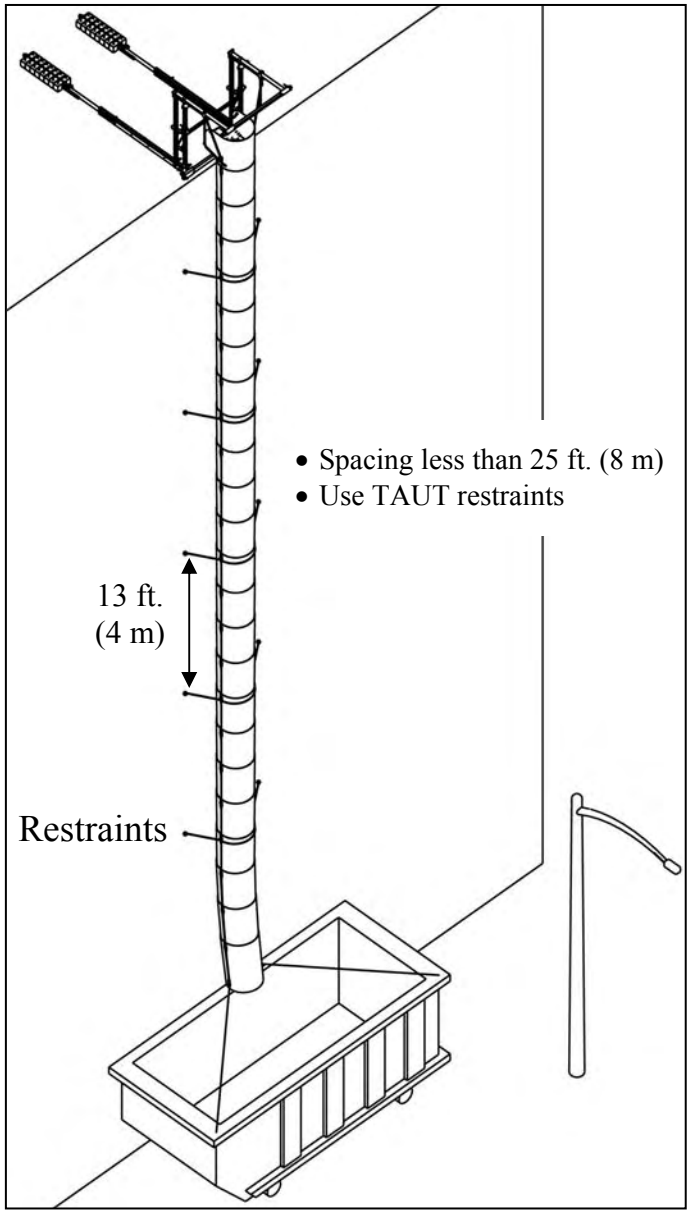
INSTALLATION (continued)

TAUT RESTRAINTS

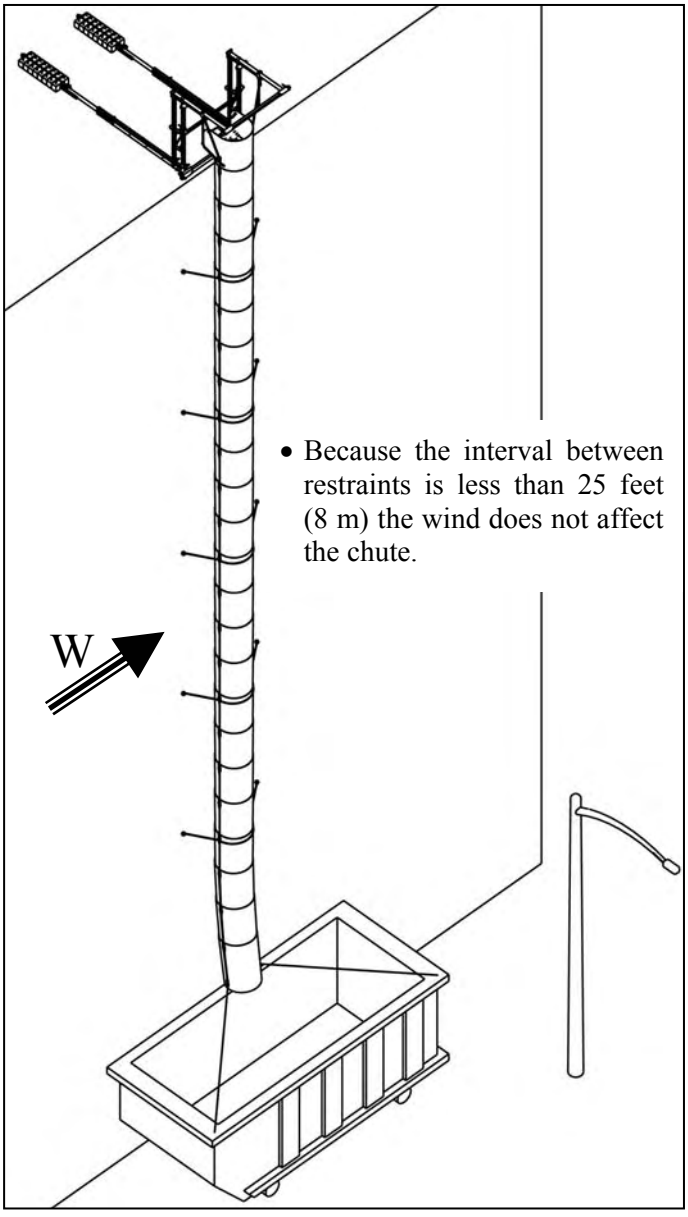
If the installer can access the entire length of the chute, use taut restraints. If the chute is anchored to a scaffold, use taut restraints. Secure the chute tightly to the building structure, at intervals of 25 feet (8 meters) or less, using a 5/8" (16 mm) diameter nylon rope or equivalent.

As the sketches show, the closely spaced restraints hold the chute tight to the building structure, preventing the wind from moving the chute.

NO WIND



WIND



The sketches on this page show the correct application of restraints.

