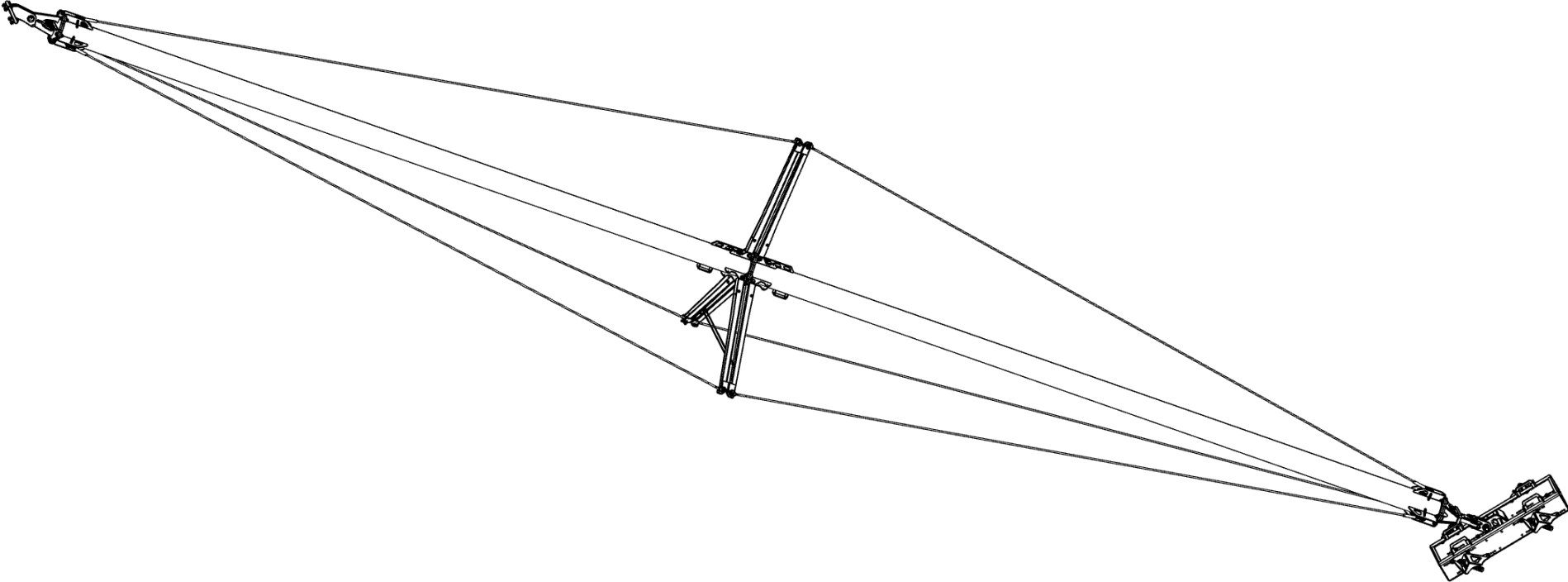


# SkyBrace 110

EQUIPMENT SAFETY, OPERATION, AND MAINTENANCE





# Contents

Overview	1
Unique Features	1
Specifications	3
Fasteners	3
Fastener Abbreviation Key	3
Capacity	5
Training	5
Inspections	5
Modifications	6
Connecting/Disconnecting	6
Worksite Safety	6
Logistics	7
Assembly	7
Planning and Procedures	7
Installation	8
SkyStretcher Mega	8
SkyStretcher Mini	8
Removal	8
Service Life	8

# Document Info

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InnovaTech, LLC, believes the information described in this manual is accurate and reliable. From time to time, design improvements will be made to the Panelization System. Photographs, text, and sketches within the body of this manual may not exactly represent your equipment. In general, this manual contains the most up-to-date information available. However, InnovaTech, LLC, cannot accept any responsibility, financial or otherwise, for any consequences arising out of the use of this material. The information contained herein is subject to change, and revisions may be issued to advise of such changes or additions.

InnovaTech, LLC, strives to continually improve their user documentation. If you have any questions or concerns about the content of this service and maintenance guide, we want to hear from you. Please e-mail us at [support@innovatechservice.com](mailto:support@innovatechservice.com) or contact us by mail at:

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InnovaTech, LLC, is continually improving their equipment to bring you the latest in building system technology. For that reason, your SkyBrace may differ slightly from what is described in this document. If you have any questions, please contact us at [support@innovatechservice.com](mailto:support@innovatechservice.com).

