SUPERCHUTE® DEBRIS CHUTE SYSTEM

CHUTE MANUAL

2nd Edition, Published January 17, 2019

Contains information and instructions on:

- Planning
- Installation
- Use
- Maintenance

When used correctly, meets OSHA 1926.852

- This edition of the Chute Manual contains important new information
- The information within is current and supersedes information in previous editions
- Discard old Chute Manual editions
- If at any time you are unsure of how to proceed, call Superchute Ltd. 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:

- **Planners and supervisors of the chute system**
- **Installers of the chute system**
- **Users of the chute system**

⚠ WARNING

- The installation and use of a Superchute Debris 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.
- This manual must be read and understood by:

  - Planners and supervisors of the chute system
  - Installers of the chute system
  - Users of the chute system.

  If one or more Superchute Chute Hoists will be used in the chute system, the above mentioned persons must also read the applicable Chute Hoist Manual.

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

- Tel: 800-363-2488
- Tel: 514-365-6121
- Fax: 514-365-8987
- Internet: www.superchute.com
- E-mail: info@superchute.com
- Address: 8810 Elmslie Rd, Montreal, QC, Canada, H8R 1V6

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. 2,119,108 U.K. Pat. 2,276,151	U.S. Pat. 5,934,437 Can. Pat. 2,177,741

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How to Use This Manual

This manual contains important information about the Superchute Debris Chute System. It should not, however, 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 Superchute Debris Chute System should obtain the services of trained professionals.

Use the Most Recent Edition

Each new edition of the Chute Manual contains important new information.

ALWAYS USE THE MOST RECENT EDITION: Compare the edition date of this booklet (printed at the bottom of every page) to the date of the edition available for download on the Superchute web site: superchute.com/manuals. Use the edition with the most recent date. If you do not have access to the internet, call Superchute Ltd.(1-800-363-2488) and ask a representative for assistance.

The instructions in a new edition supersede any instruction found in a prior edition.

Avoid confusion: discard old Chute Manuals.

Finding Information Quickly

This manual contains four key tools to help you find information quickly:

- the Table of Contents on page 5.
- the List of Figures on page 7.
- the contents page at the beginning of each chapter.
- the Index at the back of the manual.

Getting Copies of This Manual

Print copies of the Chute Manual, in booklet form, are available free of charge from Superchute Ltd. Copies can be sent to you by mail or UPS Express (United Parcel Service - next day delivery option).

You can also download, view, and print the Chute Manual from the Superchute web site www.superchute.com.

If a copy of the Chute Manual is not with the chute system at the jobsite, installation and use of the chute system should be postponed until a copy is obtained.

Who Should Read This Manual

All persons involved in any aspect of planning, supervising, installing and using the chute system should read and understand the contents of this manual.

Specifically, planners, supervisors, installers and users should read the following chapters in their entirety:

Chapter 1. Chute System Overview	Describes the product's intended use, chute sections, material options, warning and information labels, cable assemblies, cable lanyards, steel liners, and chute hoists.
Chapter 2. Planning the Installation	Explains the essential planning steps: how to select an installation area, calculate the weight of the chute, choose a suitable lifting device and anchors, produce the installation plan and fire prevention plan.
Chapter 3. Preparing Chute Sections	Provides instructions on cable assembly installation, and on preparing the chute sections for installation.
Chapter 4. Installing the Chute System	Provides instructions for raising and anchoring the chute sections, restraining the chute, incorporating load sensors, installing the container, installing liners, and implementing the fire prevention plan.
Chapter 5. Using the Chute System	Provides instructions on container use, hopper and door use, controlling access to the chute, designating a safety monitor, preventing and resolving blockages, and severe weather precautions.
Chapter 6. Chute System Maintenance	Provides instructions on the maintenance and inspection of chute sections, cable assemblies, and chute hoists.

This manual should be made readily available to all jobsite personnel at all times.

Warning Format

Throughout this manual you will see warnings used to alert planners, supervisors, installers and users to potential hazards inherent in the use of the Superchute Debris Chute System.

Warnings are displayed in a box to help set them apart from other information. The box consists of two or three panels with the following information:

- The signal word WARNING is shown in the top panel alongside the safety alert symbol.
- The hazard, consequence, and instruction statements are found in the second panel.
- If the warning contains three panels, the third panel contains an image that 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

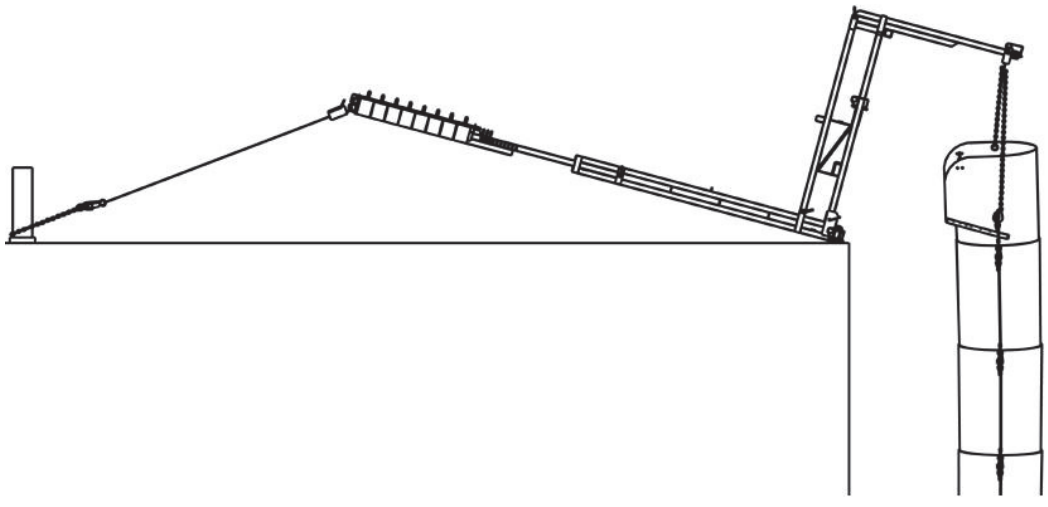
Consequence

Instruction

Image (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 tables in Chapter 2 to calculate the weight of your chute.



Chapter 1.

Chute System Overview

Intended Use

The Superchute Debris Chute System is designed for the manual removal of construction debris on construction sites.

The system is for temporary use. Do not use the Superchute Debris Chute System as a permanent garbage chute, recycling chute, laundry chute, nor for any other permanent application, since it is not designed to meet fire code regulations for permanent chutes.

Do not use the chute as a human slide, since serious injury or death could result.

Training Available

A one-day training course is offered at the Superchute factory. The course can include a factory visit, and examines the correct planning, preparation, installation, use, and maintenance of Superchute chute sections and chute hoists. The course outline is modeled on the contents of this manual.

The Superchute factory is only a ten minute drive from Montreal-Trudeau International Airport (YUL) and has a large showroom and demonstration area for training purposes.

The training course is free of charge for small groups.

Call Superchute Ltd. at 1-800-363-2488 for details.

Use of Non-Superchute Components

The chute system components manufactured by Superchute Ltd. are designed to work together as a system. Do not mix Superchute components with those of another brand. For example, do not mix Superchute chute sections with another manufacturer’s chute sections.

Chute Sections

Superchute chute sections are conical tubes, 4 feet (1.2 m) in height, that overlap by 8 inches (20 cm) when linked together. Two designs are available:

- Welded sections are permanently tubular
- Wraparound® sections can be opened and stored flat.

Both designs provide an equally safe and easy debris removal solution.

The standard diameters are 18”, 23”, 27”, 30”, 33”, and 36” (46, 58, 69, 76, 84, 91 cm).

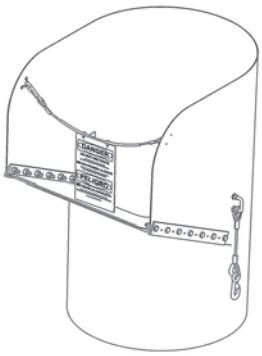


Fig. 1 Top Hopper section.

Top Hopper Section

- Uppermost section in a chute
- Allows for the introduction of debris
- Scoop shape helps channel debris into the chute
- Must be used at the top of a chute
- Use only one top hopper per chute
- The loading pan (kickboard) is replaceable
- A lockout cover is available (page 91).

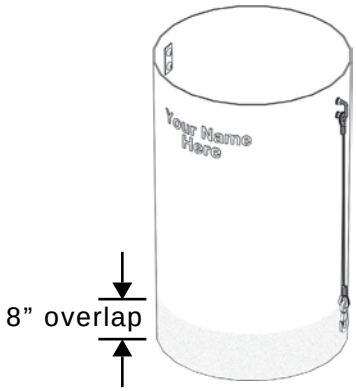


Fig. 2 Regular section.

Regular Section

- Slightly tapered tube
- A chute consists mainly of regular sections

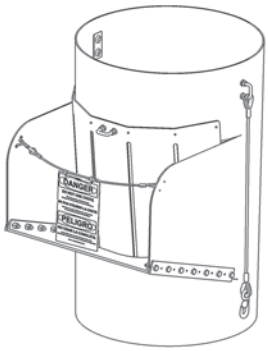


Fig. 3 Door section.

Door Section

- Entry section installed below the top hopper
- Allows for the introduction of debris
- A chute can include a door section per level
- The debris deflection curtain is replaceable
- The loading pan (kickboard) is replaceable
- Door sections can be accurately aligned with floor levels using Superchute Cable Lanyards (page 29).
- A lockout cover is available (page 91).

Chute Wall Materials

Depending on the application, one of the following materials is used to fabricate Superchute chute sections:

Non-Fire Rated Materials

Yellow Plastic: Most chute sections are built of yellow plastic, which is a strong, high quality plastic. Available in both Wraparound and Welded designs. Many thicknesses available.

Material: High Molecular Weight Polyethylene (HMWPE).

Blue Plastic: Customers requiring a chute that can withstand exceptionally high volumes of debris can purchase chute sections manufactured in blue plastic (available in both Wraparound and Welded designs). The blue plastic is five times more abrasion resistant than the yellow plastic used in most chute sections.

Material: 1/4” wall Ultra High Molecular Weight Polyethylene (UHMWPE).

Fire Rated (FR) Materials

Black Plastic: Customers requiring a Fire Rated (FR) chute can purchase Wraparound chute sections manufactured in black plastic. The black plastic has fire retardant additives and is five times more abrasion resistant than the yellow plastic used in most chute sections.

Material: 1/4” wall Ultra High Molecular Weight Polyethylene (UHMWPE).

Sheet Metal: Customers requiring a non-combustible Fire Rated (FR) chute can purchase Wraparound chute sections manufactured in sheet metal.

Material: 18-gauge galvanized steel.

Aluminum: Customers requiring a non-combustible Fire Rated (FR) chute can purchase Welded chute sections manufactured in aluminum.

Material: 1/8” thick aluminum

Learn more about chute fires and FR materials at www.superchute.com/fire.

Chute Section Labeling

Every plastic chute section is stamped with three labels:

A. General warning label

B. Fire warning label

C. Chute section information label.

These labels are reproduced below and on the following pages.

A. General Warning Label

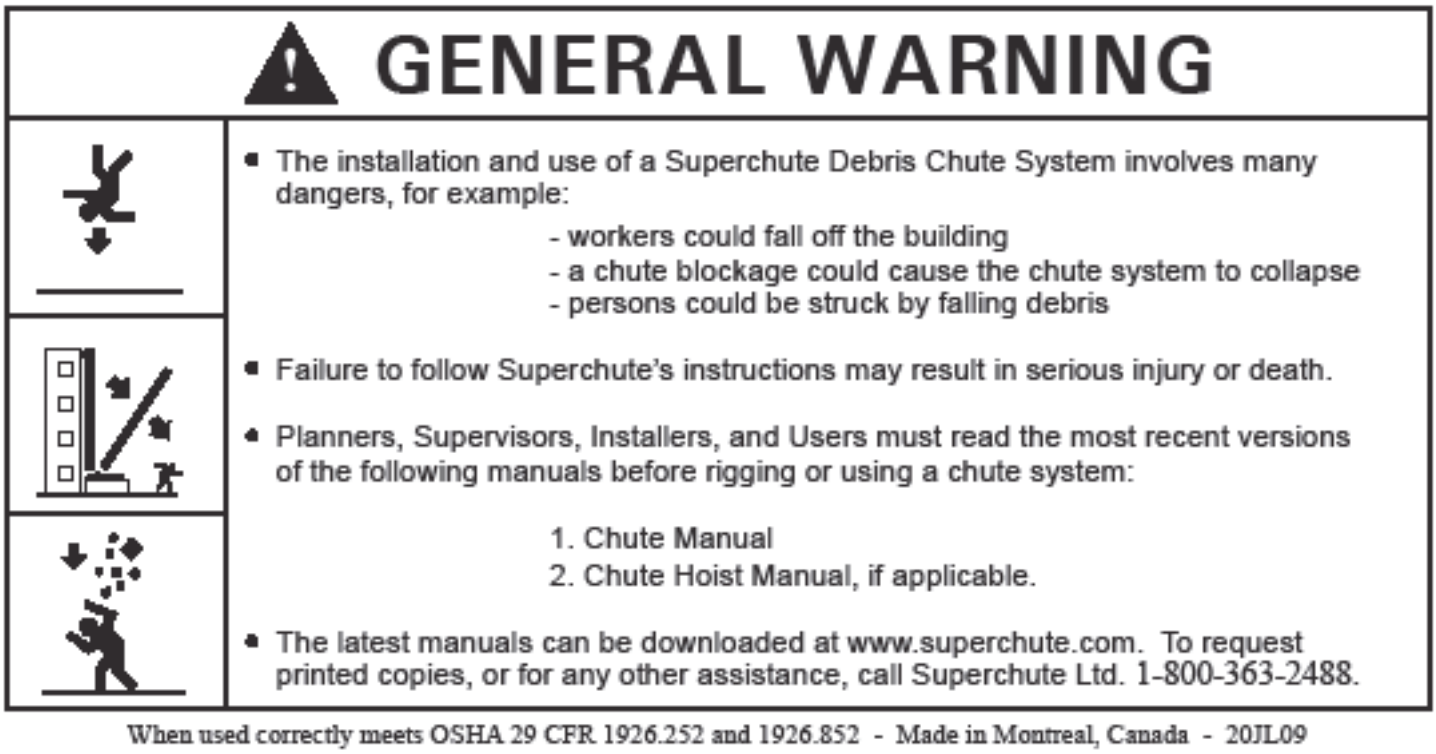
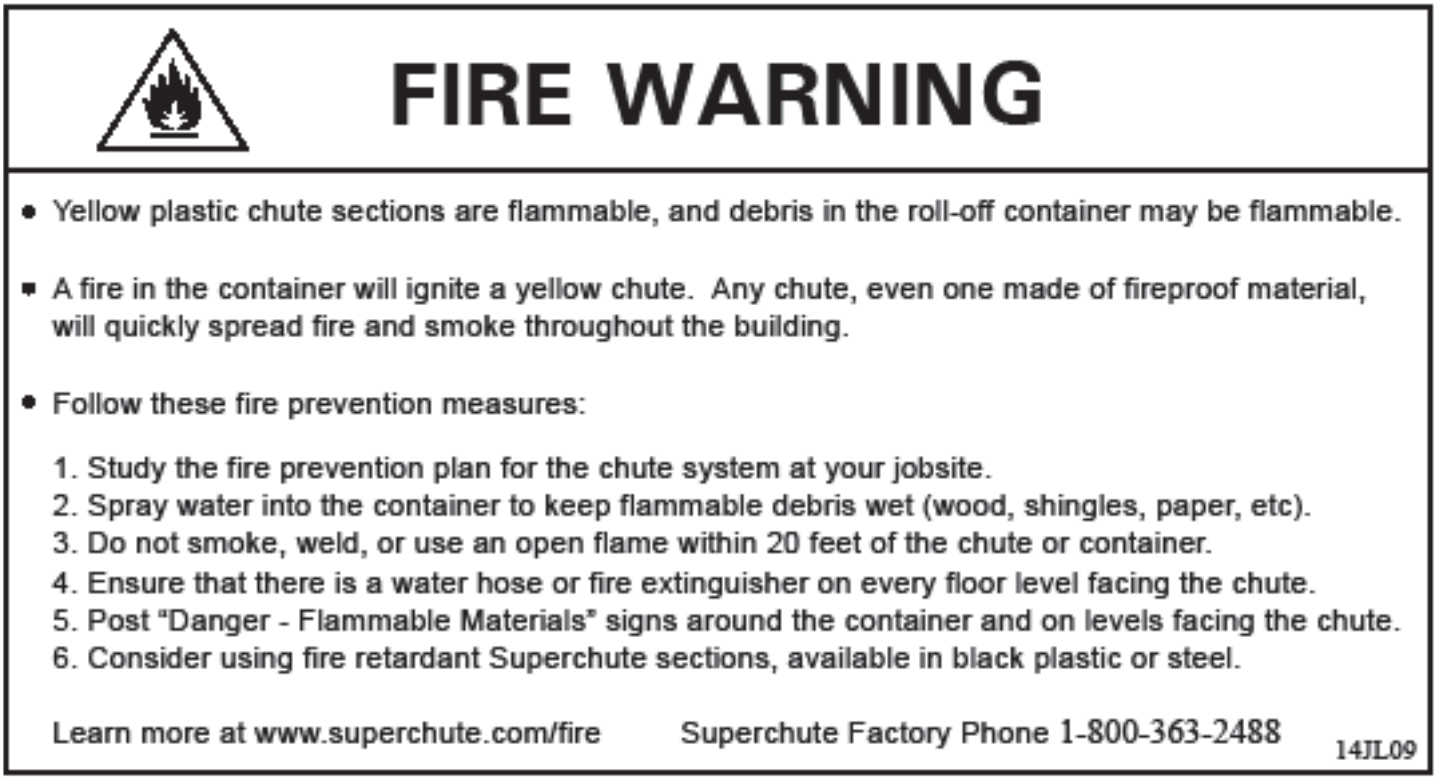


Fig. 4 General warning label stamped on all plastic chute sections.

B. Fire Warning Labels



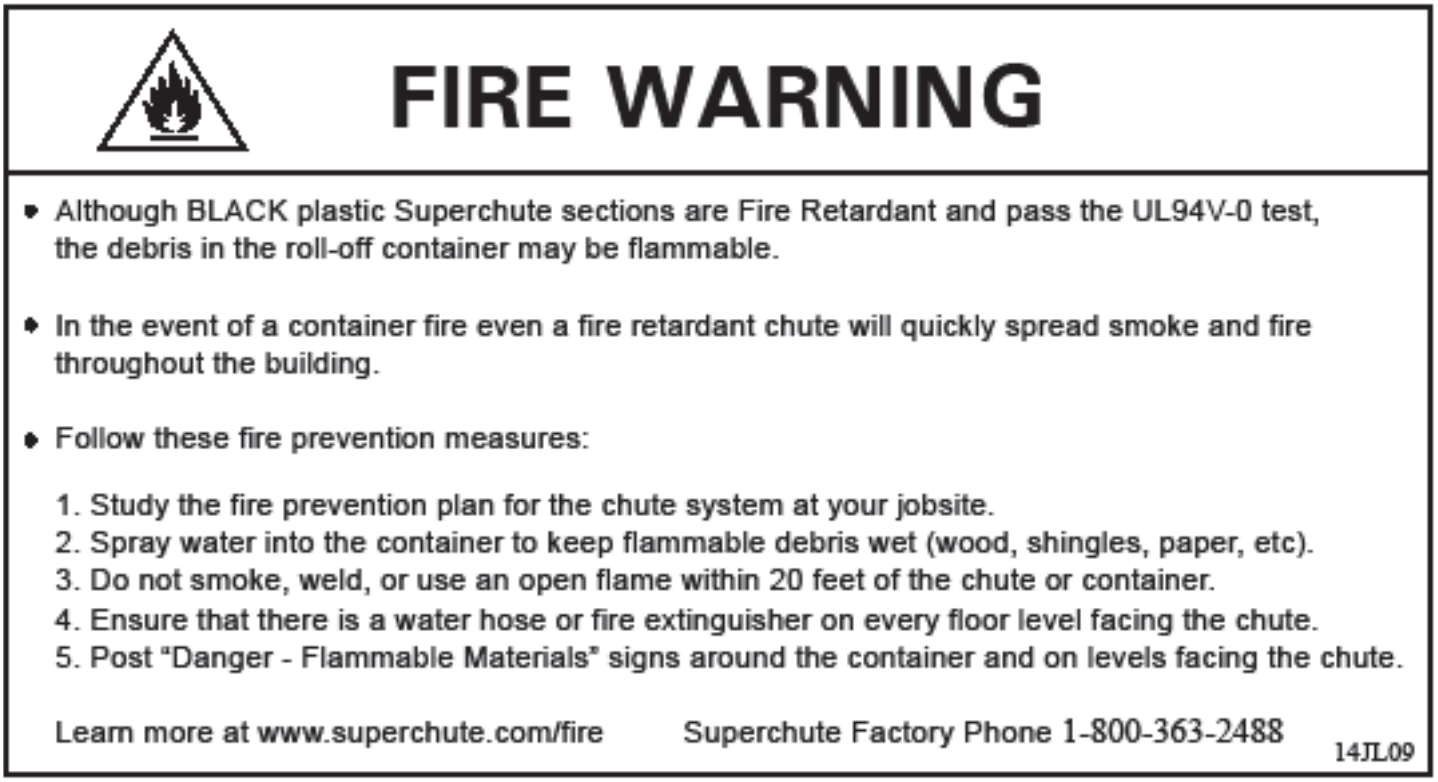
FIRE WARNING

- Yellow plastic chute sections are flammable, and debris in the roll-off container may be flammable.
- A fire in the container will ignite a yellow chute. Any chute, even one made of fireproof material, will quickly spread fire and smoke throughout the building.
- Follow these fire prevention measures:

1. Study the fire prevention plan for the chute system at your jobsite.
2. Spray water into the container to keep flammable debris wet (wood, shingles, paper, etc).
3. Do not smoke, weld, or use an open flame within 20 feet of the chute or container.
4. Ensure that there is a water hose or fire extinguisher on every floor level facing the chute.
5. Post "Danger - Flammable Materials" signs around the container and on levels facing the chute.
6. Consider using fire retardant Superchute sections, available in black plastic or steel.

Learn more at www.superchute.com/fire Superchute Factory Phone 1-800-363-2488 14JL09

Fig. 5 Fire warning label stamped on yellow plastic chute sections.



FIRE WARNING

- Although BLACK plastic Superchute sections are Fire Retardant and pass the UL94V-0 test, the debris in the roll-off container may be flammable.
- In the event of a container fire even a fire retardant chute will quickly spread smoke and fire throughout the building.
- Follow these fire prevention measures:

1. Study the fire prevention plan for the chute system at your jobsite.
2. Spray water into the container to keep flammable debris wet (wood, shingles, paper, etc).
3. Do not smoke, weld, or use an open flame within 20 feet of the chute or container.
4. Ensure that there is a water hose or fire extinguisher on every floor level facing the chute.
5. Post "Danger - Flammable Materials" signs around the container and on levels facing the chute.

Learn more at www.superchute.com/fire Superchute Factory Phone 1-800-363-2488 14JL09

Fig. 6 Fire warning label stamped on black plastic chute sections.

C. Chute Section Information Label

The following specifications are stamped onto every plastic chute section:

- Type of section
- Month of manufacture
- Year of manufacture
- Wall thickness
- Diameter of section
- Weight of section

In addition, the chute section is always stamped with one of the following company logos:

- Contractor's logo
- Distributor's logo
- Superchute logo

Fig. 7 Chute section information label, with company logo.

Chute Section Cable Assemblies

Two wire rope cable assemblies are supplied with every chute section. These are used to link one chute section to the next.

The cable assembly pair is the critical component of the chute section. Each pair supports the weight of the chute sections below. Therefore, the cable assembly pairs at the top of the chute will support more weight than the pairs lower down.

Consequently, if you will build a chute using sections with varying amounts of cable assembly wear, place sections with newer cable assemblies at the top of the chute system. Place sections with cable assemblies showing greater wear at the base of the chute.

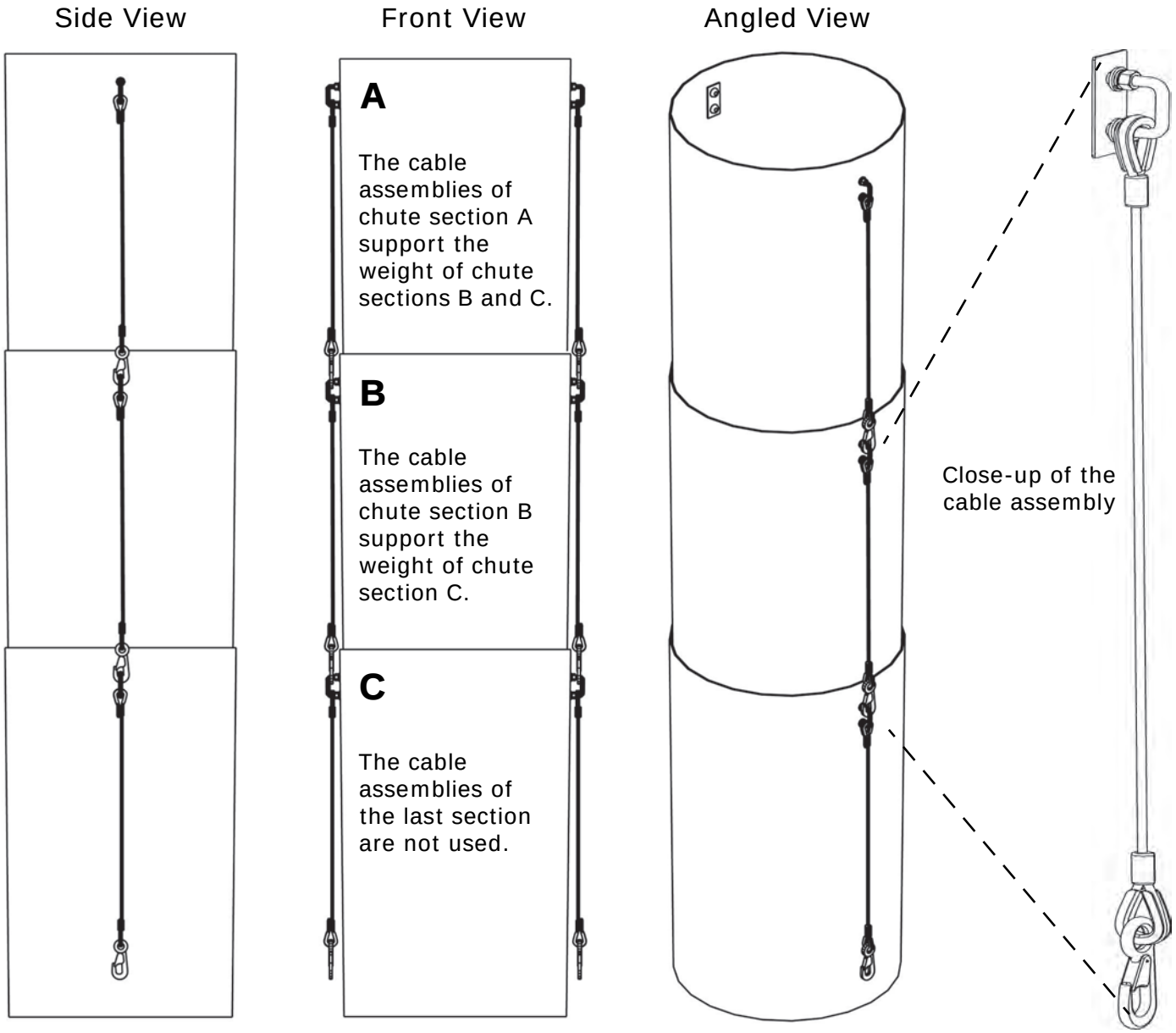


Fig. 8 Various views of the cable assembly.