INSTALLATION (continued)

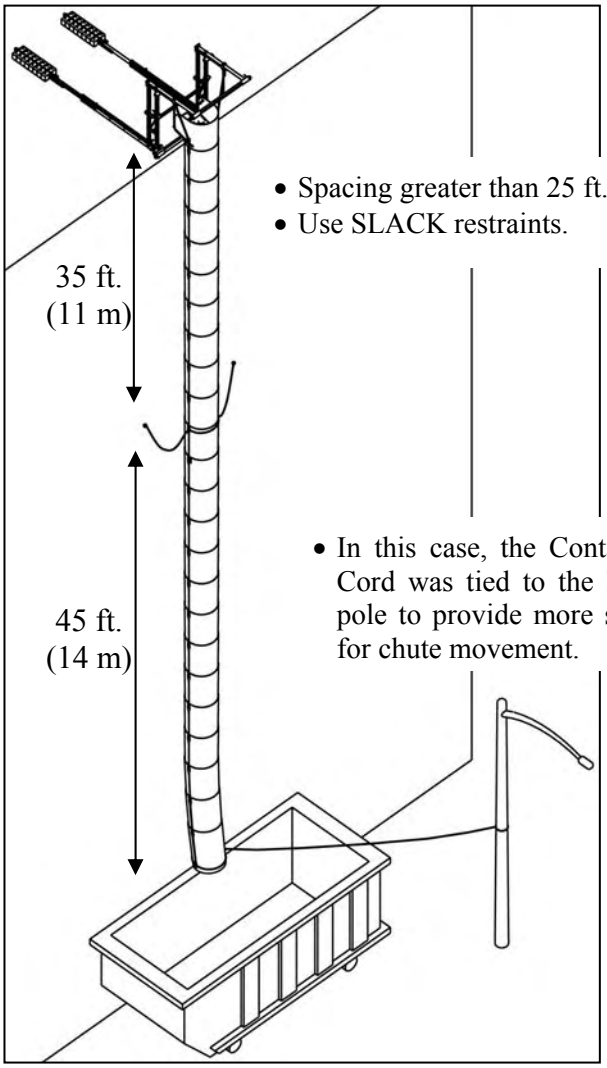
SLACK RESTRAINTS

If the restraint intervals will be more than 25 feet (8 m), use slack restraints to secure the chute to the building structure. Slack restraints keep the chute from acting like a taut sail by allowing it the freedom to form an arc and move up and down. Do not mix slack and taut restraints.

The attachment of the chute's discharge end to the container (or other anchor) must be considered a restraint. Use Container Cord. Do not tie it tightly as the chute must be able to move if heavy winds arise.

If the wind strengthens, the strain could cause the Superchute® Container Cord to fail, which is beneficial, as the chute will be released and failure of the hoist will be avoided.

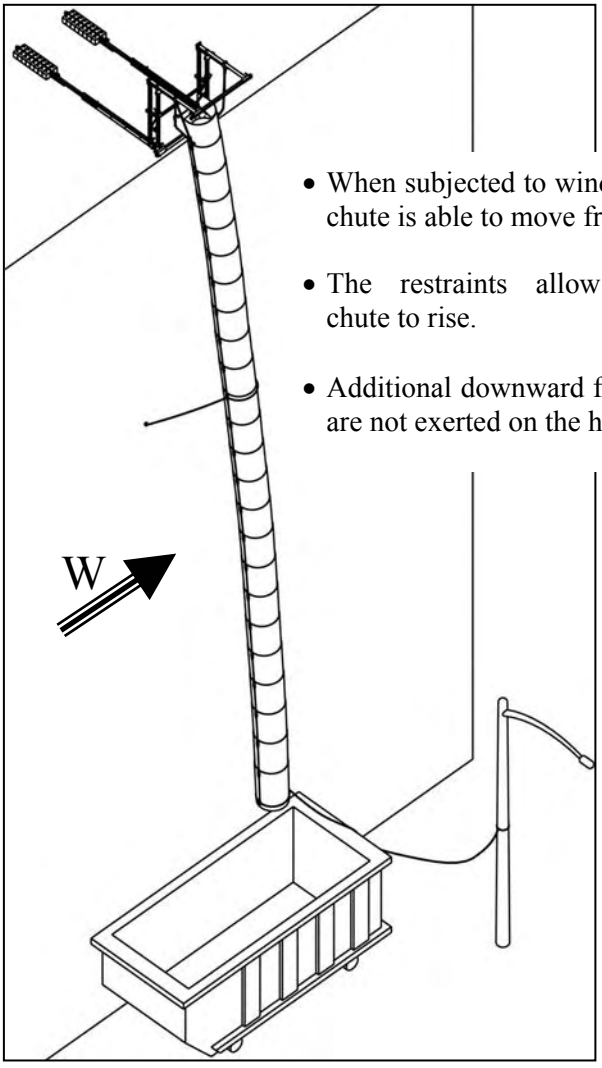
NO WIND



- Spacing greater than 25 ft. (8 m)
- Use SLACK restraints.

- In this case, the Container Cord was tied to the lamp pole to provide more slack for chute movement.

WIND

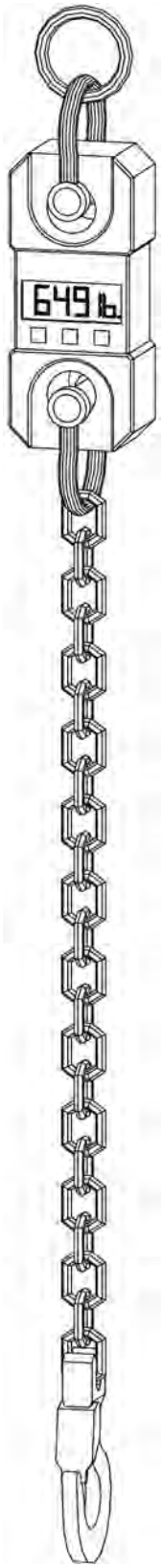


- When subjected to wind, the chute is able to move freely.
- The restraints allow the chute to rise.
- Additional downward forces are not exerted on the hoist.

The sketches on this page show the correct application of restraints.

INSTALLATION (continued)