The InnovaTech, LLC, SkyBrace is under US PATENT PENDING protection.

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# SkyBrace

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## Overview

The SkyBrace SKB-100 is engineered to perform temporary bracing of a building exterior. It should be installed to temporarily brace the exterior main structural columns to provide stability against loads that the building will be subjected to during the period in which the building could not otherwise stand on its own against wind loads and other natural forces while initially being erected.

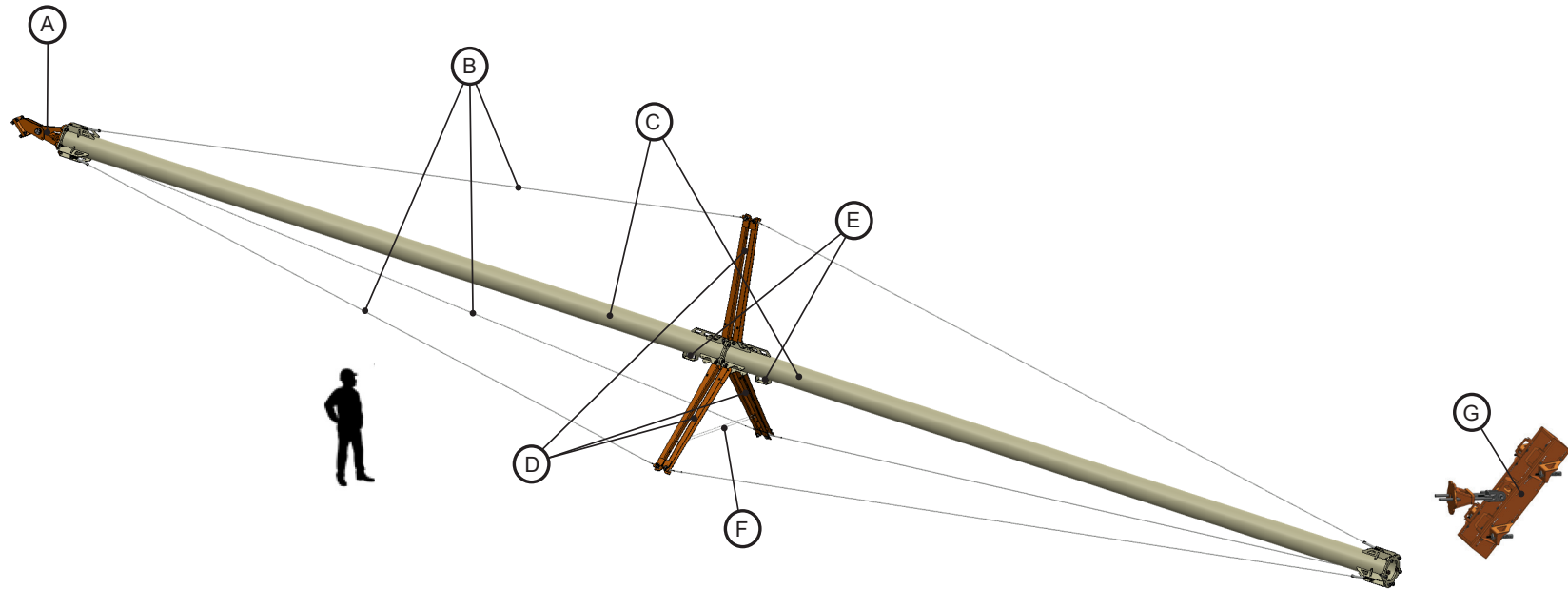
## Unique Features

- Engineered high-strength extended-length temporary bracing support.
- Two load-specific hydraulic attachments for fine-tuning the brace length for trueing the structure.
- Tension cables designed to add lateral and longitudinal support to SkyBrace.
- Configurable ground load distribution attachment to various types of ground foundation solutions.
- Various bracket solutions for connecting to building structure.