Cable Assembly Description

Cable assemblies, all of which are made at the Superchute factory, consist of 3 components:

1. U-Bolt: Used to secure the cable assembly to the chute wall.

2. Wire Rope: Safer, lighter, and easier to handle than chain.

3. Hook: Impossible to remove without cutting through the wire rope.

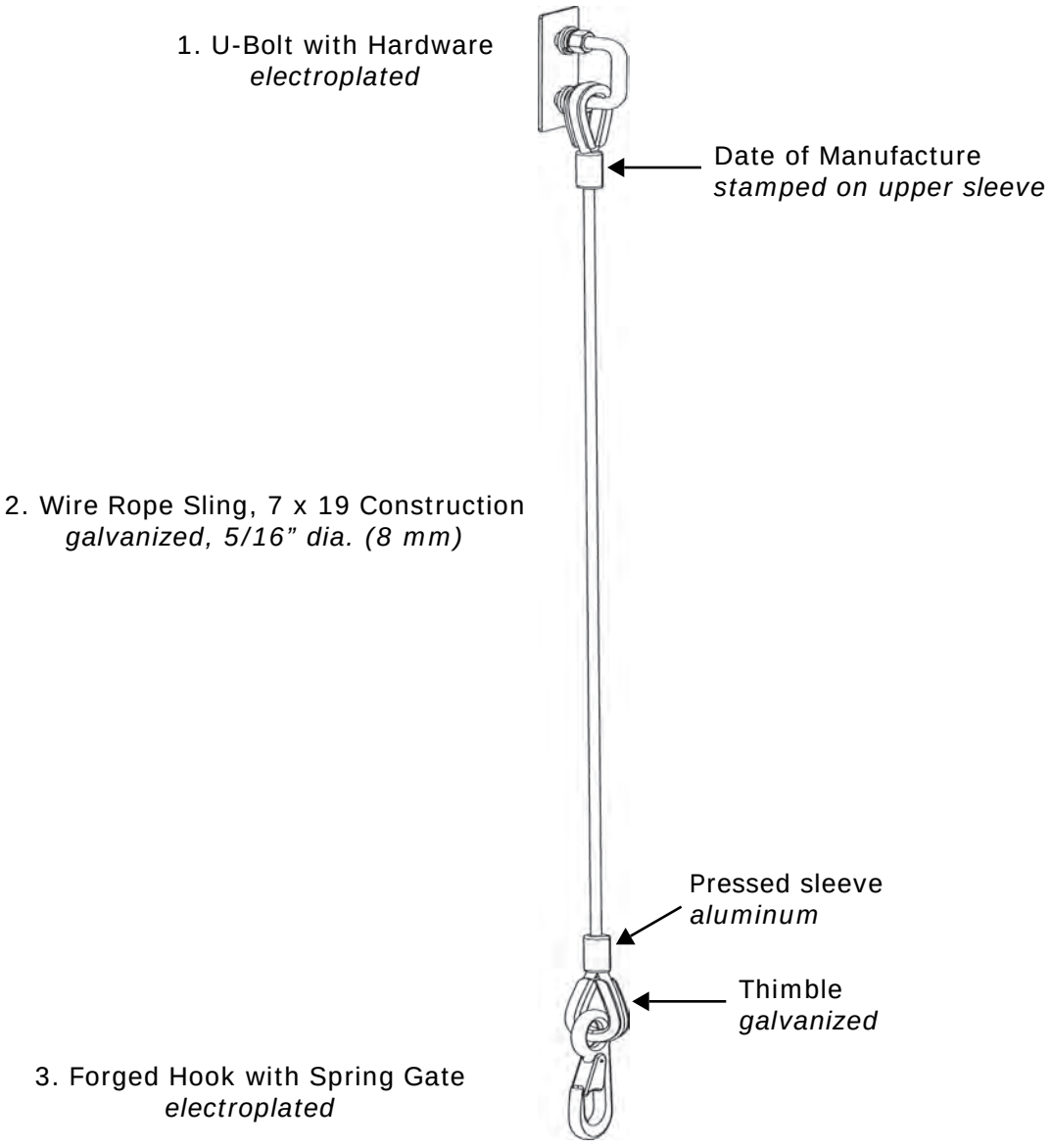


Fig. 9 Standard cable assembly components.

Cable Assembly Types

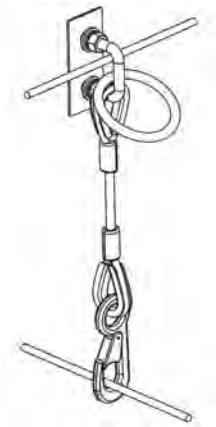
There are two cable assembly types: Type 1 and Type 2. Regular and Door sections are equipped with Type 1 assemblies while Top Hopper sections are equipped with Type 2.

Type 1

For Regular and Door Sections

- 1/2” (12.5 mm) diameter steel U-bolt
- Working length: 40” (102 cm) pin-to-pin.

Fig. 10 Cable Assembly Type 1.



Type 2

For Top Hopper Sections

- 1/2” (12.7 mm) diameter steel U-bolt
- Working length: 16” (41 cm) pin-to-pin.

Fig. 11 C

Cable Assembly Strength

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

- The *Breaking Strain* of a cable assembly is 10,000 lbs. (4500 kgs).
- The *Working Load Limit* of a cable assembly is 1000 lbs. (450 kgs). The design factor is 10 to 1.
- As there are two cable assemblies per chute section, a chute section has a *Working Load Limit* of 2000 lbs. (900 kgs).
- Every cable assembly is proof-tested at the factory to 2000 lbs. A date-stamp is then applied to the pressed wire rope sleeve next to the U-bolt (as of January 2001).

Height and weight limits for chute sections equipped with older cable assemblies are explained in Appendix D.

⚠ WARNING

- Wear and tear or abuse will reduce the strength of the cable assembly.
- The failure of a weakened cable assembly could cause the chute to collapse.
- Inspect cable assemblies frequently. See Chapter 6 “Chute System Maintenance”.

Benefits of Wire Rope vs. Chain

Why does Superchute use wire rope in the cable assembly?

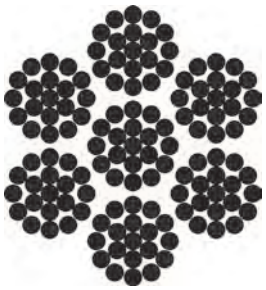


Fig. 12 Cross section of a 7 x 19 wire rope.

"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 using wire rope instead of chain. See Table 1.

Table 1. Benefits of wire rope vs. chain

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.

Superchute does use chain in some of its products (for example, Chute Hoists) where link-by-link adjustment is required. However, only high quality Grade 70 and Grade 80 rated chains are ever used.

Chain Assemblies

A very small number of customers prefer chute sections equipped with chain assemblies, and Superchute is able to accommodate this special request.

Despite the availability of Superchute chain assemblies, 99.99% of Superchute sections are sold with wire rope assemblies.

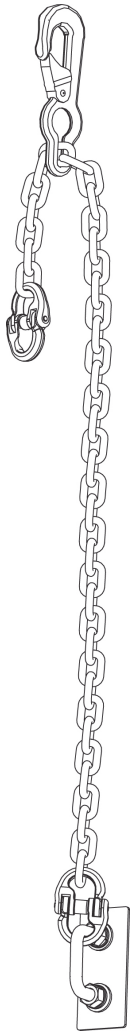


Fig. 13 Chain assembly.

Stainless Steel Cable Assemblies

Stainless steel cable assemblies are available. These are recommended for chute sections that will be used in corrosive environments such as:

- marine applications
- potash mines
- salt plants
- waste water treatment plants.

Fig. 14. Stainless steel cable assembly.

Cable Lanyards

If your chute will incorporate door sections you will need to determine door section placement ahead of time to ensure that installed door sections align with floor levels.

Ask the Superchute Factory to provide you with a custom drawn site sketch. The sketch will show you how to achieve perfect door positioning with cable lanyard pairs. The sketch will identify the required length, quantity, and placement of the cable lanyard pairs (for more details, see page 49).

The lanyard pair is always applied between two regular sections, during the installation process. An installed lanyard pair has the effect of decreasing the distance between door sections.

In most cases, standard 28” working length lanyards (71 cm) provide the necessary adjustment. However, for certain floor-to-floor spacings custom length lanyards are more effective. Every custom length lanyard is fitted with a durable yellow plastic tag engraved with the lanyard’s working length.

The Superchute Factory can easily determine the correct lanyard length for your job. Call for a site sketch every time the chute needs to be re-installed.

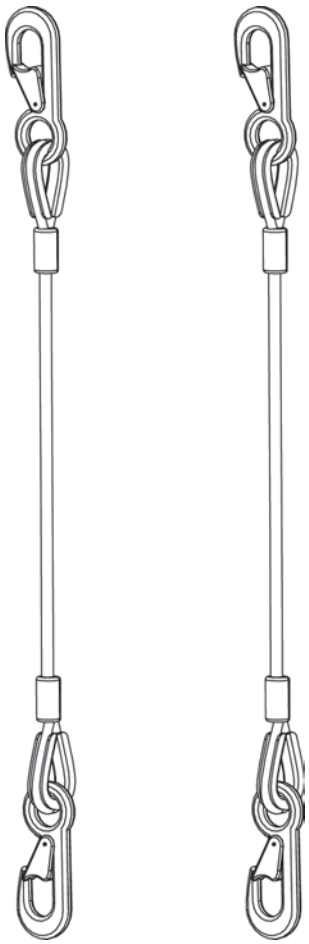


Fig. 15 Standard 28” lanyard pair.

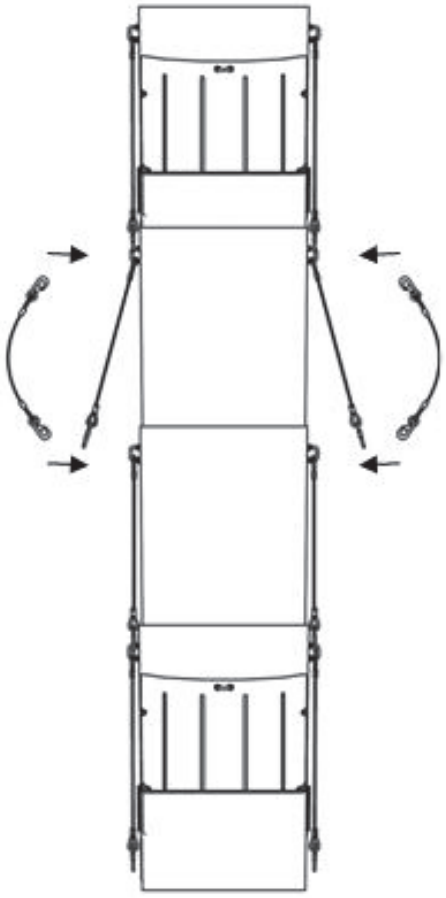


Fig. 16 Attachment of lanyards to regular sections.

Steel Liners

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

If the discharge end of the chute forms a curve, and the chute is being used for heavy debris removal, consider reinforcing the discharge end of the chute with Superchute steel liners.

The repeated impact of heavy debris will curl the liners over time. For this reason, liners need to be inspected frequently. Avoid using liners in chute sections that are not readily accessible (for example, higher up in the chute).

Liners add considerable weight to the chute (see Chapter 2, “B. Calculate the Weight of the Suspended Chute”, pages 40 to 43).

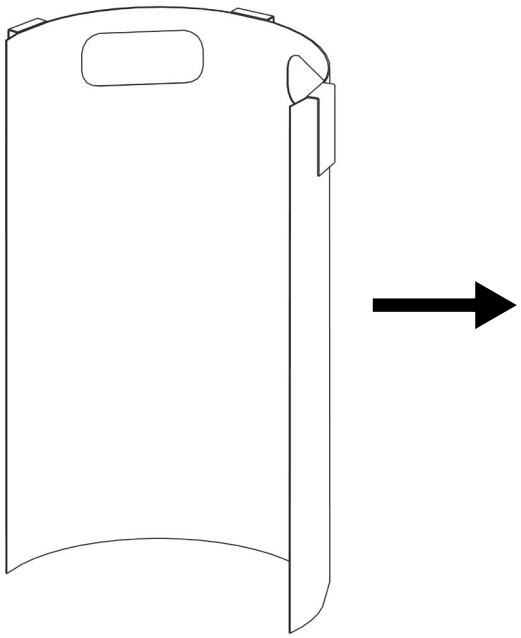


Fig. 17 Steel liner.

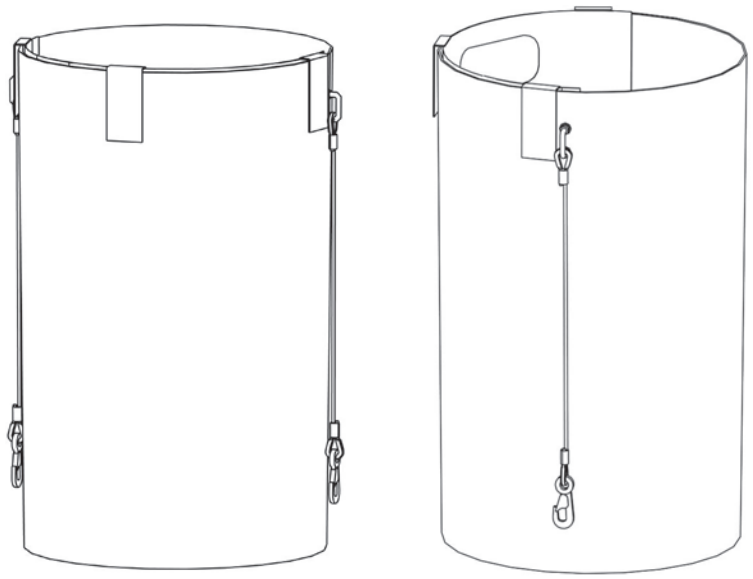


Fig. 18 Steel liners installed in regular chute sections.

Chute Hoists

Superchute Chute Hoists are designed specifically for raising, anchoring and lowering the chute. Several models are available. The hoist model name refers to the maximum weight, in pounds, that the hoist can safely raise, anchor and lower. For example, the SC-750-bd hoist can safely raise, anchor and lower 750 lbs. (340 kgs).

Bolt-Down Frames For Concrete Slabs
model SC-250-bd
model SC-500-bd
model SC-750-bd
model SC-1000-bd
model SC-1500-bd

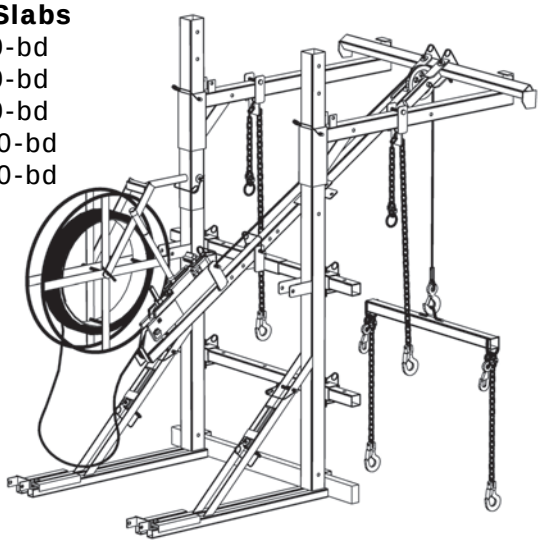


Fig. 19 Bolt-Down Frame model SC-750-bd.

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

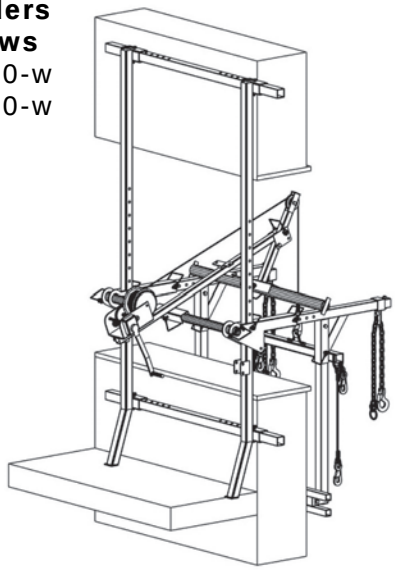


Fig. 20 Loadspreader model SC-600-w.

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

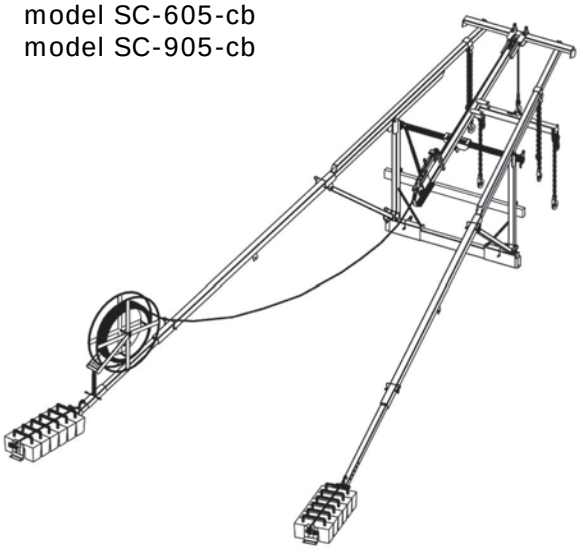


Fig. 21 Roofer Hoist model SC-905-cb.

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

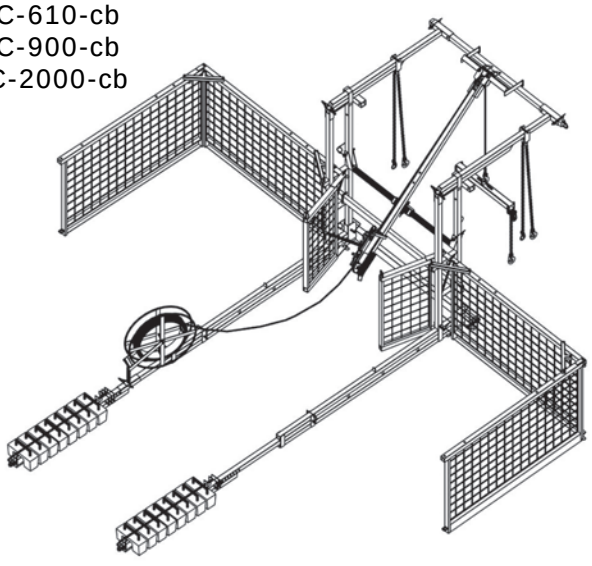


Fig. 22 Hoister model SC-900-cb

- assemble in 10 minutes with locking pins
- easy to transport and install
- galvanized steel construction
- 3:1 safety factor
- removable fishpole
- designed to work with cranes

More Chute Hoists

Scaffold Hoists
model SC-900-s
model SC-2000-s

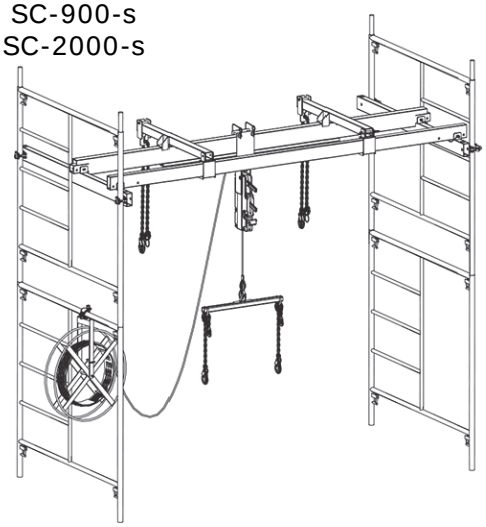


Fig. 23 Scaffold Hoist model SC-2000-s.

Forklift Frame
for Chute Suspension
model SC-900-f

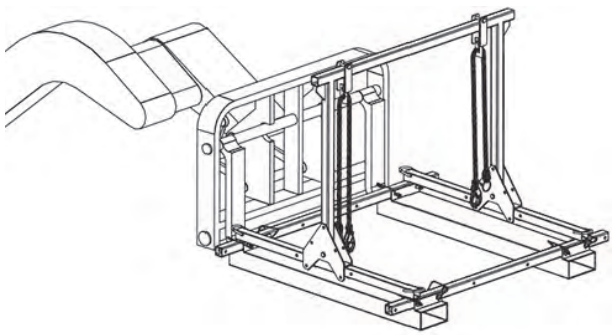


Fig. 24 Forflift Frame model SC-900-f.

Mast Climber Frame
for Chute Suspension
model HM-2000

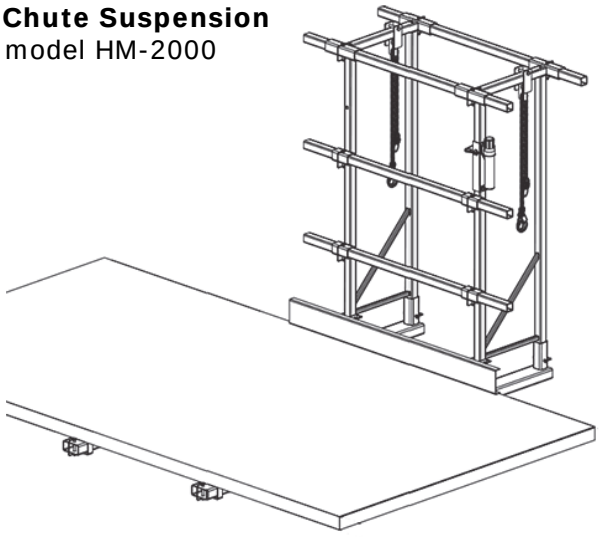


Fig. 25 Mast Climber Frame model HM-2000.

- assemble in 10 minutes with locking pins
- easy to transport and install
- galvanized steel construction
- 3:1 safety factor

Chapter 2.

Planning the Installation

Federal, State, and Local Safety Regulations

Chute planners should be aware of applicable federal, state, and local safety regulations that pertain to the installation and use of a chute.

For example, planners in the USA should be aware of the Occupational Safety and Health Administration (OSHA) regulations for chutes and fall protection, some of which are reproduced in the appendix “OSHA Information” on page 111. OSHA regulations are federal regulations. Other state or local regulations may apply.

Planning Step Checklist

For every chute installation, the planning process must include these essential steps:

A. Select the installation area. ☐

B. Calculate the weight of the suspended chute. ☐

C. Select the lifting device and anchors for the chute. ☐

D. Produce and provide the installation plan. ☐

E. Develop a fire prevention plan. ☐

Superchute factory assistance and guidance is available free of charge for the above steps.

These steps are detailed on the pages that follow.

A. Select the Installation Area

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

The following issues must be given careful consideration when selecting the installation area for your chute:

Consider Public Safety

Locate the chute in an area far from the public. Always consider the consequences of a worst case scenario. For example:

- If the chute collapsed, might it fall onto a road, a sidewalk, a park?
- If a worker throws a brick towards the top hopper or door section and misses, what might be the consequences of the brick falling outside the chute?
- If a hole wears through the chute wall, and debris escapes from the chute, could the debris shower people below?
- If the debris is combustible, consider the implications if the trash container or chute catches fire. Even a fireproof chute can spread smoke and fire throughout a building. See “E. Develop a Fire Prevention Plan” on page 52. Also visit www.superchute.com/fire for more information.

Anticipate Airborne Dust

Use of a chute will generally create airborne dust. Will the location of the container create dust intake problems for nearby ventilation units? Hospitals are particularly concerned about dust creation near air intakes.

Container Area

A roll-off steel container must be positioned beneath the chute. Roll-off containers are generally rented from waste disposal companies. A dump truck, pick-up truck, or similar vehicle, should not be used since falling material could strike the cab and injure the driver (see “A Letter from OSHA” on page 111).

Ensure that the discharge end of the chute is located above and not inside the container. A maximum gap of 2 to 5 feet between the discharge end of the chute and the container is recommended.

** If the chute will be installed in Michigan USA, note that Michigan State OSHA requires the discharge end to be within 8’ of ground level.*

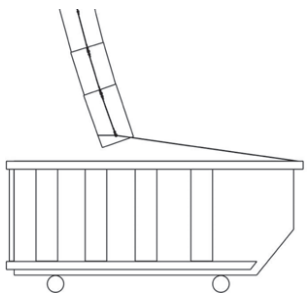


Fig. 26 Gap above container.

Seek Shelter From The Wind

Select an area that provides shelter from the wind.

- Can the chute be installed inside the building
- If not, consider the direction of 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 Fig. 27). Note the protruding corners (circled).
- The effect of wind on the chute is discussed in “Wind and Restraint Issues” on page 76.

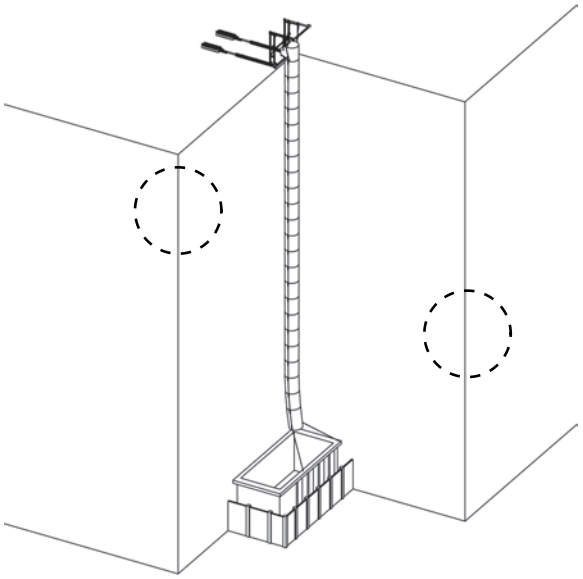


Fig. 27 Chute installed in an inset corner.

Prevent Electrocution

Prevent electrocution by choosing an area that is free of power lines. If power lines are present, consult with either the chief electrician, electrical engineer, or local power authority before proceeding.

Do Not Obstruct a Fire Escape

Do not install the chute near an exterior or interior fire escape staircase. Do not use the fire escape as a support framework for the chute. If the chute or container were to catch fire, the fire escape would be unusable.

Hang the Chute Vertically

To reduce the risk of a blockage, and minimize wear, choose an area where the chute will hang vertically. Horizontal displacement of the chute must not exceed 20% of the chute's height. See Fig. 28

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.

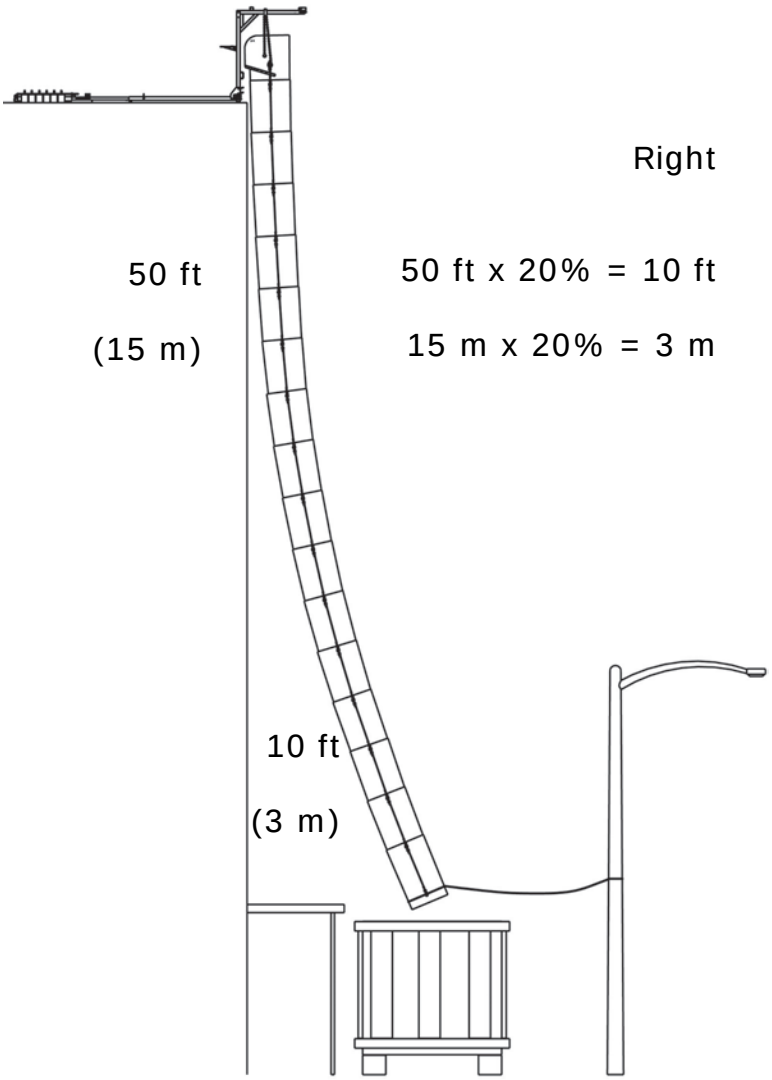


Fig. 28 Maximum horizontal displacement of the chute.

Handling Large Quantities of Rubble

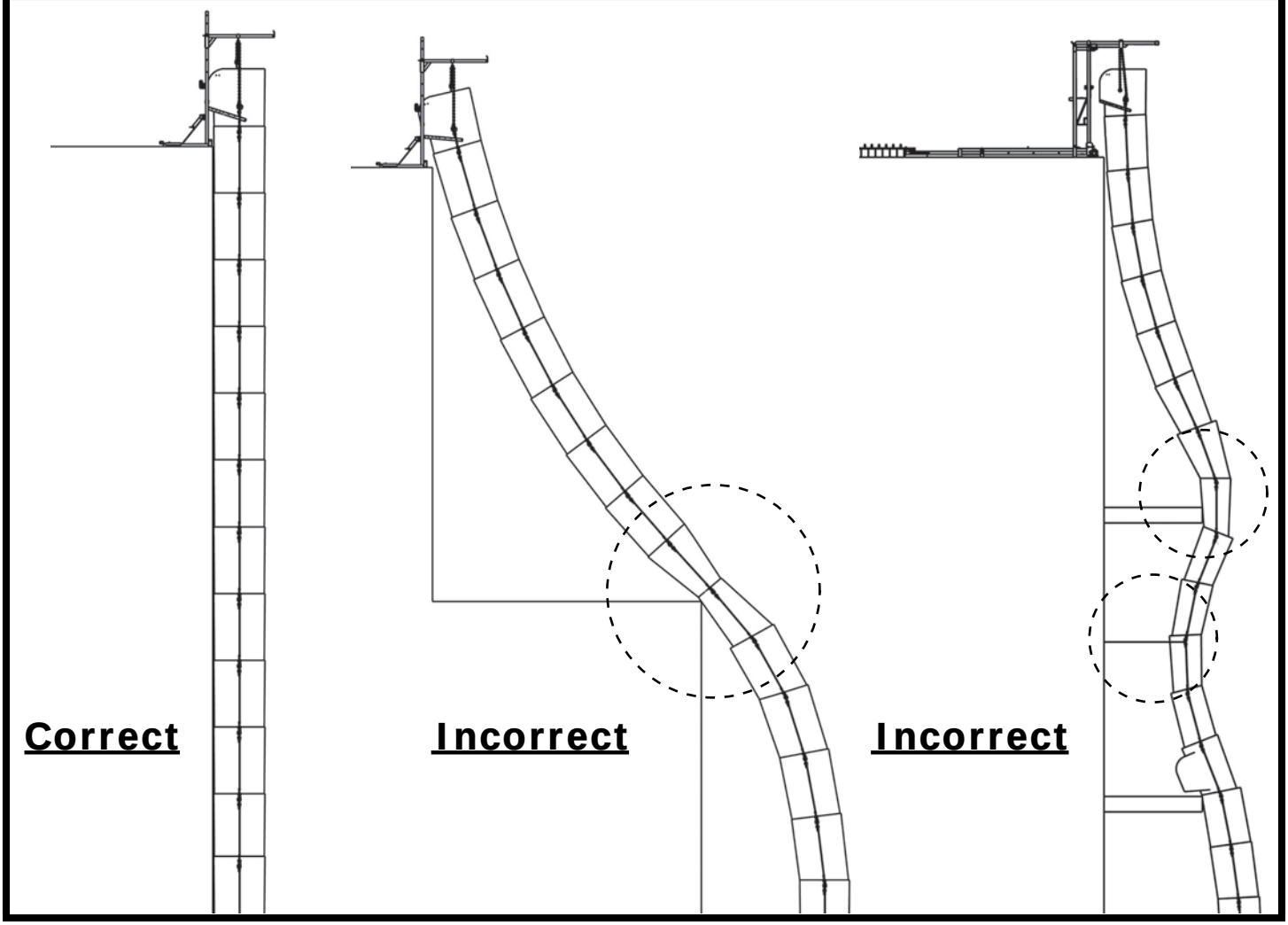
If the chute will be used for large quantities of rubble, find a location where the chute will hang straight without any curve. This will greatly reduce abrasion on the inside of the chute. If the container cannot be positioned directly beneath the chute, consider having a heavy duty discharge ramp fabricated in steel. The steel ramp will receive the dropped debris and direct it into the container. Consult with an engineer for the ramp design.