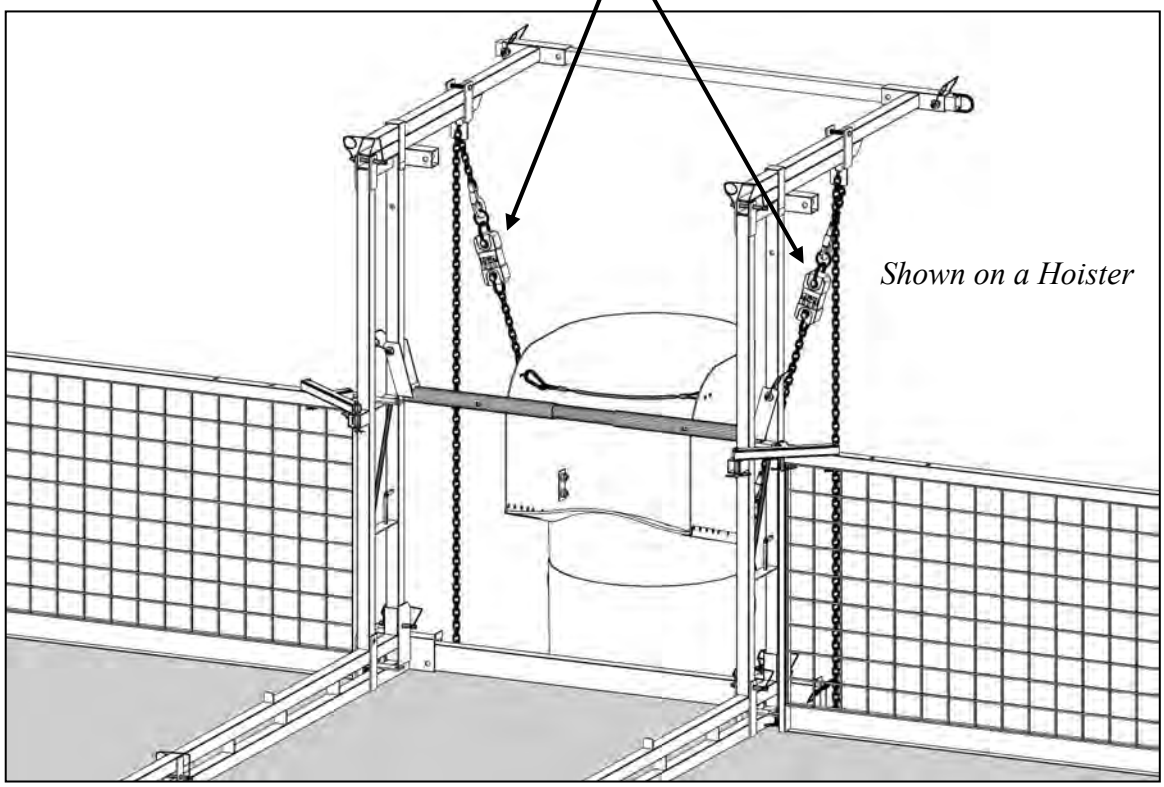
USING LOAD CELLS TO DETECT A BLOCKAGE



If load cells are installed at the top of the chute, users will be able to monitor the weight of the chute. An increase in the weight of the chute indicates that a blockage has occurred. For further information on load cells and their use in a chute system, please contact Superchute® Ltd.

Close up view of a load cell kit.

A pair of load cells



Shown on a Hoister

INSTALLATION (continued)

USE A SAFETY ROPE

If a major problem arises and the chute collapses, it could fall away from the building the way a tree falls when cut at the trunk. Prevent a chute from falling this way by using a Safety Rope.

In the event of a collapse, a chute equipped with a Safety Rope is forced to fall the length of the rope, thus keeping it close to the building.

Follow this procedure when installing a Safety Rope:

1. Secure the rope to a 5000 lb. (2250 kg) capacity anchor above the anticipated height of the chute system. Do not secure the rope to a chute hoist or to an anchor that is used or will be used for any other application. If the rope must lie across a working floor, then consider using wire rope as it will better resist people treading on it.

2. Lower the end of the rope to the ground.

3. Pass the rope through several clips (the number of clips will depend on the length of the chute).

4. As the chute is raised and added to, attach a clip to the U-bolt of every third chute section.

5. The clips will slide up the rope, rising with the chute sections to which they were attached.

6. **Tie the rope snugly and securely to the last chute section**. (Coil any unused rope on the side).

7. If the chute collapses, it will fall along the rope.

Superchute® Ltd. sells Safety Rope Kits

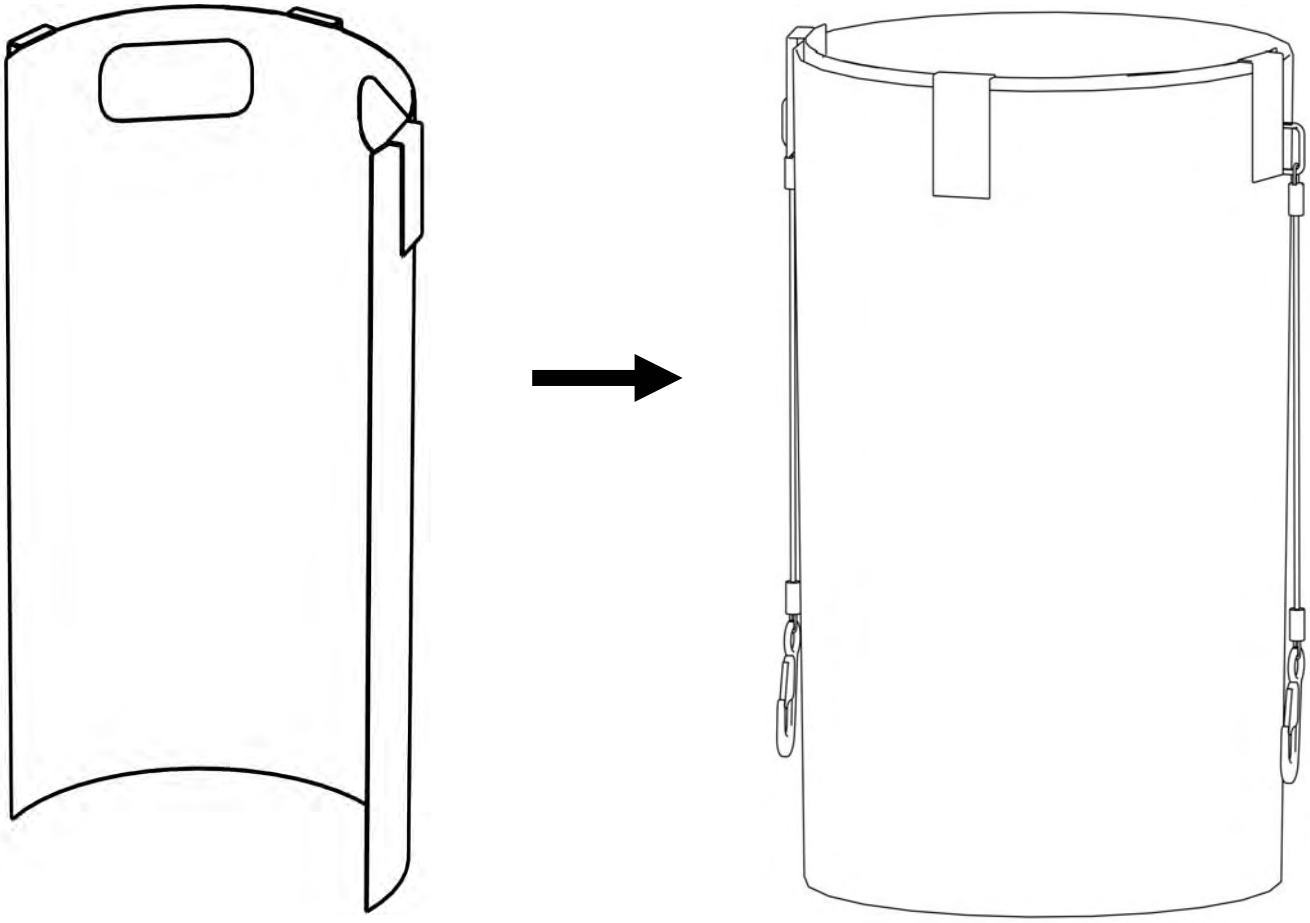
INSTALLATION (continued)

DAMAGE PREVENTION AND STEEL LINERS

Prevent damage to the chute by keeping the chute hanging straight.