# Nomenclature

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1. **Fixed Adapter** - The highest connection point where the braced structure is mounted to connection bracket accessories.
2. **Support Cables** - Steel cables pre-tensioned to add rigidity to the Main Tube Spans.
3. **Main Tube Span** - Universal hollow steel tubes providing the main bracing function of the SkyBrace assembly.
4. **Cable Struts** - Raised from transport mode and bolted together in pairs to pre-tension and form a rigid strut for the support cables.
5. **Hoisting Brackets** - Connection point for hoisting and transporting the fully assembled SkyBrace.
6. **Strut Support Cables** - Provides additional structure for the Cable Struts under load.
7. **Master Bolt** - The lowest connection point where the SkyBrace is connected to a foundation solution and accessories at ground level.
8. **Adjustment Unit** - Adjustable slip-joint connection where SkyBrace length is extended or shortened by as much as two feet (depending on the adjuster attachment being used) to plumb the supported structure and finally secured in place with bolted plate washer sets. (see "Additional Accessories" on page 4)



## Specifications

Dimensions, weights, and capacities are listed below.

Description	Shipping Mode	Erected
Net Weight	Approx. 1800 lbs.	3682 lbs.
Capacity	N/A	Refer to Capacity Charts on page 00
Overall Length	40 ft (Adjusting Unit 5')	80 ft (79'-81')
Overall Width	20 in.	9 ft. 10 in.
Overall Height	20 in.	11 ft. 8 in.
Adjusting Unit (8) Weight:	Approx. 500 lbs.	

## Fasteners

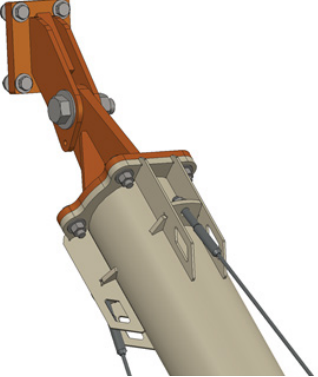
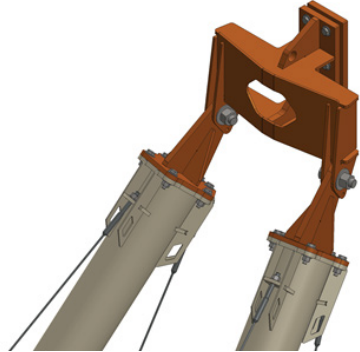
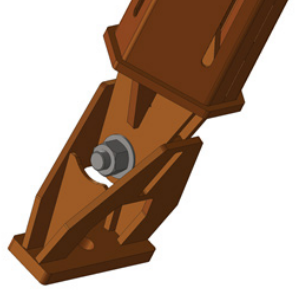

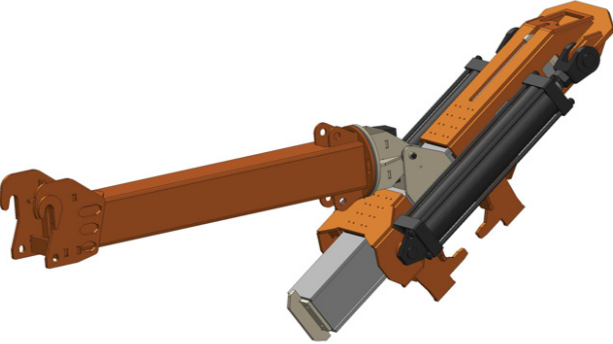

The use of proper fasteners is imperative. Make no substitutions. Use SAE washers on the nut side of the connection. Refer to tables below for fastener type, location, and specs.

### Fastener Abbreviation Key

Location Name	Nomenclature #	Abbreviation
Adjustment Unit	8	AU
Master Bolt	7	MB
Cable Struts	4	CS
Main Tube Span	3	MTS
Fixed Adapter	1	FA
Double Fixed Adapter	(1)	DFA
Support Cables	2	SC
Strut Support Cables	6	SSC

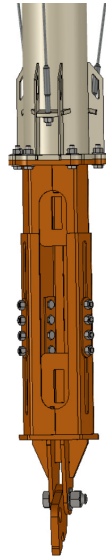
Connection	Description	Size	Torque
MTS - MTS	A325	1-8 x 4"	500 ft / lb
MTS - AU	A325	1-8 x 4"	500 ft / lb
MTS - FA/DFA	A325	1-8 x 4"	500 ft / lb
SC - MTS	Grade 5	1-8 standard nut	500 ft / lb
SSC - CS	Grade 5	½ - 13 x ½"	150 ft / lb
CS - CS	A325	1-8 x 3 ½"	500 ft / lb