Do Not Constrict the Chute

Constrictions will block the chute. Do not force the chute around balconies, ledges, or any other kind of large protrusions that will distort and reduce the chute diameter.

⚠ WARNING

- If the chute is not hung vertically, there will be a bend in it.
- If the bend crimps the chute, 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 falling chute system can cause serious injury or death.
- Do not create a blockage hazard. Choose a location that will allow the chute to hang vertically. Choose a location that will not crimp or constrict the chute.



Dealing with Stepped Facades

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, plumbing chase, or similar opening inside the building?

2. Can the chute be split into two or more lengths? See Fig. 29

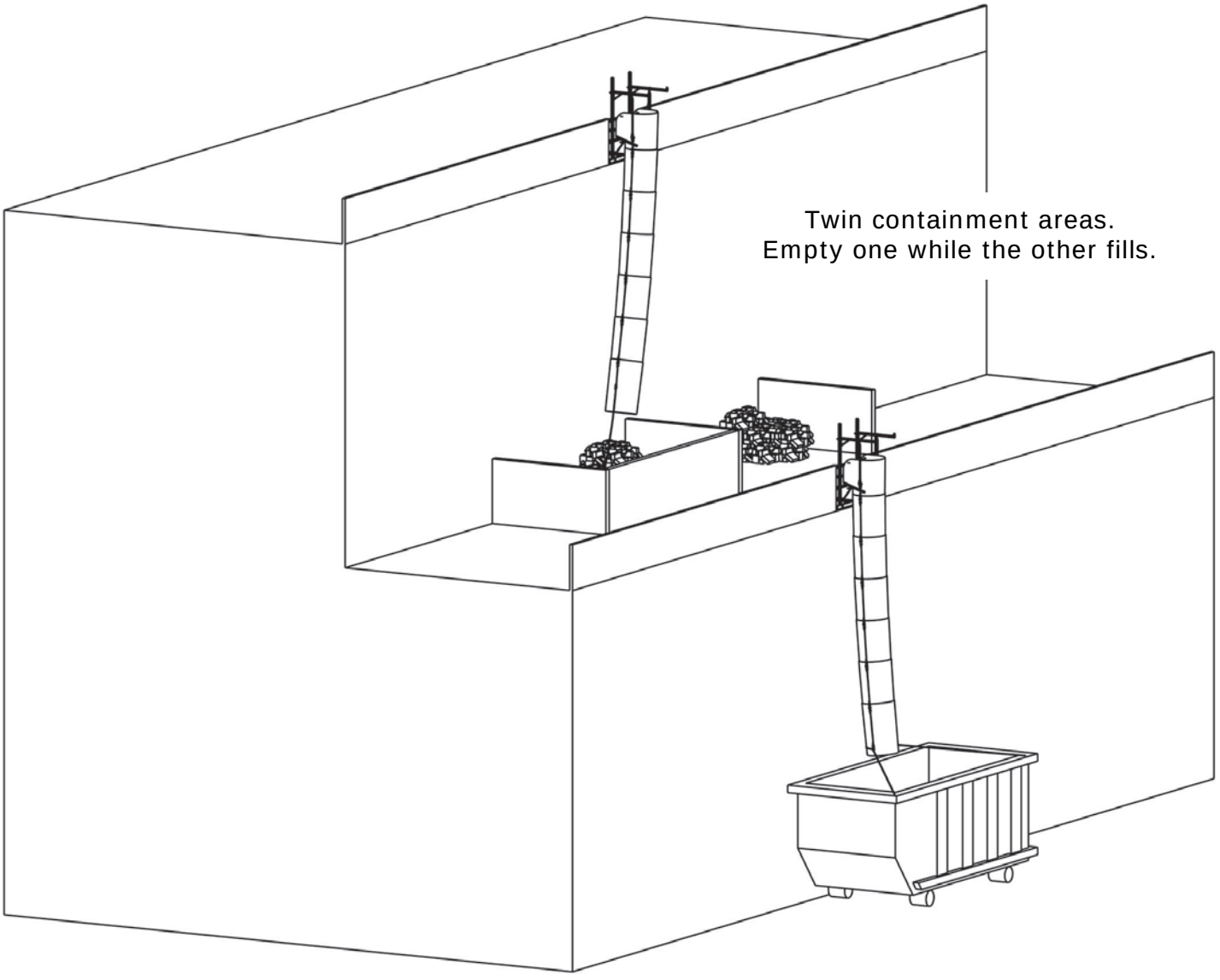


Fig. 29 Chute split into two offset lengths.

B. Calculate the Weight of the Suspended Chute

How high will the chute go? How much will the chute weigh? The form below is a planning tool. In this example, the weight of a fictitious chute is calculated. On the next page a blank form is provided for your own use.

Job Name: Hotel On First Ave. **Units of Measurement:** (Imperial) / Metric

1. What is the anticipated height of the chute? 70 (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 ÷ 10 = 21 sections
   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 meters = _____ sections needed.
   When linked, a chute section of any type creates a 1.02 meter drop.

3. How many entry sections will be needed? 3 entry 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 table below:
   Every chute section is branded with its weight.
   Section Weights are also provided in this chapter.

	Quantity		Weight in (lb.) or kg.		Weight in (lb.) or kg.
A)	1	Top Hopper Wraparound	x 46 lb. each	=	46 lb.
B)	2	Door Sections Wraparound	x 55 lb. each	=	110 lb.
C)	18	Regular Sections Wraparound – 3/16" wall	x 40 lb. each	=	720 lb.
D)	2	Steel Liners	x 40 lb. each	=	80 lb.
A+B+C+ D	=	**TOTAL WEIGHT OF THE CHUTE**		=	956 lb.

Weight Calculation Form

Photocopy this page and use it with the weight tables on pages 42 and 43.

Knowing the total weight of the chute lets planners choose the appropriate lifting device and anchors. Need help planning your installation? Call Superchute at 1-800-363-2488.

Job Name: _____ **Units of Measurement:** Imperial / 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 meters = _____ sections needed.
   When linked, a chute section of any type creates a 1.02 meter drop.

3. How many entry sections will be needed? _____ entry 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 table below:
   Every chute section is branded with its weight.
   Section Weights are also provided on the next 2 pages.

	Quantity		Weight in lb. or kg.		Weight in lb. or kg.
A)	_____	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**		=	_____

Yellow Chute Section Weights in Pounds

The weights on this page are given in pounds (lbs). For weights given in kilograms (kgs), see “Yellow Chute Section Weights in Kilograms” on page 43.

- An “X” in a column indicates that no such section exists.
- If the chute will include steel liners, do not forget to account for their weight.

Table 2. Welded Section Weights (in lbs.)

Diameter	Wall Thickness	Regular	Top Hopper	Door
18”	3/16” (5 mm)	21	25	30
23”	3/16” (5 mm)	28	32	38
27”	3/16” (5 mm)	31	39	46
30”	3/16” (5 mm)	36	44	52
30”	5/32” (4 mm)	28	X	X
30”	1/8” (3.2 mm)	X	X	X
33”	1/4” (6 mm)	40	52	61
36”	1/4” (6 mm)	46	57	67

Table 3. Wraparound Section Weights (in lbs.)

Diameter	Wall Thickness	Regular	Top Hopper	Door
18”	5/32” (4 mm)	22	28	X
23”	3/16” (5 mm)	31	35	42
27”	3/16” (5 mm)	35	41	50
30”	3/16” (5 mm)	40	46	55
30”	5/32” (4 mm)	31	X	X
30”	1/8” (3.2 mm)	27	X	X
33”	1/4” (6 mm)	43	55	65
36”	1/4” (6 mm)	49	59	70

Table 4. Liner Weights (in lbs.)

For diameter	Weight
18” (46 cm)	23
23” (58 cm)	32
27” (69 cm)	37

For diameter	Weight
30” (76 cm)	40
33” (84 cm)	48
36” (91 cm)	53

Yellow Chute Section Weights in Kilograms

The weights on this page are given in kilograms (kgs). For weights given in pounds (lbs), see “Yellow Chute Section Weights in Pounds” on page 42.

- An “X” in a column indicates that no such section exists.
- If the chute will include steel liners do not forget to account for their weight.

Table 5. Welded Section Weights (in kgs.)

Diameter	Wall Thickness	Regular	Top Hopper	Door
18” (46 cm)	3/16” (5 mm)	9.5	11.3	13.6
23” (58 cm)	3/16” (5 mm)	12.7	14.5	17.2
27” (69 cm)	3/16” (5 mm)	14.1	17.7	20.9
30” (76 cm)	3/16” (5 mm)	16.3	20.0	23.6
30” (76 cm)	5/32” (4 mm)	12.7	X	X
30” (76 cm)	1/8” (3.2 mm)	X	X	X
33” (84 cm)	1/4” (6 mm)	18.1	23.6	27.7
36” (91 cm)	1/4” (6 mm)	20.9	25.9	30.4

Table 6. Wraparound Section Weights (in kgs.)

Diameter	Wall Thickness	Regular	Top Hopper	Door
18” (46 cm)	5/32” (4 mm)	10.0	12.7	X
23” (58 cm)	3/16” (5 mm)	14.1	15.9	19.1
27” (69 cm)	3/16” (5 mm)	15.9	18.6	22.7
30” (76 cm)	3/16” (5 mm)	18.1	20.9	24.9
30” (76 cm)	5/32” (4 mm)	14.1	X	X
30” (76 cm)	1/8” (3.2 mm)	12.2	X	X
33” (84 cm)	1/4” (6 mm)	19.5	24.9	29.5
36” (91 cm)	1/4” (6 mm)	22.2	26.8	31.8

Table 7. Liner Weights (in kgs.)

For diameter	Weight
18” (46 cm)	10.4
23” (58 cm)	14.5
27” (69 cm)	16.8

For diameter	Weight
30” (76 cm)	18.1
33” (84 cm)	21.8
36” (91 cm)	24.0

C. Select the Lifting Device and Anchors for the Chute

Once the weight of the chute has been calculated, a suitable lifting device and appropriate anchors can be chosen.

Always use engineered rigging equipment to install and anchor chute sections.

Recommended Methods for Lifting the Chute

The chute should be raised with a Chute Hoist, a crane, a material hoist, or a boom lift. Ensure that the selected device can safely manage the weight of the chute.

Recommended Methods for Anchoring the Chute

The chute should be anchored using one of the following options:

1. **Chute Hoists:** In most cases, customers choose from the wide range of engineered *Support Frames* that are manufactured by Superchute Ltd. These support frames are called chute hoists because they can be supplied with a *Fishpole Winch Assembly* for raising and lowering the chute. If a crane will be used to raise and lower the chute, then the chute hoist will not need to be equipped with a Fishpole.

2. **Material Hoists:** Occasionally, customers will use their own material hoist to raise, anchor, and lower the chute. The disadvantage of this option is that the material hoist cannot be used to raise and lower materials while it is used by the chute.

3. **Overhead Beams:** In some cases, overhead beams of sufficient strength are present. These can serve to suspend the chute, thus eliminating the need for a Superchute® Support Frame.

4. **Scaffolds, Stages, or Platforms:** In other cases, scaffolds, stages, or platforms can be used to support the chute.

Additional anchoring guidelines for installers are discussed on page 73 under the heading “2. Anchoring the Chute Sections”.

In all cases, the chute must be suspended in the vertical plane, and a structural engineer must verify the adequacy of the supporting structure.

These anchoring options are discussed in more detail on the following pages.

Anchoring Option 1: Chute Hoists

Superchute® Chute Hoists are designed specifically for raising, anchoring and lowering the chute. Several models are available. The hoist model name refers to the maximum weight, in pounds, that the hoist can safely raise, anchor and lower. For example, the SC-750-bd hoist can safely raise, anchor and lower 750 lbs. (340 kgs).

The installation area for the Chute Hoist must be capable of withstanding the loads that will be imposed on the building structure once the chute is installed. A structural engineer must verify the adequacy of the supporting structure.

Fig. 30 shows a Superchute chute hoist. More chute hoist models are shown on page 31.

To see Superchute's full range of chute hoists, visit www.superchute.com.

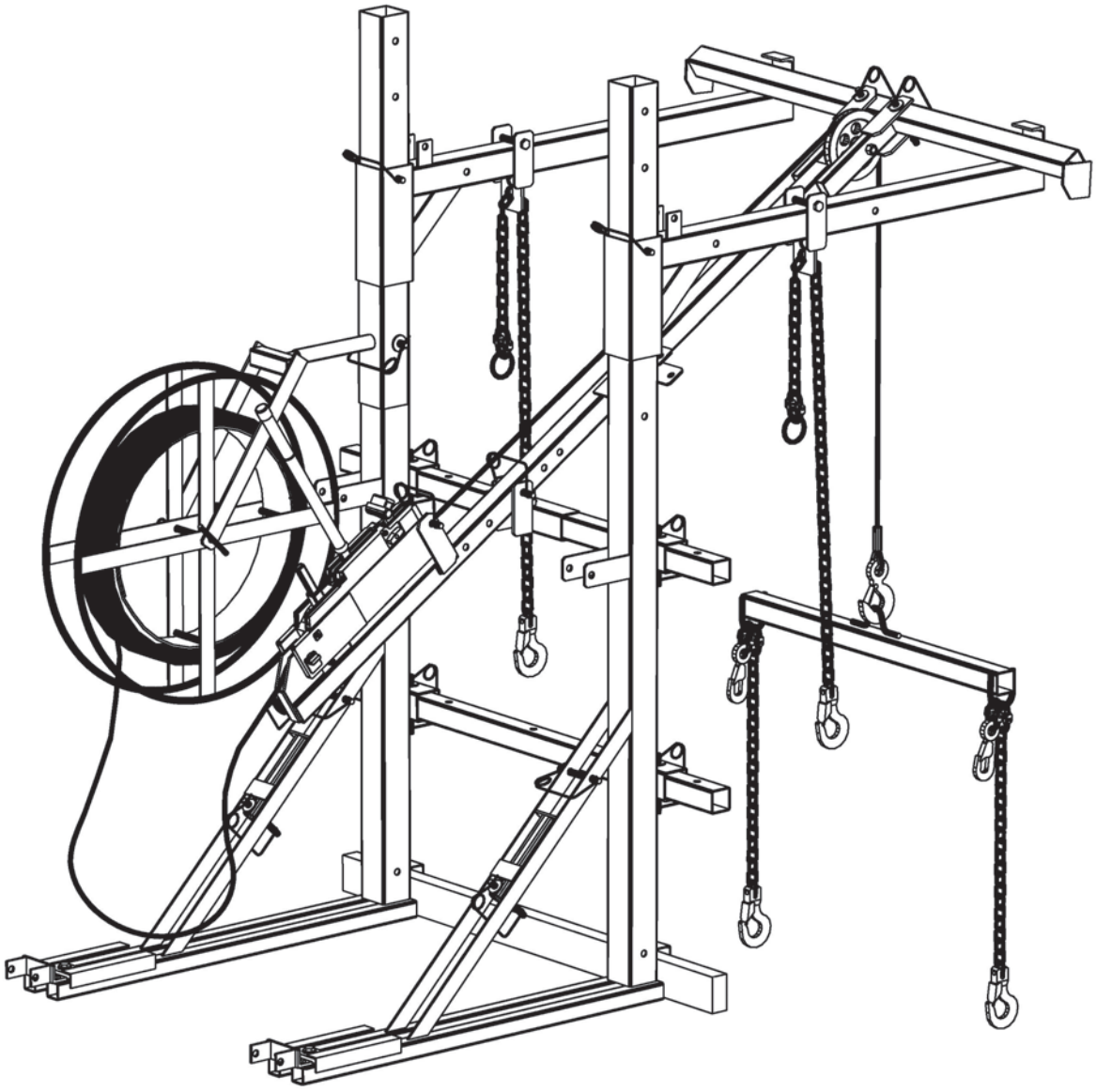


Fig. 30 Bolt-Down Frame Model SC-750-bd.

Anchoring Option 2: Material Hoists

The material hoist must be capable of safely managing the chute load.

A structural engineer must verify the adequacy of the supporting structure.

Anchoring Option 3: Overhead Beams

In some cases, overhead beams or similar structural members of sufficient strength are present. These can serve to suspend the chute, thus eliminating the need for a Superchute Chute Hoist.

A structural engineer must verify the adequacy of the supporting structure.

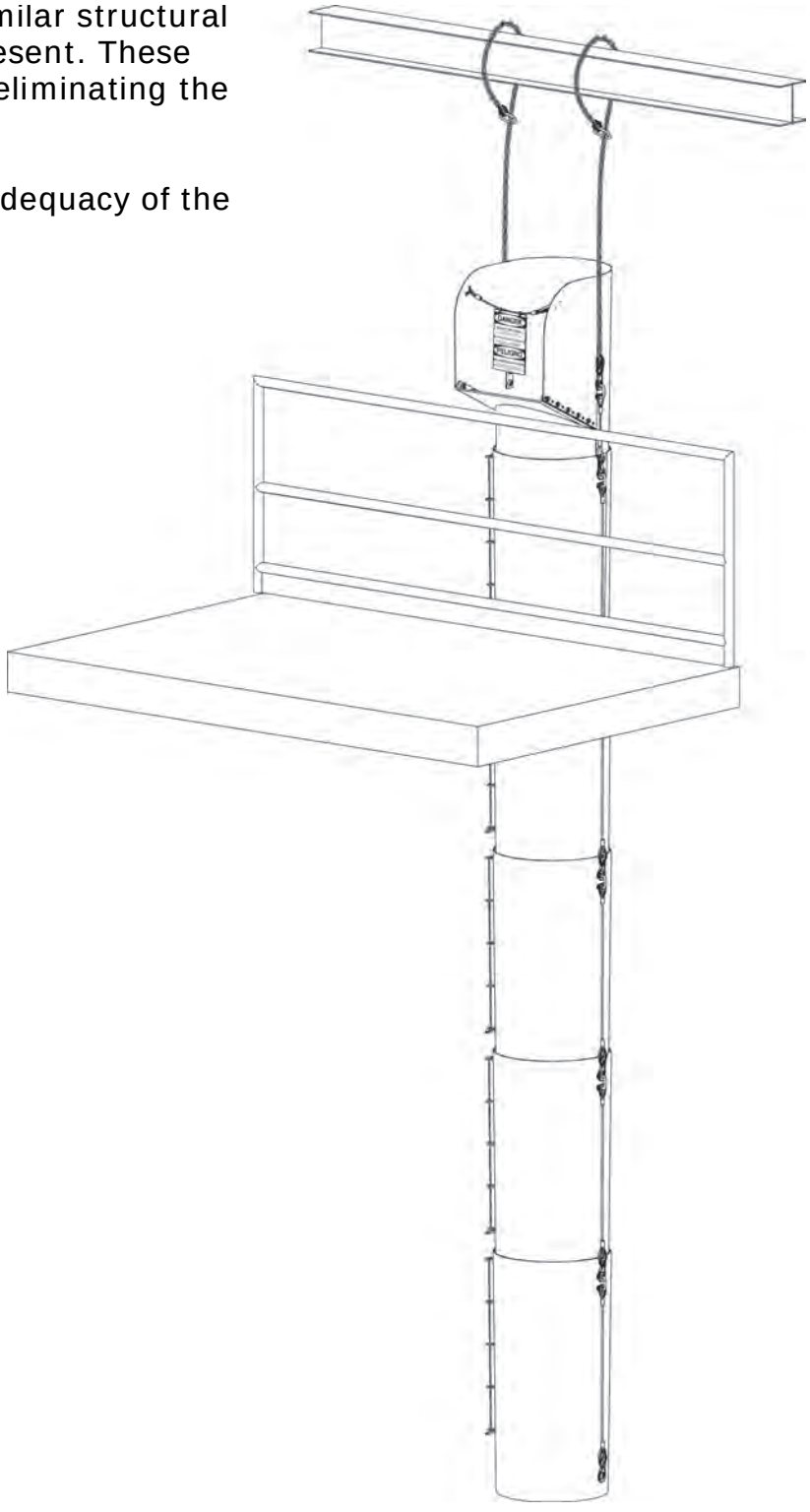


Fig. 31 Chute suspended from an overhead beam.

Anchoring Option 4: Scaffolds, Stages or Platforms

If anchoring a chute to a scaffold:

- Use professional scaffold erectors to install both the scaffold and the chute.
- Erect and tie the scaffold in accordance with government regulations and manufacturer's instructions or as designed by an engineer.
- Restrain the chute to the scaffold at intervals of less than 25 feet (8 meters) to prevent wind sway.
- Install the chute inside the scaffold, if feasible, as this is a more stable arrangement, and will better distribute the weight of the chute to the 4 corners of the scaffold tower.

If using frame scaffolding, consider using Superchute's Chute Hoist for Scaffolds. The hoist's support frame will perfectly distribute the weight of the chute to the 4 corner posts of the scaffold tower.

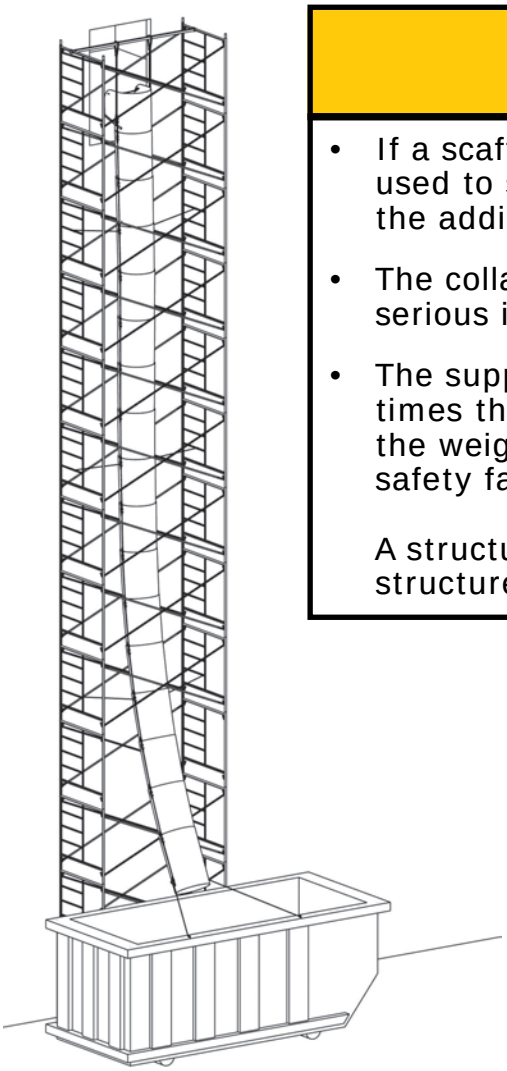


Fig. 32 Chute inside a scaffold.

⚠ 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 supporting structure.

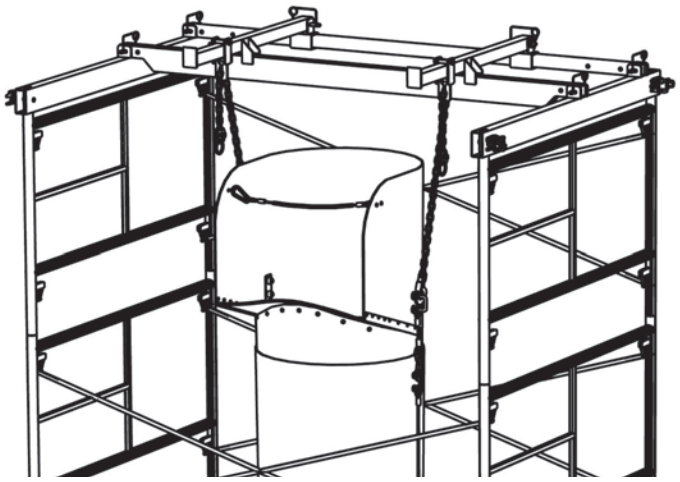


Fig. 33. Superchute® Chute Hoist for frame scaffolding.

D. Produce and Provide the Installation Plan

For each chute installation the planner will need to produce a documented installation plan and provide the plan to the installers.

Superchute Ltd. offers a free drafting service that provides a site sketch tailored to your particular job. The sketch, which is often used by planners as the basis for the installation plan, shows the chute suspended from the jobsite building.

The site sketch service provides a computer-generated technical drawing and a weight report. The site sketch is e-mailed or faxed to you, usually within 24 hours of receiving the request. To request your free site sketch, call Superchute Ltd. at 1-800-363-2488. Before calling, see “Information Required to Obtain an Accurate Site Sketch” on page 50.

In addition to showing the chute installed on the jobsite building, the sketch will:

- Show the exact quantity and type of chute sections needed for the job
- Explain how to align door sections with floor levels
- Recommend the appropriate lifting device and anchors.

All installation plans need to include these basic elements.

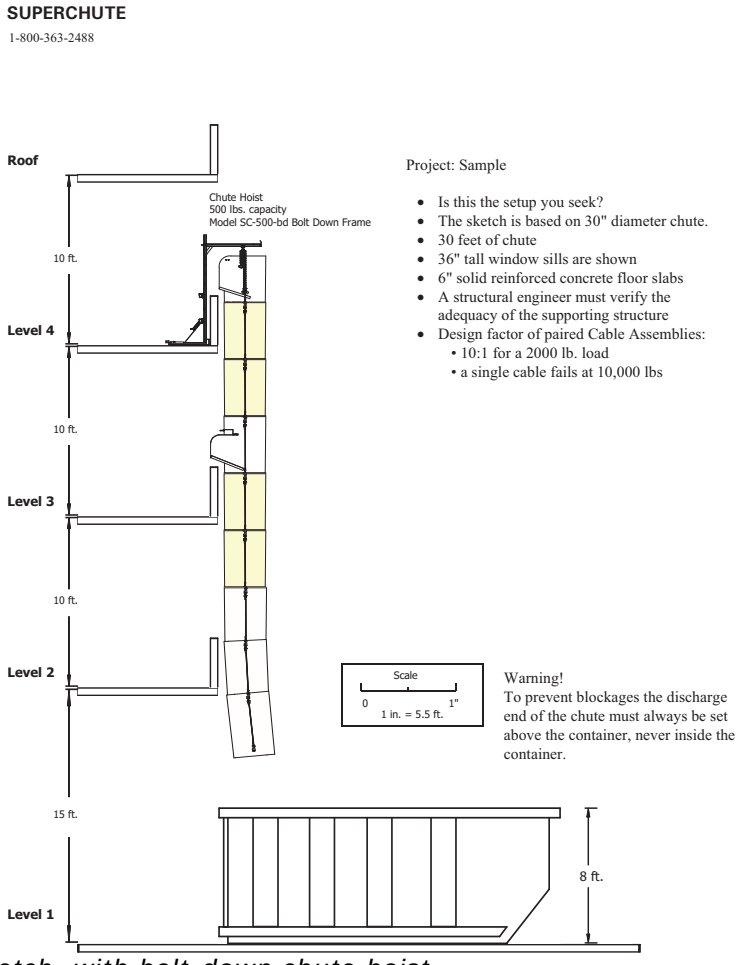


Fig. 34 Sample site sketch, with bolt-down chute hoist.