Install Superchute® steel liners in damage-susceptible areas of the chute, such as the Top Hopper, the Door, and any part of the chute where there is a slight curve in the chute.

Note: Installed liners add considerable weight to the chute (see Section 8 for individual liner weights).

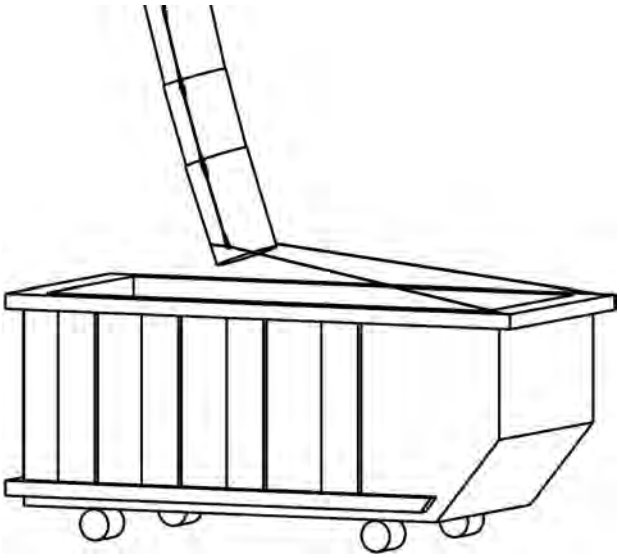


Steel Liner installed in a Regular chute section

INSTALLATION (continued)

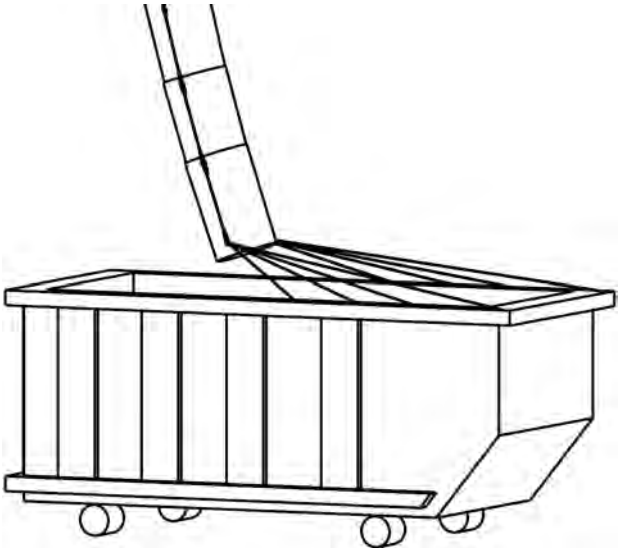
THE CONTAINER

- The debris exiting the chute will be directed into a suitable steel container. A dump-truck, or similar loading vehicle, is not suitable because falling material can present a hazard to the truck operator.
- Barricade the container area (see page 47 for details).
- Tie the chute's discharge end to the container using one or two lengths of Superchute® Container Cord (provided free of charge with every chute order). Unlike Regular cords and ropes, Container Cord is designed to fail. If a full container is accidentally driven away with the chute still attached, the Container Cord will fail and the chute system will not be pulled from the building.
- Do not double up the Container Cord or use more than one or two lengths to attach the chute's discharge end to the container. The effect would be to increase the strength of the attachment, which would make it less likely to fail if it should need to do so. See the sketches below.



← RIGHT

The chute is tied off to the far end of the container. This arrangement allows the end of the chute to be easily moved about the container, and provides a desirable level of slack for any strong winds.



WRONG →

The Container Cord has been applied in such a way that it will not fail easily if undue stress is applied.

INSTALLATION (continued)

FIRE PREVENTION

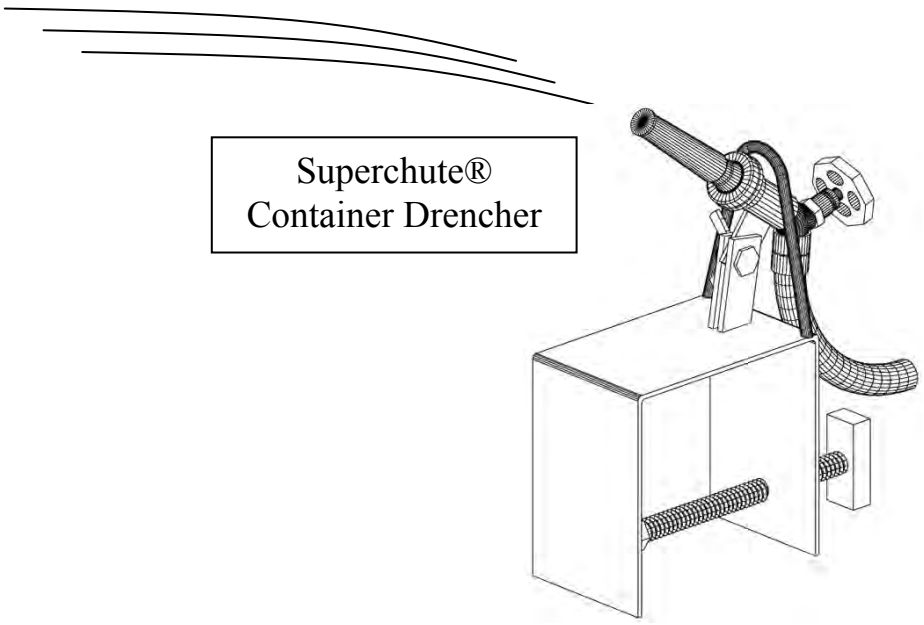
To prevent a container from catching fire and subsequently setting fire to the building and/or the suspended chute (which could also introduce smoke into the building), users and installers must take all of the following precautions:

1. Keep the contents of the trash container wet at all times (the Superchute® Container Drencher is available for this purpose). Water application will also help control dust. Do not apply water if the temperature drops below the freezing point, or if the container contains hazardous debris (the runoff could be toxic).

2. Make provisions for water application on all floors with exposure to the chute.

3. Install the container at least 10 feet (3 meters) away from the building (check local by-laws).

4. Seal the container with a fireproof lid (example: metal sheets) at the end of each workday.



5. Move the base of the chute 10 feet (3 meters) away from the container at the end of each work day, or, disconnect the last 10 feet (3 meters) of chute at the end of each work day.