## Additional Accessories

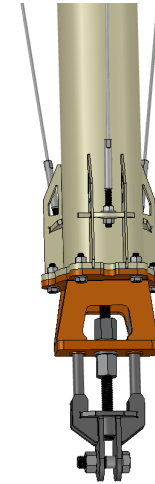
Accessory Name	Description	
SkyStretcher Mega (“SkyStretcher Mega” on page 12)		
SkyStretcher Mini (“SkyStretcher Mini” on page 12)		
Helical Piers		
		
<p><b>Fig. 1:</b> Column/Wall Fixed Adapter Bracket to SkyBrace</p>	<p><b>Fig. 2:</b> Column/Wall to Dual Fixed Adapter to SkyBraces</p>	<p><b>Fig. 3:</b> Micropile to SkyBrace</p>
<p>Weight: 85 lbs.</p>	<p>Weight: 650 lbs.</p>	<p>Weight: 135 lbs.</p>
		
<p><b>Fig. 4:</b> Multiple Micropile Load Distributor to Skybrace</p>	<p><b>Fig. 5:</b> SkyStretcher Mega - Hydraulic Adjustment Telehandler Attachment for setting the SkyBrace Adjustment Unit</p>	<p><b>Fig. 6:</b> SkyStretcher Mini - Hydraulic Adjustment Attachment for setting the SkyBrace Adjustment Unit</p>
<p>(see “SkyStretcher Mega” on page 12)</p>	<p>(see “SkyStretcher Mega” on page 12)</p>	<p>(see “SkyStretcher Mini” on page 12)</p>
<p>Weight: 1,120 lbs.</p>	<p>Weight: 3,050 lbs. (Compatible with Xtreme Telehandler 2450, 3410)</p>	<p>Weight: 50 lbs. (Powered by HPU attached to skid)</p>



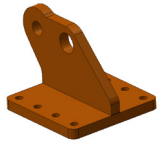
## Compatible Base Adapters



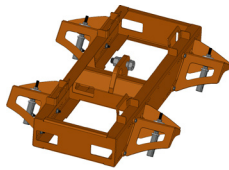
*Fig. 7: SKB 100*



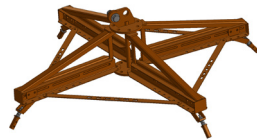
*Fig. 8: SKB 110*



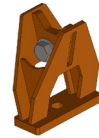
*Fig. 9: SKB to Footing Connection*



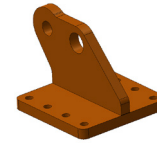
*Fig. 10: SKB to SkyBase100*



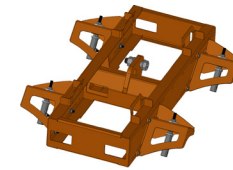
*Fig. 11: SKB to Tripod*



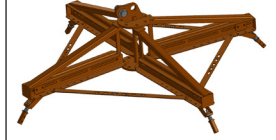
*Fig. 12: SKB to Micropile Adapter*



*Fig. 13: SKB to Footing Connection*



*Fig. 14: SKB to SkyBase100*

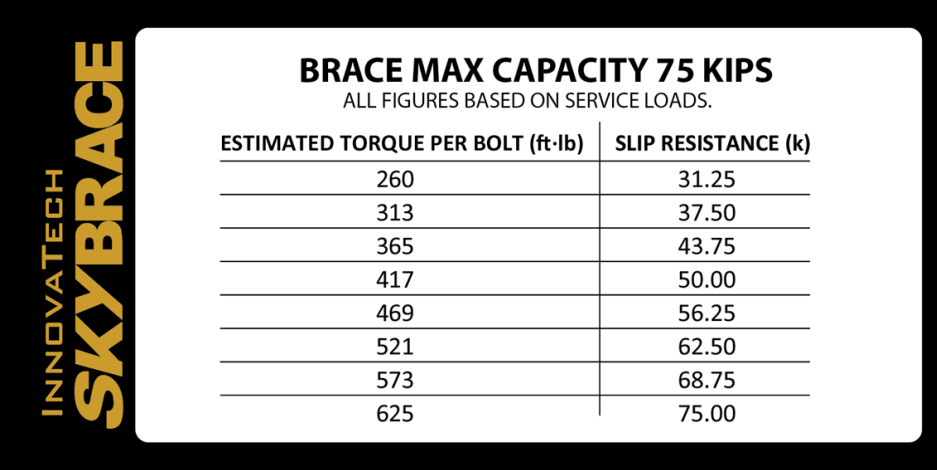


*Fig. 15: SKB to Tripod*

## Capacity

### SKB100

Refer the building plan and identify the necessary torque per bolt to achieve proper slip resistance of calculated loads. A decal copy of the chart below can be found attached to the SkyBrace 100 Adjustment Unit:



<b>BRACE MAX CAPACITY 75 KIPS</b>	
ALL FIGURES BASED ON SERVICE LOADS.	
<b>ESTIMATED TORQUE PER BOLT (ft-lb)</b>	<b>SLIP RESISTANCE (k)</b>
260	31.25
313	37.50
365	43.75
417	50.00
469	56.25
521	62.50
573	68.75
625	75.00

### SKB110

The SkyBrace 110 capacity is 75 Kips.

## Safety

This equipment was specifically designed to enhance safety in the steel construction work environment. InnovaTech endeavors to maintain a positive reputation in the industry by preventing accidents and creating a safe, efficient, and productive work environment.

## Training

Only qualified individuals should be allowed to rig, lift, and install the SkyBrace equipment

## Inspections

InnovaTech recommends a thorough inspection of the SkyBrace before deployment and regular inspection intervals during use to prevent failures and identify potential hazards, recent damage, and initiate repairs or replacements. A competent person should perform inspections. Minimum inspection procedures should be completed for the following conditions:

- Every 72 hours
- After high winds (35 mph or more)
- Monday after returning from the weekend
- After any holiday breaks

Before and during installation, a thorough inspection of the SkyBrace components should be performed:

1. Inspect Main Tube Spans for damage such as dents or cracks.
2. Inspect all Support Cables, Strut Cables for kinks, fraying, or unusual wear.
3. Assure all Cable Fasteners are in place and secure.
4. Assure all bolted connections are the correct size and type, are properly installed with washers placed on the nut side of the connection, and the properly torqued.
5. Assure all Master Bolts are the correct size and type, and are properly installed, with washers placed on the nut side of the connection, and the properly torqued.
6. Inspect all Accessory Brackets for cracks and assure that correct bolting is installed, secure and properly torqued.
7. Once installation is complete, assure all braces are properly flagged and barricaded.

If damages are found to be present that warrant repair or replacement, notify InnovaTech or a qualified maintenance technician. DO NOT use SkyBrace units that are in poor repair.

## Modifications

### WARNING

Modifications to the SkyBrace or attachments could affect capacity which could result in catastrophic failure, death, or serious injury. DO NOT make modifications to the SkyBrace or attachments without prior written approval from InnovaTech, LLC.

- DO NOT perform unauthorized modifications or alterations.
- DO NOT modify, disable, or bypass any safety procedures.
- DO NOT burn or drill holes in the SkyBrace or attachments.

## Connecting/Disconnecting

### WARNING

Failure to use proper safety procedures when connecting and disconnecting the SkyBrace could result in death or serious injury.

- When making connections, keep surfaces clear of dirt, mud, snow, ice, debris, and other hazards.
- DO NOT climb beneath equipment without proper support columns in place.

## Worksite Safety

### WARNING

Use proper safety procedures and avoid hazardous situations while installing the SkyBrace equipment to prevent death, serious injury, or property damage.

- Keep the work site clear of unauthorized persons, equipment, and any other hazards while installing the SkyBrace.
- Check the work area and installation points for conditions, and check for obstacles such as overhead power lines, and other temporary bracing.
- Know about underground hazards.
- DO NOT allow bystanders in the work area.
- Follow established site-specific safety plans for erection paths on the work site.
- Follow work site signs and signals.
- Stop for poor visibility conditions, such as dust, smoke, fog, etc. Wait until visibility improves before continuing.
- DO NOT attempt to inspect or install the SkyBrace equipment if you are using drugs, alcohol, or any medication that might impair your judgment or ability.

# Setup

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A general overview describing steps to follow before installing and adjusting the SkyBrace and adapting attachments.

## Logistics

When preparing the SkyBrace equipment for shipping, the components must be disassembled and adjusted into shipping mode. Make account for the weight of each piece and utilize proper load distribution, cribbing, and straps for safe transport and delivery.

Use care when loading and unloading to avoid property damage as well as avoiding damage to the SkyBrace Main Tube Span and Support Cables. Adhere to proper rigging techniques and communicate with spotters with pre-arranged hand signals.