Information Required to Obtain an Accurate Site Sketch

When you request a site sketch, Superchute will ask you the following questions:

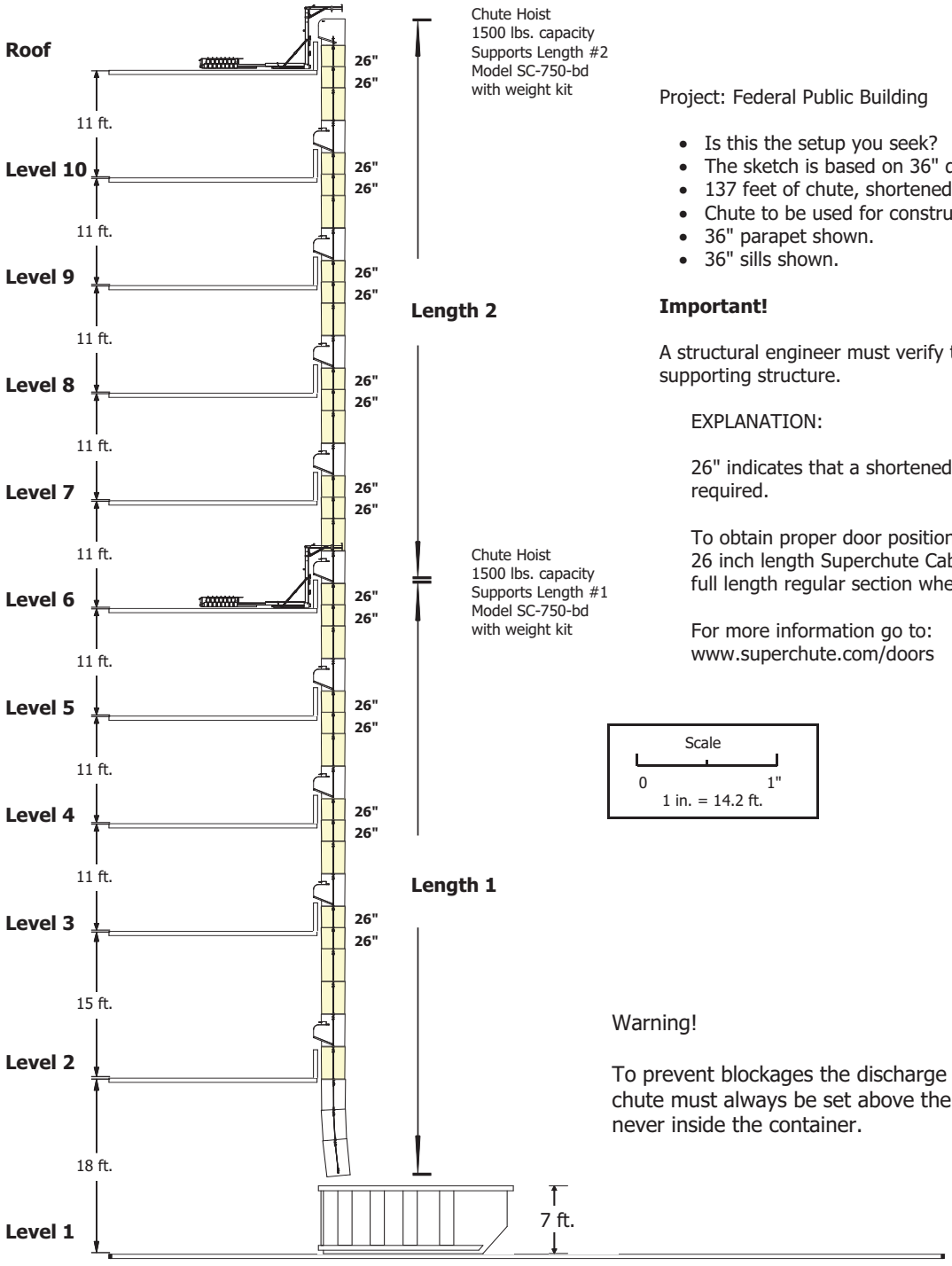
1. Would you like to reference a project name?
2. What type of debris will the chute be used for? (e.g., new construction debris, renovation debris, other debris)
3. What are the floor-to-floor heights? How many floors does the building have?
4. On which level will the highest entry point be located?
5. From which floors do you want to dump debris?
6. Is simultaneous floor access required, or will the chute be lowered/raised as the job progresses?
7. For floors where you will be dumping debris, what are the window sill heights, if any?
8. Is the roof flat or sloped?
9. If there is a parapet on the roof, how high is it?
10. Is the ground floor the same as Floor 1, or does Floor 1 start above the ground floor?
11. Will the trash container be located on the ground floor level?
12. What is the height of the container?
13. What diameter and style of chute do you prefer?
14. Is there a crane or other lifting device on site? Will it be there for the duration of the job? What is its lifting capacity?

For the levels where support frames will be installed:

15. Is the floor a solid concrete slab? If not specify.
16. If the floor is a solid concrete slab, does it contain embedded tensioning cables?
17. Can you drill into the floor in order to anchor a support frame with bolts?
18. Will you use expansion anchor bolts (supplied by Superchute) to secure the support frame to a solid concrete floor? If so, please specify your preference for either metric or imperial anchor bolts. The metric bolt is made by HILTI and requires the use of an 18 mm drill bit. The standard bolt is made by Powers and requires a 5/8” drill bit.
19. Is the floor bare, or is it covered by flooring material (tile, wood, marble, other)?
20. How thick is the floor?

SUPERCHUTE

1-800-363-2488



Project: Federal Public Building

- Is this the setup you seek?
- The sketch is based on 36" diameter chute.
- 137 feet of chute, shortened to 116 feet of chute.
- Chute to be used for construction debris.
- 36" parapet shown.
- 36" sills shown.

Important!

A structural engineer must verify the adequacy of the supporting structure.

EXPLANATION:

26" indicates that a shortened Regular Section is required.

To obtain proper door positioning apply a pair of 26 inch length Superchute Cable Lanyards to a full length regular section where indicated.

For more information go to:
www.superchute.com/doors

Scale
0 1"
1 in. = 14.2 ft.

Warning!

To prevent blockages the discharge end of the chute must always be set above the container, never inside the container.

Fig. 35 Sample site sketch, with counterweighted chute hoist.

E. Develop a Fire Prevention Plan

Planners must prepare a documented Fire Prevention Plan for the installers and users of the chute. In addition, planners are responsible for ensuring that the plan is implemented by the installers and users.

The goal of the plan should be to prevent the trash in the container or the chute from catching fire.

If a fire occurs, it will usually start in the container, since the container often holds combustible debris. A welding spark or cigarette butt is often the ignition source. The trash fire then sets the chute ablaze, which may in turn set the building on fire. Even if the building is not combustible (for example, a new concrete structure), the smoke from the burning chute and trash can be lethal. Note that even a fireproof chute can spread smoke and fire throughout a building.

Visit www.superchute.com/fire for pictures of a chute on fire and other information.

Consider including the following instructions in your Fire Prevention Plan:

- Spray water into the container to keep flammable debris wet (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).
- Do not smoke, weld, or use an open flame within 20 feet of the chute or container.
- Ensure that there is a water hose or fire extinguisher on every floor level facing the chute.
- Install the container at least 10 feet (3 meters) away from the building (check local by-laws).
- Seal the container with a fireproof lid (for example, metal sheets) at the end of each workday.

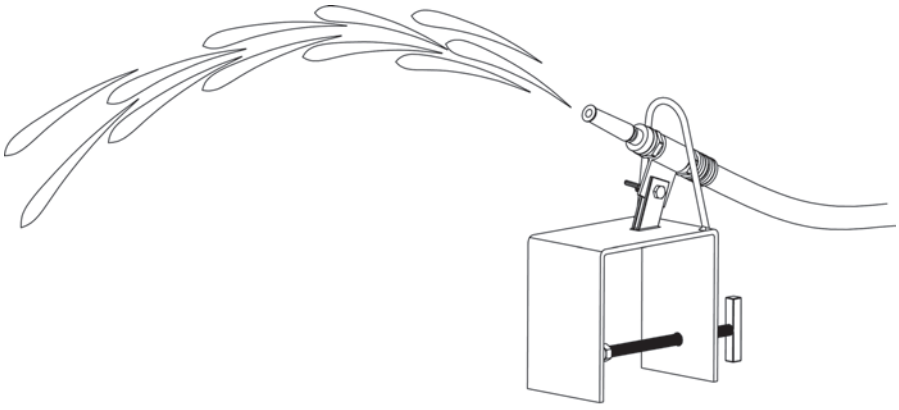


Fig. 36 Superchute® Container Drencher.

- 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 3 sections (10 feet or 3 meters) of chute at the end of each workday.
- Post Superchute® “Danger- Flammable Materials” signs around the trash container and on all floor levels facing the chute. See Fig. 37 on page 53.

Danger - Flammable Materials Sign

The plastic sign shown in Fig. 37 is included with the literature package that accompanies every order.

The sign measures 8” x 12” (20 cm x 30 cm) and warns in English, French, and Spanish.

Fig. 37 Danger - Flammable Materials sign.

Chapter 3.

Preparing Chute Sections

Introduction

Before installing the Superchute Debris Chute System, you must inspect and prepare the chute sections.

Cable Assembly Verification

Prior to installing chute sections, ensure that:

- Every section has two cable assemblies that are securely fastened to the chute wall using the supplied U-bolts (see “Cable Assembly Installation” on page 58 for instructions).
- All cable assemblies are in good condition. See Chapter 6 “Chute System Maintenance”.

⚠ WARNING

- A cable assembly U-bolt that is not installed correctly could let go and cause the failure and collapse of the chute.
- A falling chute system can cause serious injury and death.
- Ensure that cable assemblies are securely fastened to the chute wall.

Cable Assembly Installation for Crated Wraparound Sections

Wraparound sections are generally shipped flat from the factory without the cable assemblies attached to the chute wall. The sections are shipped this way to keep the wood crates as compact as possible.

If your sections have not been fitted with cable assemblies, you will need to attach a pair of cable assemblies to each chute section.

Wrenches are supplied by Superchute for this purpose:

- The 15/16” wrench is used for tightening top hopper section U-bolts.
- The 3/4” wrench is used for tightening door section and regular section U-bolts.

To help demonstrate correct cable assembly installation, Superchute factory staff always attach a pair of cable assemblies to the uppermost chute section in the shipping crate.

Installation instructions are also included with each pair of packaged cable assemblies, and are included on the following page.

Cable Assembly Installation

➢ **To install the cable assembly:**

1. Unravel the two cable assemblies and put one aside.
2. Remove the 2 dome nuts on the U-bolt (see Fig. 38).
3. Remove the backing plate from the U-bolt.
4. Force the U-bolt through the holes in the chute wall.
5. Reach inside the chute to slip the backing plate over the U-bolt ends.
6. Hand tighten the 2 dome nuts until they are flush with the U-bolt ends.
7. Tighten the hex nuts using the supplied wrench.
8. Repeat steps 2 to 8 with the other cable assembly.

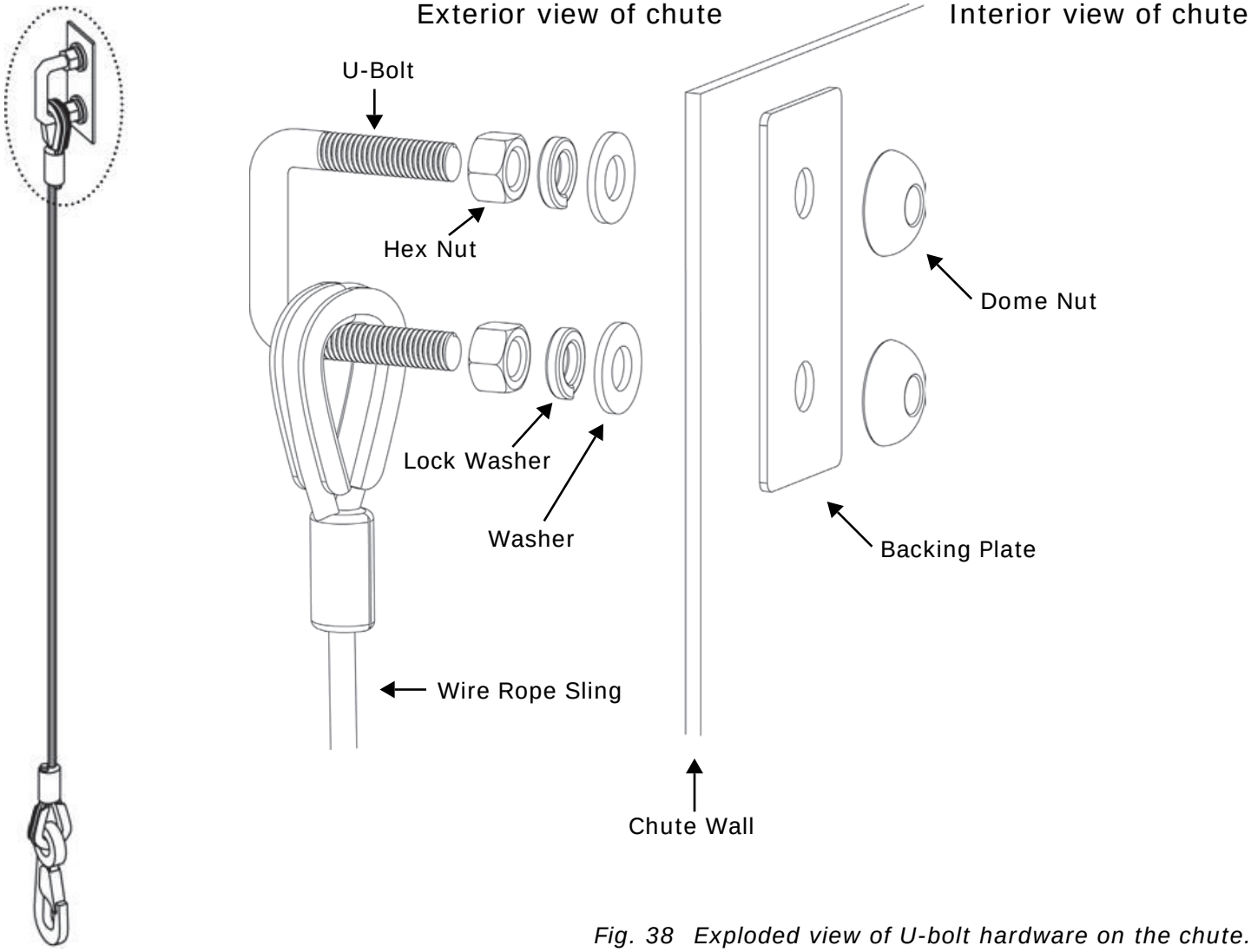


Fig. 38 Exploded view of U-bolt hardware on the chute.

Once installed, leave the cable assemblies fastened to the chute section. Replace them if they show signs of wear and tear or abuse.

Preparing Welded Style Chute Sections for Use

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

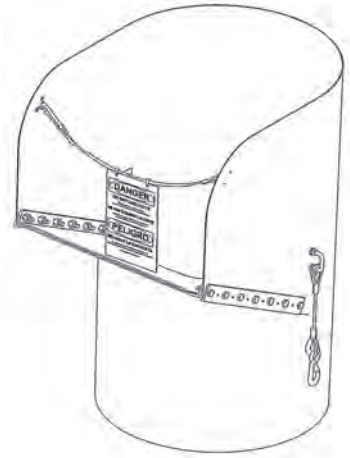


Fig. 39 Welded top hopper.

Fig. 40 Welded regular.

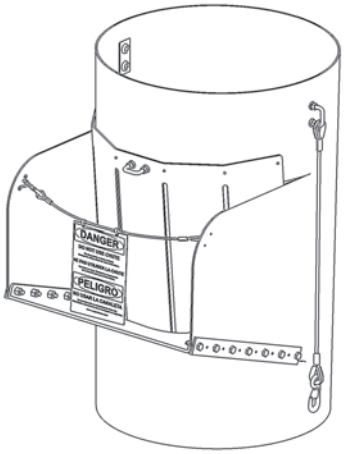


Fig. 41 Welded door section.

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 (see Fig. 42). If the sections cannot be rowed apart, use a winch to pull them apart.

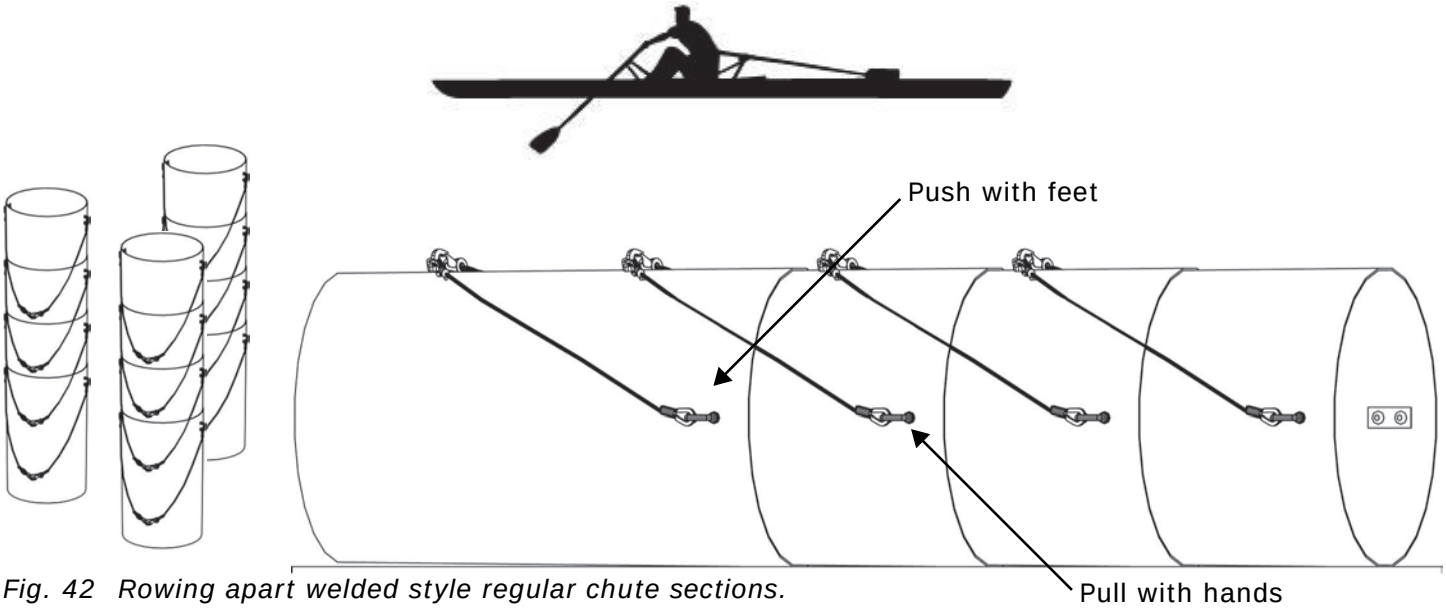


Fig. 42 Rowing apart welded style regular chute sections.

If Using Welded Style Sections Only

If you will be using welded style sections only, proceed to Chapter 4 “Installing the Chute System”.

Preparing Wraparound® Style Chute Sections for Use

Wraparound style sections can be laid flat for storage and job-to-job shipping.

Estimated assembly times for flat Wraparound chute sections are as follows:

- Assembly of a regular section requires approximately 1 minute.
- Assembly of a door or top hopper section requires approximately 10 minutes.

Assembly procedures are detailed on the pages that follow.

Assembling the Wraparound Top Hopper Chute Section

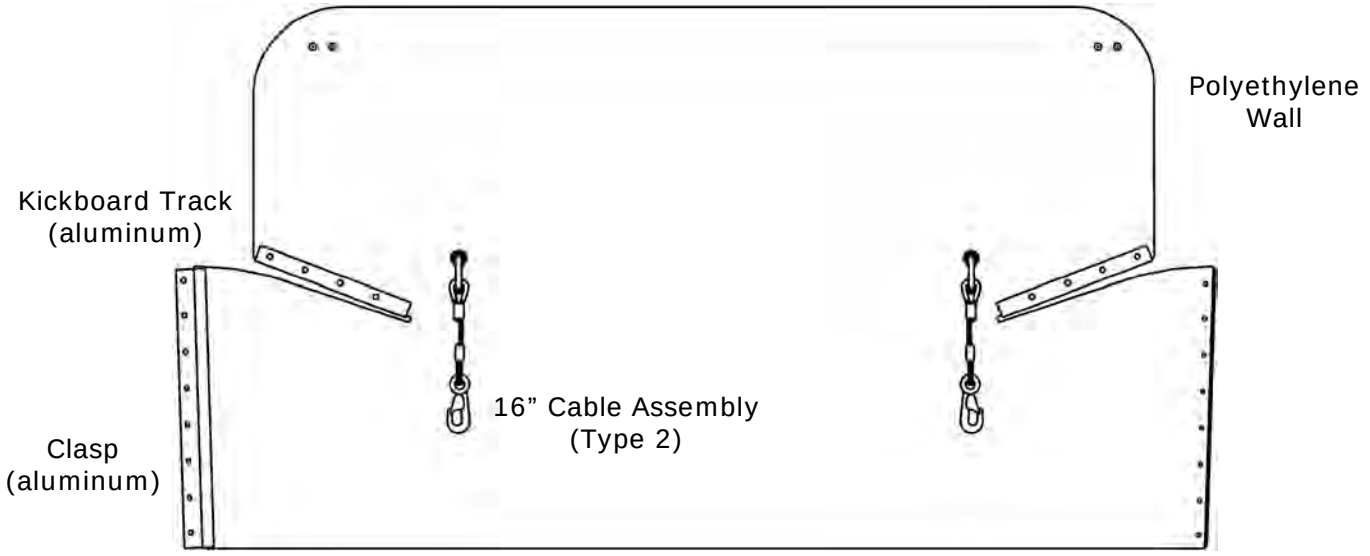
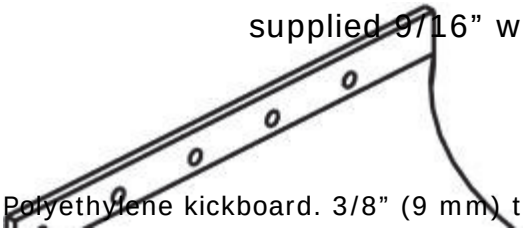


Fig. 43 Wraparound® top hopper section shown flat: ready for transport or storage.

TO USE:

1. Lay section down with U-bolts facing ground.
2. Wrap the aluminum clasp edges together.
3. Fasten clasp with carriage bolts using supplied 9/16” wrench (see Fig. 44).
4. Attach kickboard with hex head bolts using supplied 9/16” wrench.



Polyethylene kickboard. 3/8” (9 mm) thick.

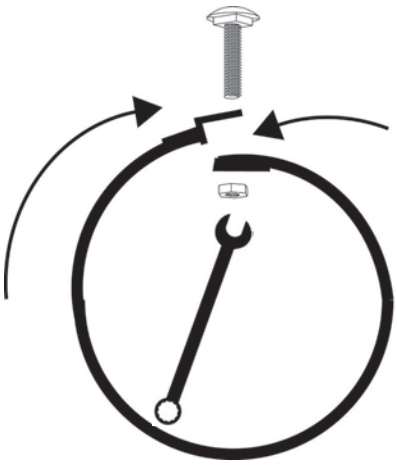


Fig. 44 Fastening the clasp.

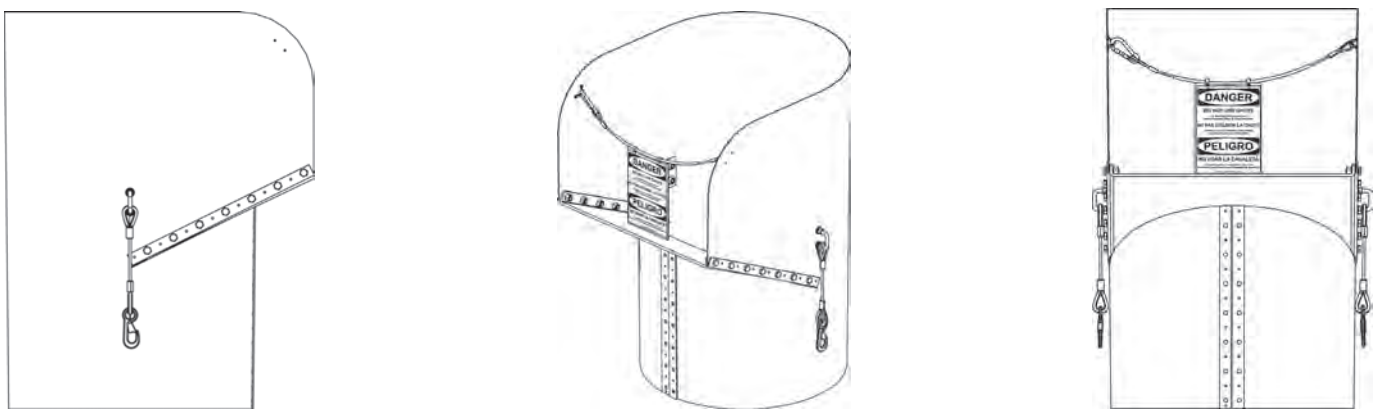
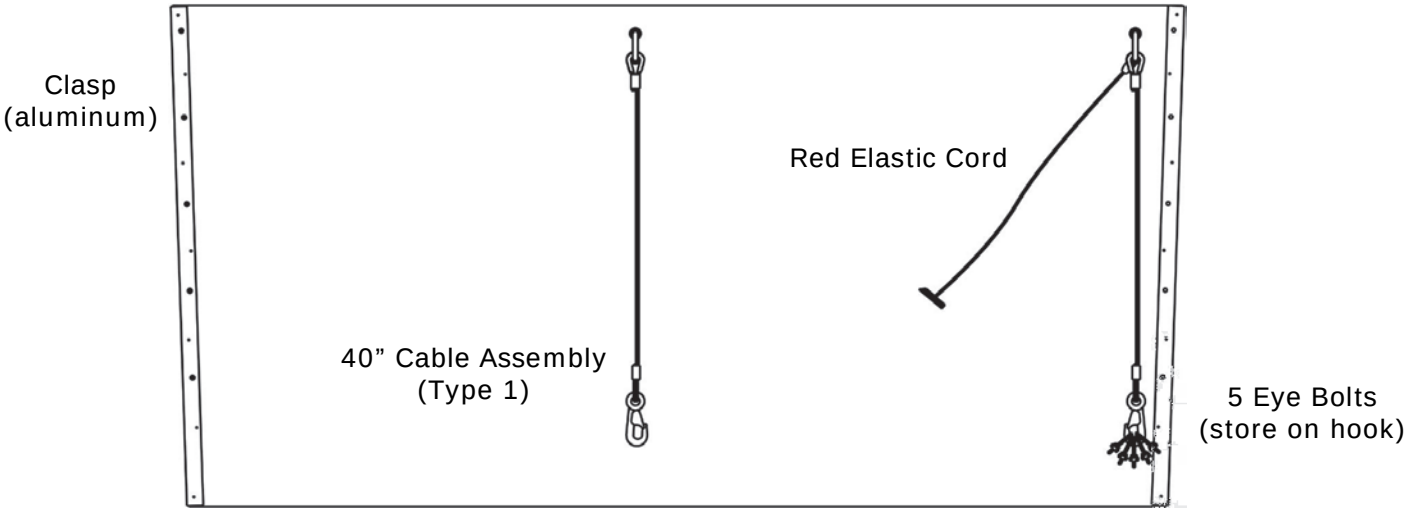


Fig. 45 Wraparound® top hopper section shown assembled: ready for use.

Assembling the Wraparound Regular Chute Section



Polyethylene Plastic Wall
Thickness (inches): 1/8”, 5/32”, 3/16”, or 1/4”
Thickness (metric): 3.2 mm, 4 mm, 5 mm, 6 mm

Fig. 46 Wraparound® regular section shown flat: ready for transport or storage.

<u>TO USE</u>:

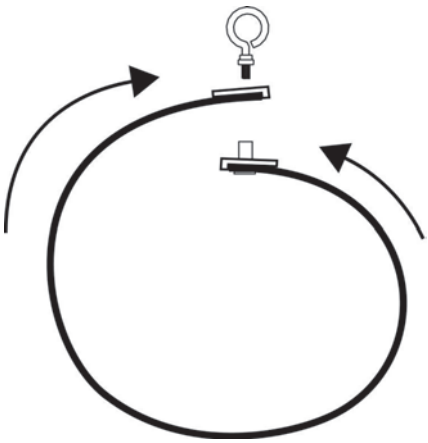


Fig. 47 Wrapping the ends together.

1. Remove 5 eye bolts from the cable assembly hook.
2. Lay down section with U-bolts facing the ground.
3. Wrap the ends of the section together (see Fig. 47).
4. Align and mate the 5 studs with the 5 holes.
5. Insert 5 supplied eye bolts into studs. Hand tighten.
6. Pass the red elastic rope through all 5 eye bolts.
7. Turn the black plastic toggle so that it is held in place by the lowest eye bolt. The installed elastic prevents vibrations from unscrewing the eye bolts.

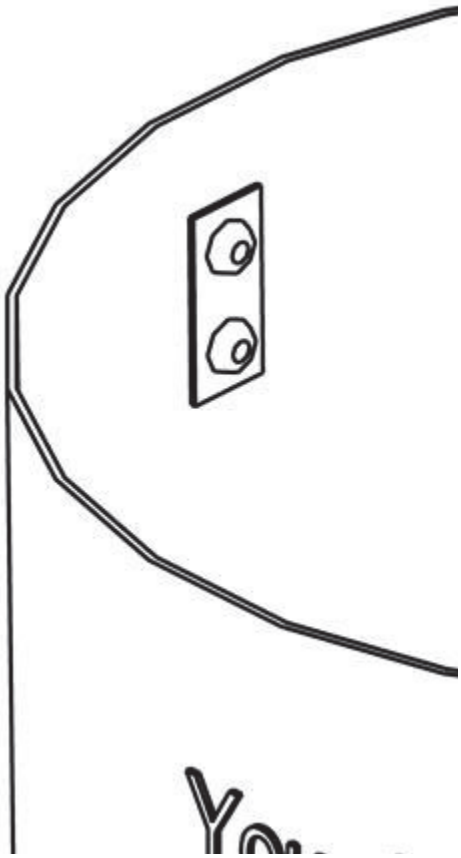


Fig. 48 Wraparound® regular section shown assembled: ready for use.