6. Post clear signs around the trash container and on all floors facing the chute. Indicate:

⚠ WARNING

No Smoking, No Open Flame, No Welding, No Ignition Source Within 20 Feet (6 Meters) Of The Chute And Trash Container.
Do Not Introduce Any Flammables.
Keep Container Contents Wet. Apply Water Frequently.

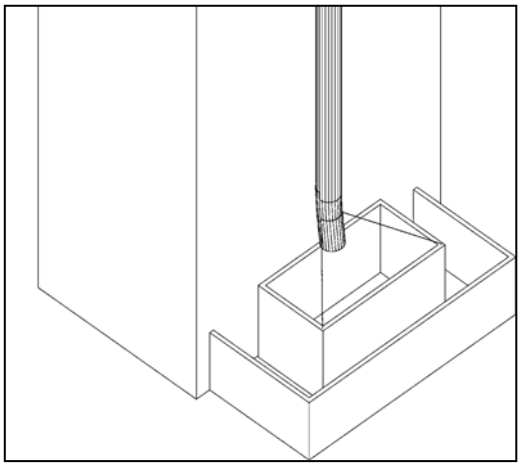
11. USAGE INSTRUCTIONS

GENERAL INSTRUCTIONS

Failure to adhere to these instructions could result in injury and/or death.

- Barricade the container area in order to protect workmen and the public from any material that may ricochet out of the container. Build the barricade using plywood sheets, screens or similar materials.

  In the event that debris is accidentally thrown into the chute when the discharge end of the chute is not directed into the container, or the container has been removed, the barricaded area may help to prevent injury.



- Do not introduce concrete blocks, spikes, flammables, or toxic dusts. Do not drop more than 50 lb. (23 kg) of debris at a time into chute. Do not use motorized loaders to introduce debris into the chute (motorized loaders introduce too much debris, too quickly).

- Never stand under, or look up the discharge end of a chute.

- Never look into, or place body parts into the opening of a Door section.

- All Superchute® openings (i.e. Top Hopper and Door sections) feature a warning gate. When the warning gate is fastened across the opening, debris must not be thrown into the chute.

- Superchute® Top Hopper and Door warning gates must be closed by a designated safety monitor before the container is moved.

- To prevent electrocution, stay away from the chute system during a lightning storm.

- Although all Superchute® Door sections feature a deflection curtain, there is still a risk of debris particles escaping and causing injury. Therefore, protective eyewear must be worn while introducing debris into Door sections.

- In the event that hurricanes, tornadoes, or strong storms are expected, dismantle the chute system and warehouse it until the storm passes.

USAGE INSTRUCTIONS (continued)

THE SAFETY MONITOR

Designate a Safety Monitor. The Monitor will keep an eye on all aspects of chute usage.

The Safety Monitor will ensure:

- The chute was installed and is used according to the instructions provided by Superchute® Ltd.
- The chute is tied properly to the container with Container Cord.
- The chute is untied from the container before the container is moved or changed.
- The container contents are kept wet to reduce airborne dust and the risk of a fire.
- The container is not overfilled.
- Any spaces between the chute openings and the building edge are covered over.
- Debris is seen to fall clear of the chute's discharge end.
- Warning gates are used at the correct times.
- All components of the chute are kept in good working condition as the job progresses.
- A means of communication with other job site workers exists.
- Empty debris containers are readily available.
- All work is conducted in a safe and responsible manner.
- Fall protection safeguards are used.

⚠ WARNING

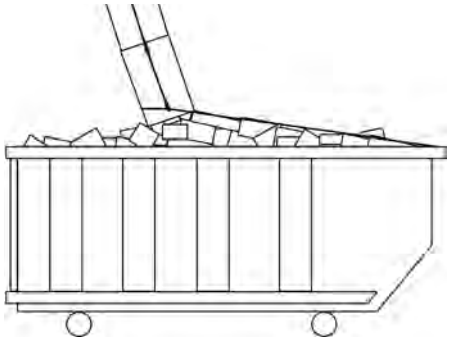
- Chute blockages are the most frequent problem encountered by chute users.
- If a chute blockage is not noticed and more debris is introduced, the total weight of the chute will rapidly increase, and the chute system could collapse. A collapsing chute system can cause serious injury and death.
- The Safety Monitor will takes steps to prevent blockages from occurring (as explained in this manual), and will keep a constant lookout for chute blockages.

USAGE INSTRUCTIONS (continued)

BLOCKAGE PREVENTION

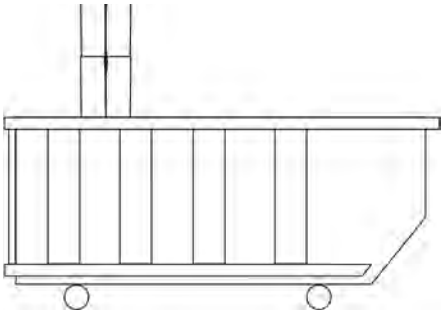
WRONG

The container is overfilled. This could cause the chute to fill from the bottom and collapse. Do not overfill the container.



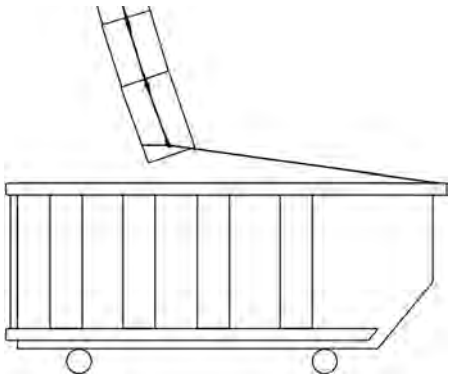
WRONG

Falling debris cannot be seen to exit the discharge end of the chute. This situation prevents blockages from being noticed.



RIGHT

Falling debris can be seen to exit the discharge end of the chute and enter the container.



In the event of a chute blockage, the chute system could tear away from the building causing serious injury or death. To prevent blockages follow these guidelines:

- Ensure falling debris can be seen to exit the chute and enter the container (see the sketches on the left).
- Make sure the chute is hanging straight (vertically). Horizontal displacement of the chute must not exceed 20% of the height. Have the chute reinstalled if it does not meet this criteria.
- Make sure the chute is not bent over balconies, shelves, or similar structural protrusions. These obstructions could crimp the chute and lead to a blockage. Have the chute reinstalled if it is bent or crimped.
- Only introduce debris with dimensions that are less than half the diameter of the chute. For example: if using a 30” (76 cm) diameter chute, the maximum allowable dimensions of the debris are 15” x 15” x 15” (38 cm x 38 cm x 38 cm).
- Do not use motorized loaders to introduce debris into the chute (motorized loaders introduce too much debris, too quickly).
- Break-up debris before throwing it into the chute.
- Move the discharge end around the container to prevent it from clogging as the container fills.
- Inspect the chute for blockages frequently.
- Designate a safety monitor who will, in addition to monitor for blockages, supervise the safety of the entire debris removal operation.
- Use load cells to monitor the chute weight and detect blockages (see page 42 for more load cell information).