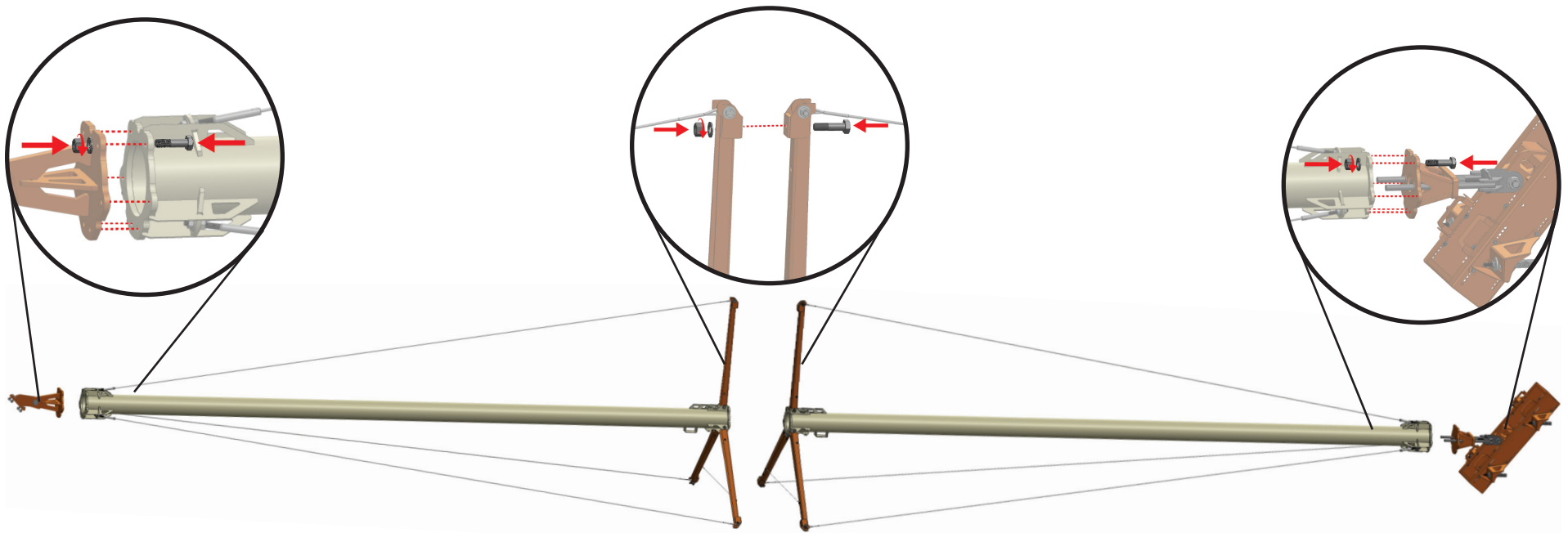
Assure adequate space for unloading, staging, and assembly of the SkyBrace.

## Planning and Procedures

Follow approved erection sequence plans and procedures which have been approved by site overseers.

Proper techniques should be utilized by trained rigging personnel and crane operators while communicating with spotters with pre-arranged hand signals.

## Assembly



*Fig. 16: Assembly process*

See “Fasteners” on page 3 for appropriate assembly hardware.

While in shipping mode, the Cable Struts will be folded against the Main Tube Span. Choose the proper connection accessories and ready them for joining to the building and micropiles or foundations.

When positioned in line for assembly, the two components of the Main Tube Span must be joined and then hoisted to allow the unfolding of Cable Struts.

The unfolding of the Cable Struts and bolting-in-place performs the action of pre-tensioning the support cables. The tension must be overcome in order to fasten the Cable Strut pairs together.

Once assembled, then the SkyBrace must pass inspection, and rigged for installation.



## Installation

Once equipment is delivered onsite and preliminaries have been completed, the SkyBrace components must be completely assembled from shipping mode in order to be erected.

Identify the proper building connection accessories and bolting as well as preparations for micropile installations or footing connections.

Once everything is arranged properly and the SkyBrace is assembled, rigged and placed in position, utilize the appropriate attachment to assist in truing and plumbing the supported structure and mounting in place. Follow the engineered torque specifications to finalize the installations. Flag and barricade all bracing.

Follow regular inspection procedures and intervals after installation.

To adjust and true the SkyBraces, determine which adjustment attachment is appropriate. Follow instructions below.