Assembling the Wraparound Door Chute Section

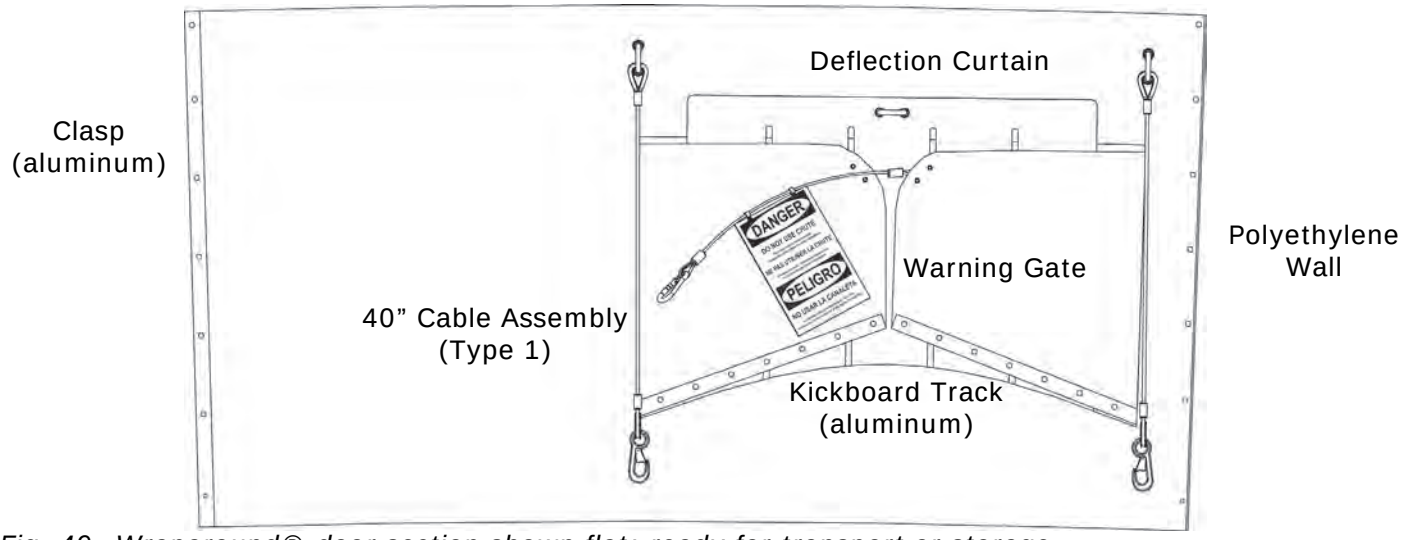
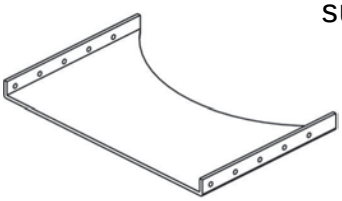


Fig. 49 Wraparound® door section shown flat: ready for transport or storage.

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 using supplied 9/16” wrench (see Fig. 50).
4. Attach kickboard with hex head bolts using supplied 9/16” wrench.



Polyethylene kickboard. 3/8” (9 mm) thick.

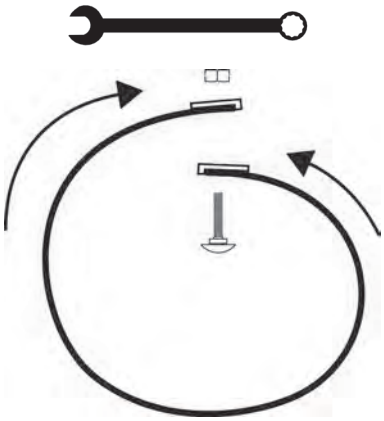


Fig. 50 Fastening the clasp.

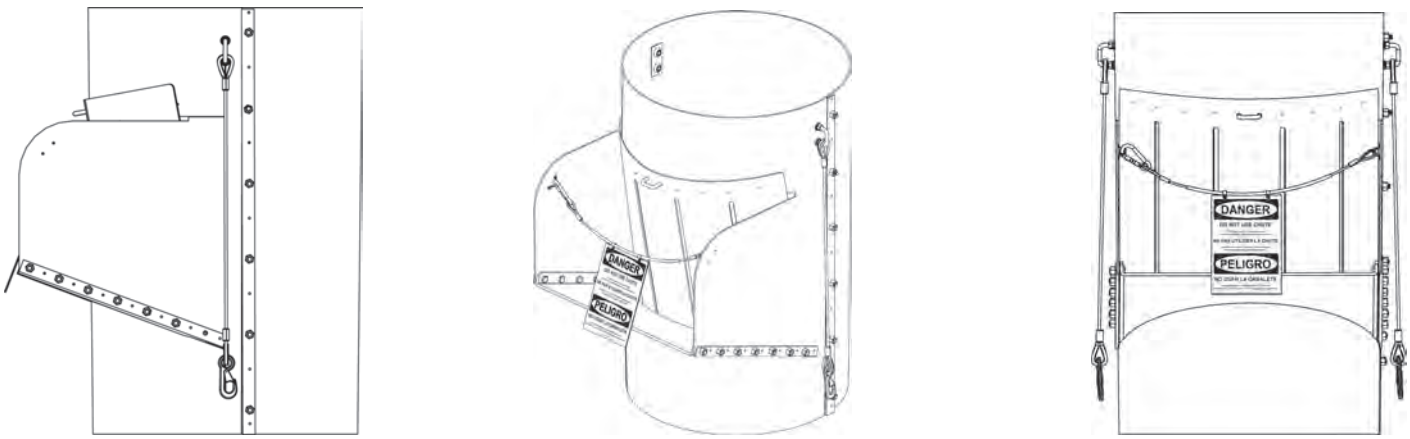


Fig. 51 Wraparound® door section shown assembled: ready for use.

Chapter 4.

Installing the Chute System

Introduction

Installers must read the preceding chapters before starting the installation.

In addition, installers should be familiar with applicable federal, state, and local safety regulations. Superchute equipment should only be used by workers who are fit to operate it in a responsible manner.

Check Component Condition

Every time the chute is to be rigged or used, ensure that the following items are in good condition:

- Superchute chute sections
- Superchute cable assemblies and cable lanyards
- Superchute steel liners
- Superchute hoists
- Superchute lifting bar
- Door Adjustment Kits, Tie-Back Kits and any other ancillary Superchute equipment.

Thorough overhaul servicing is available from Superchute Ltd.

Chute Installation Steps

The installation of a chute consists of two steps:

1. Raising the chute sections.
2. Anchoring the chute sections.

The following pages explain how to best accomplish these steps.

1. Raising 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 to prevent accidents which could occur if you attempt to lift beyond the device’s capacity.

The procedures detailed on the following pages should be followed for all lifting devices.

➢ **To raise the chute sections:**

1. Attach a lifting bar to the hoisting cable.

Superchute manufactures two lifting bars to meet your requirements: the Light Duty lifting bar, shown in Fig. 52, and the Heavy Duty lifting bar, shown in Fig. 53 The Light Duty lifting bar has cables and a working load limit (WLL) of 1000 lbs. (450 kgs.). The Heavy Duty lifting bar has chains and a working load limit (WLL) of 2000 lbs. (900 kgs).

Each Superchute lifting bar is fitted with a metal tag that identifies the working load limit.

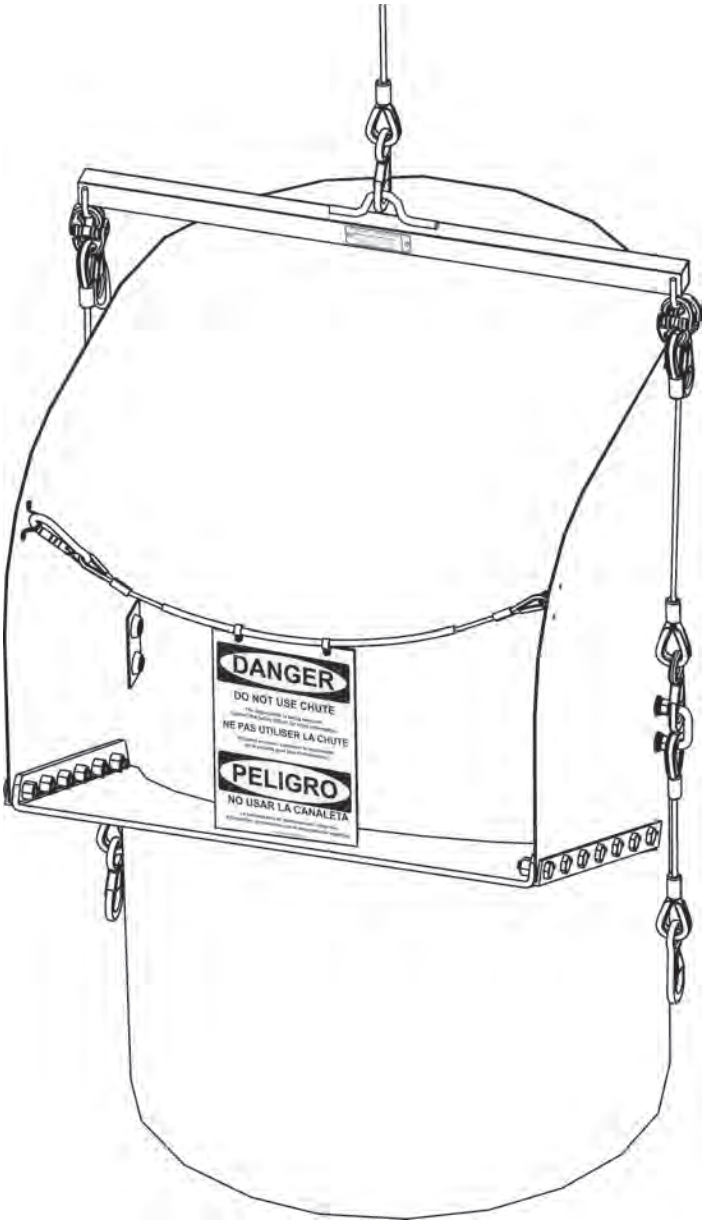


Fig. 52 Light Duty lifting bar with top hopper.

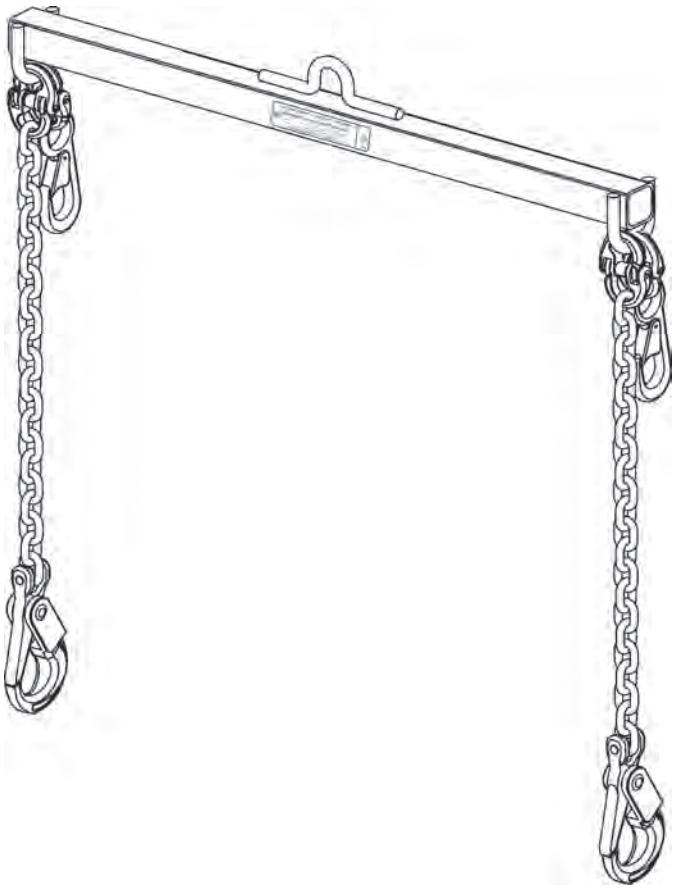
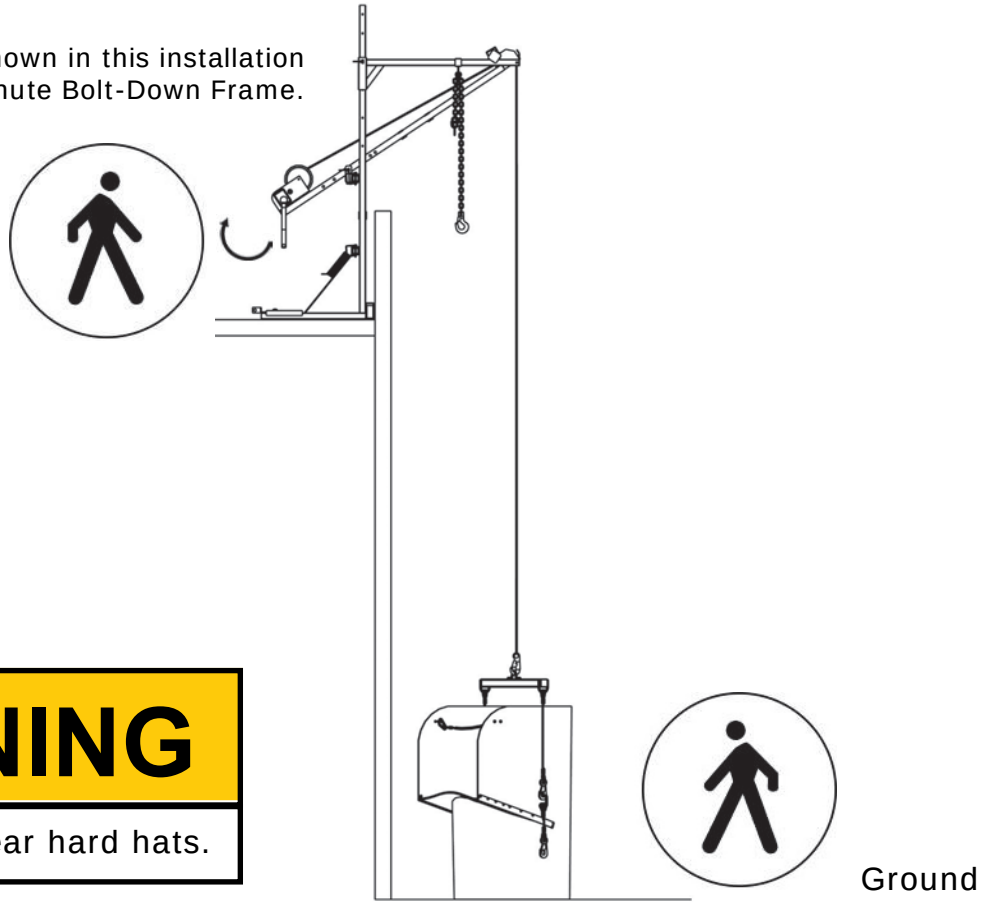


Fig. 53 Heavy Duty lifting bar.

2. Attach a top hopper section to the lifting bar (always use a hopper at the top of the chute).

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



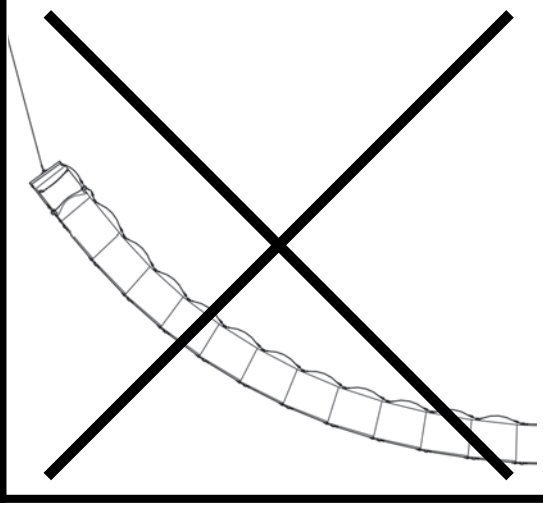
⚠ WARNING

Ground workers must wear hard hats.

Fig. 54 Raising the chute sections, step 2.

⚠ 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.



3. Raise the top hopper 4 feet (1.2 meters).
4. Position a regular section beneath the top hopper.

Communication:

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

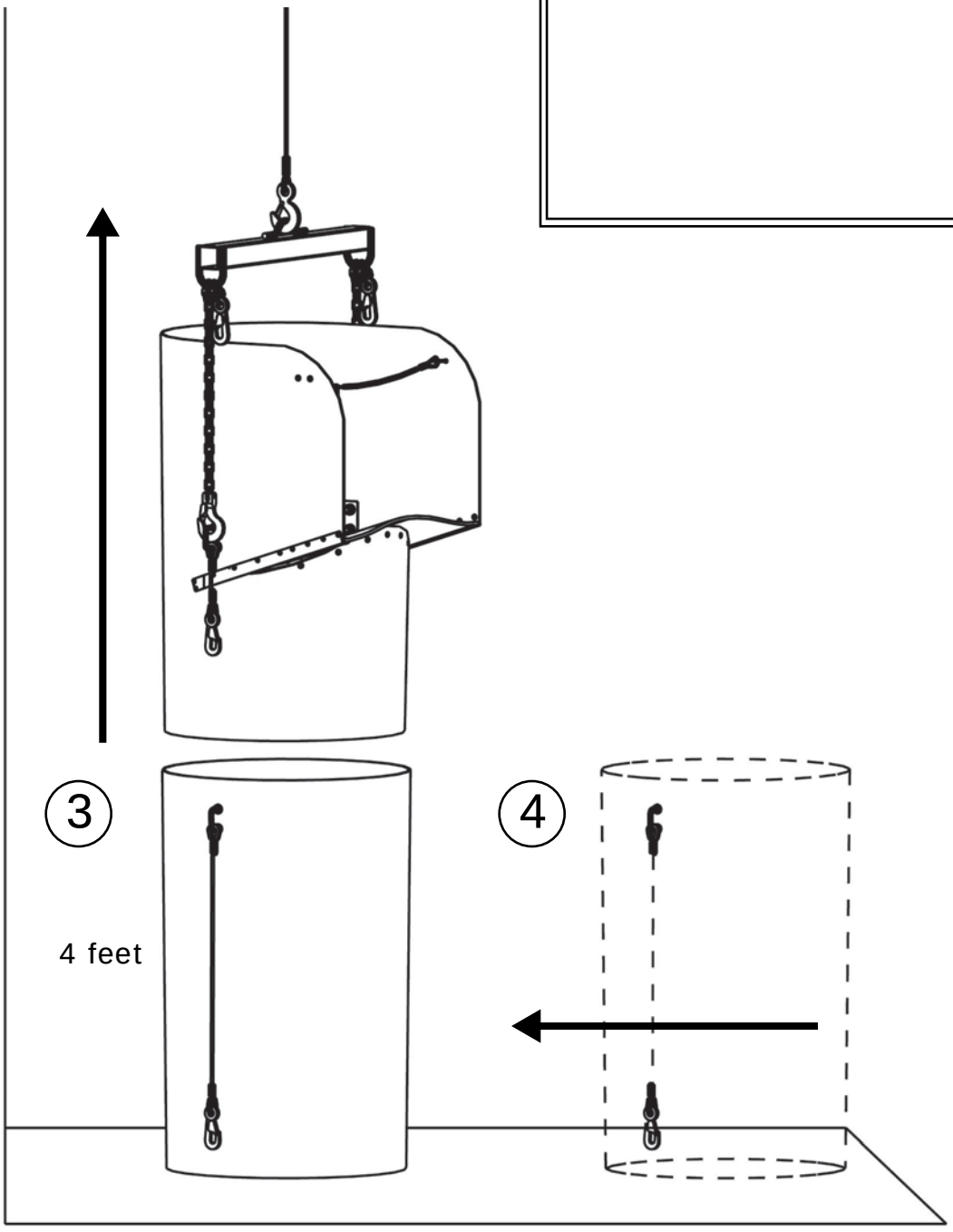


Fig. 55 Raising the chute, steps 3 and 4.

5. Lower the top hopper into the regular section.
6. Connect the two sections using the top hopper's cable assemblies.

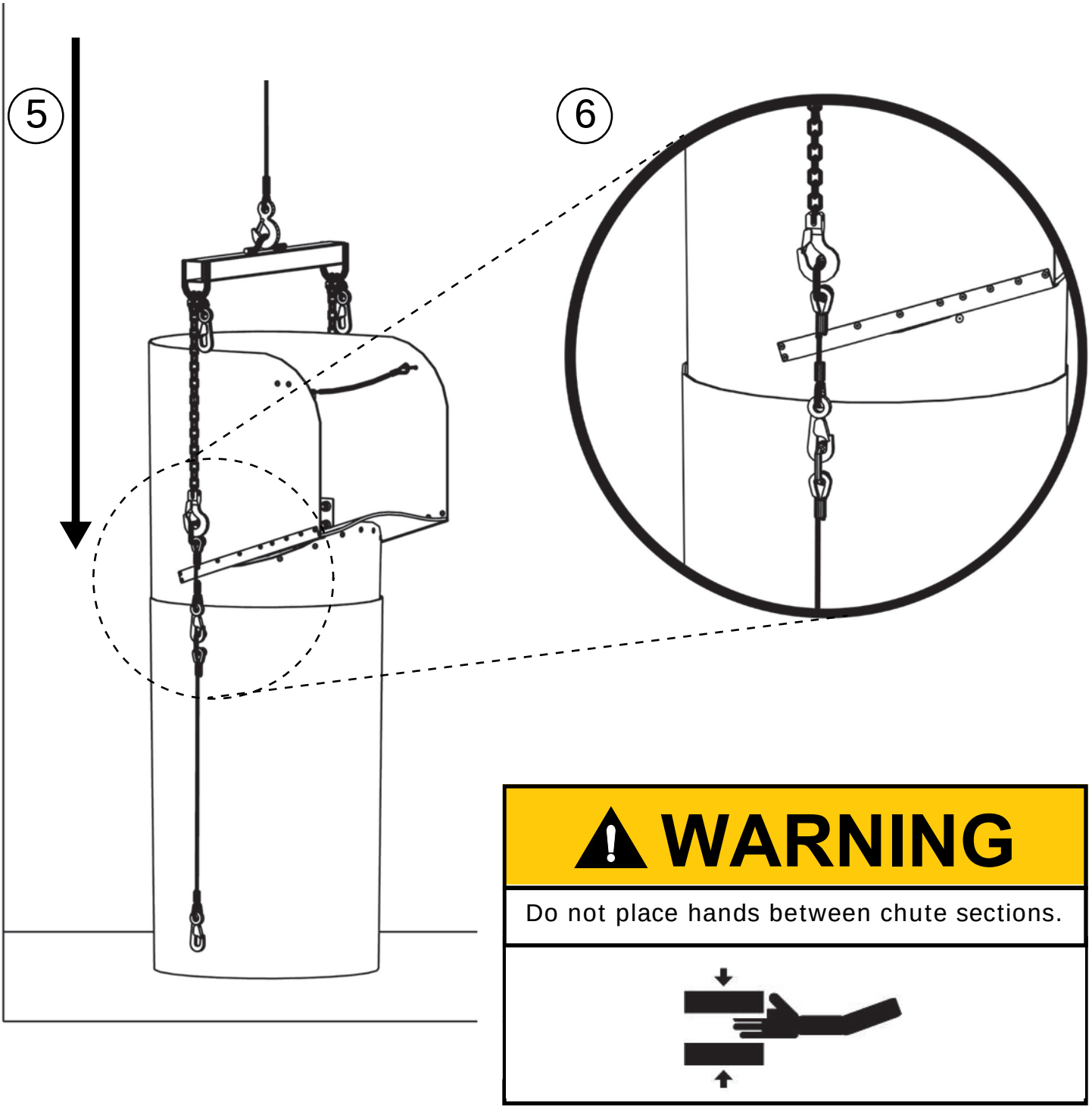


Fig. 56 Raising the chute, steps 5 and 6.

⚠ 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.

7. Raise the chute 4 feet.
8. Position another section below the suspended chute.
9. Lower the suspended chute into the section.
10. Connect the hook of section (A) to the U-bolt of section (B).
11. Repeat step 10 with the cable assembly on the opposite side of the sections.
12. Repeat step 7.

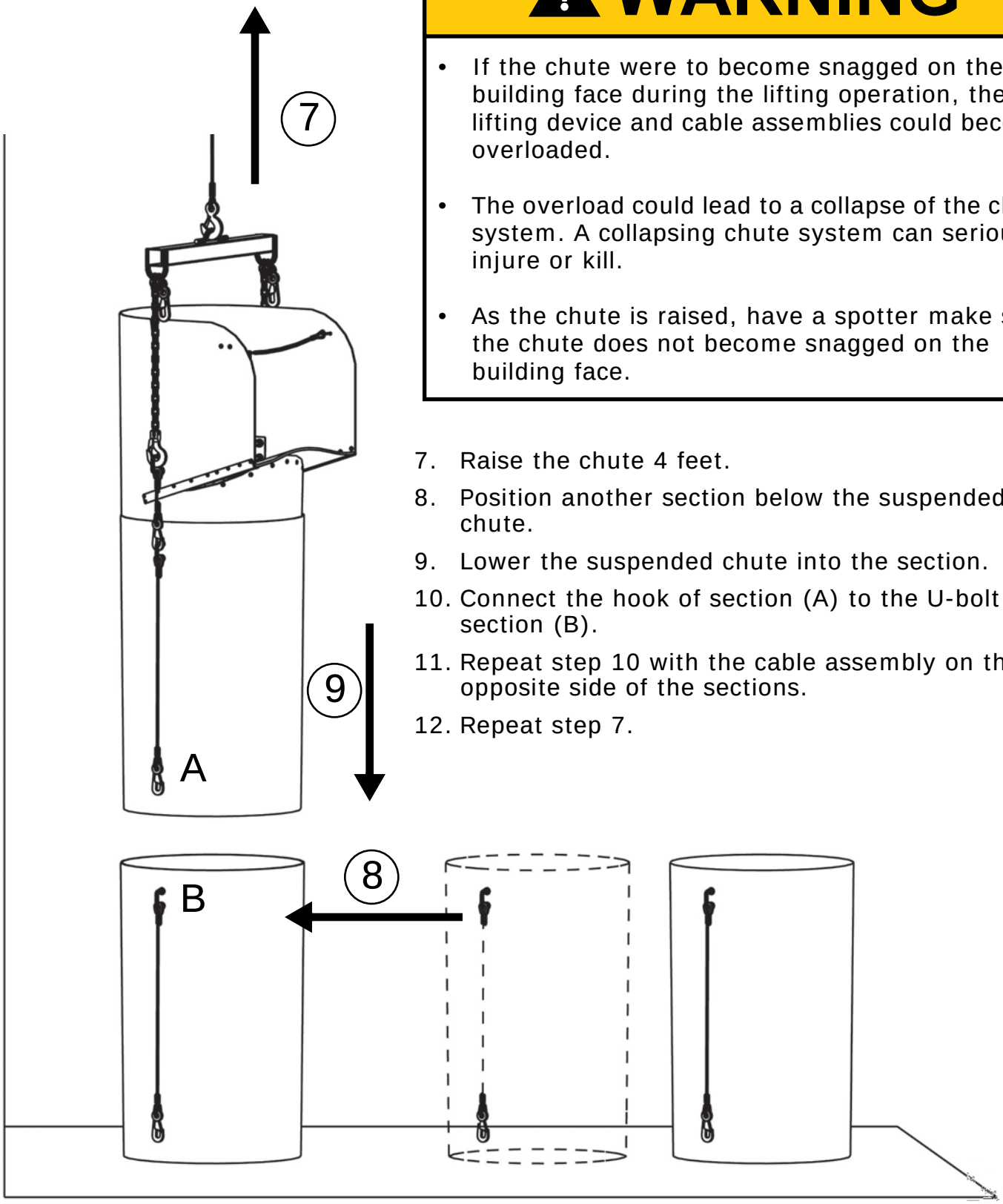
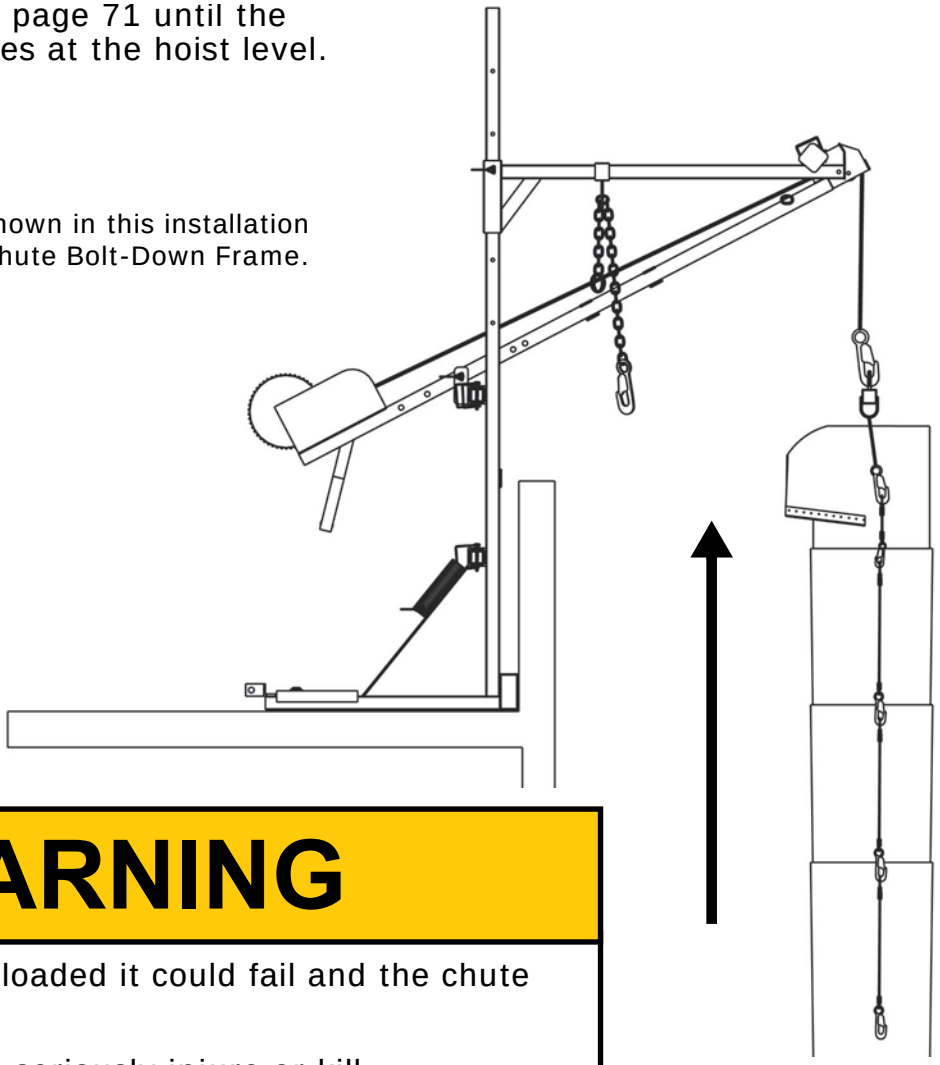


Fig. 57 Raising the chute sections, steps 7, 8 and 9.