USAGE INSTRUCTIONS (continued)

IF A BLOCKAGE OCCURS

1. Stop putting debris into the chute.

2. **The chute system could collapse without warning.**
   Evacuate the area below the chute of people. Consider that the path of destruction created by a collapsing chute could be equivalent to its height.

3. Use a crane with ample capacity to lower the entire chute to the ground.

4. Separate the chute sections on the ground.

5. Remove the blockage.

6. Consult a structural engineer and the Superchute® factory to determine if the anchors and cable assemblies were strained:

   - If the engineer concludes the cable assemblies were strained, order new cable assemblies from your Superchute® supplier or from the Superchute® factory.

   - If the anchors were strained, rig new anchors.

   - If the engineer concludes the anchors and cable assemblies were not strained, reinstall the chute system.

12. A LETTER FROM OSHA

OSHA

March 25, 1992

Mr. Andrew Anson, President
Superchute® Ltd.

Dear Mr. Anson:

This is in response to your February 10 letter requesting the Occupational Safety and Health Administration (OSHA) to review the design of a debris chute manufactured by Superchute® Ltd. I apologize for the delay of this response.

As you know, it is the policy of the Occupational Safety and Health Administration not to approve or endorse products. The variable working conditions at jobsites and possible alteration or misapplication of an otherwise safe product could easily create a hazardous condition beyond the control of the product manufacturer. However, we have reviewed the information provided in your letter and evaluation report and it appears that if properly installed and maintained and not used to load trucks the Superchute® system would comply with OSHA requirements. If a chute is being used to load trucks where falling material can present a hazard to the truck operator then a substantial gate and employee to operate the gate would be required by 29 CFR 1926.852(c).

If we can be of any further assistance, please contact Dale Cavanaugh of my staff at (206) 553-5930.

Sincerely,

Patricia K. Clark, Director
Directorate of Compliance Programs

13. OSHA REGULATIONS FOR CHUTES

From OSHA Regulations (Standards – 29 CFR)
Part 1926 Safety and Health Regulations for Construction

These are the OSHA regulations for chutes:

Subpart H - Materials Handling, Storage, Use, and Disposal
1926.252 - Disposal of waste materials *(partial copy)*

(a) Whenever materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, an enclosed chute of wood, or equivalent material, shall be used. For the purpose of this paragraph, an enclosed chute is a slide, closed in on all sides, through which material is moved from a high place to a lower one.

Subpart T - Demolition
1926.852 - Chutes *(complete copy)*

(a) No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected.

_____

(b) All materials chutes, or sections thereof, at any angle of more than 45 degrees from the horizontal, shall be entirely enclosed, except for openings equipped with closures at or about floor level for the insertion of materials. The openings shall not exceed 48 inches (122 cm) in height measured along the wall of the chute. At all stories below the top floor, such openings shall be kept closed when not in use.

_____

(c) A substantial gate shall be installed in each chute at or near the discharge end. A competent employee shall be assigned to control the operation of the gate, and the backing and loading of trucks.

_____

(d) When operations are not in progress, the area surrounding the discharge end of a chute shall be securely closed off.

_____

(e) Any chute opening, into which workmen dump debris, shall be protected by a substantial guardrail approximately 42 inches (107 cm) above the floor or other surface on which the men stand to dump the material. Any space between the chute and the edge of openings in the floors through which it passes shall be solidly covered over.

_____

(f) Where the material is dumped from mechanical equipment or wheelbarrows, a securely attached toeboard or bumper, not less than 4 inches (10 cm) thick and 6 inches (15 cm) high, shall be provided at each chute opening.

_____

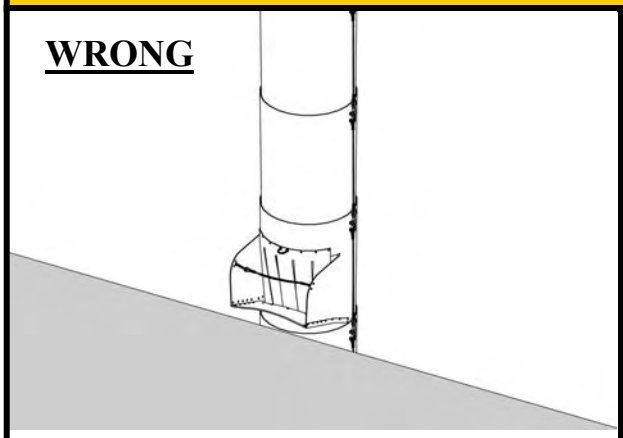
(g) Chutes shall be designed and constructed of such strength as to eliminate failure due to impact of materials or debris loaded therein.

14. FALL PROTECTION AND OSHA

**The following three pages refer to OSHA Regulations (Standards – 29 CFR)
Part 1926 Safety and Health Regulations for Construction
Subpart M - Fall Protection
1926.500 to 1926.503**

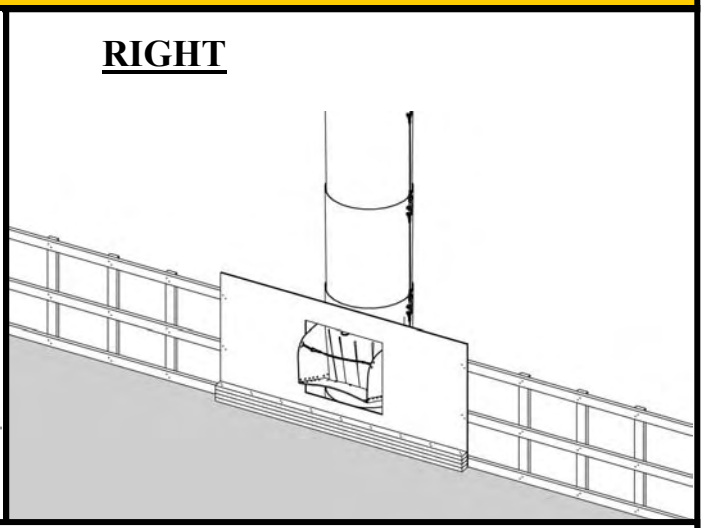
⚠ WARNING

WRONG



NO FALL PROTECTION

RIGHT



- A person can easily fall from a building if the floor edge they are working near does not offer fall protection safeguards.
- A fall from a height of 6 ft. (1.8 meters) is enough to cause serious injury or death.
- Use a personal fall arrest system (example: body harness and lanyard) when working near a floor edge that does not offer proper fall protection.
- OSHA requires that fall protection barriers be at least 42” high, plus or minus 3” (107 cm, plus or minus 8 cm). Guardrail systems, parapet walls, and window sills may be acceptable fall protection barriers provided they meet OSHA’s height and strength criteria.
- Read and understand the OSHA fall protection regulations (a few of the regulations are provided on the next two pages).