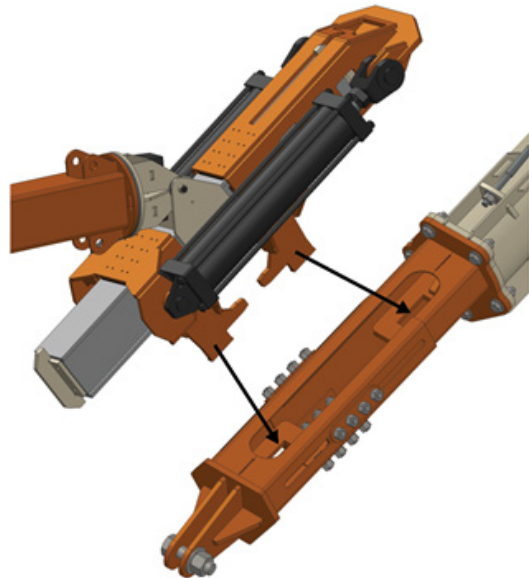
## SkyStretcher Mini



### *Purpose*

The SkyStretcher Mini is a small, hand-held hydraulic adjustment attachment for the SkyBrace. It is powered by a portable hydraulic pump. The “Mini” is preferred when site conditions prohibit the “Mega” from accessing the SkyBraces.

## SkyStretcher Mega



### *Purpose*

The SkyStretcher Mega is a Forklift-powered hydraulic adjustment attachment for the SkyBrace. It is designed to fit on a size B Forklift (it can be run by a 9K, 10K or 12K) and is connected to the Forklift’s auxiliary hydraulics.

### *Adjustment Procedure*

At least two competent people are required to perform a SkyBrace adjustment procedure: Forklift operator and spotter.

1. Forklift operator drives forklift to the brace and maneuver the SkyStretcher Mega into the brace.
2. Operator loosens the bolts holding the brace, then runs the aux hydraulics to level the beam, taking directions from spotter to determine how far to adjust the brace.
3. Operator tightens the bolts in place.

*SkyStretcher Mega Capacity Chart*

<b>Guage Pressure</b>	<b>Pushing Force lbs</b>	<b>Pulling Force lbs</b>
500	38485	28863
550	42333	31750
600	46182	34636
650	50030	37522
700	53878	40409
750	57727	43295
800	61575	46182
850	65424	49068
900	69272	51954
950	73121	54841
1000	76969	57727
1050	80818	60613
1100	84666	63500
1150	88515	66386
1200	92363	69272

1250	96212	72159
1300	100060	75045
1350	103908	77931
1400	107757	80818
1450	111605	83704
1500	115454	86590
1550	119302	89477
1600	123151	92363
1650	126999	95249
1700	130848	98136
1750	134696	101022
1800	138545	103908
1850	142393	106795
1900	146241	109681
1950	150090	112567
2000	153938	115454
2050	157787	118340
2100	161635	121226

2150	165484	124113
2200	169332	126999
2250	173181	129886
2300	177029	132772
2350	180878	135658
2400	184726	138545
2450	188575	141431
2500	192423	144317
2550	196271	147204
2600	200120	150090
2650	203968	152976
2700	207817	155863
2750	211665	158749
2800	215514	161635
2850	219362	164522
2900	223211	167408
2950	227059	170294
3000	230908	173181

## Removal

Once the structure is completed to the degree that the temporary bracing is no longer necessary, follow reverse methods for removal and stage the Skybrace in a location to facilitate disassembly and storage and/or loading for transportation away from the site.

Follow necessary inspections procedures and if damages are found to be present that warrant repair or replacement, notify InnovaTech or a qualified maintenance technician.

# Maintenance

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In order to maintain the highest level of safety and operation efficiency, InnovaTech recommends an established inspection and service interval. Contact your service representative for recommendations.

## Service Life

InnovaTech Products and Services are constantly being improved for serviceability and durability. If any portion of the equipment is deemed unsafe or in poor repair, appropriate procedures should be initiated for repair or replacement. InnovaTech recommends complete service and inspection procedures be performed prior to site deployment. No portion of damaged equipment should be utilized for any length of time.

## Replacement Manuals, Decals

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Replacement manuals and decals for the SkyBrace can be obtained by contacting us by phone, mail, or email.

## Contact Us

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Email [support@innovatechservice.com](mailto:support@innovatechservice.com)