13. Repeat steps 7 to 12 on page 71 until the top hopper section arrives at the hoist level.

The lifting device shown 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 tables in Chapter 2 to calculate the weight of your chute.

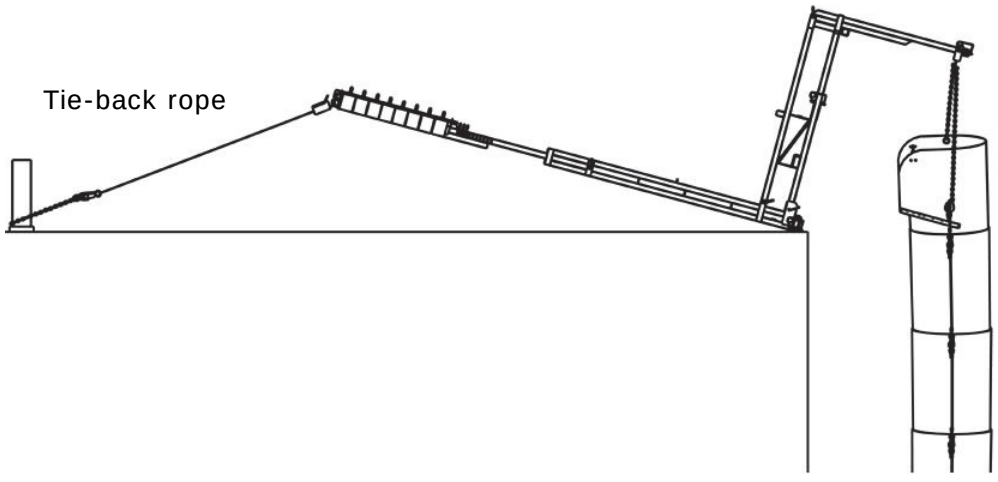
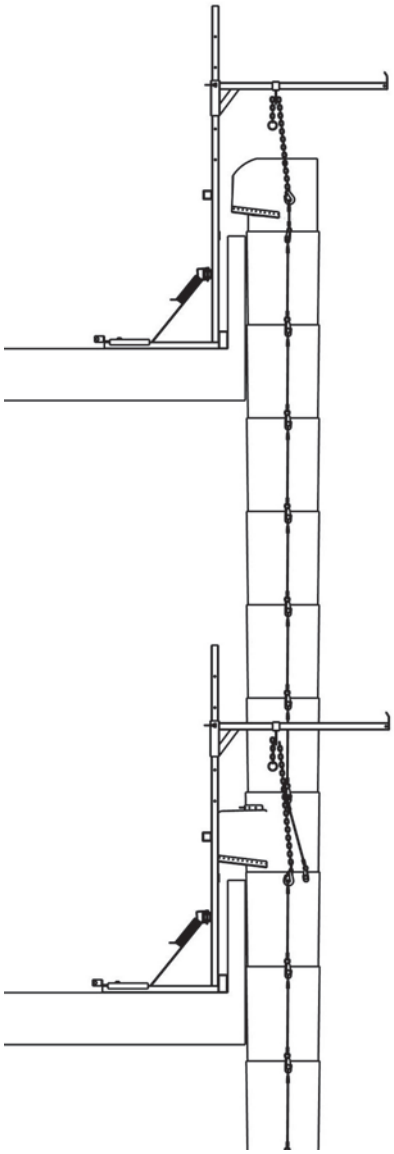


Fig. 58 Raising the chute sections, step 13.

2. Anchoring the Chute Sections

Follow the recommendations of the chute planner. Superchute chute hoists are designed to safely anchor a chute. If you decide, however, to anchor the chute using another method, Superchute Ltd. recommends that you follow these guidelines:



- A sufficiently strong anchorage must be present in order to anchor the chute to the building. Locate overhead beams, or similar 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. Nylon rope 5/8” (16 mm) diameter, rated to 10,000 lbs. (4500 kgs.), 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 the instructions provided in “Wind and Restraint Issues” on page 76.
- Do not use window washing anchors, personnel anchors, or guardrails to anchor the chute, since any damage caused by the chute to these elements could jeopardize lives. Even a small chute blockage could cause serious damage.
- Tie back counterweighted anchors to a structural member of the building. This will prevent the anchor from being dragged or pulled off the building in the event of a blockage, or a snag with the departing roll-off truck.
- Consult the section “Recommended Methods for Anchoring the Chute” on page 44.

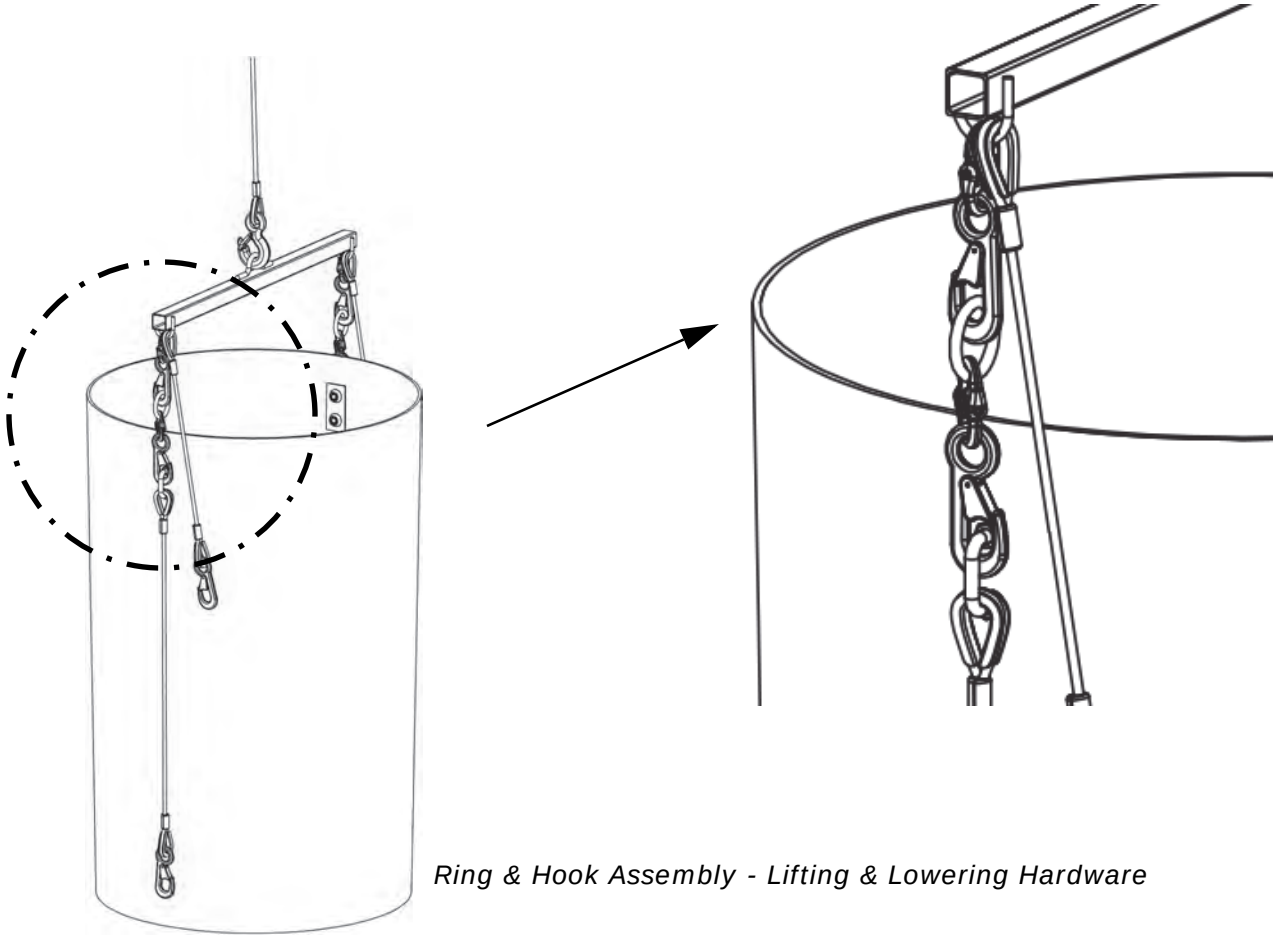
Fig. 59 Anchoring the chute.

In Fig. 59, two “piggybacked” Bolt-Down Frames are used to anchor the chute. Superchute hoists are simple to use, effective, and above all, engineered for safety.

Ring & Hook Assembly

Purpose of the RHA:

- The Ring & Hook Assembly allows a pair of lifting rings to be rapidly fitted to any Regular Section or Door Section for easy hook-on and hook-off.
- Top Hoppers are factory-equipped with lifting rings, however all the sections below the Top Hopper are not equipped with lifting rings.
- Note that the U-bolts that are bolted through the chute wall do not provide sufficient room for the connection of multiple lifting hooks.
- Each ring will easily accept 2 hooks: the Lifting Bar Hook, and the Hoist Hook.
- The Ring & Hook Assembly is highly recommended for Fishpole installations where there will be a sill or parapet at the Top Hopper level.
- For chute systems that consist of multiple lengths, a Ring & Hook Assembly is required for every length.



Ring & Hook Assembly - Lifting & Lowering Hardware

Using a Scaffold, Stage or Platform as an Anchor

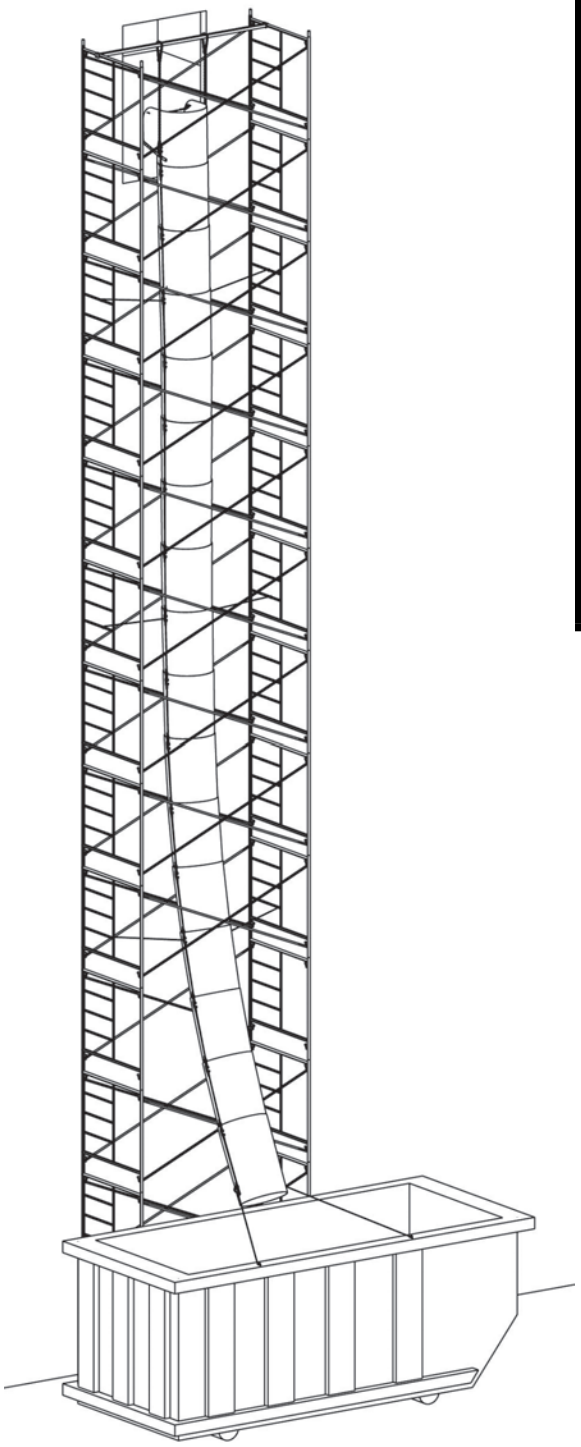


Fig. 61 Chute installed inside a scaffold.

⚠ 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 and chute 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.
- Install the chute inside the scaffold, if feasible, as this is a more stable arrangement and will better distribute the weight of the chute to the 4 corners of the scaffold tower.
- If using frame scaffolding, consider using Superchute®'s Chute Hoist for Scaffolds.

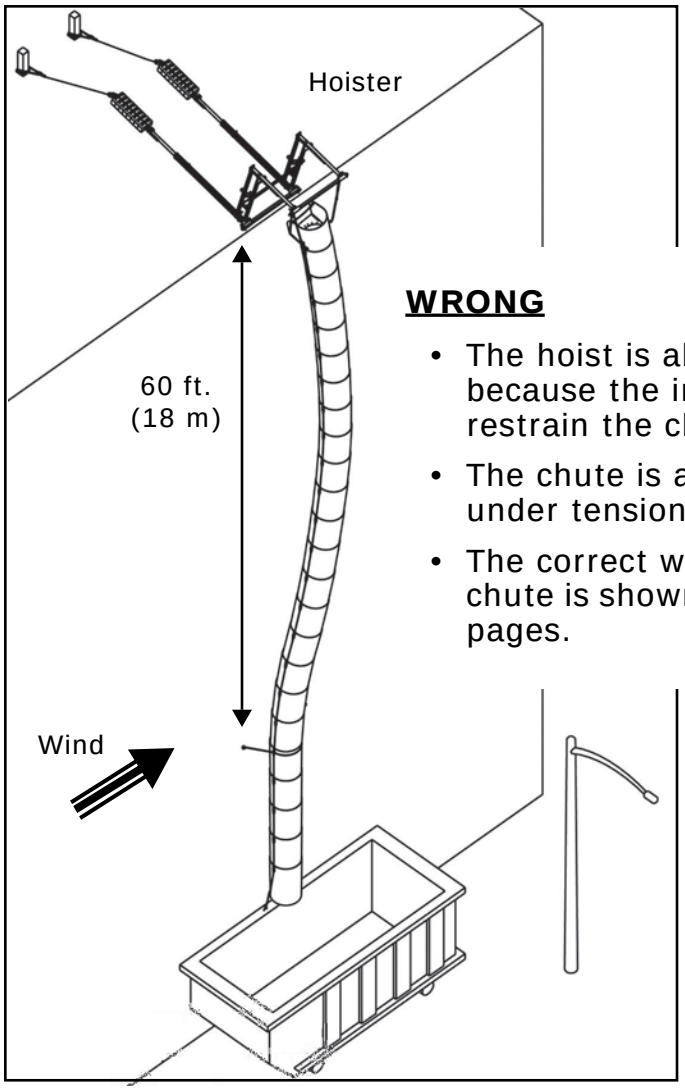
Wind and Restraint Issues

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 (overnight or during weekends, for example).

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

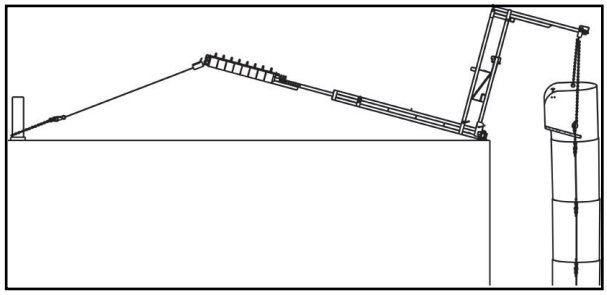
The installer can use either *taut* restraints or *slack* restraints based on the spacing between restraints. Pages 77 and 78 explain this concept further.

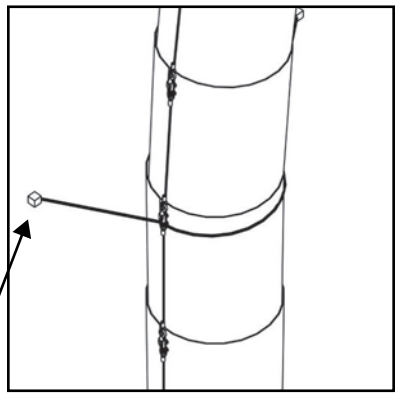
Before proceeding, however, take a look at Fig. 62, which shows the potential effect of using the wrong type of restraint. Why is the hoist pulled over? Note the hoist tie-backs, and their help in this instance.



WRONG

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





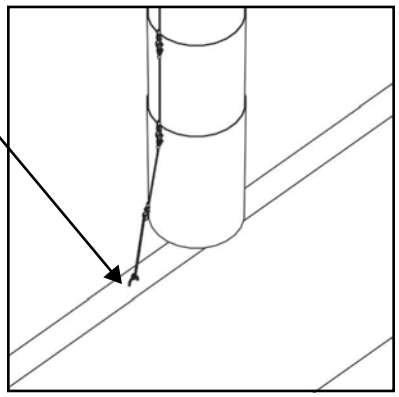


Fig. 62 Potential effect of using the wrong type of restraint.

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 shown in Fig. 63, the closely spaced restraints hold the chute tight to the building structure, preventing the wind from moving the chute.

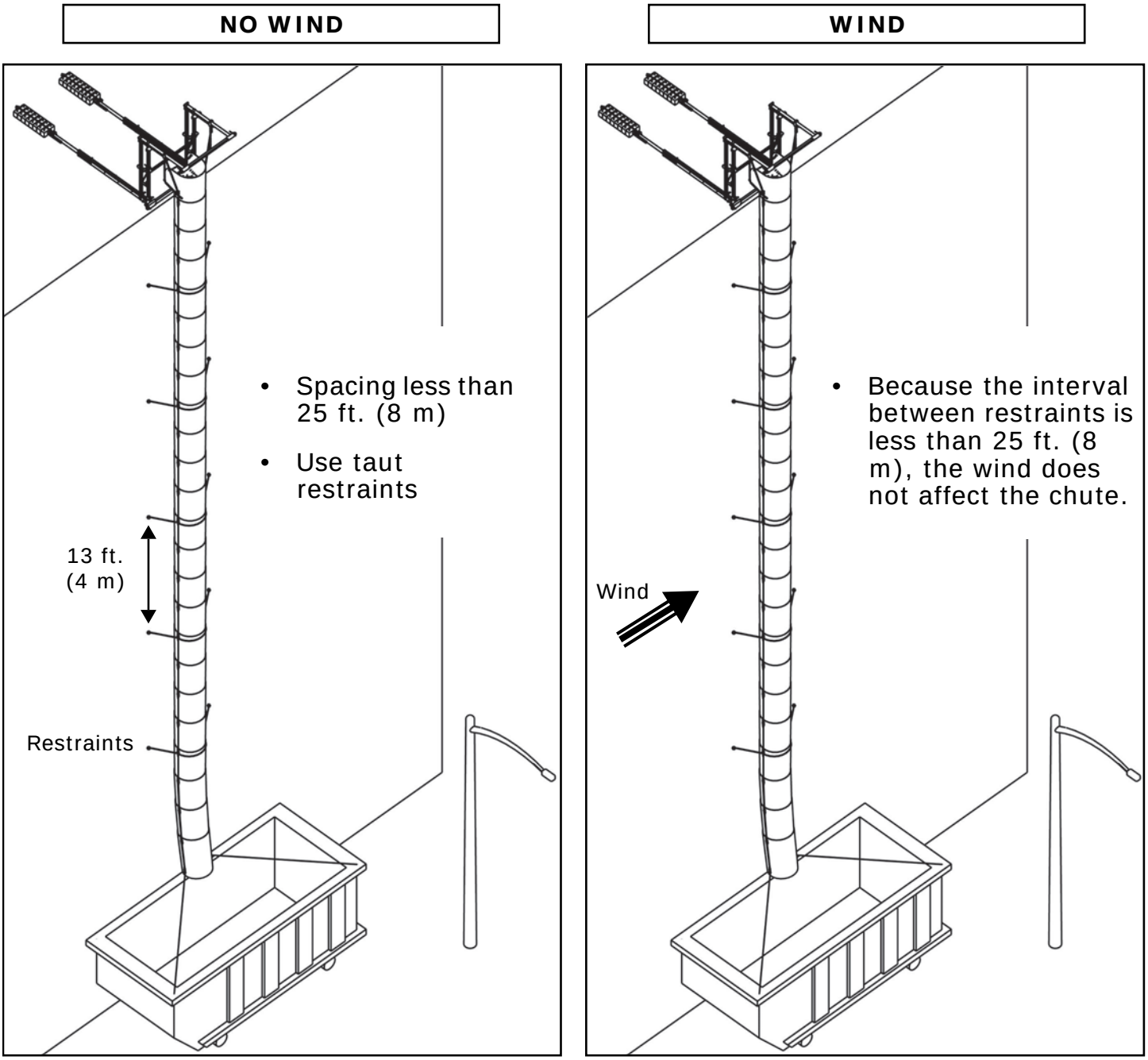


Fig. 63 Correct application of taut restraints.

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 strong winds arise.

If the wind strengthens, the strain could cause the Superchute Container Cord to fail, which is beneficial, as the chute will then be unrestrained.

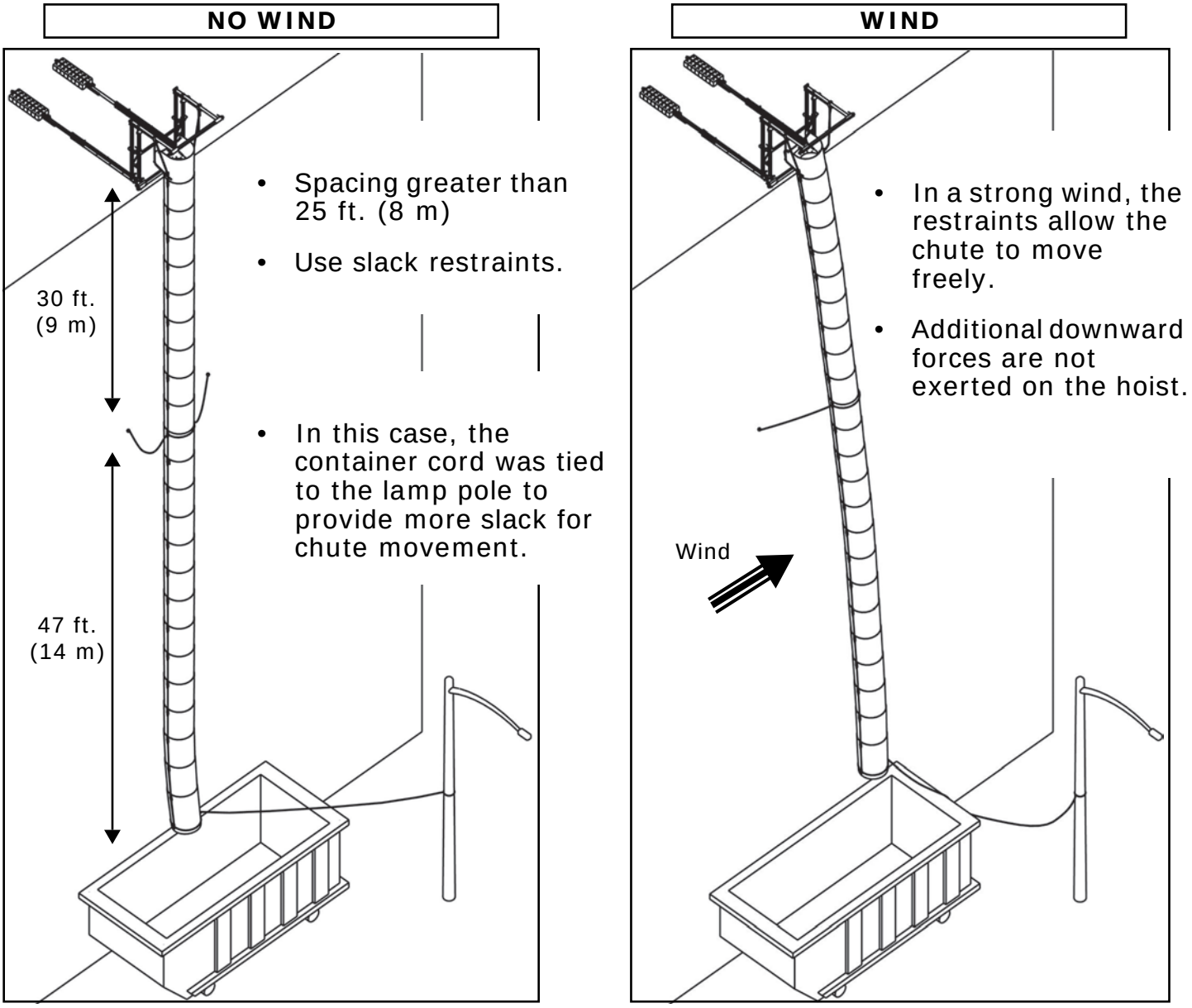


Fig. 64 Correct application of slack restraints.

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.

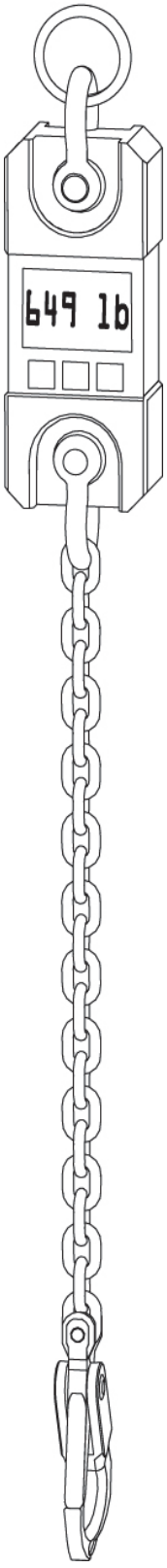


Fig. 66 Close up of load cell kit.

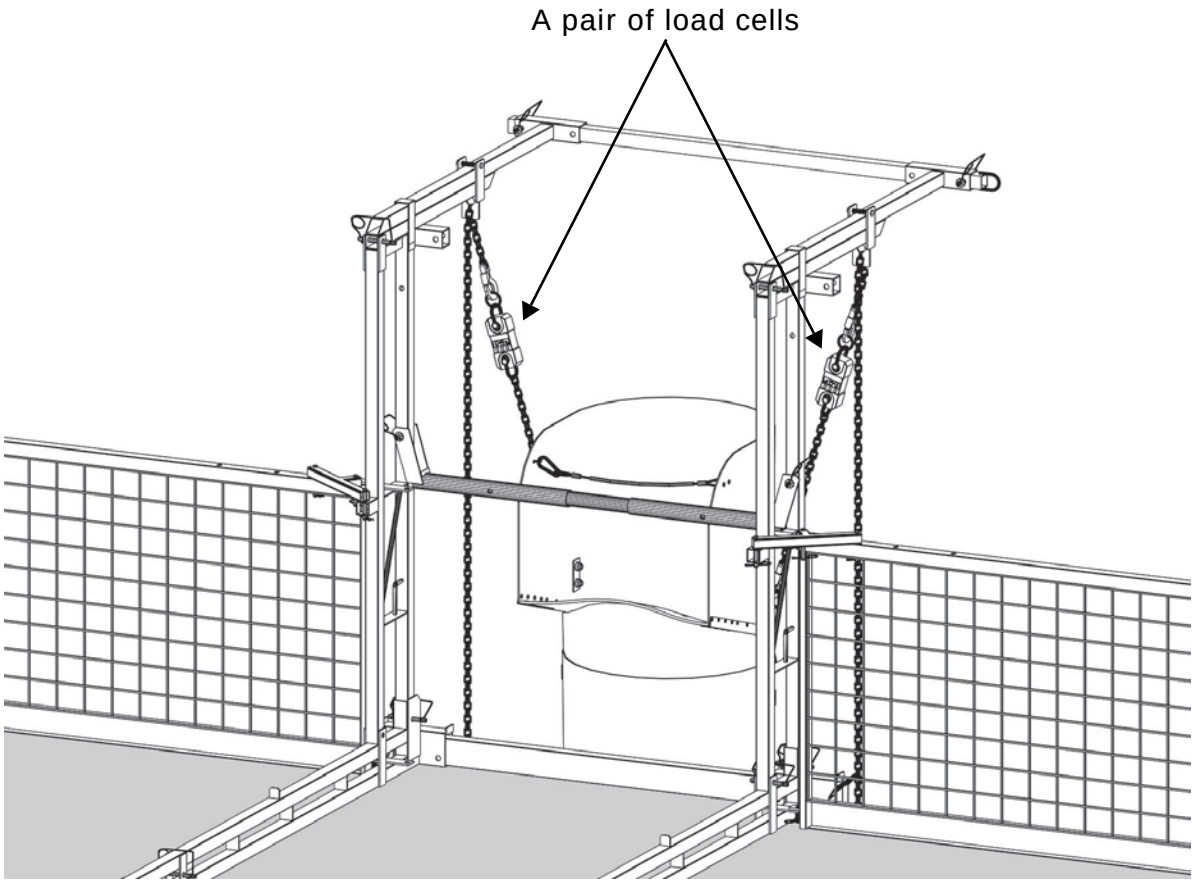


Fig. 65 Use of load cells on a Chute Hoist (Model SC-2000-cb).