FALL PROTECTION (continued)

The Fall Protection System shown below incorporates the following features:

FALL PROTECTION FOR PEOPLE:

(1) TOPRAIL "shall be 42" (107 cm) plus or minus 3" (8 cm) above the walking/working level"

(2) MIDRAIL "shall be installed at a height midway between the top edge of the guardrail system and the walking/working level, when there is no wall or parapet wall at least 21" (53 cm) high".

(3) OPENINGS "Other structural members shall be installed such that there are no openings in the guardrail system that are more than 19" (48 cm) wide.

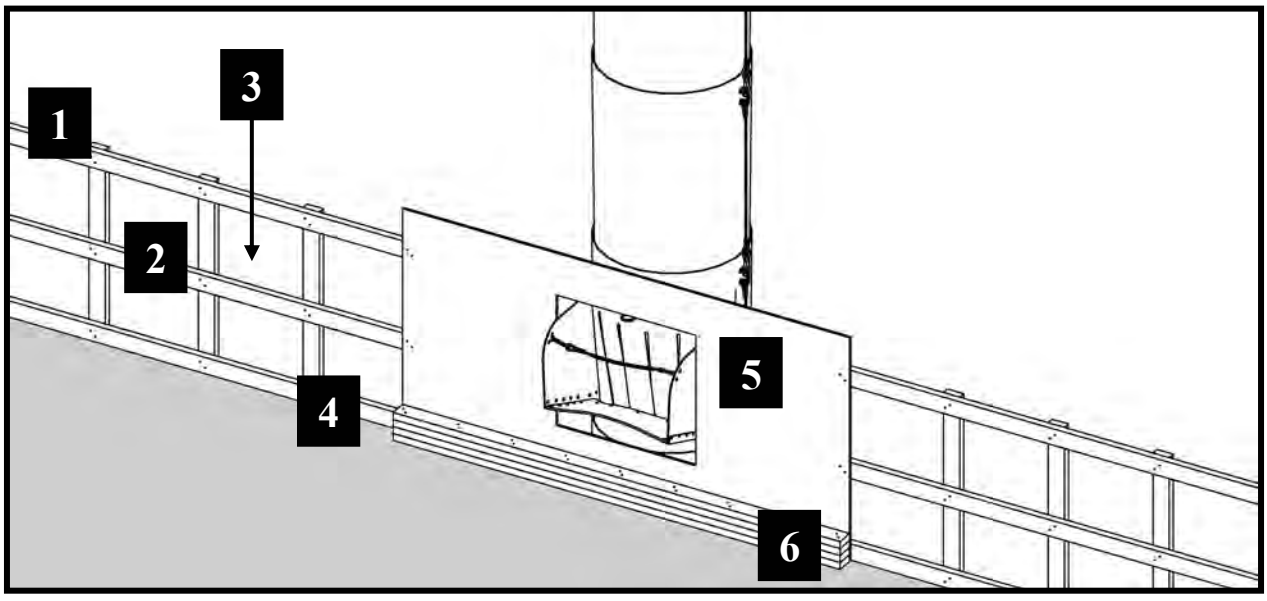
FALL PROTECTION FOR OBJECTS:

(4) TOEBOARD "shall be a minimum of 3.5" (9 cm) in vertical height from its top edge to the level of the walking/working surface. It shall not have more than ¼" (6 mm) clearance above the walking/working surface".

(5) SCREENS Openings around Top Hopper and Door sections must be covered over using screens, boards, or plywood to prevent debris from falling outside the chute.

(6) BUMPER A solid bumper, not less than 4" (10 cm) thick and 6" (15 cm) high, prevents wheelbarrows from breaking through and falling over the edge.

"Guardrail systems, when used for falling object protection, shall have openings small enough to prevent passage of falling objects"



FALL PROTECTION (continued)

These are a few of the OSHA regulations for Fall Protection:

"The employer shall determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity."

"Each employee on a walking/working surface ... with an unprotected side or edge which is 6 ft (1.8 meters) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems."

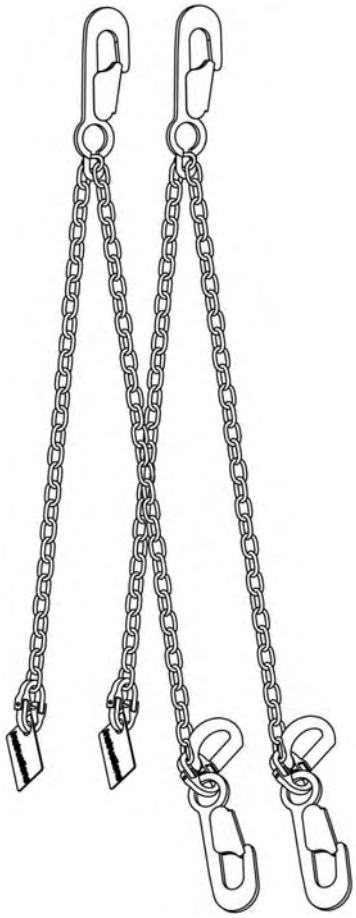
"An unprotected side or edge means any side or edge ... where there is no wall or guardrail system at least 39" (1 meter) high."

"Each employee in a hoist area shall be protected from falling 6 feet (1.8 meters) or more to lower levels by guardrail systems or personal fall arrest systems. If guardrail systems ... or portions thereof, are removed to facilitate the hoisting operation ... and an employee must lean through the access opening or out over the edge of the access opening (to receive or guide equipment and materials, for example) that employee shall be protected from fall hazards by a personal fall arrest system."

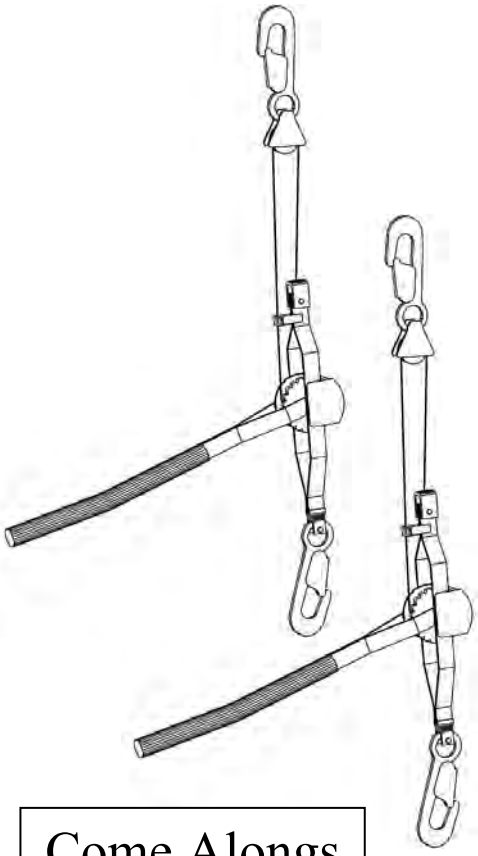
For a more complete understanding of the OSHA Regulations you can:

- Consult OSHA's excellent online documentation on the internet: www.osha.gov.
- Telephone the OSHA bookstore (206) 553-4270 and order the OSHA Regulations on CD-ROM (price $53).
- Telephone the OSHA bookstore (206) 553-4270 and order **29 CFR Part 1926** in print (price $30).
- Some states have their own regulations, which will differ from the U.S. Dept. of Labor's OSHA regulations.