Using 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, keeping it close to the building.

Superchute sells safety rope kits.

➢ **To install 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 designated 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 hooks (the number of hooks will depend on the length of the chute).
4. As the chute is raised and added to, attach a hook to the U-bolt of every third chute section.

   The hooks will slide up the rope, rising with the chute sections to which they were attached.
5. Tie the rope snugly and securely to the last chute section. Coil any unused rope on the side.

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

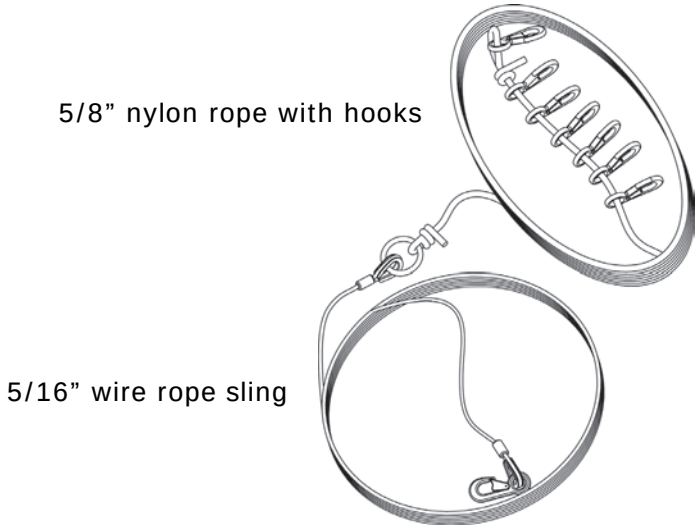


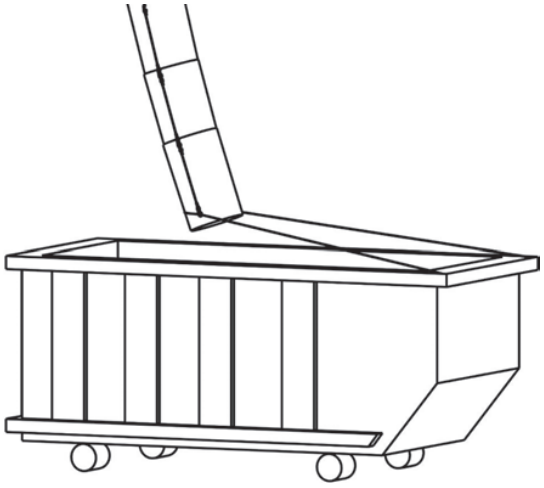
Fig. 67 Safety rope kit.

Fig. 68 An installed safety rope.

Container Installation

Direct the discharge end of the chute into a roll-off container, or other suitable steel container. A dump-truck, or similar loading vehicle, is not suitable because falling material can present a hazard to the truck operator (see “A Letter from OSHA” on page 111). Additionally:

- Build a barricade around the container area (see page 86 for more information).
- 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, Superchute 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 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 Fig. 69.



← 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.

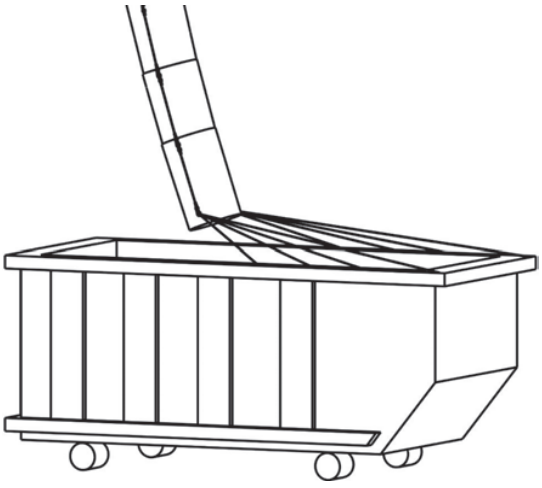


Fig. 69 Right and wrong application of container cord.

Secure the Top Hopper and Door Sections

Tie top hopper and door sections into the building. This will prevent the chute from moving away from the building when workers push debris into it.

Cover openings around top hopper and door sections using screens, boards, or plywood to prevent debris from falling outside the chute.

Liner Installation

Superchute® Steel Liners are not needed if the chute is hanging straight.

However, if the discharge end of the chute forms a curve and the chute will be used for heavy debris removal, reinforce the discharge end of the chute with Superchute® steel liners.

The repeated impact of heavy debris will curl the liners over time. For this reason, inspect liners frequently and do not use liners in chute sections that are not readily accessible (for example, higher up in the chute).

Installed liners will add considerable weight to the chute (see Chapter 2, “B. Calculate the Weight of the Suspended Chute”, pages 40 to 43).

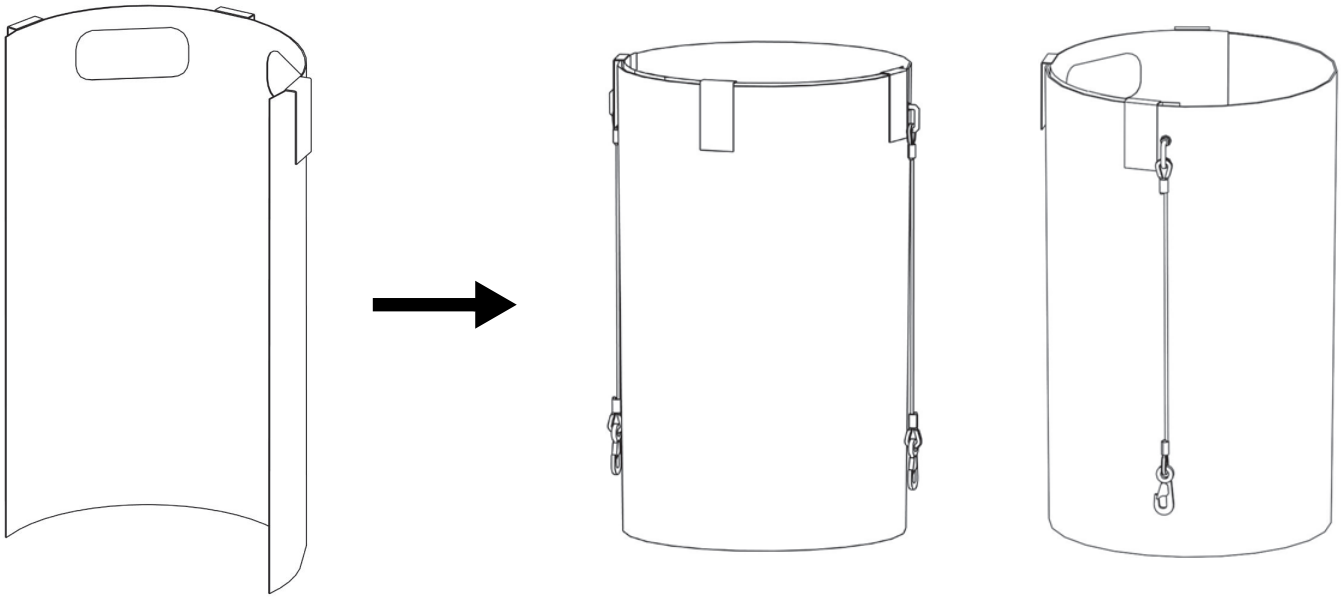


Fig. 70 Steel liner installation.

Implement the Fire Prevention Plan

To ensure safe use of the chute, installers must implement the Fire Prevention Plan provided by the chute planners. See “E. Develop a Fire Prevention Plan” on page 52.

Chapter 5.

Using the Chute System

Introduction

Before using the chute system, users should be familiar with applicable federal, state, and local safety regulations. Superchute equipment should only be used by workers who are fit to operate it in a responsible manner.

Failure to adhere to the following instructions could result in injury or death.

Container Area

A roll-off steel container must be positioned beneath the chute. Roll-off containers are generally rented from waste disposal companies. A dump truck, pick-up truck, or similar vehicle, should not be used since falling material could strike the cab and injure the driver (see “A Letter from OSHA” on page 111).

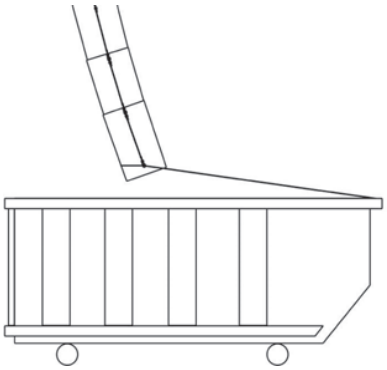


Fig. 71 Gap above container.

1. Direct the discharge end of the chute into the container, so that debris exiting the chute falls into the container.

2. Ensure that the discharge end of the chute is located above and not inside the container. A maximum gap of 2 to 5 feet between the discharge end of the chute and the rim of the container is recommended. See Fig. 71

3. Barricade the container area in order to protect workers and the public from any material that may ricochet out of the container. See Fig. 72

   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.

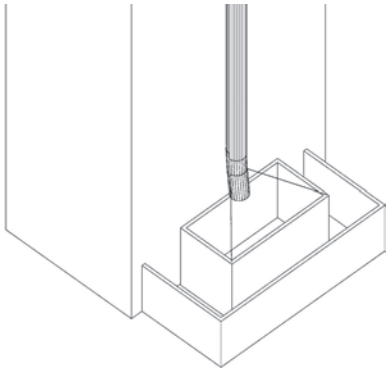


Fig. 72 Barricaded container.

4. Do not overfill the container. Overfilling can plug the discharge end of the chute and result in a chute collapse.

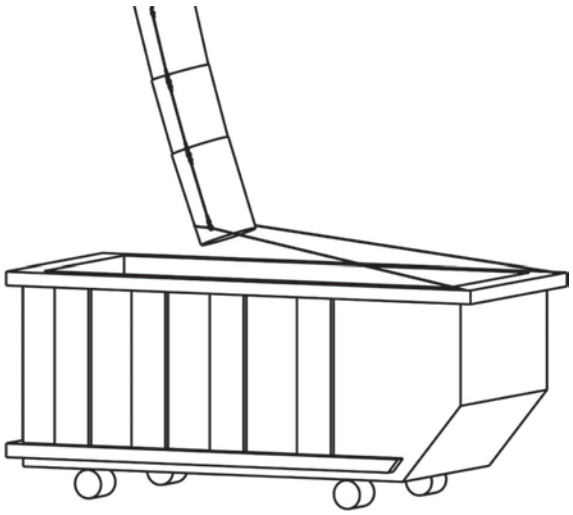
5. Do not install tarpaulins over the container and chute discharge. Users must be able to see debris exiting the chute at all times. If the container and chute discharge are covered, a blockage could go unnoticed.

6. If you must enter the container, ensure that the chute’s discharge end is temporarily directed outside the container, to a secured dumping area, free of personnel.

Container Cord

Tie the chute's discharge end to the container using one or two lengths of Superchute Container Cord (provided with the Superchute Debris Chute System). Unlike regular cords and ropes, Superchute Container Cord is designed to fail. If a full container is accidentally driven away with the chute still attached, the Superchute 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 Fig. 73



← 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.

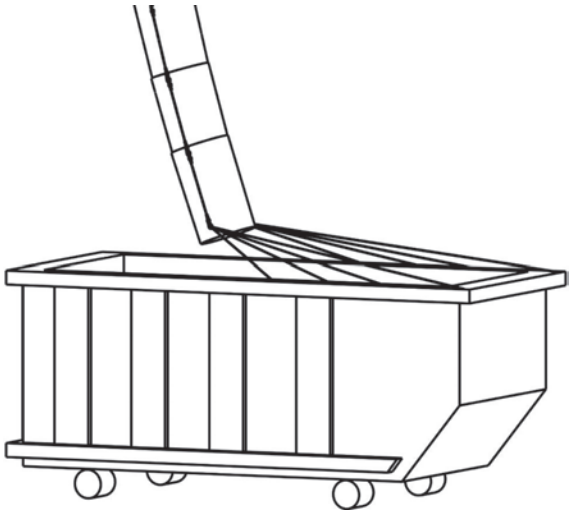


Fig. 73 Right and wrong application of container cord.

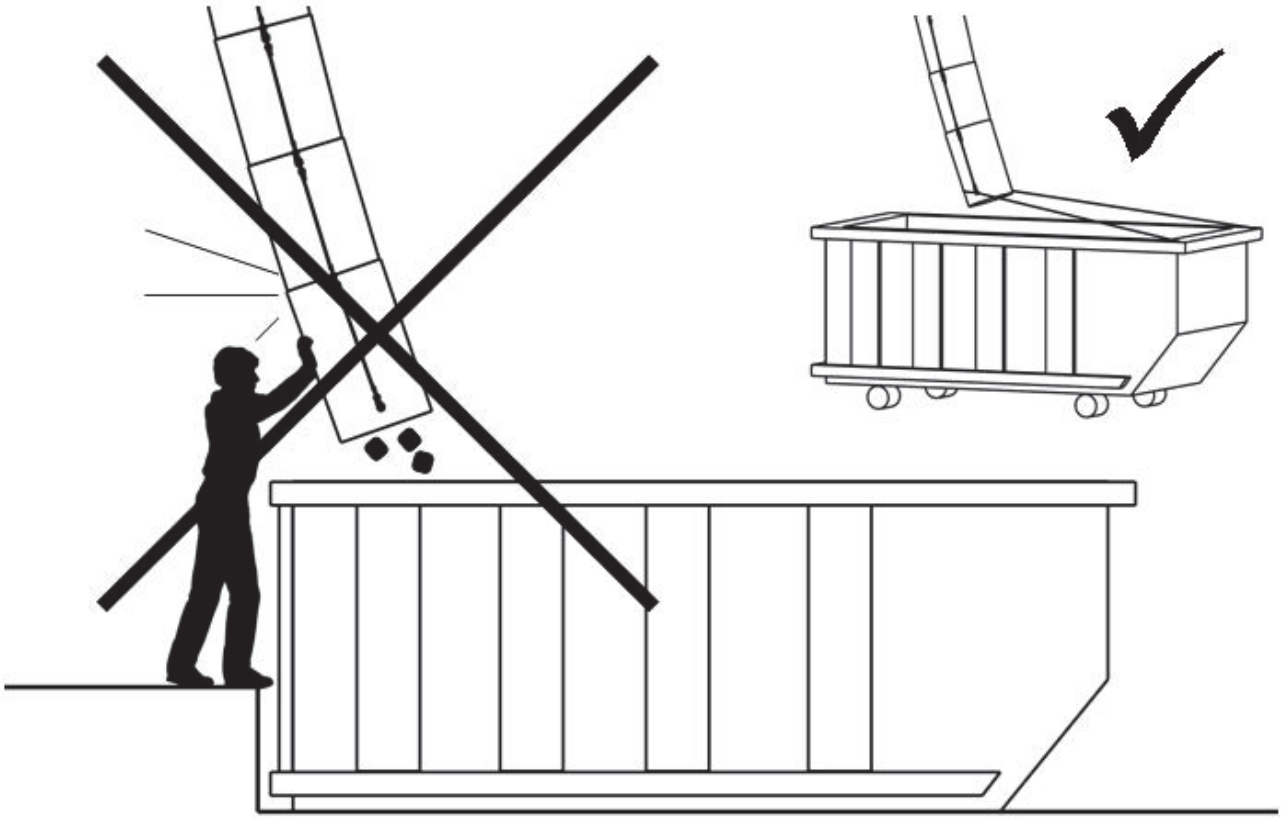
Discharge End Precautions

Always assume that debris can exit the discharge end at any time.

1. Never stand under the discharge end of a chute.
2. Never look up the discharge end of a chute.
3. Never put your hands or feet beneath the discharge end.

⚠ WARNING

- Debris falling through the chute can cause the discharge end of the chute to shake violently.
- A person near the discharge end could be injured or killed by the moving chute.
- Do not stand near the chute. Do not hold the chute. Use the supplied 20-foot lengths of Superchute Container Cord to position the chute over the container. Maintain a distance of at least 30 feet between people and the chute.



Top Hopper and Door Use

1. Ensure that the top of the chute is equipped with a Top Hopper. Do not use the chute if it is not equipped with a Top Hopper. Contact the installer.

2. Introduce debris manually. Do not use motorized loaders to introduce debris into the chute (motorized loaders introduce too much debris, too quickly).

3. Do not drop more than 50 lbs. (23 kgs) of debris at a time into the chute.

4. Do not introduce whole concrete cinder blocks, spikes, flammables, or toxic dusts.

5. Break up debris before throwing it into the chute. The largest dimension of any single piece of debris should be less than half the diameter of the chute.

6. Use supplied warning gates to close the Top Hopper and Door sections when:
   - there is no container beneath the chute
   - the full container is being changed for an empty one
   - there is a blockage in the chute.
   - a maintenance operation is being carried out.

Debris May Fall Past A Door Section At Any Time

1. Never place hands or feet in the opening of a Door Section. Use a broom, or similar, to push debris into the chute.

2. Never look into a Door Section.

3. Although all Superchute Door Sections feature a deflection curtain, there is still a risk of debris particles flying out and causing injury. Therefore, protective eye wear must be worn while introducing debris into Door Sections.

Controlling Access to Top Hopper and Door Sections

Superchute Top Hopper and Door sections are equipped with red warning gates.

In addition to the warning gates, two more options are available for controlling access to the chute:

- Entry Point Lockout Covers
- Traffic Light System

These three access controls are described in detail on the next three pages.

Warning Gates

Each Superchute Top Hopper and Door section is equipped with a red warning gate complete with attached danger sign.

When the warning gate is clipped across the opening, debris must not be thrown into the chute.

Fig. 74 Warning gate with a danger sign and mounting hardware.

- Included with every Top Hopper and Door section
- Wire rope assembly with printed red plastic sleeve and durable 8” x 12” plastic sign
- “Danger - Do Not Use Chute” sign warns in 3 languages: English, French, and Spanish
- OSHA requirement
- Spare gates can be ordered with mounting hardware (2 eye straps and 4 blind rivets)
- Spare “Danger - Do Not Use Chute” signs can be ordered with tie wraps (2 per sign)
- Please specify your chute diameter when ordering spare gates.

Entry Point Lockout Covers

Entry point lockout covers are available for Top Hopper and Door sections.

The lockout cover physically blocks and prevents use of the entry section. It is supplied with a padlock. The same key will open the padlock on every lockout.

Lockout covers are available for all chute diameters.

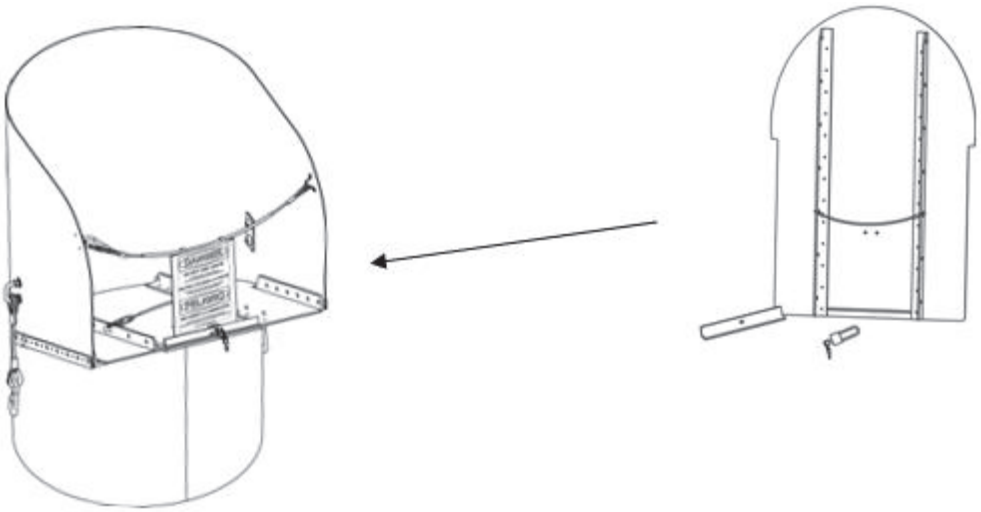


Fig. 75 Lockout cover for Top Hopper section (2 piece design).

The Top Hopper section lockout is comprised of a plastic panel and aluminum clamp. Padlock included.

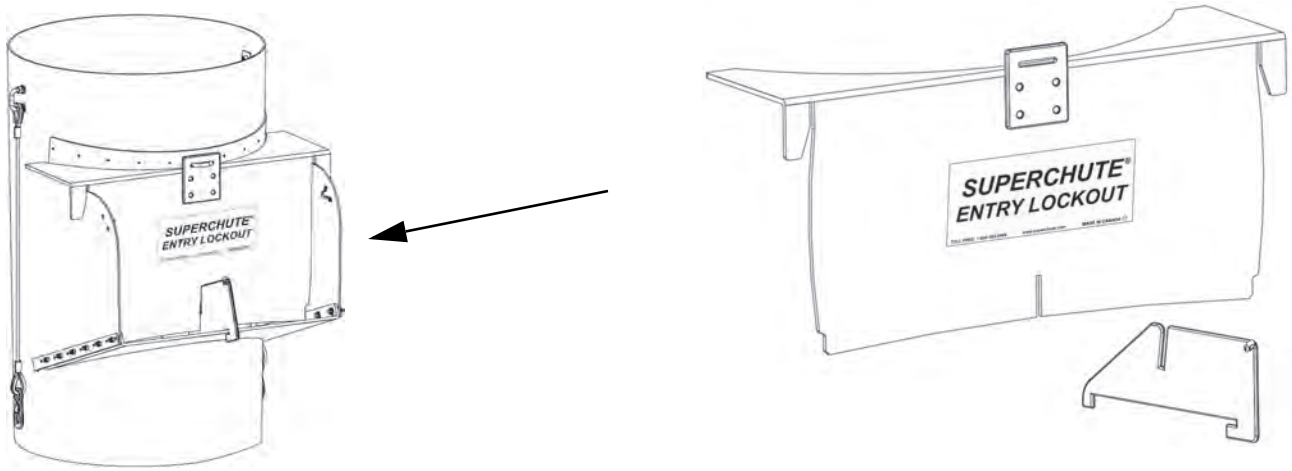


Fig. 76 Lockout cover for Door section (2 piece design).

The Door Section is comprised of a Cover and a Stiffener. The lockout engages the round u-bolt over the door opening.

Traffic Light System

Superchute's Traffic Light System allows any worker to instantly indicate a "Do Not Use Chute" situation to workers on other levels.

The Traffic Light System can prevent an incident when:

- there is no container beneath the chute
- the full container is being changed for an empty one
- there is a blockage in the chute.
- a maintenance operation is being carried out.

This modular, low voltage electronic system can easily be expanded to match the length of chute and number of chute entry points.

The entire system is watertight and features heavy duty components.

All that is required for installation is an electrical outlet (no electrician required). The system can be assembled in minutes without any tools.

Operation

1. The green light on each pendant is illuminated when the system has power.
2. In the event of a problem with the chute, press the emergency stop button on the nearest pendant, or on the power supply.
3. This will cause the green light to switch off and the red light to flash on all pendants.
4. In addition, the emergency stop button on the triggered pendant will illuminate and flash red.

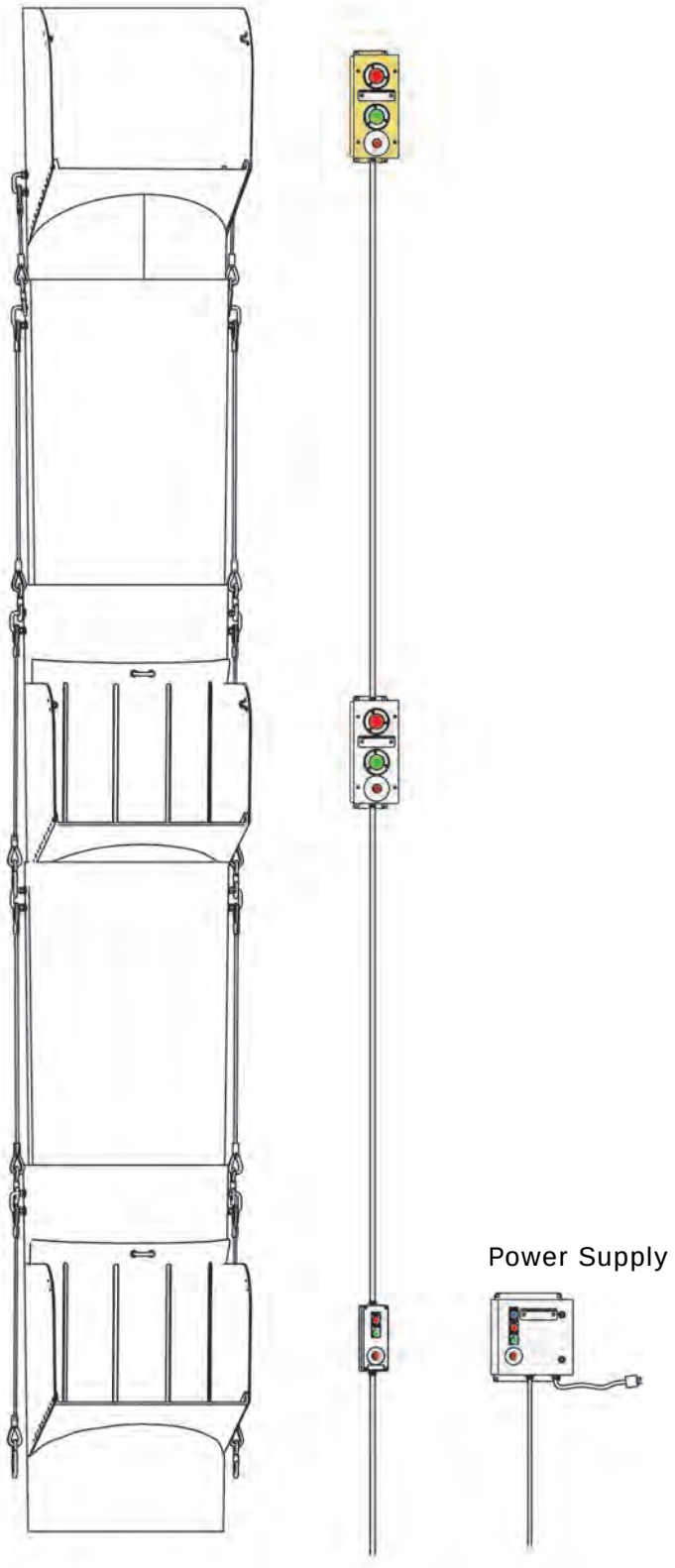


Fig. 77 Traffic Light System

Designate a Safety Monitor

Designate a safety monitor who will keep an eye on all aspects of chute usage. The Safety Monitor will ensure:

1. The chute was installed, used, and maintained according to the instructions provided by Superchute Ltd.
2. The chute is tied properly to the container with Superchute Container Cord.
3. The chute is untied from the container before the container is moved or changed.
4. Adherence to the Fire Prevention Plan (provided by the chute planner). See “E. Develop a Fire Prevention Plan” on page 52.
5. All blockage prevention measures are followed. See page 94 for guidelines.
6. There are no gaps between chute openings and the building edge. Any gaps will be covered over to prevent debris spilling outside the chute.
7. Warning gates, lockout covers, traffic lights are used at the correct times.
8. All components of the chute are kept in good working condition as the job progresses.
9. A means of communication with other jobsite workers exists.
10. Empty debris containers are readily available.
11. All work is conducted in a safe and responsible manner.
12. Fall protection safeguards exist.

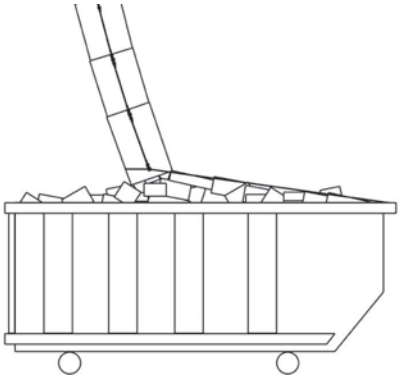
Chute Blockage Warning

⚠ WARNING

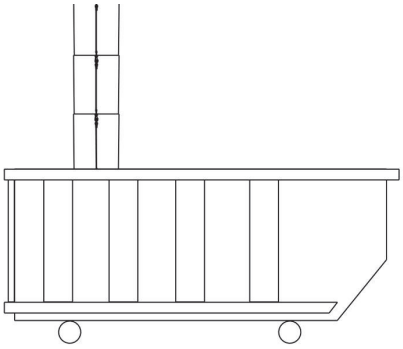
- Chute blockages are the most frequent problem encountered by chute users.
- If a chute blockage is not noticed and more debris is introduced, the total weight of the chute will rapidly increase, and the chute system could collapse. A collapsing chute system can cause serious injury or death.
- The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

Preventing Blockages

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 as it exits the chute. This situation will lead to a blockage and will prevent the blockage from being noticed.



RIGHT
Workers are able to see the debris exiting the chute and entering the container.

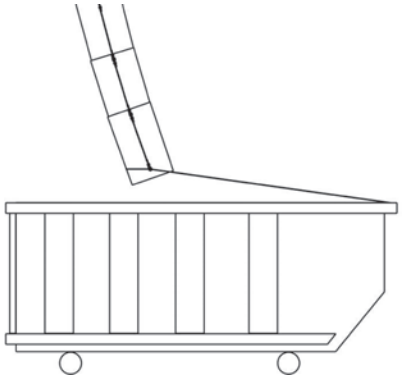


Fig. 78 Preventing blockages.

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:

- Designate a safety monitor who will, in addition to monitoring for blockages, supervise the safety of the entire debris removal operation.
- Ensure falling debris can be seen to exit the chute and enter the container (see Fig. 78).
- Ensure 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.
- Ensure the chute is not bent over balconies, shelves, or similar protrusions. These obstructions could crimp the chute and lead to a blockage. Have the chute reinstalled if it is crimped. See “Do Not Constrict the Chute” on page 38.
- 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.
- Redirect the chute’s discharge end to less filled areas of the container (chute usage must be stopped while repositioning the end of the chute).
- Test the chute for blockages frequently: Drop an identifiable object into the Top Hopper and ensure that it comes out the discharge end.
- Use load cells to monitor the chute weight and detect blockages (for details, see “Using Load Cells to Detect a Blockage” on page 79).

If A Blockage Occurs

1. Stop putting debris into the chute. Do not touch the chute.

   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. The chute could fall away from the building just as a tree falls when cut at the trunk.

2. Call in a crane with ample capacity to lower the entire chute to the ground (do not use the chute hoist or any other winching device to lower the chute, since it will not have enough capacity to safely lower a blocked chute).

3. Separate the chute sections on the ground.

4. Remove the blockage.

5. 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.

Severe Weather Precautions

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

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

Chapter 6.

Chute System Maintenance

Introduction

Although the chute system has been engineered to be long lasting, you may eventually need to replace certain parts. Always use genuine Superchute parts when replacing chute components. Do not use non-Superchute parts. Thorough overhaul servicing is offered by the Superchute factory. Call 1-800-363-2488 for details.

Repairing Small Holes in the Chute Wall

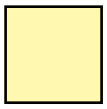
Small holes in the chute wall should be patched using plastic scavenged from unrepairable sections, or patches ordered from Superchute Ltd.

Patch kits and rivet guns are available for purchase.

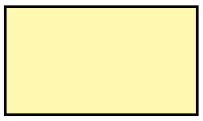
Chute sections with holes measuring more than 1’ x 1’ should be discarded.

Chute Wall Patch Kit and Rivet Gun

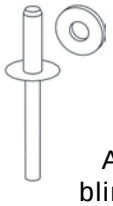
- Use the kit to patch small holes in the chute wall.
- The kit includes 6 patches, 60 rivets, and 60 washers.
- Cut the patches to size using a table saw.



3 patches:
1 ft. x 1 ft.

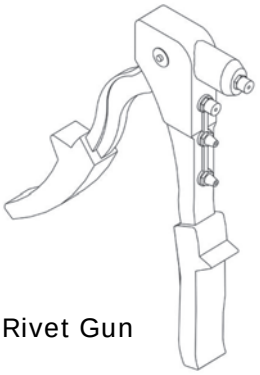


3 patches:
2 ft. x 1 ft.



x 60

Aluminum-steel
blind rivets (3/16”)



Rivet Gun

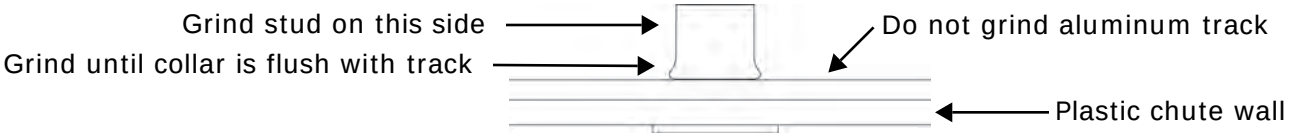
- The part number for the kit is SC-PATCH KIT.
- The part number for the rivet gun is SC-RIVGUN.

Replacing Studs on the Wraparound Regular Section

The aluminum clasp of a Wraparound regular section has 5 studs. To replace damaged studs follow these procedures:

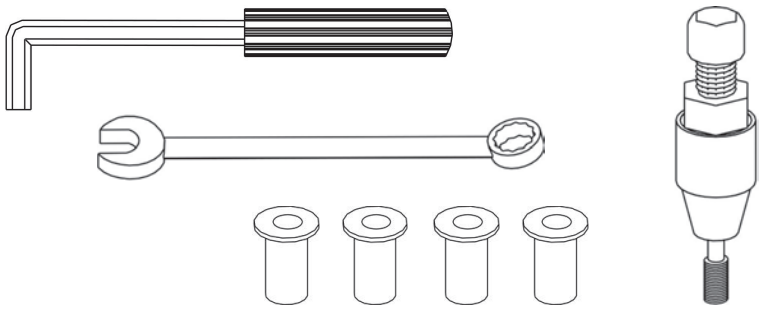
1. Remove the Damaged Stud from the Clasp

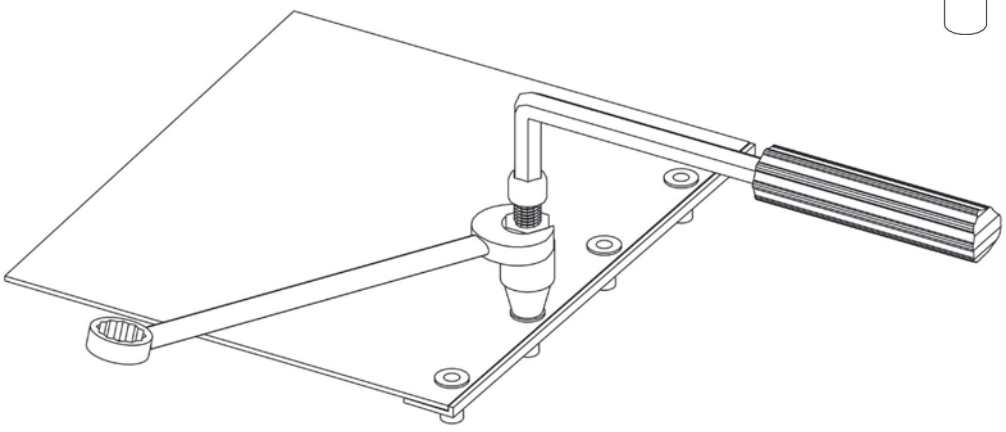
First prepare the clasp: use a mini-grinder to gently cut and grind away the damaged stud. Take care not to grind the aluminum track. Once the collar is flush with the track, use a hammer and punch to bang out the remaining head. Drilling is not recommended as it may enlarge the hole, which would make a poor fit for the new stud. Wear eye protection.



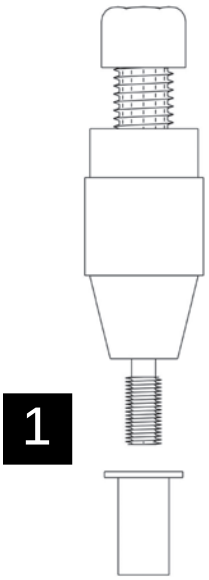
2. Obtain a Stud Repair Kit

- The kit is available for purchase from Superchute (Part No. SC-RIV TOOL KIT).
- Use the kit to install new studs on the Wraparound regular section clasp.
- The three supplied tools are used to manually attach studs to the chute clasp.
- Average installation time per stud: 1 minute.
- The kit consists of:
    - 1 Torque Head
    - 1 Allen Key
    - 1 Wrench
    - 100 Studs (Part No. SC-STUD)

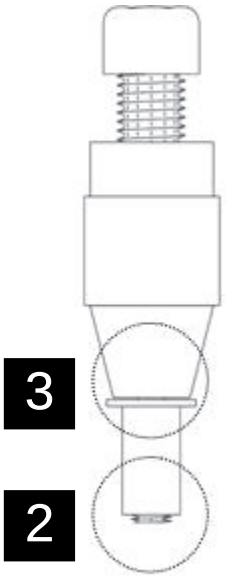


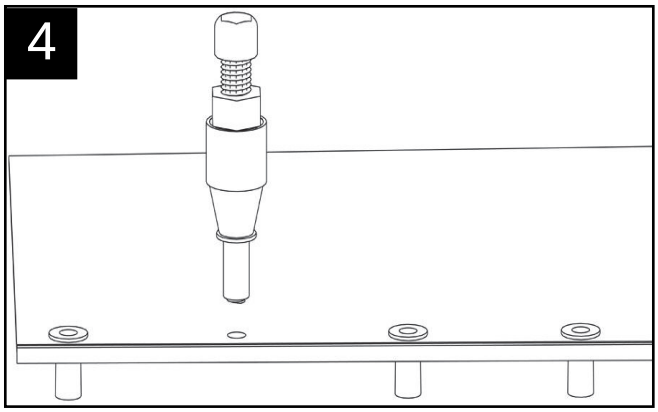


3. Install the New Stud



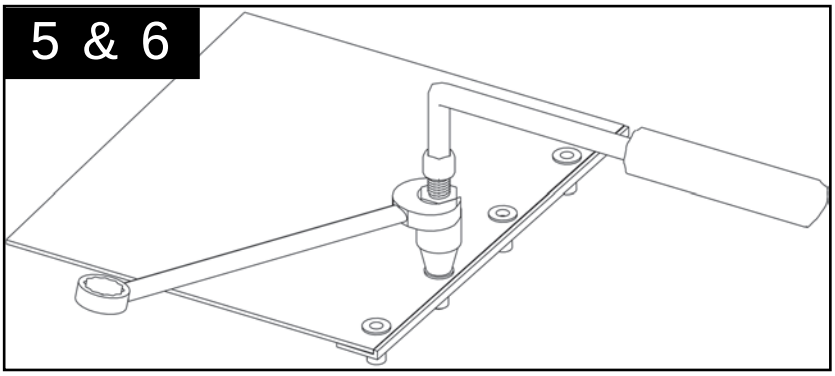
1. Screw the stud onto the bolt of the torque head.
2. The stud must be flush with the exposed end of the bolt.
3. Rotate the torque head until it is tightly seated against the flanged base of the stud.

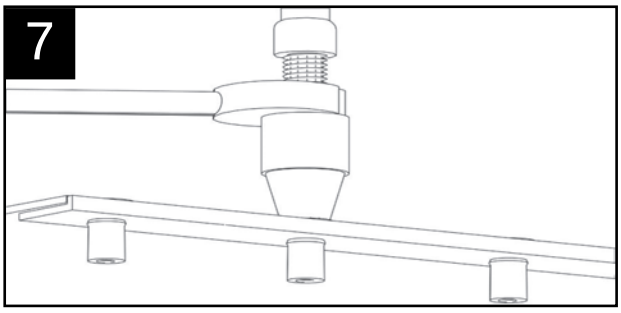




4. Insert the stud (with torque head) into the prepared installation hole.
5. Fit the supplied wrench onto the hexagonal portion of the torque-head.

6. Insert the supplied Allen key into the bolt head. While holding the torque head stationary with the wrench, turn the Allen key in a counter-clockwise direction.





7. Continue turning the Allen key until the stud's outer wall buckles. Stop when the appearance of the stud matches the other studs on the clasp.
8. Remove the Allen key and wrench from the torque head.
9. Remove the torque head by turning it.

Cable Assembly 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 hook's gate hinge and spring regularly. The gate must spring closed.
- 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). Paint or engrave a code or date into the plastic chute wall adjacent the cable assembly, or attach a durable identifying tag to the cable assembly.

Cable Assembly Inspection

Discard the entire cable assembly if any of the following conditions are discovered:

1. The wire rope:
   - has three (3) or more protruding broken wires within a 2 inch (5 cm) interval
   - has broken wires near the pressed sleeve fittings
   - has kinks, birdcages, twists, or other distortions
   - has been stretched
   - is corroded
   - has been damaged by heat, as evidenced by discolored wires.
2. The hook:
   - has a bent gate
   - has a gate that will not close
   - has a bent frame.
3. The wire rope fittings:
   - the thimble is loose and rattles in the cable eye
   - the pressed sleeve is cracked, loose or damaged.
4. The U-bolt assembly:
   - has a U-bolt that is bent, cracked or damaged
   - has missing pieces.

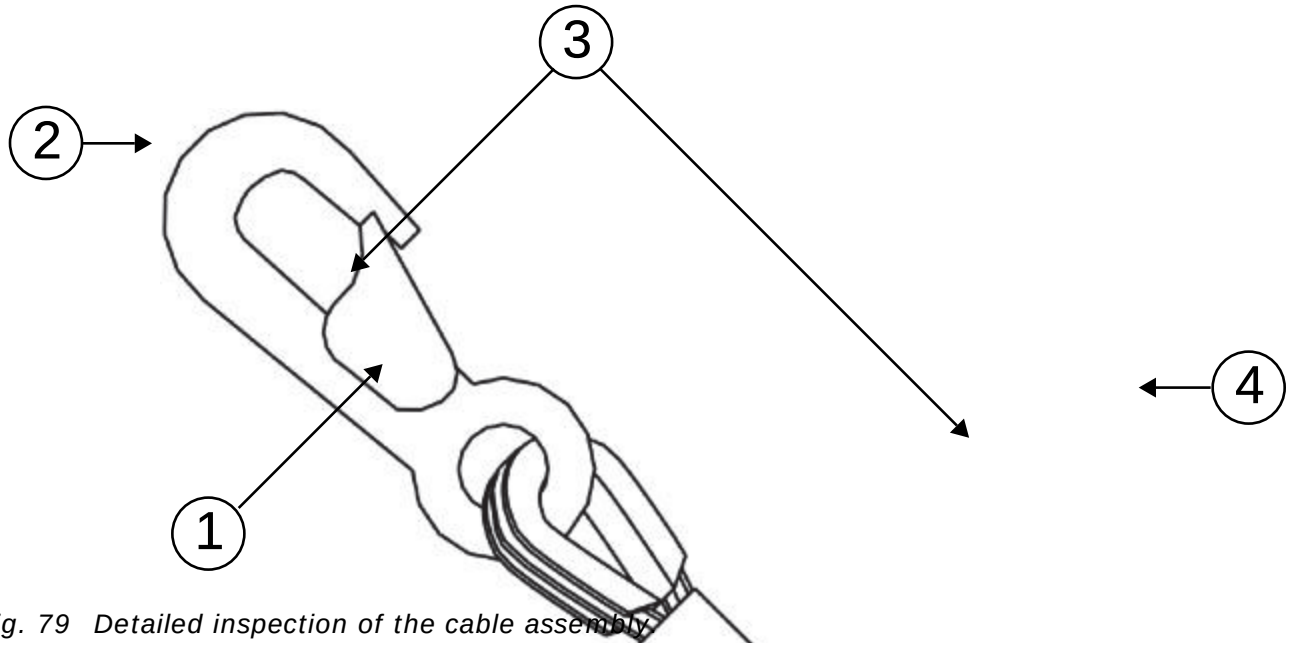


Fig. 79 Detailed inspection of the cable assembly

⚠ WARNING

- Certain factors can be abusive and lessen the load that the cable assembly (and by extension, the chute section) can withstand. Examples include:

  - twisting or bending of the cable assembly
  - disfigurement, strain, usage, weathering, heat, and corrosion
  - rapid application of load or jerking
  - the application of excessive loads.

- A weakened cable assembly can lead to a chute collapse.

- Keep corrosive substances away from the cable assemblies. Do not weld near the chute. Do not kink the cable assemblies. Do not overload the cable assemblies.

Damage Not Visible to the Eye - An Example

Incident

A blockage occurred in a tall chute. The blockage went unnoticed and workers continued to throw debris into the chute. The planners and installers had calculated the weight of the unblocked chute to be 1500 lbs. (680 kgs).

Debris continued to accumulate in the chute until the blockage was finally noticed 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 blocked chute to be 15,000 lbs. (6800 kgs).

An inspection of the cable assemblies found no obvious signs of strain. The Superchute Factory confirmed that paired cable assemblies on the chute in question provide a combined breaking strain of 20,000 lbs. (9000 kgs).

Action

Although the cable assemblies showed no obvious sign of damage, the weight of the blocked chute approached the breaking strain of the cable assemblies. 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 involved must be refitted with new cable assemblies.

Appendix A. Product 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.

Further details on “Warranties and Limitation of Liability” can be downloaded at www.superchute.com/tc.

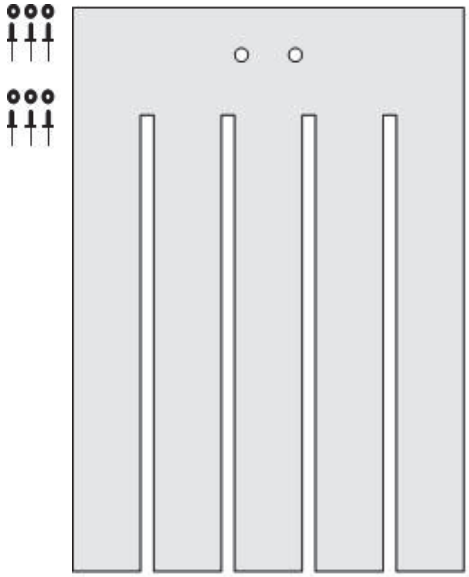
Appendix B. Chute Section Parts

This appendix illustrates and describes some of the chute section parts available for the Superchute Debris Chute System. These parts are available for purchase from Superchute Ltd.

This is not an exhaustive list of chute section parts. If you are missing a part that is not shown in this appendix, please contact Superchute Ltd. toll free 1-800-363-2488.

Part Illustrations

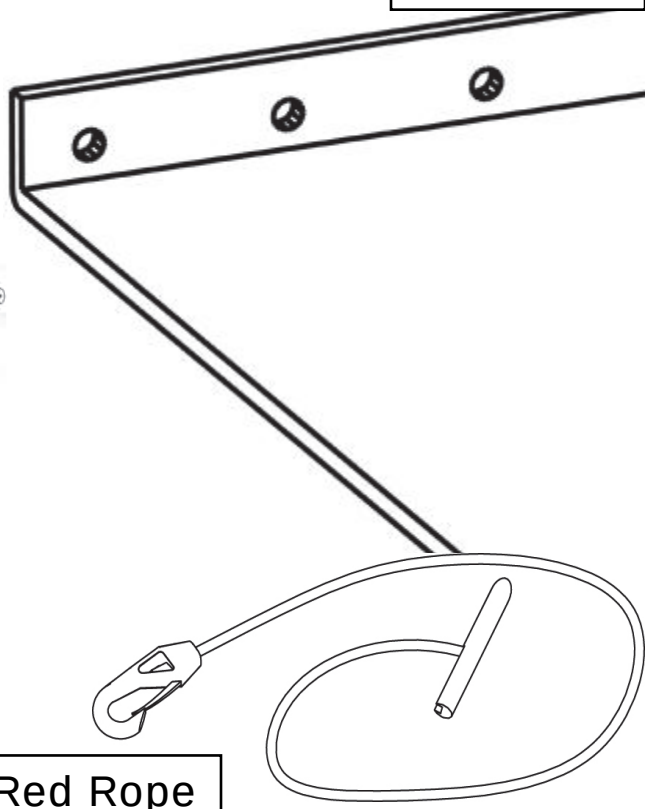
16” Cable Assembly
for Top Hopper Section



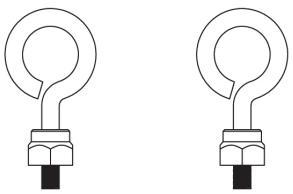
40” Cable Assembly
for Regular or Door Section

Debris Deflection
Curtain for Doors

Kickboard



Warning Gate



Eye Bolts

Red Rope

Part Descriptions

40” CABLE ASSEMBLY FOR REGULAR OR DOOR SECTION
- Working length 40” pin-to-pin
- Includes hook, 5/16” dia. wire, 1/2” dia. U-bolt
- Hook is stamped with working load limit of 1000 lbs. Breaking Strain: 10,000 lbs.

16” CABLE ASSEMBLY FOR TOP HOPPER SECTION
- Working length 16” pin-to-pin
- Includes hook, 5/16” dia. wire, 5/8” dia. U-bolt
- Hook is stamped with working load limit of 1000 lbs. Breaking Strain: 10,000 lbs

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 ordering specify chute diameter

KICKBOARD
- Loading pan for top hopper and door sections
- Replaceable
- When ordering specify diameter

RED ROPE
- For Wraparound regular sections
- Red elastic shock cord with clip and toggle
- Prevents fastened eye bolts from unscrewing

EYEBOLT
- For Wraparound regular sections
- Five required per section

WARNING GATE
- For top hopper and door sections
- Wire rope with red plastic sheath (stamped with warning)
- Includes attached durable plastic Danger sign
- Includes 2 mounting brackets and 4 blind rivets
- OSHA requirement
- When ordering specify chute diameter

ROPE BAG (not shown)
- Complete set-up for 1 Wraparound regular
- Includes two 40” (102 cm) long cable assemblies, 5 eye bolts, 1 red rope and instruction sheet.

Appendix C. OSHA Information

This appendix contains information about Occupational Safety and Health Administration (OSHA) requirements and regulations as they apply to the installation and use of the Superchute Debris Chute System.

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

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 toe board or bumper, not less than 4 inches (10 cm) thick and 6 inches (15 cm) high, shall be provided at each chute opening.

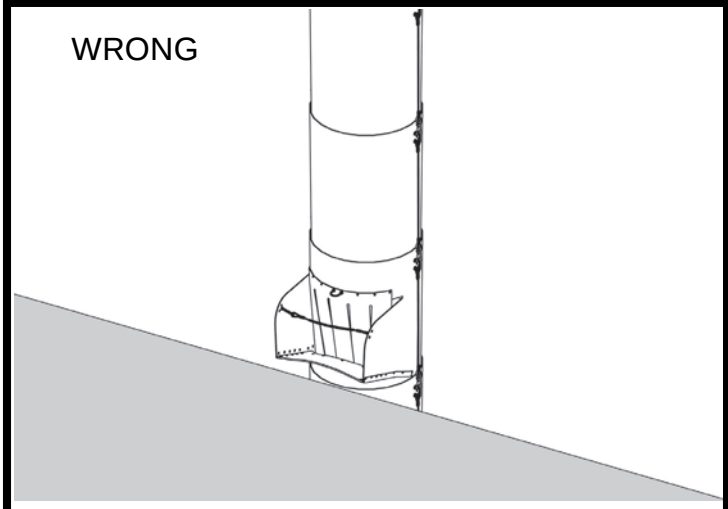
(g) Chutes shall be designed and constructed of such strength as to eliminate failure due to impact of materials or debris loaded therein.

OSHA and Fall Protection

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

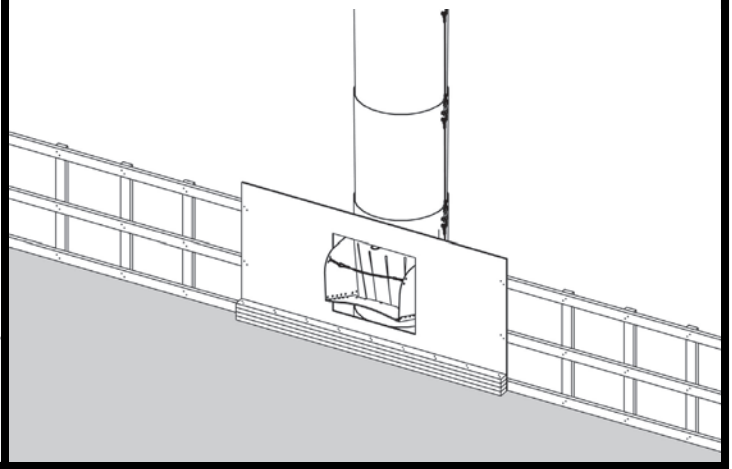
⚠ WARNING

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).

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.

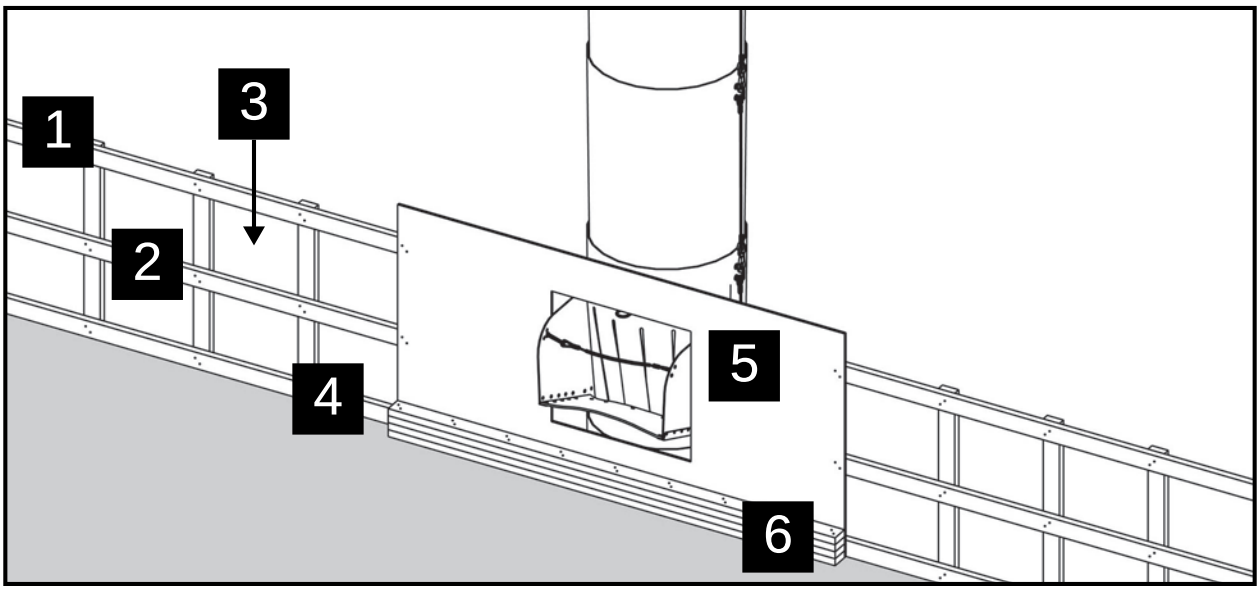
FALL PROTECTION FOR OBJECTS:

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"



These are some 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.
- Note that some states have their own regulations, which will differ from the U.S. Dept. of Labor's OSHA regulations.

Appendix D. Height and Weight Limits of Older Sections

Changes have been made to the cable assembly over time. As well, new height and weight limits are in effect. Check the date stamp on every chute section to understand your new height and 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 lbs. (900 kgs) 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.[2] 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 lbs. (225 kgs) of chute, whichever is reached first.[2] The cable assemblies of these sections feature lightweight, metal alloy hooks stamped with the words "KONG – BONAITI - ITALY" (shown on the right). The KONG hook is much weaker than the forged hooks currently used. The three possible colors of the KONG hook 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 hooks, 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" HOOK 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 with hook gates that do not spring shut.

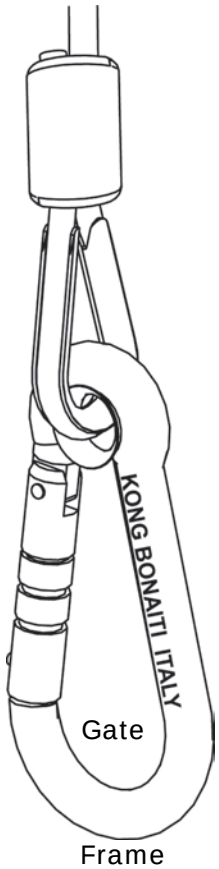


Fig. 80 KONG hook.

The above information applies to new, undamaged cable assemblies working together in pairs. Abuse or wear and tear will reduce the

1. As of June 1996 the month and year of manufacture have been branded into every chute section.
2. Superchute Ltd. 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 weight tables in Chapter 2.

strength of the cable assembly. If you are unsure of the strength of your cable assemblies, please call the Superchute factory at 1-800-363-2488.

Appendix E. Information Request Form

The Superchute factory sends out regular notices regarding new products, changes, recalls, and upgrades. Keep 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.

Name: _____ Company: _____ Address: _____ Phone: _____ Fax: _____	E-mail address: Web site address:
Number of chute sections owned: _____ Diameters of the chute sections: _____ Dates of purchase: _____ Name of the Supplier: _____	
Number of chute hoists owned: _____ Models and Serial Numbers: _____ Dates of purchase: _____ Name of Supplier: _____	

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

Appendix F. 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: Two or more chute sections linked together and used to channel debris into a container.

Chute Hoist: An engineered device 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 called a chute hoist.

Chute Section: A modular conical tube with linking hardware. Chute sections are connected 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 center line of the component. Abbreviated as WLL.

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