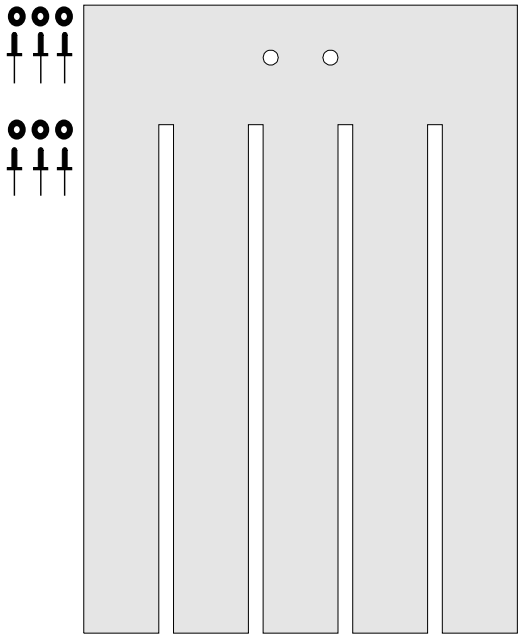
15. AUXILIARY ITEMS & PARTS



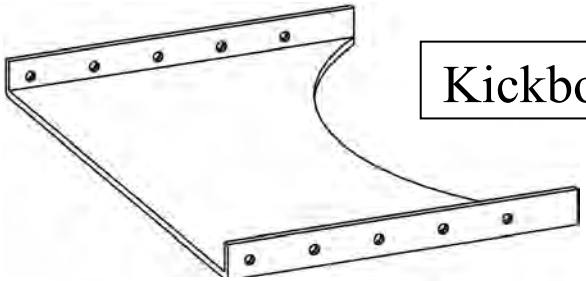
Door Adjustment Kit



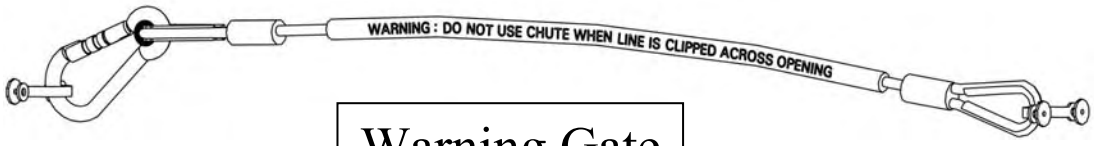
Come Alongs



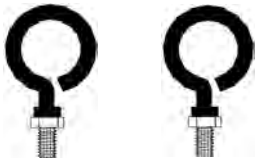
Debris Deflection Curtain for Doors



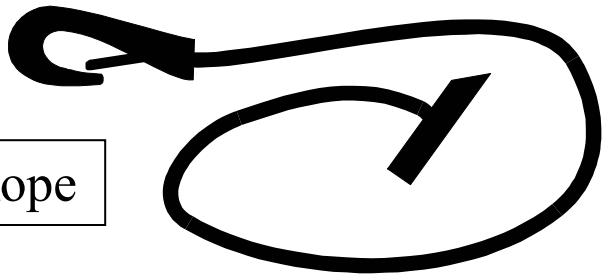
Kickboard



Warning Gate



Eyebolts



Red Rope

AUXILIARY ITEMS & PARTS (description)

DOOR ADJUSTMENT KIT
- For the adjustment of Door sections
- Use to nestle Regular sections within one another, thus raising the Door(s) below
- Increases the chute section overlap by up to 12" (30 cm), in addition to the usual 8" (20 cm) of overlap
- Each chain length has a Working Load Limit of 1000 lb. (450 kg).
- The design factor is 10 to 1

COME ALONGS
- Use in conjunction with the Door Adjustment Kit
- Working Load Limit of one come along: 1000 lb. (450 kg).
- The design factor is 8 to 1
- Leverage 18:1, 6' (1.8 m) lift, 3/16" (5 mm) diameter galvanized cable
- Model 72-AP, Made by POWER PULL™ in the USA

WARNING GATE
- For Top Hopper and Door Sections
- Wire rope with red plastic sheath
- Sheath stamped with warning
- OSHA requirement
- When re-ordering specify chute diameter (includes 2 mounting brackets & 4 blind rivets)

DEBRIS DEFLECTION CURTAIN
- Deflection curtain for the Door section
- Prevents falling debris from escaping through the Door opening
- Includes 6 blind rivets and 6 washers
- When re-ordering specify chute diameter

EYEBOLT
- For Wraparound® Regular sections
- Five required per section

RED ROPE
- For Wraparound® Regular sections
- Red elastic shock cord with clip and toggle
- Prevents fastened eyebolts from unscrewing

KICKBOARD
- For Wraparound® Top Hopper & Door sections
- Replaceable
- When re-ordering specify: Top or Door / diameter

ROPE BAG (not shown)
- Complete set-up for 1 Wraparound® Regular
- Includes two 40" (102 cm) long cable assemblies, 5 eyebolts, 1 red rope, 1 instruction sheet.

All of the above items are available for purchase.

16. WARRANTY

Superchute® trash chutes are made for heavy wear, but like all tools, time and use will take its toll. There is no warranty for wear and tear, or misuse of the chute. Superchute® warrants all products against manufacturing defects, which must be reported in writing to Superchute® Ltd. upon receipt of goods. Thorough overhaul servicing is offered by Superchute® Ltd.

17. STAY INFORMED

The Superchute® factory sends out regular notices regarding new products, changes, recalls, and upgrades. Stay informed by filling out the form below and sending it in. Please feel free to enclose any other comments. Thank you for choosing Superchute® Ltd.

Your Name: _____ Company: _____ Address: _____ Phone: _____ Fax: _____	E-mail address: Website:

Number of chute sections owned: _____

Diameter(s) of the chute sections: _____

Date(s) of purchase: _____

Name of the Supplier: _____

Number of chute hoist(s) owned: _____

Models and Serial Numbers: _____

Date(s) of purchase: _____

Name of the Supplier: _____

Fax to: 514-365-8987, or mail to: Superchute® Ltd., 8810 Elmslie Road, Montreal, QC, Canada, H8R 1V6